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Title

Bioarchaeology, Activism and Social Justice: Equitable and Sustainable Global Futures

Permalink

https://escholarship.org/uc/item/28q460bp

ISBN

978-3-032-10354-3

Publication Date

2026-03-30

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Bioarchaeology and Social Theory
Series Editor: Debra L. Martin

Siân E. Halcrow · Sabrina C. Agarwal · Carlina de la Cova · Rebecca Gowland · Gwen Robbins Schug *Editors*

Bioarchaeology, Activism and Social Justice

Equitable and Sustainable Global Futures

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Springer

Bioarchaeology and Social Theory

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ISSN 2567-6776 ISSN 2567-6814 (electronic)
Bioarchaeology and Social Theory
ISBN 978-3-032-10353-6 ISBN 978-3-032-10354-3 (eBook)
https://doi.org/10.1007/978-3-032-10354-3

This work was supported by University of California, Berkeley Foundation

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

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Siân E. Halcrow: To my kids, who remind me of what I am fighting for
Sabrina C. Agarwal: For Niko, the future is yours to change
Carlina de la Cova: For all that were taken without consent for us to learn from, may this book do right by you and your memory to make us do and be better
Rebecca Gowland: For my boys, as always
Gwen Robbins Schug: To a more just, equitable, sustainable future for all

Foreword

This volume is the 26th to come out since the first one in 2015 in the Springer series, *Bioarchaeology and Social Theory*. In 10 years, the series has showcased innovative, new and emerging approaches to bioarchaeology that have pushed boundaries, explored new ways of doing research, and addressed complex historical, ethical and moral issues. These volumes demonstrate the challenges of balancing scientific data collection and analysis, while addressing the broader implications, responsibilities and ethical dimensions of working with human remains.

This volume is a breakthrough in terms of its compelling thesis regarding bioarchaeologists as activists. The approach here side-steps the outdated dictate that scientists should be apolitical and passive as well as neutral in their opinions. The chapters provide a number of pathways for how to combine research with activism and why it is important to do so. Each chapter engages with notions of activism in all of its complex formulations, contexts, motivations and outcomes. Authors examine activism in a variety of settings such as academia, laboratories, field sites, museums and heritage locales, as well as within communities. The chapters demonstrate that bioarchaeology is never separate from social and political realities of the present. Because the past is contested, vulnerable, and deeply tied to understanding things such as structural violence, bioarchaeologists have a responsibility not only to study past humans but to advocate for the ethical use of data in how it is collected, analyzed, interpreted, displayed and used or not used.

The collection of chapters here engage with the question—why should bioarchaeologists be both scholars and researchers along with being engaged with the broader world through activism? That is a complex, deep and extremely important question for all bioarchaeologists to be asking themselves. Collectively, the volume chapters makes a very strong argument for why and how to make activism part of how bioarchaeology is taught and practiced. All of the chapters start with a commitment to social justice, equity, inclusivity and broad engagement and most rely on a relatively new theory, a Theory of Change. This framework aids bioarchaeologists in formulating bioarchaeological and forensic work that will be transformative, that is, that will not only reveal the root causes of human problems such as injustice and inequality, but will also promote long-term structural changes. In other words, these

authors are revealing where structural violence resides and in a variety of ways, suggest what avenues of change can be used to subvert and rescind the forces that keep in in place.

The chapters cover many specific case studies that touch on topics that will resonate with students and those interested in what we can learn from the past. From climate change and environmental responsibility, to democratizing knowledge, to social justice and humane approaches to animal welfare, to exploring the ethical obligations of bioarchaeologists in their research using age, sex and DNA, to the ethics of representation, to collaboration with individuals whose ancestors are at risk, these chapters demonstrate the concrete ways that research and activism can be undertaken in order to make inroads into doing good and making real transformations in the world. Bioarchaeologists and forensic anthropologists are uniquely situated to do this kind of work, but relatively few avenues of training and gaining experience were available until now.

Bioarchaeology as envisioned by the authors in this volume is inseparable from social justice. Bioarchaeologists often work with Indigenous, descendant, and local communities whose voices have historically been marginalized. Chapters in this volume make clear that to practice bioarchaeology without activism risks perpetuating colonial patterns of extraction and exploitation. Bioarchaeologists cannot pretend that their work is neutral. To excavate is to make choices about whose stories are told, whose ancestors are disturbed, and whose history is preserved. Those choices are inherently political. By embracing activism, bioarchaeologists in this volume affirm their responsibility as stewards of heritage, as allies to communities, and as defenders of truth in a world where the past is constantly under attack and misused to preserve the structural status quo. Silence may appear apolitical, but it is, in fact, complicity. The bioarchaeologists who do not make connections to the world today risks becoming the unwitting accomplice of maintaining social and environmental injustices.

Reading this volume will affirm that many ways that bioarchaeologists can be of use to alleviating urgent problems in the world today. Bioarchaeology is not only about the past but about human resilience and adaptation. This volume offers an exciting and innovative approach that can move studies that rely on human remains and mortuary contexts into new arenas bolstered by social theories such as the Theory of Change. These chapters provide a body of scholarship that demonstrates the relevance of this kind of approach. In the end, activism is not an add-on to bioarchaeology—it is its natural extension. What we learn collectively from these chapters is that to dig into the past is also to stand up in the present.

University of Nevada, Las Vegas, NV, USA Debra L. Martin

Foreword

Bioarchaeology as an Activist Practice

This volume arrives at a moment when archaeology and anthropology can no longer afford neutrality. The climate crisis, rising authoritarianism, resurgent racism, and widening inequality demand disciplines that act, not simply observe. This volume positions bioarchaeology not as a technical subfield of anthropology but as an activist practice grounded in ethical responsibility to both the living and the dead.

My own career has been shaped by these questions. In the Philippines, my work on the Ifugao Rice Terraces, long celebrated as "2,000 years old," demonstrated that these landscapes were constructed about 400 years ago during Spanish colonization. This re-dating reframed the terraces as products of historical agency rather than ancient monuments, showing that the Ifugao built them as a strategy of resistance and adaptation to colonial pressures. Describing the terraces as "timeless" erases Indigenous innovation; recognizing their historical dynamism restores Ifugao creativity and intent to the narrative.

This approach moves beyond academic correction and reflects a commitment to collaboration and accountability. Working with the Ifugao community has shown that archaeology can strengthen local heritage initiatives and challenge colonial frameworks that persist in both scholarship and policy. Community-centered research transforms the field into a platform for advocacy, ensuring that the knowledge produced contributes to local empowerment and the protection of cultural landscapes. In this way, activism becomes inseparable from ethical practice.

This activist stance, which centers Indigenous voices and builds collaboration with communities, resonates with the framework of this volume. Like the contributors, I see archaeology as inseparable from advocacy. In recent years, I have written about climate change, the democratization of food, and the persistence of racialized migration theories in Philippine education, all driven by the conviction that scholarship must speak beyond the academy. Activism is not a departure from research; it is its fulfillment.

Confronting Structural Violence and Colonial Legacies

The first part of the volume demonstrates how bioarchaeology exposes the embodiment of inequality. By examining institutionalized and marginalized populations, the contributors show how poverty, racism, and structural neglect become inscribed on human bodies. Their work resonates with broader struggles to uncover how systems of oppression shape both biological and social realities.

In my own research, this commitment to confronting structural violence parallels efforts to challenge colonial frameworks that persist in Philippine archaeology. For decades, narratives of "waves of migration" and the "Malay race" have reinforced racial hierarchies disguised as scientific explanation. Such frameworks continue in state curricula, such as the new Matatag program, showing how outdated theories perpetuate inequality. Like bioarchaeologists who question scientific complicity, archaeologists must resist theories that erase Indigenous histories and deny local agency.

This section also engages the politics of curation and display, urging scholars and institutions to confront how museums aestheticize or commodify suffering. The discussion recalls efforts in the Philippines to develop community museums, such as the Ifugao IPED Center, that allow heritage to be experienced as lived identity rather than distant spectacle. Curation, whether of artifacts or of narratives, is never neutral. It can reproduce structural violence or become a site for resistance and reclamation.

Expanding Justice: Gender, Sexuality, and Disability

The second section broadens the conversation on justice by engaging gender, sexuality, and disability. Contributors demonstrate how new technologies, such as ancient DNA analysis and proteomics, can unintentionally reinforce social biases if left unexamined. Their call to "queer" bioarchaeology, to recognize the complexity of identity rather than impose binary categories, parallels efforts in pedagogy that seek to make classrooms spaces of inclusion and activism.

This intersectional approach mirrors the challenges we face in Southeast Asia, where inequalities in health, education, and environment continue to deepen. My own reflections on food and identity follow similar lines. Popular Philippine dishes like the munggo (mung beans), KBL (pigeon peas, pork, and jackfruit), and laing (taro leaves) speak of adaptation, exchange, and social history. Chili peppers and pigeon peas, introduced through global trade, carry stories of movement, inequality, and resilience. Food, like bioarchaeology, is an archive of struggle and creativity. To democratize it is to confront the hierarchies that shape both diet and knowledge.

The section's discussions of disability also underscore how social determinants such as poverty, segregation, and racism leave biological traces. This perspective connects with ongoing debates about disaster vulnerability in the Philippines, where

typhoons and economic precarity deepen existing inequities. Understanding how inequality becomes embodied, whether through disease or disaster, situates bioarchaeology squarely within contemporary conversations about justice.

Community-Centered Scholarship and Public Engagement

The final section highlights the transformative power of engaged scholarship. Contributors show how community partnerships, collaborative research design, and inclusive museum practices redefine what ethical science can look like. The contributors show how community partnerships, collaborative research design, and inclusive museum practices redefine what ethical science can look like. They demonstrate that the role of the scholar extends beyond documentation to participation, ensuring that research serves the communities whose histories it studies.

This commitment aligns closely with my work in Ifugao, where archaeology has become a shared enterprise between researchers, local governments, and schools. Collaborative fieldwork and heritage education have created opportunities for dialogue and self-representation, demonstrating how archaeology can inform heritage policy and nurture cultural pride. The Banaue Declaration, developed through the 2024 Global Indigeneity Conference, embodies this spirit of engagement by calling for ethical, non-extractive, and community-driven research.

The editors close the volume with a roadmap that encapsulates this vision by urging readers to interrogate positionality, center communities, dismantle hierarchies, amplify diverse voices, and institutionalize change. These commitments echo ongoing efforts across Southeast Asia to link archaeology with climate action, equity, and capacity building. The future of bioarchaeology, and anthropology more broadly, depends on embracing activism as integral to scholarship.

Bioarchaeologists as Activists

This book demonstrates that activism is not an optional addition to bioarchaeology. It is the discipline's ethical foundation. To study the dead is to inherit responsibilities to the living, to tell stories ethically, resist narratives that erase agency, and ensure that research benefits rather than exploits communities. Every excavation, interpretation, and publication carries consequences, shaping how societies remember, value, and protect their pasts.

Activism in this sense does not mean abandoning scientific rigor. It means recognizing that the questions we ask, the collaborations we pursue, and the ways we communicate our findings all have political and ethical dimensions. It asks us to consider who gains and who is left out, who speaks and who remains unheard. Bioarchaeology, when practiced with awareness of these dynamics, becomes a form

of social engagement that connects evidence from the past to struggles for justice in the present.

The skeletons we study, like the terraces or the foods that sustain communities, are not relics of a silent past. They are archives of struggle, adaptation, and survival. Each fracture, healed wound, or nutritional marker tells a story of endurance under systems of power and inequality. To honor these lives requires more than analysis. It requires action. We honor the dead by ensuring that their stories inspire accountability, empathy, and change.

To be a bioarchaeologist is to be an activist who recognizes that research is inseparable from responsibility. The pursuit of knowledge gains meaning only when it contributes to a more just and humane world.

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Stephen B. Acabado

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About the Editors and Contributors

About the Editors

Sabrina C. Agarwal is a Professor and Chair of the Department of Anthropology at the University of California, Berkeley. She is engaged in the application of research in bone maintenance to dialogues of social identity, embodiment, developmental plasticity, and inequality in bioarchaeology. She has examined age- and growth-related changes in cortical bone microstructure, trabecular architecture, bone mineral density, and bone strength in several historic British and Italian archaeological populations, and has examined the long-term effect of growth and reproduction (parity and lactation) on the human and non-human primate maternal skeleton, and studying samples from prehistoric Turkey and Japan. Her current research is also invested in bioethics of skeletal biology/bioarchaeology, specifically the practice and ethics curation and repatriation of skeletal/ancestral remains. She has numerous peer-reviewed publications and co-edited volumes including *Social Bioarchaeology* and *Exploring Sex and Gender in Bioarchaeology,* and co-author of the best-selling textbook *Laboratory Manual and Workbook for Biological Anthropology.* She is co-founder of the Western Bioarchaeology Group (WeBiG), co-founder and former co-chair of the Bioarchaeology Interest Group in the Society for American Archaeology (SAA), is co-founding Editor-in-Chief of *Bioarchaeology International*, and currently serves on the Editorial Board of *American Antiquity*.

Carlina de la Cova is Professor of Anthropology at the University of South Carolina, where she specializes in bioarchaeology with a focus on health disparities, ethics, structural violence, and the treatment of historically marginalized populations. Her interdisciplinary research interrogates the legacy of medical racism and the ethical dimensions of anatomical collections, highlighting how social inequality becomes inscribed on the body. She has published extensively on the impact of social marginalization on skeletal health amongst impoverished groups, institutionalized individuals and 19th-century-born African American populations in numerous edited volumes and peer-reviewed journals, including *American Anthropologist*,

the *American Journal of Biological Anthropology,* and the *International Journal of Paleopathology*. In addition to this, de la Cova serves on the editorial boards of the *American Journal of Biological Anthropology* and *American Anthropologist*. She is also an Associate Editor for *Bioarchaeology International*. Dr de la Cova's work has driven critical conversations around the ethics of human remains research, advocating for more transparent, community-engaged, and historically conscious approaches. With her colleagues, she has contributed to national guidelines on the management of legacy anatomical collections and is regarded as a leading voice in the movement to reform anthropological practice around issues of ethics, consent, representation, and social justice. She chairs the Paleopathology Association's Ethics Sub-Committee, is a member of the American Association for Anatomy's Ethics and Legacy Collections Task Force and sits on the American Anthropological Association's Commission for the Ethical Treatment of Human Remains. Her current work strives to shape ethical frameworks within biological anthropology and influence policy across academic and forensic settings.

Rebecca Gowland is a Professor of bioarchaeology and forensic anthropology at Durham University where she is Director of the MSc in Human Bioarchaeology and Palaeopathology. She has trained several hundred bioarchaeologists and forensic practitioners at all levels of experience over the last 20 years. She also developed a Massive Open Online Course, which reached over 30,000 learners in over 130 countries during the five years that it ran. She is especially interested in interactions between the biological tissues of the body and the socio-cultural and physical environment, publishing over 100 articles and book chapters on the topic. Her research has driven methodological and theoretical developments within the field. She has had a particular focus on improving the visibility of marginalized demographics in the past, including infants, children and older people. Rebecca's research also includes the recovery and analysis of skeletal remains from modern forensic contexts and she works alongside a range of international organizations and human rights lawyers to resolve issues of human identification in post-conflict countries and other humanitarian contexts. In addition to her academic work, Rebecca has held a number of senior leadership positions within her institution, with a particular focus on policies and practices relating to people and culture.

Siân E. Halcrow is a Professor in Bioarchaeology at the University of Otago | Ōtākou Whakaihu Waka and holds a British Academy Global Professorship at Durham University. Her research focuses on the anthropology of social justice, through the study of the bioethics of the holding and use of anatomical skeletal individuals; and the societal impacts of climate and environmental change and the agricultural transition through studying the health experiences of the most vulnerable: infants and children. Significant works in this area include Gowland and Halcrow (eds), *The Mother-Infant Nexus in the Past: Small Beginnings, significant outcomes* (Springer, 2020). She manages the skeletal analyses on several international archaeological projects in Thailand, Laos, Cambodia, China, and Chile. Since 2007, she has produced >130 peer reviewed publications in high impact journals

and books in the field and secured >9 million in research funding, e.g., Wenner-Gren, National Geographic, Fulbright, NZ Marsden, British Academy. Honours include: The University of Otago Rowhealth Trust Award and Carl Smith Research Medal (2018), the NZ Association of Scientists Hill Tinsley Medal (2018), a NZ Scholar Fulbright Award (2023), and a British Academy Global Professorship (2024).

Gwen Robbins Schug is a Professor of Biology at UNC Greensboro, where her research integrates bioarchaeology, climate change, and social inequality to explore human resilience in the face of environmental crises and other adaptive challenges—from South Asia to Arabia and the Mediterranean. She is particularly interested in how lessons from the past about human variation and diversity can inform contemporary policy on environmental justice and ethical, sustainable development. She was recognized as a Climate and Justice Leader by Grist and the Clinton Global Initiative (2023). She has published >50 peer-reviewed publications, including leading contributions in bioarchaeological ethics, including Robbins Schug, Halcrow, & de la Cova, *They Are People Too: The ethics of curation and use of human skeletal remains for teaching and research* (American Journal of Biological Anthropology, 2025). She has received two Fulbright Research Fellowships, has been funded by Wenner Gren and the American Institute of Indian Studies, and is currently a co-PI on a National Science Foundation funded project to increase representation and student success in undergraduate STEM education ($999,791 award #2029883). She is heavily involved in service as the Director of the RISE Network (Research and Instruction in STEM Education) at UNCG, which is dedicated to improving DEI in STEM education. She is the Chair-Elect of the UNCG College of Arts and Sciences Executive Committee, and an Advisory Board Member for the Triangle Center for Evolutionary Medicine, among other roles.

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Introduction: Bioarchaeologists Should Be Activists Too

Siân E. Halcrow, Rebecca Gowland, Gwen Robbins Schug, Sabrina C. Agarwal, Carlina de la Cova, Jamie Metzger, Casey Halcrow, and Stephie R. Lončar

Activism, at its core, is an act of doing—a commitment to pursuing change. Although many may initially associate activism with public protests and rallies, it encompasses a far more extensive, multifaceted range of actions aimed at achieving social, political, environmental, and/or economic reform (Snow & Oliver, 1995). These actions can include everything from writing letters to policymakers and organizing vigils, to leading boycotts and orchestrating large-scale collective

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_1

movements, to changing systems from within (Dumitraşcu, 2015). Although activism exists across the political spectrum, left-wing activism often centers on social justice, with goals that prioritize equity, sustainability, accessibility, and autonomy (Came et al., 2015; Shields, 1993). It is these goals that are at the heart of this book.

Although anthropology is rooted in colonial and extractive practice, the early twentieth century also saw foundational figures emerge in the field. Franz Boas challenged early racial typologies and anthropologist Margaret Mead similarly believed anthropology should actively contribute to social transformation (Boas, 1940; Mead, 1928). Recent medical anthropologists have also demonstrated how anthropology can directly address inequities and health (Bourgois, 2003; Farmer, 1996, 2004b), with anthropologists such as Nancy Scheper-Hughes (1995) championing a "militant anthropology" arguing that anthropologists have a moral obligation to speak out against injustice. These scholars transformed anthropology by insisting that ethnographic work should serve social justice, challenge power structures, and benefit the communities being studied.

In the academic realm, activism takes on unique dimensions, particularly when applied to disciplines with complex legacies of colonialism, exclusion, and exploitation. Black feminist theory, for example, has been instrumental in defining the role of activism in scholarly spaces. Pioneering thinkers like bell hooks (1996) in *Teaching to Transgress* have argued that education should be an act of liberation—a space where pedagogy is inherently intertwined with social justice. For hooks, activism in academia is not optional but necessary to challenge and dismantle oppressive systems that marginalize voices, thereby redefining the production of knowledge to include historically excluded perspectives. This foundation of thought is synergistic with Kimberlé Crenshaw's (1989) concept of intersectionality, which underscores the necessity of addressing how overlapping systems of race, gender, and class create compound experiences of marginalization. In disciplines like bioarchaeology, the impact of these intersecting structures is clear in our research methodologies and museum collections shaped by colonialism and systemic racism.

Black feminist scholars emphasize approaches that integrate ethics, empathy, equity, and active community engagement in academia. Brittney Cooper's *Beyond Respectability* (2017) illustrates how Black women intellectuals have historically merged scholarship with activism to challenge institutional norms and advocate for ethical community-centered research. Patricia Hill Collins (2000) adds that academic spaces must disrupt dominant ideologies and prioritize community-based research practices that foster inclusivity and ethical accountability. These principles are mirrored in activist bioarchaeology, which prioritizes practices such as the repatriation of the deceased, and transparent, collaborative research that centers the voices and rights of descendant communities.

Queer theory complements these frameworks by challenging rigid academic norms and proposing non-normative, inclusive approaches. Eve Kosofsky Sedgwick's (1990) *Epistemology of the Closet* is a critique of binary and hierarchical thinking, urging academics to disrupt conventional methods that may reinforce exclusionary legacies. Jack Halberstam's (2011) *The Queer Art of Failure* expands

this by advocating for subversive tactics that question established definitions of success in academia, thereby fostering an environment open to alternative ways of knowing. For activist bioarchaeology, these perspectives inspire a re-examination of research practices, emphasizing the need to include diverse voices and reject methodologies that perpetuate historical harms (e.g., Adams et al., 2023; Geller, 2017, 2019; TallBear, 2019).

The colonizing agenda of the Western world has often gone hand-in-hand with the origins of bioarcheology and pursuit of scientific knowledge. The dominance of Western world-views and modes of practice have imposed a singular model of understanding that can often dismiss Indigenous knowledge systems as not equally valid or vital. We are aware that we must remain committed to developing and sustaining activist approaches within our scholarship and practice to achieve meaningful change. How might bioarcheology help to shape decolonial futures and offer a pathway to meaningful transformation? Embracing Indigenous holistic approaches, which are grounded in the environment, relationality and belonging may provide us with a pathway to confront historical legacies and dominance of Eurocentric perspectives. While there is a burgeoning interest in "Indigenous alterity", rightful criticism has been levied against the selective appropriation or homogenization of Indigenous epistemologies (Montgomery, 2021). Gazing Wolf et al. (2024) working within the field of ecology, identify four key themes to center Indigenous Knowledge (IK) within Settler Colonial Institutions (SCIs), which are relevant to all disciplines. These include ethical guidelines for teaching and researching IK, addressing trauma inflicted upon Indigenous Peoples, the elevation of Indigenous scholars within SCIs, and shifting IK as central paradigms within SCIs. Centering Indigenous knowledge in bioarcheology means genuine engagement and collaboration with communities, in ways that are not performative, box-ticking exercises, but authentic steps towards healing and restoration.

Recent history has seen the global push for the return of ancestral human remains held in museums, universities and other intuitions to their descendant communities. Repatriation of human remains and other items of cultural significance is now becoming business as usual and an essential expectation of ethical and culturally responsive practice. The repatriation movement has grown significant momentum in the Pacific region. In Aotearoa New Zealand international and domestic repatriation programs have seen the return of over 850 Māori and Moriori ancestors from overseas institutions to New Zealand, as well as over 400 sets of human remains returned from Aotearoa New Zealand museums and universities to their ancestral homelands both within the country and abroad (Metzger, 2022; Museum of New Zealand Te Papa Tongarewa n.d.-a, b; University of Otago, 2024). Australia has also seen an increase in domestic and international repatriation, with 1787 Aboriginal and Torres Strait Islander ancestors returned over the past 35 years. It is also estimated that more than 3400 ancestors and 2300 sacred objects have been returned domestically from Australian museums (Commonwealth of Australia, Office for the Arts n.d.-a, b). Since the 1990s, Hawai'i has been repatriating the remains of iwi kūpuna (Hawaiian ancestral human remains) held in museums around the world and from 2021–2024 Project Iwi Kuamo'o provided training to 300 native Hawaiians to build

repatriation awareness and teach practitioners the cultural protocols and skills to return remains for reburial (Halealoha Ayau, 2022; Hui Iwikumaoʻo, n.d.; U.S. Department of Health & Human Services, 2023). In Canada, efforts are gaining traction as institutions work towards realizing the recommendations of the 2015 Truth and Reconciliation Commission (2015) and activating UNDRIP (United Nations Declaration on the Rights of Indigenous Peoples) through repatriation (Canadian Museums Association, 2022; Feld, 2022). Confronting the long and painful legacy of residential school systems and the crisis of missing and murdered Indigenous women and children is inseparable from broader efforts to repatriate museum-held human remains. In the United States, repatriation initiatives continue to evolve under the 2024 amendments to the Native American Graves and Protections Act (NAGPRA). There has also been proposed AAGPRA (African American Graves Protection and Repatriation Act) legislation to protect and repatriate African American ancestors. The shift reflects a growing move towards accountability, acknowledgement of historical harms and affirmation of Indigenous self-determination. Repatriation is not just a symbolic gesture or framed as a loss, but a necessary step in decolonizing scientific practices and restoration of relationships. Despite progress, challenges persist. Limited resources, lack of dedicated funding, absence of legislative or policy mechanisms, restrictive provisions that do not align with practical realities, are still all barriers to enabling repatriation to occur. However, we have now entered into a new phase where the focus shifts from questioning why repatriation is necessary, to addressing how it can be undertaken.

By its nature, many people who engage in social justice and activism are also those who invest in service to their communities, governance, and pastoral work. For example, it has been Indigenous scholars and groups who have highlighted the urgent and ongoing need for the rightful return of ancestral human remains (e.g., Aranui, 2020; Montgomery & Supernant, 2022; Ruckstuhl et al., 2016). As a result of this, and in combination with the increased 'cultural load' of being a scholar from an Indigenous or minoritized group, their contributions are often unrecognized and unrewarded in the larger academic community. For those working in this space, its true value lies in the work itself—rather than translating it into academic outputs that document and analyze repatriation from an Indigenous perspective. Although this volume doesn't include chapters explicitly devoted to repatriation of Indigenous human remains, this work could use activism frameworks (e.g., Fig. 1) in parallel with specific cultural models and concepts that Indigenous scholars engage with as repatriation practitioners (e.g., Aranui, 2020; Halealoha Ayau et al., 2020; Ormond-Parker et al., 2020; Tapsell, 2002; Tuhiwai Smith, 2021). We refer readers to other published volumes that explore aspects of working with and for ancestral human remains in more detail (e.g., Feld, 2022; Fforde et al., 2020; Hook, 2023; Kakaliouras, 2021; Meloche et al., 2020; Pfeiffer, 2021).

As scholars push for these changes, they often meet resistance, as noted by Sara Ahmed in *Living a Feminist Life* (2017). She underscores the labor and emotional toll of activism in academic spaces, where efforts to revise entrenched practices frequently face institutional pushback (Ahmed, 2017). This challenge is familiar in activist bioarchaeology, where the histories of collections and their curation reflect

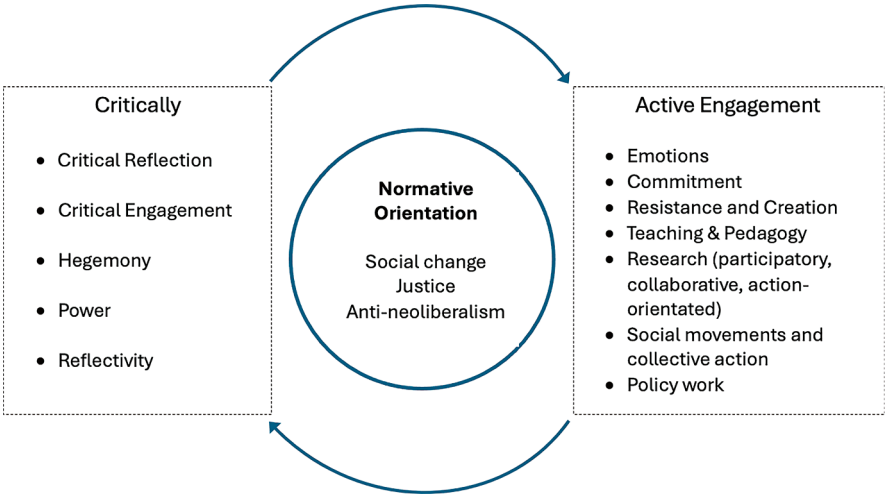


Fig. 1 Conceptual framework categorizing the different components of scholar-activism identified in this study as criticality, normative orientation, and active engagement. (Modified from Bashiri, 2023)

broader structures of inequality and systemic violence (Agarwal, 2024a, b; de la Cova, 2019, 2020a, b; Gruenthal-Rankin & Somogyi, 2025; Lans, 2020, 2021, 2022; Muller et al., 2017; Southorn et al., 2024; Watkins & Muller, 2015; Zuckerman et al., 2021). Activist scholars must navigate this resistance while advocating for reform that holds institutions accountable for their legacies (Robbins Schug et al., 2025).

Activism in bioarchaeology involves more than reclaiming and repurposing the past; it is about actively transforming the structures of the present to forge an ethical future (de la Cova et al., 2024; Blatt et al., chapter "Cripping, Queering, and Transforming Education in Biological Anthropology", this volume). Audre Lorde's (1984) assertion that "the master's tools will never dismantle the master's house" resonates deeply here, urging bioarchaeologists to develop transformative practices that move beyond performative acts of inclusion, something our discipline has been plagued with. Activist bioarchaeology must not only decolonize the discipline but also reconstruct research methodologies and policies to prioritize equity, justice and community engagement.

In practice, this involves not only acknowledging the legacies of exploitation that underpin many collections and excavation studies, but actively working to rectify them through repatriation efforts, collaborative partnerships with descendant communities, and the development of ethical models of curation. Grace Lee Boggs's (2012) vision that crises should be seen as opportunities for profound change encapsulates the call to action in activist bioarchaeology. By looking back at the injustices of the past, scholars can craft research that respects and uplifts the voices of the marginalized, aligning with Mickel and Olsen's (2021) assertion that archaeologists

must act as advocates for the communities whose histories they uncover (Barton, 2021; Stottman, 2010; Zimmerman, 2014).

Building on the foundational work of scholars like Sabrina C. Agarwal, Carlina de la Cova, Rachel Watkins, Aja Lans, Pamela Geller (see below) and other bioarchaeologists, activist bioarchaeology leverages Black feminist, Indigenous scholarship, and queer theoretical insights to redefine scholarly work as an inherently activist practice. By embedding principles of social justice, equity, and inclusivity into every aspect of academic practice, activist bioarchaeology can position itself at the intersection of rigorous scholarship and transformative action. This practice includes reshaping curricula to incorporate ethical guidelines that recognize historical trauma, engaging descendant communities as collaborators rather than subjects, and ensuring that the stories told through bioarchaeological insight and research empower rather than exploit. It calls for transparency in research practices, the adoption of community-based participatory research methods, and a commitment to addressing the socio-political implications of bioarchaeological findings.

1 Scholar-Activism Framework

Most of the work in this edited volume can be loosely defined as scholar-activism. Scholar-activism can have a synergistic and strengthening relationship with socio-political activism and academic scholarship (Came et al., 2015). Activism within scholarship has become more prominent in archaeology in recent years as evidenced by the development of Critical Race Studies, Intersectional Studies, Indigenous studies, (Dis)ability studies, Queer studies, and more (Adams et al., 2024; Cobb & Crellin, 2022; Goliath et al., 2023). Scholar-activism has been defined in various ways. Bashiri (2023) developed a conceptual framework that describes scholar-activism's normative orientation—one's moral approval or disapproval of behaviors and structures based on perceptions of harm and ethics—focused on justice and social change, with an anti-neoliberal focus (Fig. 1; and Gowland and Daxini, chapter "Justice, Equality, and Diversity within the Academy", this volume). Forms of engagement of academic activists includes emotional engagement (often stemming from personal experiences), committed engagement, practical engagements and interventions in teaching, research, academic structures and collaboration with social movements or collectives.

Active engagement not only includes the types of activities but emphasizes the *quality* of engagement. Activities do not need to be what some would traditionally think of as activism (i.e., loud, confrontational, or visible). Rather, they can include emotional engagement and long-term commitment to a cause that extends beyond one-time participation in collective action. Activism is about caring for people with compassion and conviction, but it is also about instilling structural change for the greater good of society. Within this model, criticality refers to critical engagement with the status quo and hegemony that act to create systems of injustice. The process of reflexivity is central to this model, where the researcher critically examines

their positionality in addressing the problem and their relationship with the groups they are working with.

Creating lasting, sustainable change around ethics, equity, and inclusion within a discipline and its academic and professional institutions requires a comprehensive understanding of how to shift entrenched structures and cultures. Theory of Change (ToC) offers a strategic, evidence-based approach to guiding these transformations. ToC literature emphasizes not only identifying systemic challenges but also mapping pathways that align core values across institutional leadership and faculty to create unified momentum for change (Ambos, 2024; Kezar, 2018; Robbins Schug et al., chapter "Racial Equity, Ethics, and Sustainable Futures in Anatomical Sciences", this volume). This approach ensures that efforts to transform ethics and equity are not fragmented or superficial but embedded into the heart of academic practice and culture.

Academic leaders play an instrumental role in this process. The attitudes and actions of leadership significantly influence institutional behavior and the willingness of faculty to engage in change initiatives (Kotter, 2012; Marchiondo et al., 2023). ToC provides the framework for leaders to assess the underlying beliefs that shape institutional culture, identify barriers to equity and inclusion, and align goals with actionable strategies. This alignment helps bridge the gap between policy and practice, fostering a culture where ethics and inclusion are woven into the fabric of everyday academic life (Fig. 2).

A critical aspect of achieving cultural transformation in large, diverse institutions is incorporating the lived experiences of faculty and leaders. Diverse voices bring unique perspectives and insights that illuminate the complex realities of institutional barriers and inequities (Johnson-Mallard et al., 2019). For meaningful change, institutions must actively recruit, support, and empower individuals from historically marginalized backgrounds at all levels of leadership and faculty (Castillo, 2022; Sun, 2024). These efforts must be paired with concrete, measurable objectives that can be implemented and evaluated across all tiers of professional societies, journal editorial boards, academic institutions, and accreditation bodies (Esparza et al., 2024; Naidoo, 2023; Nora, 2022). This approach ensures that change is not only aspirational but also trackable and accountable (see Gowland and Daxini, chapter "Justice, Equality, and Diversity within the Academy", this volume).

By embedding ethics, equity, and inclusion into institutional structures, academic disciplines can shift from reactive to proactive approaches. Leaders can foster an environment where diverse perspectives are not just included but valued as essential to shaping the future. Sustainable change, therefore, is achieved not through isolated initiatives but through a comprehensive, evidence-driven strategy that redefines the standards of academic and professional integrity at every level and aligns individual and institutional interests.

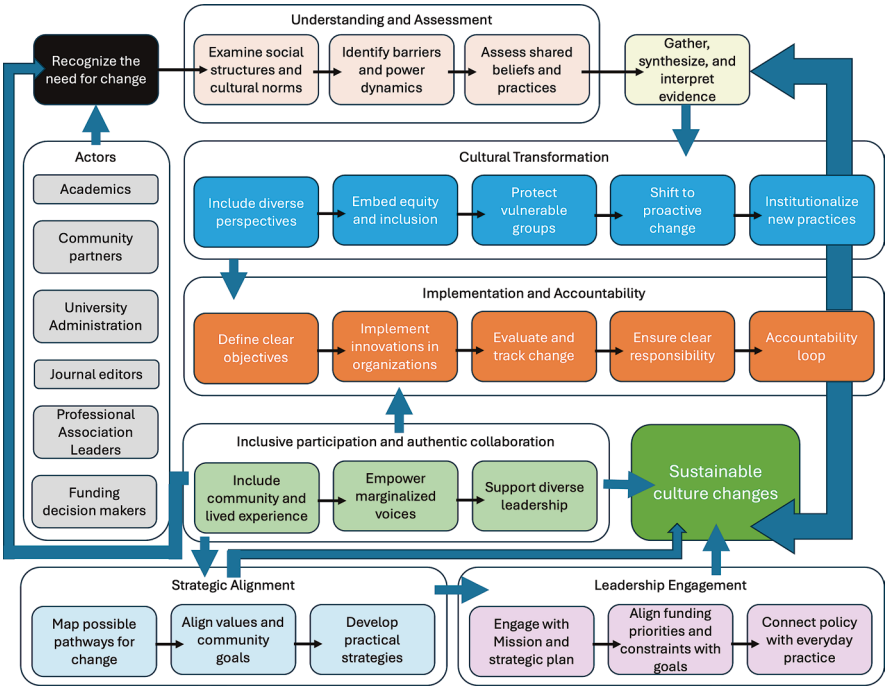


Fig. 2 Theory of Change model for sustainable ethics and DEI reform in bioarchaeology

2 Bridging Academic Bioarchaeology, Activism and ToC

Bioarchaeology, a field that studies humans in the past, is especially well-suited to illuminating the marginalization of people through a holistic approach that combines the biological aspects of past populations with their social, cultural, and ecological contexts, along with the intersections and interconnectivity of these factors (Agarwal, 2022; Gowland et al., 2023; Robbins Schug et al., 2023). Now, more than ever, bioarchaeologists are needed to find solutions to modern-day issues of inequity, which have been exacerbated by the global COVID-19 pandemic. For example, the devastating health and social effects of the pandemic were largely predictable based on bioarchaeological research on past populations (Agarwal, 2022; Dada et al., 2021; Robbins Schug & Halcrow, 2022; Van Doren & Sattenspiel, 2021). Similarly, bioarchaeologists are well-positioned to assess climate change and its relationship with human demographics and shifting disease-scapes, thereby contributing to justice-oriented climate activism (e.g., McLaren et al., 2024; Robbins Schug, 2020, 2024; Robbins Schug et al., 2023).

Bioarchaeology and the broader academy, for the most part, are currently complicit in performing and perpetuating contemporary social injustices. Disciplinary inequities have historically been overlooked or regarded as a marginal concern, as though addressing them is an inconvenient distraction from (or threat to) our main

business. These inequities, however, perpetuate fundamental harms that not only undermine the veracity of our disciplinary endeavors, but both generate and reinforce broader societal injustices. The strength of the current neoliberal, Western academic edifice is such that it creates a slipstream effect that feels impossible to break free from (or break into). For many, this can lead to feelings of despondency, frustration, futility and inertia resulting in many outstanding students and staff leaving the discipline. In recent years, there has been a groundswell in the number of academics challenging the status quo and calling for collective action (Adams et al., 2024; Cobb & Crellin, 2022). This volume brings together some bioarchaeologists who are building on the foundational work of earlier scholar-activists (e.g., Blakey, 2008, 2010; Conkey & Spector, 1984; Gero, 1991) and are actively engaged in challenging current systems of racism and sexism etc. within the discipline while also contributing to broader societal and environmental justice.

This book looks to the future to illustrate the promise of bioarchaeology, palaeopathology, and related disciplines to make important contributions to pressing issues of climate change, disease, structural violence, intersectional inequities including race, Indigeneity, gender, sexuality, class, and (dis)ability etc. The issues explored in this volume are at the heart of the United Nations 2030 Agenda for Sustainable Development adopted in 2015 and encapsulated in the 17 UN Sustainability Goals (https://sdgs.un.org/goals). These goals take a holistic approach to addressing urgent global issues including deprivation, health, climate change, and inequalities. While the discipline of bioarchaeology is just beginning to play a role in advancing these goals on the global stage, lessons from the past are imperative for developing pathways towards sustainable futures.

Early archaeological and bioarchaeological work was underpinned by racist agendas and biased interpretations of findings. Understanding this historical context and addressing the past of the discipline is an essential first step for developing ToC-driven strategies that aim to dismantle these legacies and reconstruct bioarchaeology as a field rooted in justice and equity. We must address and acknowledge the past transgressions of our discipline and its founding fathers. It cannot be swept under the proverbial rug because it is "uncomfortable" to confront. Racist, colonialist, misogynist, and ableist undertones persist in our discipline, which is why we cannot continue to be complicit about engaging with its past or how these harms resonate in the present day. The important work of colleagues from marginalized identities has been crucial in calling this out and driving change (e.g., Agarwal, 2024b; Blakey, 2020; de la Cova, 2017, 2019; Franklin et al., 2020; Lans, 2021; Watkins, 2020). To address the lingering effects of the colonial, racist, and eugenicist origins of bioarchaeology requires active engagement with the history of the discipline, contextualizing it, and acknowledging the roles of social apathy, societal marginalization, and racism/classism (Adams et al., 2023; Blakey, 2020; Robbins Schug et al., 2025; Watkins, 2020). This will assist in healing wounds, forging inroads, and gaining the trust of those who have been harmed, including descendant and other marginalized communities. However, we must clearly articulate and demonstrate how we are moving the discipline forward in a way that embraces a new ethically based bioarchaeology and paleopathology (Blakey, 1998, 2008; Buikstra

et al., 2022). ToC calls for honest evaluation of first-order values and traditional practices within anthropology, advocates for stakeholder/descendant/community engagement and strategic pathways to address complex challenges holistically, ensuring that the voices of affected communities guide research processes and outcomes.

Bioarchaeologists are starting to interrogate our practices and to push against the perpetuation of inequity and the marginalization of groups, including in the interrogation of structural violence against marginalized communities (Hildebrandt, 2025). The pioneering precedent is the collaborative work of communities and bioarchaeologists involved in the New York African Burial Ground, which ensured that African American descendants could be engaged and empowered through bioarchaeology (Blakey & Rankin-Hill, 2009; Clinton & Jackson, 2021; LaRoche & Blakey, 1997). This paved the way for subsequent activism to ensure that the African American Burial Grounds Preservation Act was passed (Blakey, 2022) and helped provide a sense of identity and representation for people who had been dislocated from their cultural and genetic history (Clinton & Jackson, 2021). A contemporary example includes Justin Dunnavant and Chip Colwell's contribution to activist bioarchaeology by embedding ethics, community engagement, and social justice into their research and advocacy (Dunnavant et al., 2021). Dunnavant, through his work on the archaeology of Africa and the African Diaspora and leadership in the Society of Black Archaeologists, emphasizes representation and public engagement (Flewellen et al., 2021; Franklin et al., 2020). Colwell's scholarship, particularly on the repatriation of Native American artifacts and his award-winning book *Plundered Skulls and Stolen Spirits*, advances ethical reforms and transparency in archaeology (Colwell, 2017). Together, their collaborative efforts push for structural changes that make bioarchaeology more equitable and accountable (Dunnavant et al., 2021).

Over many years bioarchaeologists have examined the historical context of anatomical dissection, the motives and means for the collection of deceased individuals, and the fate of anatomical collections in the U.S., highlighting how historical practices have perpetuated harm and necessitate ethical reform. Carlina de la Cova's scholarship emphasizes the impact of structural violence (social apathy) and the dehumanization inherent in the historical curation of human remains from deceased individuals (de la Cova, 2019). Furthermore, it illustrates, through an intersectional lens, how marginalized individuals of color, institutionalized individuals, and the poor were preyed upon, objectified, and consumed by medical elites. Her focus on restoring narratives to these marginalized individuals whose bodies have been subjected to scientific scrutiny without consent calls for a bioarchaeological practice that is not only ethical but reparative (Buikstra et al., 2022; de la Cova, 2012; Muller et al., 2017). This kind of work advocates for the repatriation of deceased humans and transparent community engagement, moving beyond objectification to honor the personhood of those represented in collections (de la Cova, 2020b).

Recent impactful work within the bioarchaeology of activism sphere is Sabrina C. Agarwal's research on the origins of many anatomical teaching skeletons from the Indian subcontinent. Her research advocates for a critical understanding of how race, gender, and class shape the health and lives of individuals, both past and

present, pushing bioarchaeologists to consider broader social implications in their work (Agarwal, 2024a, b; Kinkopf et al., 2023). Agarwal's work emphasizes the need to interrogate and disrupt the systemic biases embedded within traditional methodologies (Agarwal, 2022). Understanding this historical context is an essential first step for developing ToC-driven strategies that aim to dismantle these legacies and reconstruct bioarchaeology as a field rooted in justice and equity. The next step in an ethical transformation is a call for activism to employ ethical frameworks that prioritize respect for cultural heritage and foster meaningful community engagement (Johnson-Mallard et al., 2019). These processes need to acknowledge the history of our practice and engage with it; humanize the people we work with therefore breaking free from those enlightenment, colonial chains. If we fail to do so, we continue the cycle of structural apathy. We also need to be reflective in our work, addressing our privilege and giving precedence to descendant and community engagement. The growing dialogue around these issues underscores a pressing need for transparency, empathy, and active collaboration in bioarchaeological research (de la Cova, 2020a, b; de la Cova et al., 2023, 2024). Wilton et al. (2024) discuss the potential of educators as change agents within academic departments, a concept that bioarchaeology can adopt to inspire leadership and advocacy for ethics and DEI initiatives (Sun, 2024).

The theoretical lens of Black feminist thought, as articulated in the biological anthropology by Lans (2018) and Watkins (2020), further enriches the ToC framework by foregrounding the intersectionality of race, gender, and class in bioarchaeological research (Hale, 2008). Work by Rachel Watkins highlights the necessity of involving descendant communities in the research process and repatriation decisions, challenging the idea of academic authority as the sole voice in interpreting historical narratives (Watkins, 2012, 2018, 2020). Watkins emphasizes the value of collaborative research models that prioritize the perspectives and needs of individuals and communities, embodying an activist approach that seeks justice and healing. Indigenous scholars are also pushing back against recent appropriation and homogenization of Indigenous Knowledge by scholars from Settler Colonial Institutions (SCI) (Gazing Wolf et al., 2024). They highlight the need to acknowledge and address historic and current harms, and to authentically and proactively center and value Indigenous science and knowledge within SCIs. To be successful this requires a relinquishing of the power and constraints imposed by the Western scientific paradigm, which has dominated ontological and epistemological thinking in the discipline of bioarchaeology and Western/Settler Colonial Universities since the Enlightenment. Diverse voices are essential for shaping the development of ethical practices and to ensure that research outcomes do not reinforce existing inequalities but instead address them proactively.

ToC frameworks can also be used to frame and visualize desired changes in bioarchaeology, such as enhancing policies surrounding consent (Halcrow et al., 2021, 2024), facilitating repatriation (Dunnavant et al., 2021), and implementing research on equitable sustainability with policy implications in mind (Robbins Schug, 2020; Robbins Schug et al., 2023). Zuckerman et al. (2024) underscore the significance of embedding ethical engagement into biological anthropology, advocating for

practices that prioritize the dignity and agency of both past and present communities (Castillo, 2022). Identifying indicators of success such as the number of repatriated remains, depth of community partnership, or the integration of sustainability protocols provides measurable benchmarks to track progress and accountability.

This volume is the first dedicated to action within bioarchaeology and cognate disciplines, aimed at fostering social and political change. It seeks to serve as an initial step in bridging the gap between practice and activism. Archaeological and bioarchaeological work is never fully divorced from political influences. However, there is often a disconnect between the work that we do and direct engagement in social change or acknowledgement of the power that our work has in this domain. In developing this volume, the editors and authors were mindful that this book should be more than an abstract academic exercise. All the authors care deeply about effecting positive change. Each chapter provides explicit links to contemporary issues and demonstrates how we can use our work to effect social change, offering practical steps for building an activist lens in research, practice, and academia. We bring together a diverse range of bioarchaeologists and related practitioners whose work speaks to some of the most pressing social issues affecting humanity today, including climate justice, infectious disease, structural violence, healthcare and inequality to resources, racial injustice, hunger and food insecurity, displacement of people, equitable education, and the intersections these have with each other and with identities such as race, ethnicity, gender, sexuality, class, and disability and intersectionality (Crenshaw, 1989, 1991).

The following sections describe the work we accomplish in this volume, but we are aware that this is an entry point, not exhaustive of all the social justice activities that bioarchaeologists do. We have grouped the chapters of this volume into three sections: social justice in academia; structural violence, marginalization and systems of colonialism; and community bioarchaeology, stakeholders, and ethics.

2.1 Section 1: Social Justice in Academia: Towards a More Inclusive and Equitable Discipline

As a field of anthropologists who study intersectionality, inequality, racial disparities, Queer theory, disability theory, and the ethics of dealing with human remains, among other topics, we can advocate for changes in our practices and university structures to create an inclusive, diverse, and safe environment in teaching, learning, and research—for both students and academics (Adams et al., 2024; Blatt et al., chapter "Cripping, Queering, and Transforming Education in Biological Anthropology", this volume; De La Paz et al., chapter "Diversity, Representation, and Inclusion in Forensic Anthropology", this volume; Gowland and Daxini, chapter "Justice, Equality, and Diversity within the Academy", this volume). Similarly, we are starting to interrogate the structural barriers to entering and progressing within our field (De La Paz et al., chapter "Diversity, Representation, and Inclusion

in Forensic Anthropology", this volume, Watkins, 2020), and the ethics of our research relationships and practices with communities that we work with Alexander, chapter "Engaging the Public: Anthropology's Power to Impact Communities", this volume; Piombino-Mascali and Sablone, chapter "Ethics and Exhibition of Historical Human Body Casts: A Brief Case Study from Pompeii, Campania Region, Southern Italy with an Activist Lens", this volume). It is important to note that a failure to take action toward these goals is not a neutral position: if we do not actively strive to address injustices and inequities, we perpetuate harm, whether we choose to consciously acknowledge it or not. The following chapters present ways to actively engage in resisting and challenging racist, neoliberal, and conservative systems in academia and training, and cis-heteronormative and ableist processes within the student-teacher experience. Only by continuously critically challenging systems of power and hegemony within academia can we bring about true structural change (Fig. 1).

Rebecca Gowland and Shivani Daxini present an accessible chapter entitled "Justice, Equality, and Diversity within the Academy". Gowland and Daxini draw on their experiences working towards "system-challenging" praxis in DEI and outline potential mechanisms for implementing radical and permanent structural changes within university environments. There are no "off the peg" solutions for DEI and while Higher Education Institutions may share some common DEI challenges, specific issues need to be identified through quantitative and qualitative data gathering activities and tailored actions produced. An essential component is to create, embed and disperse accountability to meet these goals. DEI initiatives that rest on the shoulders of a few passionate (often overworked) staff will generally fail because this approach sequesters responsibility and does not address the fundamental structural issues. This chapter provides practical guidance on how to move forward, even in the face of resistance to any change to the status quo. Their chapter is important for re-envisioning higher education as a form of resistance against conservative, neoliberal systems and structures using radical system-challenging praxis. This approach of resistance to neoliberal systems is a central tenet within Bashiri's (2023) conceptual framework, which categorizes the different components of scholar-activism (Fig. 1).

In the chapter "Racial Equity, Ethics, and Sustainable Futures in Anatomical Sciences", Gwen Robbins Schug, Shelly Brown-Jeffy, Torren Gatson, Andrea Hunter, Aileen Reid, and Anne Marie E. Sohler-Snoddy provide a model for institutionalizing social justice in American anatomy teaching. Their approach integrates STEM faculty professional development addressing core values that hinder progress in national DEI goals with Black leadership in curriculum reform and creating ethical models of practice for community informed efforts to repatriate African American deceased individuals removed from their graves without consent. These authors delve into ToC frameworks, using faculty professional development as a tool to address core values that hinder national progress on DEI initiatives. They highlight the importance of cultivating and supporting racially minoritized students and faculty leadership, that will enable more inclusive and representative academic environments. The chapter introduces a comprehensive framework that combines

ethical models of practice, community engagement, and curricular reform to address the longstanding legacies of exclusion and exploitation in the anatomical sciences. The ToC principles adopted in this chapter have synergies with the approach discussed by Gowland and Daxini, providing a detailed example specific to anatomical curation and teaching. Emphasis is placed on the ethical imperative to fund community-based repatriation projects for Black and African American human remains from legacy skeletal collections, acknowledging their origins and respecting the rights of descendant communities. By intertwining these approaches with a ToC model, the chapter outlines pathways for sustainable reform that align academic practices with values of justice, equity, and respect. This chapter is based on a funding proposal to the National Science foundation Racial Equity program, which was archived on January 22, 2025. Despite changing national political landscapes and federal funding priorities, their model serves as a guide for institutions seeking to enact meaningful change, ensuring that future anatomical education and research are ethically conscious and inclusive.

In the chapter, "Diversity, Representation, and Inclusion in Forensic Anthropology", Jade S. De La Paz, Jesse R. Goliath, and Nandar Yukyi discuss the critical importance of representation and diverse perspectives for enhancing research, training, and job performance in forensic anthropology. Their concerns and perspectives echo those that Robbins Schug et al. also attempt to tackle in this volume. As De La Paz and colleagues discuss, forensic anthropology is highly dominated by White scholars representing a stark misalignment with the demographics of the populations it serves. The chapter critiques the structural barriers, such as Eurocentric and racist methodologies, that impede inclusivity and decolonization efforts. The authors propose solutions to these systemic issues including recognizing the impact of colonialism, systemic racism, and economic disadvantage on education and research. Many of their proposals can be adopted by individual academics to improve inclusivity and a sense of belonging in the classroom. They also emphasize the need for intentional collaboration, equitable opportunities, and policy reform to create a more equitable and just forensic anthropology profession. Many of the insights provided in this chapter are equally pertinent to the discipline of bioarchaeology, which shares many of the methodologies and modes of training and research.

Samantha Blatt, Ashley C. Smith, Juliette R. Bedard, Miles Hodges-DeLone Rhoads, Trace Miles, and Patricia N. Morales Lorenzo's chapter "Cripping, Queering, and Transforming Education in Biological Anthropology", emphasizes the critical necessity of applying crip and queer theories in education to dismantle deeply ingrained cis-heteronormative and ableist perceptions of norms. The authors highlight how traditional education systems often reinforce these biases, making it imperative for educators to proactively challenge these systemic barriers. The chapter carefully outlines detailed and actionable-specific queer/crip models, which aim to foster student engagement and wider recruitment of marginalized groups while encouraging proactive reflection on institutional biases. The authors show how these models as essential for creating transformative educational spaces in biological anthropology that embrace and uplift marginalized identities, such as

incorporating land acknowledgements, allowing flexible and multimodal assessment methods (e.g., visual projects, discussion-based evaluation), integrating gender-neutral anatomical language, and encouraging student-led curriculum contributions that reflect diverse lived experiences.

2.2 *Section 2: Structural Violence, Marginalization, and Systems of Colonialism*

Inequitable societies result in exclusions that have profound physiological consequences. Inequality kills and those who are most marginalized across intersecting axes of oppression can experience not only a drastically reduced life expectancy, but more years of their life spent in ill health (Krieger et al., 1997; Marmot et al., 2010; Wilkinson, 2006). Galtung (1969) originally characterized these effects as 'structural violence'—inequalities that cause harm upon a person. This term was brought into anthropological study by the work of Paul Farmer (2004a), whereupon it was developed and applied by a number of bioarchaeologists in their studies of the past (e.g., de la Cova, 2012; de la Cova et al., 2023; Tremblay & Reedy, 2020). In the context of global meat production, we see an arc of violence through colonial regimes extending to animals, environmental and land destruction, and inequality of food production (Agarwal, chapter "The Past, Present, and Future of Eating Animals", this volume). The chapters in this section provide clear and varied examples of the impact of marginalized lives on health, with resounding implications for the present-day.

In the chapter "Institutionalization and Health in Past Populations: Social Justice Perspectives", Molly Zuckerman and Hannah Willis explore the intersection of biological and social vulnerabilities in understanding health disparities among institutionalized individuals in the past. Using data from the Mississippi State Insane Asylum, they investigate how systemic racism, poverty, and overcrowding contributed to heightened mortality, particularly among Black patients, during pandemics such as the 1918 influenza and tuberculosis outbreaks. The authors argue that addressing these historical injustices is critical for informing contemporary public health policies aimed at improving care for people with disabilities, particularly in institutional settings, by focusing on social determinants of health and prioritizing equitable care as a social justice imperative.

In "The Unborn in Bioarchaeology: Personhood, Care, and Pregnant Person-Infant Health Through a Structural Violence Lens", Siân E. Halcrow, Tracy Betsinger, Eileen Murphy, Stephie R. Lončar, and Gwen Robbins Schug examine how bioarchaeology can contribute to social justice by analyzing the historical treatment of fetuses, pregnant individuals, and their health within the social determinants of health model. After decades of focus on adults, bioarchaeology has shifted towards understanding the lives of infants, children, and fetuses, particularly in relation to family dynamics, health, and care systems. This chapter explores how

bioarchaeological research uncovers the structural violence faced by pregnant people and the unborn, both historically and in contemporary societies. It also reviews the marginalization of fetuses in museum collections and addresses sensitive issues such as societal reactions to pregnancy loss, debates on reproductive rights, and the criminalization of miscarriage. By deconstructing these injustices, the chapter emphasizes how bioarchaeology can drive activism and social change, fostering a more humane approach to understanding personhood, reproductive health, and the legacies of violence against vulnerable populations.

Anne Marie E. Sohler-Snoddy and Ellen J. Kendall, in their chapter "Marginalization in Life and Death: Moving Towards Re-humanization of Archaeological Bodies" highlight the growing call for bioarchaeologists to acknowledge the discipline's role in perpetuating power imbalances against marginalized groups. They argue that, when applied ethically and with community involvement, bioarchaeology can serve as a tool for restorative justice. By reconstructing life histories, this chapter offers new narratives that challenge past stigmatization and bring visibility to those erased by structural violence. The chapter illustrates this through two case studies: the stigmatization of impoverished communities in the English Fens over 2000 years, and the marginalization of mothers and infants in twentieth-century Ireland's Mother and Baby homes, also known as Magdalene Laundries. The authors explore how bioarchaeological research can address historical injustices and contribute to re-humanizing those who were demeaned in both life and death.

Sabrina C. Agarwal's chapter "The Past, Present, and Future of Eating Animals", is a poignant and direct challenge for anthropologists to consider the eating of meat within frameworks of racism, sexism, masculinity, colonialism and imperialism. Since the beginning of our discipline there has been a focus on human evolution and the consumption of meat from within sexist and outdated models. These reconstructions of meat eating have given rise to the justification of modern meat consumption, despite the drastic differences between food procurement in the past and meat production that we see today, which results in unimaginable animal suffering and cruelty. Importantly, Agarwal notes the association between settler livestock introduction and the devastation of Indigenous ecosystems and the dismantling of Indigenous systems of food production and relationships with the land and their displacement. The paper argues that contemporary factory farming continues to create multiple crises including environmental degradation, pandemic risk through zoonotic disease transmission, and structural violence against marginalized communities. Agarwal calls for anthropologists to move beyond depoliticized multispecies studies and actively engage with animal ethics, recognizing the connections between colonial violence and contemporary meat systems. She argues that if anthropologists aim to address issues of colonialism, racism, and social justice, they must also confront the historical trajectory of violence embedded in current animal food systems and challenge cultural assumptions about the "naturalness" of industrial meat consumption.

Bioarchaeologists are starting to be more aware of their place as actors in countering the perpetuation of inequity and the marginalization of people, including in

the interpretation of stigmatization and the interrogation of structural violence of past groups (e.g., Buikstra, 2018; Gilmore & Halcrow, 2014). These chapters clearly demonstrate the important link between the bioarchaeological approach, data, case studies, and current issues related to social determinants of health. Now that we have seen the value of bioarchaeological work in informing current social determinants of health, the challenge is to continue fostering and building relationships with other activists, both inside and outside academia, to ensure our work makes a real and tangible difference for people today. One way to achieve this is by developing strong relationships with communities during excavation, analysis, and outreach, as illustrated in the next section.

2.3 Section 3: Community Bioarchaeology, Stakeholders, and Ethics

The ethics of anthropologists' research relationships and practices with the communities that we work with is central to a socially responsible and just methodology (Halcrow et al., 2018, 2019; Squires et al., 2019; Stantis et al. 2023). As bioarchaeologists we have the privilege of working with Indigenous and local communities to address questions that are of interest to them. While society potentially has an incredible amount to gain from Indigenous and Local Knowledge (ILK), more so we have a social responsibly to work in authentic collaboration that acknowledges how much these communities have already contributed to global equitable, sustainable futures (Robbins Schug et al., 2023). Working in authentic collaboration means listening to what matters to the communities in question, being led by their needs, as well as providing information in a way that is culturally appropriate, meaningful for communities, and translated into their languages. Bioarcheological futures are rooted in deep and meaningful engagement and building of relationships and understanding of nuances of the communities we work with (Adame, 2021). We can extend these relationships further to make this work relevant to any social justice issues that groups may have and/or to right the wrongs of past colonial and neocolonial bio/archaeological practices and injustices related to them.

Myeashea Alexander's chapter on "Engaging the Public: Anthropology's Power to Impact Communities" provides an engaging and personal discussion of her experiences of public outreach and bioarchaeology, both within museum environments and through her production of a mobile lab, which she takes to schools. Here she touches on the intersection between her identity as a Black woman and a scientist within a discipline that has an overt history of racism. She acknowledges the mistrust that can sometimes be felt in the context of African American people and their relationship with the dead, and skepticism between primarily white scientific and academic institutions and Black communities. She explains how representation by BIPOC scholars in public outreach can contribute to critiquing harmful ideologies and break down barriers, inspiring participation and engagement amongst

underserved communities. She shares a how-to list from her experiences of public engagement including making it mobile; conceptualizing the audience; hands-on requirement; rules of engagement especially when considering students who have experienced trauma and violence; making it matter to the group you are interacting with; interdisciplinarity; and community event orientated. Her work is a clear example of the transformative power and value that public communication can have to grant communities agency on the outcome of issues that have bearing on their lives today and in the past and moving forward into the future.

On the opposite side of the ethical spectrum the chapter "Human Remains as 'Conflict Antiquities' and How Bioarchaeology and Forensic Anthropology Can Change the Narrative" by Damien Huffer, Katherine Davidson, and Shawn Graham draws attention to the continued unregulated global trade in human remains. Parallels with nineteenth century collecting practices are echoed in the internet age via the commodification of human skeletal remains on platforms such as eBay and Instagram. The chapter emphasizes how this trade is often linked to the fetishization of trauma, violence, and exploitative narratives, rendering human remains desirable for niche collectors. The authors highlight the ethical dilemmas this poses for bioarchaeologists and forensic anthropologists, urging these professionals to collaborate with law enforcement and the wider academic community to combat this practice. They also explore how social media has amplified this trade and poses significant challenges to effective regulation. The authors suggest proactive measures that bioarchaeologists can take to counter it, such as reporting posts, raising awareness, and supporting law enforcement efforts to address this growing issue.

Pamela Geller explores the ethical issues arising from science communication further in her chapter "The Road to Hell is Paved with Good Intentions: Queering Biotechnical Analysis of Sex Estimation". Geller tackles the tensions between recent advances in ancient DNA and proteomics analysis, which have tended to reify dichotomized perspectives of sex, and feminist and queer scholarship which challenges 'heteronormative truths'. Geller critically interrogates the communication of bioarchaeological results to non-specialist audiences, and the tendency for interpretations using terms such as "transgender", "intersex" and/or "non-binary", to go viral. As she highlights, the meaning of these is culturally specific and could entirely misrepresent individuals lived experiences in the past. She argues that we cannot absolve ourselves of responsibility for how the media picks up our work, or how it is appropriated by those with harmful political agendas. We should think deeply and carefully about our reporting of, for example, those with XXY chromosomes, and take care that subsequent social media reports are not sensationalized. In particular, she argues for more ethically responsible and politically attuned investigations into socio-sexual lives in the past. Failure to do so can have real world implications for groups of people who are already facing violence and persecution. During a time when expert knowledge is routinely delegitimated to serve political ends, Geller calls for us to "do and think smarter" and not to unwittingly provide social media fodder for the "bots and the trolls and the haters".

Dario Piombino-Mascali and Sara Sablone, in their chapter, "Ethics and Exhibition of Historical Human Body Casts: A Brief Case Study from Pompeii,

Campania Region, Southern Italy with an Activist Lens" present the ethical consideration model they applied to the exhibition of human body casts left in hardened ash after the eruption of Mount Vesuvius in 79 AD. Acknowledging the strong reactions that these casts can provoke and potential for re-victimization of the individuals on display, the authors discuss their place as educational tools and their preservation challenges. They use a balanced approach that takes into consideration the interests of researchers and a broad number of stakeholders and advocate for the use of replicas of casts. They present an 'ethical laboratory' model that involves all stakeholders to guide future work on exhibitions, which considers principles of freedom, accountability, transparency, and social responsibility. This chapter is a good case study for the ethical display of replicas and in a way that engages with the community.

The chapters in this section, and the book more broadly, urge us to reflect more deeply about our individual and collective responsibilities for ethical considerations and practices, and how we can be activists in bioarchaeology. We should not wait for our universities or professional organizations to produce ethical guidelines or codes of practice before we act. We cannot claim a lack of awareness of the harms our work can perpetuate or absolve ourselves entirely from the way in which our work is appropriated by others. We have an individual responsibility to educate ourselves and to be proactive in how we practice in terms of teaching, research, and community engagement.

3 Conclusions

A bioarchaeological lens and deep understanding of the biocultural constitution to the human body through time, has significant potential to contribute to social and structural change in resistance to oppressive structures, thereby fostering social and environmental justice. This volume does not aim to be exhaustive of all the issues and changes that bioarchaeology addresses or enacts. It is not a means to an end, but a beginning. Rather, we hope this volume will inspire a more critical, active, and reflexive approach to future bioarchaeological scholarship. Many of these actions are directed towards individuals who are in a position to enact and implement change, while some others require institutional and structural support from professional organizations and universities. It is incumbent upon those of us who hold positions of privilege to take on the mantle of responsibility and accountability towards greater equity and inclusion within our discipline. Bioarchaeology has been constructed on a foundation of immense harm. In addition to acknowledging this, we must prioritize the development of relationships with stakeholders that are no longer extractive but operate in service of communities. Activism is hard; it can be emotionally draining, time-consuming and resource heavy. It can, however, also be incredibly liberating, energizing and lead to new and exciting collaborations, relationships, and innovations. But above all, it is the right thing to do. We hope that the following chapters go some way to inspiring positive change *within* bioarchaeology

and *from* contemporary bioarchaeology towards a more equitable and inclusive future for our discipline.

Acknowledgements We thank Amber Aranui for suggestions on the topic of activism and Indigeneity. Thank you to the team at Springer and to the Bioarchaeology and Social Theory Series editor Debra Martin for your support and patience with the gestation of this volume and to Stephen Acabado for his thoughtful foreword. Finally, we thank our wonderful colleagues for contributing their time to these chapters and for sharing their important work.

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Social Justice in Academia: Towards a More Inclusive and Equitable Discipline

Justice, Equality, and Diversity Within the Academy

Rebecca Gowland and Shivani Daxini

1 Introduction

Higher Education globally is tackling issues of Justice, Equity, Diversity and Inclusion (framed as EDI or DEI) within the academy, with varying degrees of commitment and success. Academia is only one part of the educational journey and there are many barriers and exclusions at every stage of life, even before kindergarten. Broader societal inequities constrain opportunities for the poorest and marginalized and lead to the hemorrhaging of talent and potential, resulting in what is often referred to as the 'leaky pipeline'. Academia has a part to play in addressing these earlier barriers too (Denson and Bowman, 2013), through outreach initiatives and broader engagement, but the focus of this chapter will be DEI within academic institutions and professional bodies. How do we ensure that we confront the inequities within academia, acknowledge our complicity in reinforcing societal injustices (Mirza, 2018; Reay, 2018), and take active steps towards a more equitable profession? This chapter is largely a personal reflection of our experiences working collaboratively within the DEI space and is therefore relatively light in terms of references; however, there is a wealth of research within the education literature on this topic (especially from scholars marginalized by our current systems) for those who wish to explore this further (e.g., Arday & Mirza, 2018; Burke et al., 2016; Datta, 2018; Jeffries, 2018; Kruse et al., 2017; Abu Moghli & Kadiwal, 2021; Nyamnjoh, 2020).

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_2

Universities and professional bodies play a crucial role in alleviating the obstacles to admittance and in realizing the potential of students during their studies, as well as graduates who continue on to professional practice (Bolliver, 2018; McCrane et al., 2022). The pro-active interrogation and dismantling of barriers to access, participation and belonging, as well as identifying and providing tailored support, engaged mentorship (sponsorship), and role-model leadership, can go some way towards fostering a more inclusive culture (De La Paz, chapter "Diversity, Representation, and Inclusion in Forensic Anthropology", this volume; Goliath et al., 2023; Robbins Schug et al., chapter "Racial Equity, Ethics, and Sustainable Futures in Anatomical Sciences", this volume). One can envisage that a truly equitable, diverse and inclusive academy would be a profound and powerful entity; it could engender a ripple effect in wider society (Milem, 2003), fostering a representativeness of talent, voices and lived experiences, with the potential to provide the building blocks for broader structural change within society.

As discussed throughout this book, the discipline of bioarchaeology has specific and well acknowledged DEI issues, many of which are routed in the discipline's culpability in eugenics, scientific racism and structural violence, the legacies of which continue to cause harm today (Adams et al., 2024; Agarwal, 2024; Blakey, 2020). Bioarchaeology is dominated by white academics, with BIPoC scholars woefully underrepresented (Robbins Schug et al., chapter "Racial Equity, Ethics, and Sustainable Futures in Anatomical Sciences", this volume). In the UK the situation is particularly stark, as outlined in the British Association of Biological Anthropology and Osteoarchaeology's (BABAO) independent Race Equality review (Arday & Craig-Atkins, 2021). Excellent chapters in this section of the book discuss important interventions towards anti-racism, decolonisation and disability within bioarchaeology. The aim of this chapter therefore is to shift focus from discipline-specific issues to the wider academy, and to situate bioarchaeology as well as DEI initiatives within a broader institutional context. It is not possible in this short space to discuss all the barriers experienced by marginalized peoples, or ways of mitigating them. Nor is it our intention to do so. Instead, we aim to discuss DEI by focusing on our experiences (working individually and together) of devising and implementing initiatives within our own elite and predominantly white academic institution. Shifting an academic culture is not easy: it requires firstly clear acknowledgement that there is a problem and there is often a reluctance to do so (Shain et al., 2021). It then requires sustained institutional commitment to address the problem, which includes investment in time and resources, coordinated actions, accountability and, crucially, prioritization (Akhtar, 2022). We discuss some steps that professional bodies and academic departments associated with biological anthropology might take towards a more socially just academy. We draw upon scholarship from critical medical anthropology, the Theory of Change literature, and the broader social sciences to provide a theoretical underpinning for the proposed actions.

Given that this chapter is largely derived from personal reflections, we outline our own positionality and experience in relation to what follows:

Rebecca is a white, neurotypical, cisgender female, first generation scholar, and mother of two boys. She attended University in the UK in the 1990s, a period when it was there were no tuition fees, and she also received a full maintenance grant for living expenses (Higher Education in the UK is no longer free). She was privileged by this and many other aspects of her identity. She has also benefited from supportive colleagues in her early career, although she has experienced exclusions and aggressions relating to her gender and status as a mother. Her research in bioarchaeology focuses on bodies and societies and she is interested in issues of inequality in the past as well as the present. She has worked on DEI initiatives in official capacities at all levels of her institution over the last 8 years, including as Chair of DEI in her Department, as Deputy Executive Dean for People and Culture for her Faculty (overseeing and supporting work of eight academic Departments in DEI), and as Interim Deputy Provost. Her work has benefitted enormously from the insights of many colleagues from under-represented groups who shared their experiences and expertise. She met and collaborated with Shivani on a Faculty and University-wide Decolonizing initiative in 2021 and they continue to work together.

Shivani is PhD student with a full scholarship. The active support offered when applying for this award by her primary supervisor, a white British male, led to her becoming a strong advocate for mentorship between 'senior' and 'junior' members of the academy. She recalls the simplicity yet effectiveness of her prospective supervisor listening to her during his virtual office hours in lockdown, as she, a complete stranger, introduced herself by explaining: 'I want to do a PhD and my focus must be India.' With parents who began working at the age of 18 and a mother who had to enroll herself into school upon arrival in the UK, the opportunities Shivani has been presented with are quite the contrast to that of her forebearers. Whilst Shivani knew doctoral training programs and funding existed, she sought a mentor who was receptive and proactive in his approach—meaning she soon had a thorough understanding of the whole process. Shivani has become a firm believer in the importance of proactive peer and reciprocal mentoring as key DEI interventions. She has just finished a year of fieldwork in India where her Indian looking appearance, but British sounding accent caused confusion. And so began a year of explaining her grandparents were born in India, her parents in East Africa, and herself in the UK. Whilst a British passport was Shivani's birthright, her grandparents and parents were British subjects before anything else. Explaining this in the field was a source of contention as the assumption was often that she had left India at 18 in pursuit of becoming a 'westerner.' Shivani has co-produced and coordinated the University's Faculty decolonizing curriculum initiatives, including acting as Faculty lead for the student decolonizing internship program.

2 We Have a Problem

The 2020 documentary 'Picture a Scientist', directed by Sharon Shattuck and Ian Cheney, exposed the entrenched discrimination against women in academia. One of the featured scientists, Nancy Hopkins, Professor of Biology at MIT, discussed her experiences of work-place gender inequality in the 1990s and attendant gaslighting by senior male leaders. As a scientist, she took an evidence-based approach to tackling their denial of gender equality head-on: she spent her evenings meticulously measuring the size of offices and laboratory spaces allocated to different Faculty members and calculated the average square feet by gender. Her results clearly showed that senior female academics were given fewer resources than even the most junior male faculty. Eventually, with the collective support of other senior women, she was able to use this information as one strand of evidence to force senior leadership action. Unequal resource distribution was only one of the many ways in which Hopkins was marginalized, diminished and worse: she was also sexually assaulted by Francis Crick. Her positionality within her institution and in relation to this much lauded man was such that she pretended that this criminal act had not happened—she felt compelled to protect her male colleagues from the embarrassment of her own assault. Many women can relate to such silence: a hallmark of the disempowered and a focus of the global #MeToo movement. Hopkins experiences are echoed by many women and other academics across the globe and while their voices are now starting to be heard, this does not always translate into tangible actions.

Similarly exclusionary and violent experiences continue to be commonplace, especially for those experiencing intersecting axes of oppression, including women of color, LGBTQ+, and/or students/staff from low socio-economic backgrounds and first-generation scholars (Bhopal & Henderson, 2019; Richardson et al., 2020). Persistent, every day, micro (and macro-) aggressions and exclusions, experienced by staff and students of color especially, reinforce a perception that Universities are white middle-class spaces only, with 'whiteness' perceived as the invisible norm (Reay, 2018). The insidious and grinding impacts of everyday exclusions and aggressions for wellbeing and mental health are profound and are neither acknowledged nor routinely catered for within university environments, where the majority of counsellors are also white and very few are trained to understand the impacts of racial trauma (Arday, 2022). Staff and students of color have stated that the lack of appropriate support in the face of institutional racism means that they must rely on their own social connections and family to mitigate the psycho-social impacts of navigating white academia (Arday, 2022). This has clear implications for attainment (awarding) gaps for students and career progression for staff. One Black female student at a UK institution described feeling the need to suppress/hide her own feelings of anxiety and depression due to cultural/racial stereotypes around mental health: she felt that disclosing mental health issues was the privilege of white students only. Arday (2022) discusses the need for more targeted interventions around mental health to support staff and students from ethnic minorities who are consistently 'lacerated' by their racialized experiences. It is death by a thousand cuts.

We know that a diverse and inclusive academic culture in which all staff and students feel a sense of belonging creates a productive and positive environment in which we can all thrive, including white academics. But how do we achieve this? Cultural change is something that many institutions strive for; DEI initiatives abound, but progress is ponderous, actions can be ineffectual and often rely on the unremunerated labor of those who are oppressed by the system in the first place. For Nancy Hopkins (discussed above), change rested on her shoulders and became her responsibility. To achieve this, she had to continually battle institutional inertia, undertake time consuming, out-of-hours labor, which not only took her away from her core business of teaching and research but had an emotional toll. It should not have been her responsibility to fix the system that was oppressing her.

Adding to the complexity of DEI activity is the current backlash against such initiatives: framed as nonsense work undertaken by the "wokerati", undermining freedom of speech, academic freedom, and the (persistent myth of) meritocracy, threatening the very core of our post-enlightenment academic paradigm, and diminishing the achievements of white academics. It is worth noting, however, that there is also a discontent with DEI initiatives from marginalized demographics, who view many of the current attempts to be performative and ineffectual—reeking of institutional tokenism but with no real desire to change to status quo. Or, even more perniciously, actively servicing inequitable structures, through the provision of "window dressing" initiatives that don't provide the fundamental challenge required to effect meaningful change. Stein (2020, p. 157), for example, notes a 'reconciliation fatigue' concerning superficial efforts to transform institutions which are entrenched in 'colonial logics, economies, and relationships' (Stein, 2020, p. 157). Ruha Benjamin discussed her lived experiences as a Black academic in the United States on the 'What Now?" podcast with Trevor Noah and expressed her frustration with DEI and representational politics as a means of "insulating business as usual". As she provocatively noted: "plantations were very diverse places" and "we need to think about what we're being invited into…diversity and domination can go hand in hand". The following section will discuss these issues and some ways in which we might start to address them in relation to concepts in critical medical anthropology.

3 "System Challenging" Versus "System Correcting" Praxis

The medical anthropologist Merrill Singer (1995) developed the concept of "System Challenging" versus "System Correcting" praxis to explore structural inequities in health. He built upon Gorz's (1973) discussion of "reformist and non-reformist reform" and translates "reformist reform" as "system correcting praxis". This refers to marginal, incremental shifts in practice introduced to address an inequity, but which in reality allow the status quo to continue because these actions have avoided any fundamental structural change. Examples might include the introduction of a University/Professional Body 'values statements', which then float in the ether and are not linked to practice, or diversifying reading lists, which is a useful exercise but

hardly addresses the core problems. As Waitzkin (1979, p. 359, cited by Singer, 1995, p. 90) notes: "reforms most often follow social protest, make incremental improvements that do not change overall patterns of oppression, and face cutbacks when protest recedes". Waitzkin's statement has resonance with the explosion of DEI initiatives following the unlawful deaths of George Floyd and Breonna Taylor in 2020, contrasting with the more recent retrenchment of these initiatives across many public and private sectors.

Many DEI initiatives can, therefore, be viewed through the lens of "system-correcting praxis": providing the veneer of action but not fundamentally concerned with unmasking and addressing the sources of inequity; consequently, falling foul of "inertial forces" (Singer, 1995). Furthermore, as Singer (1995, p. 89) highlights: "Characteristic of system-correcting praxis is its vulnerability to co-optation by dominant forces in a social system". Changes to academic structures, including professional bodies, require the relinquishing of (at least some) power by senior leaders, as well as a willingness to face and act on uncomfortable truths, and to embrace different ways of doing.

"System-challenging praxis" by contrast seeks to reveal the origins of inequity and requires more radical and permanent structural alterations. Much of what we discuss below can be aligned with the Theory of Change approach discussed in the chapter "Introduction: Bioarchaeologists Should be Activists Too" and by Robbins Schug and colleagues (chapter "Racial Equity, Ethics, and Sustainable Futures in Anatomical Sciences", this volume) as both approaches are outcomes focused. One way of achieving system challenging praxis is to enhance the democratization and demystification of processes (Singer, 1995). University and Professional Body structures, as with broader society, are intensely hierarchical and can seem bizarrely labyrinthine to the uninitiated. Indeed, many marginalized groups fall foul of similar "hidden curricula" and ways of doing, where knowledge is assumed through legacy and connections rather than made explicit. Under these circumstances one can feel powerless and obstacles to change can seem almost insurmountable. A flattening of these hierarchies, providing the space for active engagement and co-production with colleagues and students at different levels of the institutions and, crucially, ensuring and valuing representation from those marginalized within the current system is an important step. In our experience, co-production between students and staff, with students as equals in the design and implementation of change is valuable and empowering for all parties: staff as well as students have reported feeling invigorated and excited by this model of working.

As an example, the authors' own partnership stemmed from experiences of co-production and we have each found sharing and valuing our experience and expertise to be enriching, enlightening and mutually rewarding. In co-production the equality of partnerships needs to be enacted and reinforced through practice; everyone's contributions are respected and valued and traditional hierarchies disregarded. Every participant should feel able to share their knowledge in a space that feels secure, although not necessarily comfortable. In our experience of working in DEI, feelings of discomfort are part of the process, and this can be true whether one is

working from either a position of privilege or oppression. Effecting change is hard and emotional work.

Another key requirement of "system challenging praxis" is long-term institutional commitment. We have been involved in processes that have lasted only 1 year, and this created uncertainty, inefficiencies in terms of workload, and impacted the quality of the work produced (Daxini et al., submitted). Short term projects are problematic because it takes time to establish momentum and the original impetus and new practices do not have chance to become self-sustaining; thus, the system snaps back to its previous inequitable state. We refer to this as "elastication" (Daxini et al., submitted). To extend beyond the system's elastic potential requires sustained and profound pressure. It also requires that the responsibility for any initiatives become dispersed and structurally embedded: change cannot rest on the shoulders of a few. From our experience, if this is the case, as soon as a key figure leaves or is simply no longer able to carry the sole burden of change, progress halts and initiatives fall apart. This can then contribute to broader disenchantment with DEI initiatives. Adequate succession planning is therefore essential, but to mitigate risks further, accountability for interventions has to be embedded throughout University/Organisational structures. This also sends the clear message that cultural change is a collective responsibility. This requires widespread buy-in from senior leaders, students and staff, resource investment, and a dogged, long-term commitment to the pathway, even when buffeted by broader financial and socio-political crosswinds. For a deeper discussion of System Challenging and System Correcting praxis in relation to decolonizing activities we refer you to Daxini et al. (submitted). Below, we provide a more generic perspective on how to implement authentic, democratized, embedded, and long-lasting change. Other pathways likewise aligned to the Theory of Change are possible and, again, we are speaking purely from our own experiences of implementing tangible cultural change.

4 Identify the Problems and Tailor the Solutions

An initiative that works well in one University may be entirely inappropriate to another—even within the same country, let alone geographically dispersed institutions. As obvious as this might sound, a source of failure and frustration with respect to DEI initiatives relates to the mistaken perception that one size fits all. Given that there are no "off the peg" solutions, the starting point for any work is to first identify and construct a clear evidence base (just as Nancy Hopkins did at MIT) and a deep, well-informed knowledge of specific institutional problems. Most staff or students hold an anecdotal or personal understanding of key issues, especially those from minoritized groups; however, the process of gathering evidence is still critical and has the following benefits:

A. It provides marginalized colleagues and students with a 'voice' and the opportunity to both contribute to and direct initiatives from the outset.

B. It exposes the extent and nature of the issues to senior leaders and other staff and students in a way that is fact-based and incontrovertible. It thus invalidates any potential denials and reduces the likelihood of superficial responses. Hard evidence of inequity also articulates the risks associated with inaction (which is rarely a neutral response) and provides an impetus for engagement.
C. It allows the formulation of actions that are closely aligned to specific problems and therefore more likely to be successful.
D. It allows the quantitative and/or qualitative (as appropriate to the problem) evaluation of the success of any targeted interventions, which is important for future reflections and amendments.

Positive examples of system challenging praxis within medical anthropology have highlighted the importance of grass roots involvement and engagement; evidence gathering is an essential part of this (Singer, 1995). The evidence should be collected using a mixed-method, qualitative and quantitative approach, including focus groups, surveys, and a detailed analysis of any centrally held student and staff data (e.g., staff and student composition by protected characteristic, promotion data for those with different characteristics, degree award gaps by protected characteristic, etc.). Indeed, initiatives such as this often highlight deficiencies in institutional record keeping and may be a driver of improved systems.

In our experience, focus groups are essential for evidencing directly the perspectives and lived experiences of those marginalized by current systemic inequities. But there are a number of considerations when attempting these (in addition to ethical sign off). Ideally, those contributing their time to focus groups should be recompensed; for example, student participation could involve renumeration or gift vouchers, while staff could be workloaded, or their contribution recognized as service/citizenship for promotion applications. Otherwise, such work becomes another hidden labor or burden for people of color and other marginalized groups. It is important to acknowledge that frequent requests to 'represent' for minoritized staff and students, though all the different forms this can take, can feel like a second job and this presents an unfair burden unless properly recompensed. It is also important to be mindful that the process of recounting or explaining marginalized experiences can be traumatic and emotionally draining and people should not be asked to participate unless there is the firm intent and commitment to produce tangible outcomes. In our experiences, focus groups, which can be quite intimate discussions, should also be led by a person with personal characteristics aligned to the topic in question. This is more comfortable for participants, changes the tone of the conversation and the nature of the disclosures, which become more 'real' and less filtered. Alexander (chapter "Engaging the Public: Anthropology's Power to Impact Communities", this volume) provides an excellent illustration of the importance of shared characteristics and identity for connecting with people in her work with Black American museum visitors and school children.

Surveys are also an important means of providing quantitative baseline information which can then be used, alongside other data, to provide measurable indicators of success (or not) of any DEI intervention after implementation. We find that

surveys utilizing the Likert scale (using a 5-point system such as Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree) can be most effective for this. An important component of such surveys is the collecting of anonymous demographic information, including gender and ethnicity/social race, disability, and possibly socio-economic background. Data categories used for these are culturally specific and require careful consideration. Furthermore, these categories can change within a census period (highlighting the fluidity of such constructs) and this can be challenging for mapping surveys over time, and monitoring the effectiveness of interventions. While free text comments in surveys are useful to include, these should be restricted as they make analysis more difficult and make the survey take longer to complete for participants, which will reduce the response rates. More nuanced and detailed responses can be teased out in the focus group discussions. Giving students time in class to complete an online survey is helpful for improving participation and allows an in-person explanation of the purpose and significance of the survey. It is all too easy for us to delete survey requests in emails, and many students now engage with email to a lesser extent than previous generations.

Finally, when constructing your evidence base through surveys, focus groups and the analysis of centralized data, note that academic institutions do not consist only of academic staff and students. It is important to also include the wide range of professional/administrative and custodial staff in the conversation to achieve holistic cultural change. In our experience during a decolonizing initiative, we found that Professional staff, including Learning and Teaching Administrators, Technicians and Library staff were excluded from discussions. This was an especially significant oversight given that such staff may be at the sharp end of institutional inequities (e.g., gender pay gap). Needless to say, when this was subsequently addressed, their contributions were invaluable. All staff need to be briefed on the process and the 'why' for any DEI initiative and there needs to be a strong and staged communications plan at the outset in order to improve engagement. The timing of any initiatives also needs to be carefully coordinated to be as inclusive as possible (e.g., avoiding exam periods, religious holidays, or other particularly busy times of year).

5 Action Towards Cultural Change

For DEI interventions in the UK, particularly those instigated by Advance HE Charter marks (a national body focused on gender and social race equity in Higher Education), Action Plans are the cornerstone of cultural change. Again, this aligns with the Theory of Change outcomes focused approach. For action plans to be effective they need to be SMART (Specific, Measurable, Achievable, Relevant, Time-bound). The idea of this is to create accountability for change and disperse the responsibility for various actions across the institution. Each action should address a specific problem highlighted by the evidence, although some issues will of course require a multi-action response. In our experience individuals and institutions can

be resistant to action plans and the most oft-repeated objection we have heard is: "we don't want to create hostages to fortune"; meaning that we don't want to create challenging objectives with specific measures of success, where we can visibly fail. But this is precisely the point: it is called accountability.

We have been involved in creating numerous action plans for improving equity, specifically for gender and social race, but also disability and intersecting identities. An initiative is more likely to be "system challenging" if there is a close alignment between the problem and the action, and the action owner is sufficiently empowered to implement it. Although this is a seemingly obvious point, we have found initiatives flounder because of the absence of this logic. It is of course essential to have the action owners' buy-in and they need to feel empowered to meet the assigned tasks, either through their seniority or institutional backing. Co-production of the Action Plan with students and a representative cross section of the Institution is essential—there needs to be a collective agreement and ownership. Opportunities for students to engage and provide leadership for institutional change can be career enhancing, but they should still be renumerated or benefit in some other way for their time, and students from marginalized demographics should be prioritized for these roles.

Experience has shown us that once the action plan has been written, this is just the starting point, and it cannot be sequestered from everyday business otherwise it will be forgotten. This has frequently happened in the past with Athena SWAN gender equality action plans across UK departments and institutions, creating numerous problems, including disenchantment with such processes. To avoid this, an Action Plan cannot be the responsibility of a single committee. Actions must be disseminated and embedded within the relevant committees and University governance which are then held to account, via regular reports on progress. Oversight can be provided by a DEI committee, but this cannot be responsible for doing all the work.

Action plans should last for 3–5 years and actions staggered/prioritized as appropriate. Institutions should commit to the action plan and sign it off at the highest levels for the duration. Against the backdrop of acute financial pressures currently experienced by many Universities across the globe, DEI is often seen as a luxury that they simply cannot afford. When resources are stretched, short termism abounds, and DEI is seen as dispensable or a 'nice to have'. It is therefore essential to obtain this longer-term commitment, otherwise there is the potential for considerable effort, energy and good will to be expended, but with very little in the way of outcomes and this can be even more damaging than no action at all.

6 When Change Feels Like a Threat

While not everyone has an equal capacity or power to instigate change, the culture that we nurture within our discipline and institutions is a collective responsibility. Small interactions can make a big difference and as we increase in seniority it is

important to recognize and critically reflect on our own privilege and practices. It is essential that we identify and help remove barriers for colleagues and students who are oppressed, and to improve our institutions for the next generation of scholars. DEI initiatives are not a threat to our expertise or our power, they will enhance our working environment for everyone. Despite this, they can be a hard sell. Many people intrinsically do not like change; they feel worried and even threatened by it, whatever it may be. Managing resistance to change is difficult, because it is highly emotive. In conversations with colleagues who express concerns, focusing on the "why" can contribute to finding common ground but this is not always possible. Clear communications and trust building are essential; there are inevitably some staff or students who misunderstand, or who get a skewed perspective of what is being attempted. Or perhaps colleagues have simply had poor prior experiences of institutional change. It is important to recognize that you will not bring everyone with you on the journey. As a general rule, 20% of people may be really enthusiastic about the changes, 60% somewhere in the region of slightly positive, ambivalent, to slightly negative, and 20% might be actively resistant. The literature on transformational change discusses the need to "manage resistance" and in an ideal world you would want to be able to bring everyone with you on the journey. In our experience this is unlikely, and we feel that given the finite nature of our own resources and energy, a more strategic and considered approach is necessary. This work is hard, and while hearts and minds are important, so it is best to focus on the majority, whilst respecting the position and not alienating colleagues who are completely resistant. It is possible that they might be persuaded at a future point when they realize that they fundamentally have not lost anything from this change and may even have gained.

7 Knowledge Production

Not only is DEI a moral and ethical imperative, but it is also an essential component of knowledge production and dissemination, which is at the heart of our endeavors. A homogenous staff and student body inevitably leads to monolithic ways of thinking and doing. A diverse academy stimulates new avenues of exploration and disciplinary innovation (Adams et al., 2024; Arday et al., 2020). Unfortunately, the conservatism of academia and professional bodies, which simply hasn't provided sufficient space for alternate voices, has led to a continuation of pedagogical hegemonies and an increasing inter-generational disconnect in learning, teaching and research imperatives. As discussed, these tensions often play out through increased mental health issues and a culture in which many of those who are not able to 'fit the mold' become 'expunged' at various points along the academic pipeline (McCrane & Tallman, 2022).

A diverse academy is not simply about window dressing. It can help forge a vibrant academic environment, which can challenge existing modes of knowledge production, along with what types of knowledge and subject matter are valued.

Attempts in many countries around the globe to diversify and decolonize their curricula and other activities relate to these concerns (Bhambra et al., 2018). However, Ahmed (2020) has outlined risks of institutional responses being hierarchical and ineffective with universities falling prey to a 'the decolonial bandwagon'. The inability of institutions to develop structural responses beyond broadening reading lists and library collections has catalyzed a more radical set of demands, often driven by the student body. Thus, the ethical position of university institutions is challenged as their business cases often depend upon low-risk approaches to problem-solving (Hall et al., 2021).

The dominance and apparent immutability of the Western Post-Enlightenment scientific paradigm within university settings around the world has been an obstacle to progress, including within our own discipline of bioarchaeology (Gowland, 2025; Grauer & Gowland, 2025). This is characterized by dualist categorizations (nature/nurture, biology/culture, subject/object), an insistence on scientific objectivity, the logic of cause and effect, and the linearity of chronological time. A rigid adherence to this paradigm has stifled attempts to seriously integrate Indigenous Science and non-Western perspectives and has led, instead, to a performative tinkering around the edges of curricula. Karen Barad's (2007) concept of "agential realism" as well as other work within what's been termed 'New Materialism' challenges these Cartesian epistemologies and dualist categorizations. Within Barad's analysis, knowledge emerges and is co-constituted through entangled materializations with relational agencies. Barad (2007) describes knowledge production as an embedded and embodied material engagement with the world: "knowing is a material practice of engagement as part of the world in its differential becoming" (Barad, 2007). The observer and observed are co-constituted within Barad's agential realist approach; therefore, who the "knower" is, their identity, is a critical part of the "intra-action" involved in the production of knowledge. The importance of the "knower", and their specific positionality and material engagement with the world, within this paradigm highlights the fundamental importance of a diverse academy. Additionally, strands of Barad's approach have more in common with Indigenous and non-Western scholarship and could pave the way for a radical shift towards a more authentically inclusive academy; one that actively embraces alternate ways of knowing the world (Bradley, 2023; Rosiek et al., 2020).

8 Conclusions

Cultural change towards a more inclusive academy is possible but will not happen if responsibility is sequestered within a single institutional group/committee. We have seen some positive changes within our own institution; however, this can be slow and does not happen in tandem for all marginalized demographics (Bhopal & Henderson, 2019). DEI initiatives frequently fall apart or provide only incremental change because of a lack of long-term institutional investment and commitment and the failure to disperse and embed DEI responsibility and work into everyday

practice. This dismantling or falling apart of initiatives creates enormous damage and wastes resources, including the energy and goodwill of participants, resulting in the erosion of trust, frustration and despondency. Embedding DEI within everyday business and creating measures of success and accountability for initiatives is essential. Within Higher Education we are often trapped within conservative, neoliberal systems and structures, and ways of doing, which feel almost impossible to overcome. A more radical, system-challenging praxis requires a fundamental, grass roots rethink of our academic ways of doing, alongside a sustained and authentic commitment to DEI.

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Racial Equity, Ethics, and Sustainable Futures in Anatomical Sciences



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1 Introduction

Science, Technology, Engineering, and Math (STEM) education is critical for global progress on the major challenges facing our time. American STEM education has been globally recognized for leadership in teaching STEM as part of a broader liberal arts education, necessary for training students in critical thinking and problem solving (NSF, 2023). However, American STEM education is also characterized by institutionalized exclusion, a lack of representation among faculty and student leadership, and a fundamental disconnect between curriculum and the needs of underrepresented marginalized communities (Asai, 2020; Hatfield et al., 2022; McGee,

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_3

2021; NSF, 2023; Tanenbaum et al., 2016). For example, despite constituting 30% of the American population and 34% of incoming STEM college students, individuals from racially minoritized (RM) backgrounds account for only 18% of STEM degree earners (Asai, 2020). This leaky pipeline leads to tremendous loss of potential and reflects deeper issues within STEM educational structures that prioritize tradition over inclusivity and overlook the harmful legacies embedded in the logistical rigor of the syllabus. Universities, funding agencies, and foundations have been actively working to address these issues by advancing institutional transformation within STEM departments through structured efforts aimed at fostering diversity, equity, and inclusion (but see https://www.nsf.gov/updates-on-priorities).

Systemic inequity is apparent in anatomical sciences, like biological anthropology, where historical practices are inseparably linked to the legacies of racism and unethical treatment of marginalized communities. In academic settings across the United States, anatomy and biological anthropology are taught based on collections and foundational knowledge often built upon exploitation—such as the use of unconsented human remains of Black individuals, Indigenous people, and institutionalized populations (Agarwal, 2024; Blakey, 2024; de la Cova et al., 2023; Dunnavant et al., 2021; Lans, 2021; Watkins, 2020). The legacy of these practices continues; thousands of bodies remain curated in academic spaces and museums without full knowledge and consent of their communities, descendants, and relatives. In many cases, bodies and body parts obtained through unethical practices have been anonymized, their identities erased through anatomization and systematic dehumanization (de la Cova, 2020; Lans, 2021).

Institutional transformation does not occur because we care, or because we announce principles—it occurs when we deliberately realign incentives, labor, curriculum, and power. We developed the REBOoT (Racial Equity, Bioethics, and Organizational Transformation) Model to apply a Theory of Change (ToC) framework to anatomical sciences by identifying the structural forces that exclude racially marginalized students (RMS) and faculty, articulating the conditions required for equity, and building coordinated interventions in faculty development, curriculum design, and student leadership. Our Model aligns with activist bioarchaeology's call for restorative justice (Blakey, 2024; Watkins, 2020), centering both community engagement and intersectional equity in anatomical sciences. We build on a systems-thinking approach to student success that centers on inclusion rather than a deficit-based intervention model (McGee, 2021). Guided by Theory of Change, our Model emphasizes the need to shift first-order values, attitudes, and power dynamics that hinder academic progress (Kezar, 2018; Kotter, 2012; Malachowski et al., 2024). This approach targets systemic barriers to address three mutually reinforcing pillars:

- **Faculty Professional Development**: Emphasizing emotional investment and a commitment to equity, this component provides a structured path for STEM faculty to develop inclusive teaching practices and a deeper understanding of their field's historical and social context.
- **Curriculum and Pedagogy Innovation**: These reforms address historical injustices by promoting ethical practices in teaching anatomical sciences and creating inclusive learning environments.

- **Leadership and Power-Building for Diverse Students**: This innovation prioritizes establishing pathways for underrepresented, RM students to engage in meaningful research, peer mentorship, and leadership development.

By addressing these interconnected challenges, the REBOoT Model aims to transform STEM education in anatomical sciences, providing a scalable framework for promoting student success in anatomical sciences across diverse institutional contexts, and particularly at Minority Serving Institutions (MSIs), like UNC Greensboro. This approach is essential in addressing the ethical and pedagogical foundations of anatomical sciences, especially in fields where historical legacies of colonialism, racism, and structural violence have shaped both the field's methods and its collections. This chapter provides a roadmap for American public universities seeking to create more equitable, ethical, and sustainable futures in anatomical sciences through a detailed examination of implementation strategies, assessment frameworks, and potential challenges. Our ToC Model begins by rejecting deficit logic. Racially marginalized students do not "lack preparation"; institutions lack structures that recognize racism's role in shaping access and belonging. The REBOoT framework therefore sets three preconditions for equitable anatomy education:

- Faculty see harm clearly and have tools to stop reproducing it.
- Curricula teach ethical and historical context alongside scientific technique.
- Students from marginalized groups hold compensated leadership positions in shaping the discipline.

Through this integrated approach, the REBOoT Model seeks to dismantle inequitable practices in anatomical sciences, ensuring that future practitioners not only understand but also actively challenge the legacies of exclusion and unethical curation. By fostering equity, diversity and inclusion at every level—from curriculum development to student leadership—the model represents a roadmap for institutions aspiring to create sustainable, ethical futures in STEM fields.

2 Theoretical Framework: Addressing Systemic Barriers in Anatomical Sciences

Achieving institutional transformation toward a more equitable, just, and sustainable future within anatomical sciences requires a shift that is both systematic and grounded in established ToC frameworks designed to change organizational culture and practices. The REBOoT Model's multiyear, multistage process as outlined in this chapter demonstrates how ToC is adaptable to various institutional settings and can be employed to address institutional and systemic barriers. The REBOoT Model is structured around two critical components: leadership development and labor recognition as well as identification and removal of structural barriers. These components are designed to create an environment that promotes student success and addresses historic inequities embedded in anatomical sciences.

2.1 Leadership Development and Labor Recognition

Transforming anatomical science education requires dedicated leadership and fair recognition of labor, particularly the often-overlooked mentorship provided by RM faculty. Faculty from RM backgrounds are disproportionately tasked with mentoring RM students, who frequently gravitate toward mentors who share similar experiences and backgrounds (Atkins & Hodges, 2024; Bryson & Webber, 2024; Estrada et al., 2018; Foltz et al., 2014; Maton et al., 2000). This mentorship is crucial for helping students develop their scientific identities and navigate academic environments that may otherwise feel isolating or unwelcoming. However, the demands placed on RM faculty to support these students often go unrecognized within the traditional academic reward structures that prioritize publications, grants, and formal instruction over mentorship and community-building roles (Hurtado & Alvarado, 2018; Joshi et al., 2015; Kim et al., 2019; Lee, 2012; Markle et al., 2022).

Persistent salary gaps further exacerbate these issues, as RM faculty face additional financial inequities, unacknowledged labor expectations, and systemic barriers to career advancement (Faucett et al., 2022; Fritzsche, 2022; Henderson et al., 2010; Lee, 2012; Li & Koedel, 2017; Yadav et al., 2020; Zambrana et al., 2023). Addressing these disparities requires institutional support in several areas to ensure that RM faculty are adequately compensated and recognized for their contributions. The REBOoT Model advocates for change at the department and individual faculty level, where mentorship for RM young faculty research, teaching, and service can be deeply impactful (Espino & Zambrana, 2019; Ransdell et al., 2021; Zambrana et al., 2023). However, we also strongly advocate for securing external funding or institutional commitments to compensate RM faculty for their mentorship work through summer salary or other flexible means; offering course release time for program development and mentorship initiatives; providing administrative recognition of mentorship and educational research in annual performance reviews; and institutional commitments to physical spaces and resources that support this mentorship and educational mission. These measures not only acknowledge the critical role that RM faculty play in student success but also help to build a sustainable pipeline for future RM leaders within anatomical sciences. Engaging faculty without offering adequate compensation only exacerbates the system of inequality.

2.2 Identifying and Addressing Structural Barriers

The second component of the REBOoT Model uses ToC to address structural barriers that hinder RM student success. Key among these are the restrictive structures of gateway courses in anatomical, anthropological, and biological sciences, which often overemphasize logistical rigor in course policy and structure in lieu of inclusivity, resulting in high attrition rates among RM students (Benford & Gess-Newsome, 2006; Entezari & Javdan, 2016; Gabriel, 2023; Griff & Matter, 2008;

Gultice et al., 2015; Harris et al., 2004). These foundational courses frequently employ rigid syllabi that demand perfectionism and impose false urgency, creating a discouraging or even impossible learning environment (Okun & Jones, 2000). Additionally, the curricula in these courses often lack diverse representation and fail to acknowledge the historical and racial biases embedded in the discipline. Consequently, high failure rates serve as unnecessary barriers to STEM careers, especially for students from under-represented backgrounds.

The historical context of anatomical sciences further compounds these challenges. Given the field's problematic legacy, which includes the unethically acquired human remains of marginalized communities, RMS may feel alienated, identifying more closely with the "specimens" used in teaching than with the instructors (Agarwal, 2024). This disconnection is intensified by the lack of RM faculty representation, which limits students' opportunities to form scientific identities and envision themselves as future leaders in the field (Atkins & Hodges, 2024; Fadeyi et al., 2020; Hofstra et al., 2022).

Rather than treating students as the site of remediation, REBOoT shifts responsibility to institutions and educators, insisting that ethical practice, community accountability, and racial justice are core professional competencies in anatomy—not optional ideals (McGee, 2020, 2021; Okun & Jones, 2000; Warikoo & Carter, 2009). Faculty development must dismantle white hegemony in STEM pedagogy (hooks, 1996), not merely accommodate diversity. The Model's approach includes:

- Faculty professional development programs that foster faculty commitment to inclusive excellence and challenge entrenched biases.
- Integration of liberation principles into gateway course syllabi, creating a curriculum that respects diverse perspectives and prioritizes equity.
- Recognition of students' complex lives and responsibilities, with an emphasis on flexibility and inclusive educational policies.
- Adoption of flexible course policies aligned with educational design justice principles (Design Justice Network, 2018), ensuring that courses support rather than penalize students.

The REBOoT Model provides a robust theoretical framework for addressing the historical inequities within anatomical sciences and fostering a more inclusive and sustainable approach to education. By focusing on institutional-level changes and prioritizing the experiences and success of RM students and faculty, this model offers a pathway toward an ethical and equitable transformation of STEM fields. Institutional-level change means also addressing faculty STEM culture and structural rewards to emphasize inclusive teaching and mentoring.

2.3 *Implementation of the REBOoT Model: A Three-Tiered Approach*

Drawing from ToC research (Kezar, 2018; Malachowski et al., 2024), the REBOoT Model implements transformation through three interconnected components: faculty development, curriculum innovation, and student leadership development. Each component addresses specific barriers while building toward comprehensive change (Fig. 1).

2.4 *Faculty Professional Development*

Faculty transformation is the keystone. Without shifting attitudes, assumptions, and reward structures, any "DEI" initiative collapses into symbolism. Our Head-Heart-Hands model operationalizes this (Islam et al., 2022). The H3 (Head-Heart-Hands) program in the REBOoT Model is a structured, three-phase faculty development initiative designed to foster inclusivity and equity in STEM education by

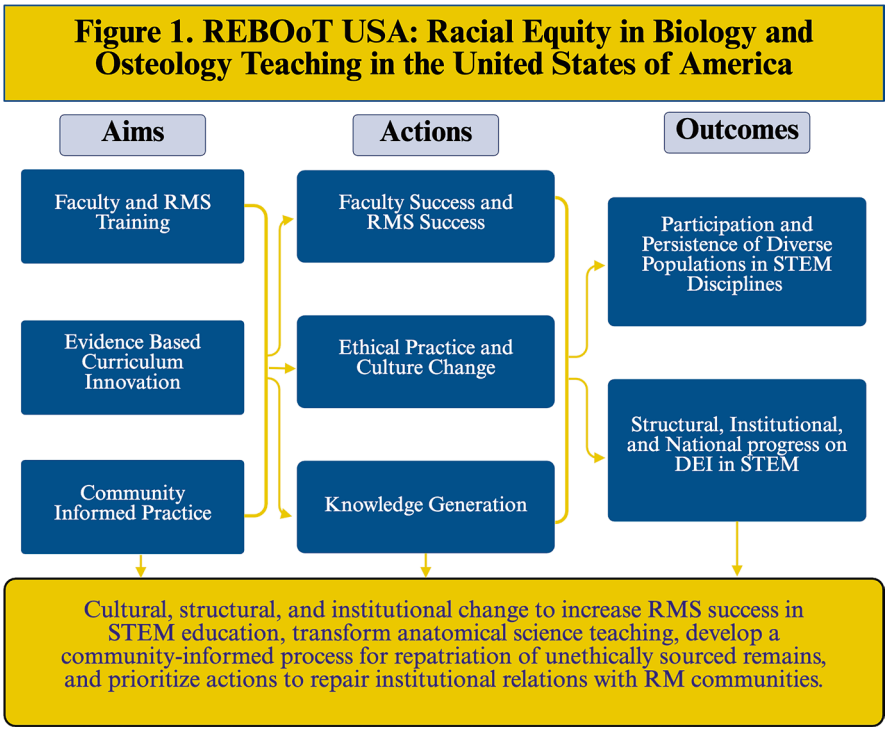


Fig. 1 Theory of change model adapted for the REBOoT Project

transforming both pedagogical approaches and faculty attitudes toward diversity, equity, and inclusion (DEI). In the first phase, The Head, faculty members engage with a certificate-granting course, "DEI: Dialogue for Change," which focuses on historical and cultural literacy; explicit training on race, coloniality, and bias in STEM education. The second phase, The Heart, provides faculty with a supportive environment for emotional and relational work to confront harm and privilege without fragility. Through facilitated retreats with social workers who are also equity specialists, faculty engage with anonymous student feedback on how racism impacts their educational journey and they are provided with data on racial disparities in course grades and assessment outcomes, which encourages reflective, one-on-one discussions to deepen empathy and awareness. Finally, The Hands phase centers on the practical work of transforming curricula by incorporating DEI best practices. This is described in more detail in the next section. Together, these three phases equip faculty with the knowledge, empathy, and practical tools necessary for enacting sustainable change in their classrooms and institutions.

2.5 Curriculum Innovation

Curricular change must dismantle gatekeeping logics disguised as "rigor." We distinguish academic rigor—deep learning, ethical grounding, scientific competence—from logistical rigor—arbitrary deadlines, punitive assessment, inflexible delivery. The latter disproportionately harms marginalized students and protects faculty comfort rather than educational quality. The REBOoT Model's curriculum innovation component seeks to transform foundational STEM courses by embedding inclusivity and active learning strategies that support students, including those from underrepresented, RM groups. Traditional gateway courses in anatomy and biology, which are often rigid in structure and prioritize high-stakes assessments, disproportionately disadvantage RM students, contributing to elevated attrition rates (Benford & Gess-Newsome, 2006; Entezari & Javdan, 2016). To counteract these trends, REBOoT introduces active learning strategies that include collaborative projects, peer support systems, and case studies designed to contextualize course material within students' lived experiences (Gast et al., 2017; Leupen, 2020). By combining best practices in teaching with the reduction of logistical barriers, such as inflexible deadlines and exclusive grading policies, these restructured courses create a learning environment that is both rigorous and supportive, allowing all students, particularly those from marginalized backgrounds, to succeed (Gabriel, 2023; Griff & Matter, 2008; Gultice et al., 2015).

The REBOoT Model includes the creation of one-credit companion courses as a practical approach to support RM student retention and engagement in STEM fields. These courses offer peer-mentored study sessions, provide space for learning strategy discussions, and include case studies that link course content to real-world applications (Boyce, 2017; Boyce & Rivera, 2023; Boyce et al., 2023; Clements et al., 2022; Reid, 2020). Guest speakers and alumni, including those from diverse

backgrounds are invited to share success stories, fostering a science identity and sense of belonging among RM students, who may otherwise lack role models in the sciences (Foltz et al., 2014; Hurtado & Alvarado, 2015; Lee, 2012). These companion courses serve as a bridge, enhancing comprehension and engagement in demanding gateway courses while allowing students to build academic resilience and community support (Joshi et al., 2019; Markle et al., 2022).

In addition to curriculum modifications in lower-level courses, the REBOoT Model incorporates ethics training in upper-level courses, emphasizing the historical and contemporary ethical challenges within anatomical sciences. This includes a focus on the problematic origins of many anatomical collections and the need for ethical frameworks that respect community input and descendant communities' rights regarding human remains (Agarwal, 2024; Blakey, 2010; de la Cova, 2020, 2022). By addressing these sensitive topics in an academic setting, students are equipped not only with technical skills but also with a comprehensive understanding of the ethical implications of their work. This integration of ethics fosters a new generation of scientists who are not only knowledgeable but also socially and culturally responsive and prepared to engage in community-based research with respect and responsibility (Blakey, 2024; Easterling & Byram, 2022).

2.6 Student Leadership Development

Student leadership is not enrichment—it is redistribution of power. The REBOoT Model's third component focuses on cultivating leadership skills among RM students, particularly within anatomical sciences, through a structured 2-year program. This program is designed to equip students with the skills and confidence to become leaders and role models within STEM fields, fostering a science identity that empowers them to navigate and succeed in academic and professional environments (Sellami et al., 2017; Wilton et al., 2024). This initiative aligns with research that underscores the importance of mentorship and structured leadership pathways in increasing RM student retention and success in STEM, where students often lack visible leaders who share their backgrounds and experiences (Estrada et al., 2018; Joshi et al., 2019).

The RM students recruited into the REBOoT program receive scholarships and training that prepares them to take on mentoring roles during the academic year, providing guidance and support to peers who may be struggling to find their footing in rigorous STEM courses. In addition to mentorship training, students participate in field training sessions on research methodologies, giving them early exposure to the skills and practices they will employ in future academic and professional research settings (Boyce et al., 2023; Clements et al., 2022; Reid, 2020). This initial training period sets the stage for students to step into mentoring roles during the school year, helping to build a supportive community where RM students feel a sense of belonging and are empowered to succeed.

After serving as peer mentors, student participants advance to more specialized research roles that focus on ethical curation, community-engaged research, and other socially relevant topics within anatomical sciences. This progression allows students to apply their initial training in research methodologies to real-world challenges, fostering critical thinking and leadership skills in ethically complex fields. This approach is supported by research that highlights the benefits of involving RM students in research with direct community impact, as it helps them connect their scientific pursuits to meaningful social contributions, thereby strengthening their science identity and commitment to STEM (Hurtado & Alvarado, 2015; Lee, 2012). RM students in the REBOoT program embody activist scholarship by leading community-engaged repatriation projects, exemplifying Wilton et al.'s (2024) model of student-driven DEI change. This Model compensates students, trains them in research and community ethics, and positions them as peer-educators. Their work in ethical curation and descendant-engaged practices is not symbolic; it shifts who defines knowledge and whose humanity anchors anatomical science.

3 Expanding Epistemologies: Ethical Transformation in Anatomical Sciences

For centuries, the accumulation and curation of human remains in American universities and museums have been marred by unethical and often illegal practices (see review in Robbins Schug et al., 2025). The nineteenth century, in particular, witnessed the mass exhumation and theft of African American bodies, often by "Night Doctors" and "Anatomical Men," who preyed upon marginalized communities to supply cadavers for medical dissection (Blakely & Harrington, 1997; Brenna, 2022; Varga et al., 2022; Willoughby, 2022). This exploitation was not limited to African American graves; human remains were also procured through colonial networks, including what is known as the "Red Market" in India, where remains were obtained under conditions of severe colonial and racial violence (Carney, 2012; Finn et al., 2022). Additionally, many remains in these collections originated from unclaimed bodies of individuals who died in prison, asylums, or other institutions, often those who were poor, homeless, or estranged from family, further reflecting the disregard for human dignity and autonomy (Robbins Schug et al., 2021).

The unethical treatment of human remains persisted well into the twentieth century, exemplified by high-profile cases where institutions retained remains without family consent, sparking public outrage and revealing the pervasive commodification of these individuals (Pilkington, 2021). These collections not only objectified the deceased but also reinforced harmful racial and cultural hierarchies, as the acquisition practices were rooted in a scientific ethos that dehumanized marginalized groups and rationalized their use as "specimens" rather than individuals with histories and communities (Ghosh & Walocha, 2022). Recent scholarship emphasizes that such practices were not incidental but systematically aligned with Western

scientific frameworks that prioritized detached observation over ethical engagement with the living and the dead (Champney et al., 2019).

Today, an estimated 100,000 human remains are held in approximately 700 academic and museum collections across the United States. A significant portion of these remains were acquired without consent from families or communities, and in many cases, institutions have continued to resist or delay repatriation and restitution efforts, citing logistical and research-based justifications (de la Cova, 2020; Dunnavant et al., 2021). The unethical sourcing of deceased human remains mirrors bioarchaeology's colonial past (de la Cova, 2020; Lans, 2021). The REBOoT Model rejects objectification by prioritizing community consent and repatriation, as advocated by activist scholars (see review in Robbins Schug et al., 2025).

This enduring resistance to addressing the ethical legacies of human remains collections reflects a reluctance within some scientific circles to fully reckon with the moral implications of their origins (Agarwal, 2024). By failing to engage with descendant communities and acknowledge these histories, institutions not only perpetuate historical injustices but also hinder progress toward a more inclusive and equitable approach to anatomical sciences (Hildebrandt, 2024; Robbins Schug et al., 2021, 2025).

The REBOoT Model advocates for an ethical transformation in anatomical sciences by promoting policies that center the voices and rights of descendant communities, thereby challenging the entrenched epistemologies that have long dominated the field. This includes developing transparent protocols for the ethical curation of human remains, forming advisory boards with community representation, and adopting policies that prioritize repatriation and respectful engagement with affected communities (de la Cova, 2022; Hildebrandt, 2024). Such measures seek to restore personhood to these individuals, dismantling the scientific detachment that has traditionally obscured the complex human histories represented in these collections.

In shifting from objectification to ethical stewardship, anatomical sciences can contribute to a broader movement within STEM fields to acknowledge and rectify historical harms. By recognizing the humanity of those whose remains have been curated and by fostering a culture of respect and collaboration with descendant communities, the REBOoT Model demonstrates how institutions can both honor the past and build a foundation for more just and ethical scientific practices in the future (Blakey, 2024; de la Cova et al., 2023, 2024).

The REBOoT Model advances ethical transformation in anatomical sciences through three interconnected levels: policy and pedagogical reform, curriculum integration, and active student engagement in ethical practice. REBOoT does not suggest that including more students of color in existing systems is justice. Justice requires rebuilding systems. Our Theory of Change insists that anatomy cannot be ethically taught without confronting the histories that built its collections and the inequities that persist in its classrooms. The model is scalable, but its demands are real: institutional investment, faculty reflection, and accountability to communities whose bodies have too often been treated as data rather than kin. By codifying these

expectations as professional norms, we shift from episodic efforts to structural change.

3.1 Policy and Pedagogical Reform

Ethical transformation in anatomical sciences does not emerge from individual goodwill; it requires changing rules, incentives, and professional norms. The first requirement is structural. Institutions must create governance systems that treat ethical curation and community accountability as fundamental responsibilities rather than optional values. To address the ethical challenges posed by historical practices in anatomical sciences, institutions must implement comprehensive policies and ethical guidelines for working with human remains. Key aspects of this reform include the creation of university-level ethical oversight boards dedicated to supervising both the curation and teaching of human remains. These boards can establish protocols and develop policies for accountability, ensuring that all faculty, students, and staff adhere to high ethical standards. We are currently undertaking this work at UNC Greensboro and we are also including student voices through projects and assignments in courses devoted to ethical considerations in working with human remains.

Furthermore, transitioning to ethically sourced teaching materials is essential for respecting human dignity in anatomical studies (Easterling & Byram, 2022; Finn et al., 2022). For example, plastinated specimens obtained through informed consent can serve as an alternative to traditional materials, providing high educational value while honoring ethical obligations. New lab manuals incorporating these ethical considerations and explicit standards of practice for faculty and students are also essential to institutional reform. By embedding clear guidelines within instructional materials, institutions can ensure that ethical standards are taught and practiced consistently. This transition promotes a culture of respect and responsibility in anatomical education, aligning the field with broader movements toward ethical accountability and social justice in STEM (Liscum & Garcia, 2022). Finally, ethical practice becomes sustainable only when it is recognized in workload, tenure criteria, and resource allocation. Faculty who do ethical labor—consultation, documentation, student training—must be credited for it.

3.2 Curriculum Integration

Policy change must be paired with pedagogical change. REBOoT positions ethical literacy as scientific literacy. Students are not simply trained to "use" collections—they are trained to ask whether they should, and under what conditions. Central to this curriculum integration is a focus on the embedded historical and ethical context of Western anatomy, including the exploitation and dehumanization of marginalized

groups. Ethical instruction is not an add-on unit—it is threaded across courses. By discussing these issues openly, students gain insight into the racist and colonial origins of many anatomical practices, which continue to have consequences for medicine and science today (Liscum & Garcia, 2022). In addition to historical context, the curriculum should cover legal frameworks and a critical evaluation of consent and agency. Learners grapple with contemporary ethical codes, the Vienna Protocol, and the politics of body donation, imaging, and digital remains. They evaluate case studies where community wishes conflict with academic interests. The Vienna Protocol, a guideline for ethically managing anatomical images, serves as a critical component of this education, alongside discussions of community-based approaches to repatriation and engagement with descendant communities (Hildebrandt, 2024). This curriculum not only educates students about ethical norms but also encourages critical reflection on the field's responsibilities toward living communities connected to these remains (Blakey, 2024; de la Cova et al., 2023).

3.3 Student Engagement in Ethical Practice

The final level of the REBOoT Model's ethical transformation framework is direct student engagement in ethical practices. Students document collections, help develop protocols, and collaborate with community partners. Rather than passively "receiving" ethics, students practice accountable stewardship. This component empowers students to actively participate in research on institutional histories, shedding light on the origins and treatment of collections within their institutions. Through training in ethical curation practices, students learn to handle human remains with the respect and sensitivity that such work demands. Furthermore, students engage in community-based research that builds bridges between academia and communities with historical ties to anatomical collections, fostering transparency and mutual respect (de la Cova et al., 2024). Beyond research, students are also involved in developing ethical guidelines and participating in documentation and archival projects that ensure accountability for institutional practices. This dual engagement—research and documentation—offers students meaningful opportunities to apply ethical principles in practice while gaining valuable research experience. By understanding and participating in the ethical dimensions of their work, future practitioners are better prepared to carry these values forward in their careers, helping to reshape anatomical sciences into a field committed to justice, respect, and inclusion. This model demonstrates that student engagement in ethical practice is not only an educational tool but a vital step toward sustainable, ethical transformation in the field (de la Cova, 2020).

4 A Community-Engaged Approach to Legacy Skeletal Collections

The REBOoT Model emphasizes community engagement as a foundational approach for addressing historical injustices associated with the curation of human remains in anatomical and anthropological collections. This approach requires both a commitment to restorative justice and the development of culturally responsive strategies that honor the rights and needs of affected communities, especially those whose ancestors' remains were collected unethically (Agarwal, 2024; Blakey, 2010, 2024; de la Cova, 2020, 2022; de la Cova et al., 2023, 2024; Dunnavant et al., 2021; Halcrow et al., 2018, 2021; Isable, 2021; Lans, 2018, 2020, 2021, 2022; Prince et al., 2022; Sholts, 2024; Stantis et al., 2024; Watkins, 2018, 2020; Watkins & Muller, 2015; Zuckerman et al., 2024). By engaging with communities connected to these collections, institutions can address past harms, foster trust, and ensure that ethical principles guide both current and future practices in anatomical sciences.

The first phase of the REBOoT approach to this issue involves a rigorous initial assessment and documentation process. Institutions must thoroughly inventory all human remains within their collections, documenting not only the physical attributes—such as estimated age, sex, and stature—but also the historical context surrounding each deceased person (Dunnavant et al., 2021). This requires gathering all available records of excavation, acquisition, and any previous consultation efforts, including permits obtained during the original collection process. Genetic testing could be useful in cases where identification is difficult, particularly if pedigree analysis might help locate potential descendants or communities with claims to the remains (Harney et al., 2023); however, this must be approached carefully to avoid recapitulating past harms (Dunnavant et al., 2021). Institutions should assign a dedicated researcher, ideally a Ph.D. student or postdoctoral fellow specializing in the Black Past, anatomy, biological anthropology, forensic anthropology, and/or public history to oversee this work. This individual would coordinate technical aspects of the documentation while adhering to ethical standards that prioritize transparency and accountability (de la Cova, 2020).

Following documentation, community identification and engagement forms the second critical phase of the REBOoT Model's approach. Effective engagement requires institutions to build partnerships with local genealogical societies, religious and civic leaders, and funeral service professionals who are often key stakeholders in discussions around human remains. Exactly who should be consulted about African American and Black people in University and Museum collections? Here is one definition of Descendant Community that was developed in 2018 in a partnership between the National Trust for Historic Preservation's African American Cultural Heritage Action Fund and James Madison University's Montpelier at the inaugural National Summit on Teaching Slavery. Many of us can start by reading the National Trust for Historic Preservation's 2018 publication, *Engaging Descendant Communities* (Montpelier Descendant's Committee, 2018). Collaborations with local organizations, such as the Afro-American Historical and

Genealogical Society, and state-level entities, like African American Heritage Commissions, help to ensure that community voices are integral to decision-making. Establishing advisory boards with representatives from these communities allows institutions to foster culturally appropriate and collaborative relationships. These boards should guide outreach efforts, informing decisions on the disposition and future handling of remains, ensuring that the communities' values and preferences are respected (Blakey, 2010).

The repatriation process ideally represents the third phase, in which decisions regarding the final disposition of human remains are directed by the communities themselves. Institutions must provide a range of options, such as reburial, cremation, or continued curation under newly established ethical guidelines. The development of Standard Operating Procedures (SOPs) for each option ensures that repatriation decisions are well-documented and executed with the utmost respect. There are already models for doing this work (E.g., City of Tulsa, n.d.; Dallas City Hall, n.d.; NPS, n.d.; Penn Museum, n.d.). Additionally, creating public archives and memory projects preserves these histories in ways that honor the individuals while educating the public about the ethical transformations in anatomical sciences (Gatson, 2018, 2023). Critically, institutions must adopt a neutral stance on the outcome, offering financial and logistical support for community-chosen paths, whether that includes reburial or retention within the institution under strict ethical protocols (Halcrow et al., 2024).

Another integral part of this process is student participation in community-engaged research. Through training in ethical research methods and community engagement, students gain practical experience in handling sensitive historical issues while contributing to documentation and public history projects. Students assist with creating educational materials, institutional memory projects, and ethical guidelines, which not only reinforces their understanding of ethical practice but also builds skills in collaboration and cultural sensitivity. This engagement serves dual purposes: it provides students with valuable, real-world research experiences while preparing future practitioners who are committed to upholding ethical standards and respecting community connections to ancestral remains (de la Cova et al., 2024).

The REBOoT Model's approach to community engagement is designed to be culturally responsive, community-directed, and centered on restorative justice. Each phase is rooted in transparency and ethical accountability. This model offers a template for other institutions seeking to navigate the complexities of human remains collections in a manner that honors both the deceased and the living communities connected to them, serving as a path toward a more ethical and socially responsible practice in anatomical and anthropological sciences (Carroll et al., 2022).

5 Transforming Organizational and Structural Practice in Anatomical Sciences

Ethical harm in anatomical science is structural, not accidental. Our model creates policies and teaching practices that center community authority, transparency, and accountability. Institutional oversight plus curricular normalization of ethical practice and student participation leads to future anatomists and biological anthropologists who understand that ethics, consent, and community accountability are foundational to a changed discipline. This framework underscores the need to incorporate ToC principles to address historical and systemic inequities within academic spaces, thereby creating an educational environment that supports under-represented RM students and faculty and promotes sustainable, ethical practices in the anatomical sciences (Kezar, 2018; Kotter, 2012;McGee, 2021). When we change the rules and change the training, we change the culture and end exploitative and discriminatory practice.

5.1 Core Components of Institutional Change

Embedding inclusive excellence requires institutions to integrate diversity, equity, inclusion, and access as core values across all domains. These actionable values need to permeate cultural, structural, and administrative levels, promoting just and equitable practices that transform academic spaces into inclusive environments. This includes implementing structural reforms at the administrative level and fostering a climate of social transformation through data-driven assessment and continuous improvement (Estrada et al., 2018). Institutions should regularly assess their progress in advancing equity and inclusion, using data to identify areas of improvement and to ensure accountability in creating equitable spaces for learning and research (Kezar, 2018; Kotter, 2012; Palmer & Streifer, 2022).

The REBOoT Model's approach to student leadership development not only builds individual skills but also creates a sustainable, scalable framework that can be adapted to various institutional contexts. Through continuous evaluation using mixed-methods research—such as pre- and post-intervention surveys, focus groups, grade analysis, and retention data—this program provides evidence of impact and areas for improvement, maintaining the core principles of equity, inclusion, and excellence in anatomical sciences education. In doing so, REBOoT supports RM students in becoming resilient leaders who are well-equipped to advocate for ethical and inclusive practices within STEM fields.

A critical component of institutional change involves the development of diverse leadership structures with a focus on RM student success. This includes not only enhancing the representation of RM faculty and graduate students but also creating meaningful leadership opportunities for them within institutional hierarchies. Building partnerships with community leaders through advisory boards allows

institutions to engage authentically with external stakeholders and ensure that decisions reflect the needs and values of the communities they serve (Hurtado & Alvarado, 2015). Recognizing and rewarding inclusive practices and equity-focused teaching within academic evaluation systems is essential for encouraging faculty participation in these initiatives and ensuring that DEI contributions are valued alongside traditional academic metrics (Kim et al., 2018; Joshi et al., 2019).

For institutional transformation to be effective, alignment with institutional goals and administrative support is crucial. Key institutional supports include aligning DEI initiatives with the university's strategic goals and securing commitment from top administration, such as provost-level endorsements for student access and success initiatives. Departments should invest in curriculum innovation that reflects faculty values, including DEI, while colleges must support faculty development focused on inclusive pedagogies and research practices. Securing resources for implementing these initiatives, whether through funding, staffing, or infrastructure, is critical to sustaining these efforts and enabling measurable, long-term change (McGee, 2021; Palmer & Streifer, 2022).

5.2 Implementation Strategies

Effective faculty development is integral to embedding DEI values within the curriculum and broader institutional culture. Institutions should offer professional development opportunities that emphasize DEI principles and integrate these goals into curriculum mapping and course design. Program learning outcomes must reflect a commitment to inclusivity, supporting innovative teaching approaches that acknowledge and address the diverse needs of students. DEI contributions should be rewarded in faculty evaluations, establishing clear incentives for faculty to engage meaningfully with equity-focused initiatives (Estrada et al., 2018; Kezar, 2018; Kotter, 2012).

Creating pathways for RM students to assume leadership roles is a central strategy in promoting student success in anatomical sciences. Developing RM student cohort programs and peer mentoring opportunities enables students to build networks of support and develop critical leadership skills. Research experiences and professional development pathways that target RM students contribute to a more inclusive academic pipeline, enhancing diversity in graduate programs and beyond. Institutions should support graduate student diversity initiatives, thereby preparing a new generation of scholars equipped to lead in STEM fields (Sellami et al., 2017; Wilton et al., 2024).

Addressing historical injustices within anatomical sciences requires intentional structural reforms, particularly regarding the curation and ethical treatment of human remains. Institutions must develop comprehensive ethical guidelines and protocols that prioritize transparency, accountability, and respect for the communities associated with curated remains. Establishing accountability measures and frameworks for regular assessment ensures that reforms are embedded within

institutional practices and that progress is continually evaluated against clear, equitable standards (de la Cova, 2020; Easterling & Byram, 2022).

Community engagement is essential to building sustainable, ethical practices within anatomical sciences. Institutions should establish advisory boards that include community leaders and create collaborative partnerships with affected communities to foster shared decision-making processes. Ensuring transparent communication and documenting outcomes publicly strengthens accountability and trust, allowing institutions to demonstrate their commitment to ethical practices and responsive action. Through meaningful partnerships and transparent documentation, academic institutions can work toward restorative justice, particularly in contexts where historical collection practices have caused harm (Carroll et al., 2022; Robbins Schug et al., 2021, 2025).

This holistic approach to institutional change ensures that transformations within anatomical sciences are sustainable and embedded across all levels of the institution. Supported by committed leadership and aligned with strategic goals, these changes are designed to be accountable to communities and measurable through clear metrics. By adopting the REBOoT Model, institutions can create inclusive, equitable environments that foster academic excellence and social responsibility, setting a new standard for ethical and inclusive practices in anatomical sciences education (Kezar, 2018; McGee, 2021; Palmer & Streifer, 2022).

6 Conclusion: Building a Sustainable and Equitable Future for Anatomical Sciences

The REBOoT Model confronts the historical reality that anatomical sciences were built through extraction, exclusion and racialized harm. This model treats these legacies as structural conditions to be dismantled. By addressing past injustices and actively creating opportunities for RM students and faculty, this model offers a framework for institutional change that emphasizes ethical integrity, inclusivity, and social responsibility. By centering racial equity and ethical stewardship, the REBOoT Model advances the activist bioarchaeology mandate: to transform STEM from a site of historical harm into a space of justice and belonging. Through three interconnected pillars—faculty development, student success and leadership, and ethical transformation and community engagement—the model provides concrete strategies to dismantle systemic inequities and promote a sustainable, just future in STEM education.

By focusing first on faculty values, incentives, and practice, the Head-Heart-Hands (H3) framework equips faculty to understand the history of the field, interrogate their own role in reproducing structural harm, and design learning environments that are rigorous without being punitive. This faculty-focused approach ensures that inclusive excellence becomes embedded at all instructional levels, fostering an environment where RM students are supported by allies

committed to ethical and equitable pedagogical practices. In parallel, the model's emphasis on structured pathways for student success, including mentorship, research opportunities, and leadership development, empowers RM students to thrive academically and professionally, thus expanding diversity in STEM.

The model also recognizes that ethical practice is not a "soft skill" or optional enrichment—it is professional competence. Restorative engagement with descendant communities, transparent stewardship of human remains, and using ethically obtained remains for teaching are the baseline for credible scientific training. By instituting policies that prioritize collaboration with descendant communities, the model—which includes repatriation protocols, ethical curation practices, and community-guided decision-making—redefines the role of anatomical sciences in society, highlighting the importance of respect, transparency, and shared authority in handling human remains. Simultaneously, REBOoT builds pathways for racially marginalized students to shape the field rather than just survive it. Leadership development, paid research opportunities, and curricular co-creation redistribute authority. Students do not enter an unchanged system; they help re-engineer it.

Undertaking the REBOoT Model will position anatomical sciences as a leader in STEM education reform, advocating for a holistic and inclusive approach that addresses both historical inequities and contemporary challenges. By operationalizing racial equity in teaching, research, and community outreach, the model offers a pathway for institutions to build sustainable, ethical practices that contribute to social justice in STEM. Ultimately, the future of anatomical sciences depends on our collective commitment to confront past injustices while fostering new opportunities for those historically excluded. The REBOoT Model provides a visionary yet practical roadmap for achieving this transformation, creating a discipline that upholds ethical rigor and equity at its core.

Acknowledgements The authors wish to thank Andrea Nixon, the Program Officer for the Racial Equity Program (Division of Undergraduate Education) at the National Science Foundation for encouragement and advice during the process of developing these ideas into a funding proposal. The Racial Equity program was archived on January 22, 2025 and our proposal based on these ideas was declined without review because it "did not effectuate NSF program goals or agency priorities" (personal communication, 7/21/2025) after Donald Trump took office. We would like to thank Chad Fogleman for assistance with preparing the proposal. We would like to thank Amy Adamson (UNCG Dean of the College of Arts and Sciences) and Sherine O'Bare (UNCG Vice Chancellor for Research and Engagement) for providing seed funding to accomplish part of the curation and repatriation work outlined in this chapter. We would also like to thank Kim Petersen (Director of the Undergraduate Research and Creativity) for funding one undergraduate research assistant, Elisabeth Eleazer, to direct lab activities related to racial equity projects. We would like to thank Elisabeth for her phenomenal commitment and the following undergraduate and post-baccalaureate students—Chéyse Lattie, Tracy Guzman-Guytan, Janet Chavarria, Brittany Diamond, Yazmyn Lowe, Mya Bey, and Samiya Mbacke—who have volunteered their time to work on restorative justice and ethical curation in the Human Diversity Lab at UNCG (https://www.humandiversitylabuncg.com/people).

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Diversity, Representation, and Inclusion in Forensic Anthropology

Jade S. De La Paz, Jesse R. Goliath, and Nandar Yukyi

1 Introduction

Representation refers to the basic notion that if people can see others like them in their education, training, and work environments, it brings about a sense of belonging and promotes innovation. The profession of forensic science is critical for advancing public safety and the administration of justice for all members of a community, which is why advocacy for diversity and representation of diverse viewpoints at all levels is so important. Forensic anthropology is currently relatively homogenous in terms of its constituent practitioners and does not match the demographic of the populations it serves (Yim et al., 2022). Diversity and representation are essential for better research, more holistic training practices, better job performance, and encourage us to challenge our own assumptions and inherent biases (Antón et al., 2018; Apfelbaum et al., 2014; Erhart & Spradley, 2022; Sulik et al., 2022; Tallman & Bird, 2020; Wagstaff & LaPorte, 2018); however, implicit and explicit barriers persist in forensic anthropology.

There is significant interest and an enrolment upswing in forensic anthropology programs (Passalacqua et al., 2021), but institutions and agencies are failing to

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*, Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_4

address the pervasive structural barriers that continue to impede diversity and representation. This includes Eurocentric, racist, and cis-gender biased methodologies, lack of recognition of past scholars of color and other marginalized groups, financial constraints and exclusivity of higher education, illusions of objectivity and impartiality, and relevance of these barriers to curriculum and training structure (Adams et al., 2023; Go et al., 2022, 2023; Goliath et al., 2023; Stewart & Delgado, 2023; Tallman et al., 2022; Tegtmeyer & Hulse, 2023; Winburn & Clemmons, 2021). The aim of this chapter is to focus on the impacts that colonialism, systemic racism, and economic disadvantage have on education and research in the field of forensic anthropology today. Further, we will discuss how these barriers inform policy and impact the professional application of forensic anthropology and provide a case study detailing one author's (NY) experience navigating the research of her ancestors within a process controlled by their colonizers. Finally, we propose solutions for how we can approach these issues in forensic anthropology and the broader forensic sciences.

1.1 Positionality Statement

In writing this chapter, we respect and acknowledge that human identity is not based only on, or limited to, belonging to one group but rather is multidimensional. Factors such as race, class, and gender are interconnected as they apply to a given individual or group, and this intersectionality is important to recognize. Understanding that multiple intersecting forms of discrimination can exist and be compounded by these societal factors is essential (Crenshaw, 1989; Henne, 2018). We are speaking from our own lived experiences, often drawn from a US perspective, and we recognize our views may not be shared by everyone. Additionally, we are early career professionals, and, because of this, we come from a place of privilege compared to some in the field. However, we hope this privilege gives us a platform to act as advocates and allies to those from systematically excluded groups.

2 Impacts of Colonialism

Discourse surrounding diversity, equity, and inclusion initiatives in anthropology, and academia in general, often involves the discussion of decolonization efforts in the curriculum. Generally, the definition of decolonization, according to the United Nations (UN), refers to the "granting of independence to colonial countries and peoples" (United Nations, n.d.). In recent years, the word decolonization has quickly become a buzzword across academic departments in universities and professional contexts alike (Appleton, 2019; Tuck & Yang, 2012). But what exactly does decolonization mean, and what changes need to be implemented for it to be effective? As Tuck and Yang (2012) articulate, decolonization is neither a metaphor, nor does it

have synonyms. One of the main purposes of decolonization is to destabilize the status quo (Tuck & Yang, 2012; Watkins, 2021; Wynter, 2003). Yet, many White-dominant academic institutions have co-opted the term decolonization as a type of virtue signaling but have failed to assert the effort that is necessary for effective systemic change (Appleton, 2019; Tuck & Yang, 2012).

Prior to discussing what decolonization is and what it entails, a discussion on colonialism and its impacts on colonized communities must be addressed. Recognizing and understanding the impacts and long-term legacies of colonialism on colonized populations are crucial steps to understanding why we must decolonize in the first place. Specifically, in academia, colonialistic values have been embedded in the education systems of colonized countries over generations (Khan et al., 2018; Trinh, 2018). Colonial education systems undermine native and Indigenous cultures and values through forced assimilation, leading to the dissociation with their own cultures and values (Southard, 2017).

Through the enforcement of colonial languages onto classrooms of Indigenous students and curricula imposing Eurocentric ideologies, colonizers brought about abrupt changes into Indigenous education systems. For example, in Ghana, English has become the lingua franca in schools, instead of the 78 native languages prevalent in the country (Edu-Buandoh & Otchere, 2012). In many cases, English and other colonial countries' languages are deemed the superior language, creating power dynamics in which one's prestige, and sometimes intelligence, are measured by one's ability to speak colonial languages (Edu-Buandoh & Otchere, 2012; Khan et al., 2018). These types of dynamics in which the languages and education values of European and European-derived countries are viewed as superior to those of Indigenous communities are only a few of the many harmful impacts of colonialism. Although colonialism, in the sense of blatant invasion by powerful nations, is not as prevalent (and is mostly frowned upon) today, the aftermath of colonialism is far from over. Colonialistic values, also known as neocolonialism, persist on systemic levels in academia and other sectors alike, as long as the status quo is maintained. As Wolfe (2006) contends, colonialism is not an event, but a structure (Shaw, 2019).

Just as colonialism is inherent in education systems across the world, it is embedded deeply in research practices as well. Many universities established in colonized countries were implanted by their colonizers either through direct jurisdiction or as a byproduct of powerful nations coming into economically developing countries (Selvaratnam, 1988). As a result, many academics from economically developing nations often rely on scholars from wealthier, European-derived nations to advance research initiatives in their host nations, usually due to the lack of access to economic and human resources (Yukyi et al., 2022). The majority of international research collaborations frequently involve researchers from wealthy nations conducting research in a less wealthy nation, with the help of local experts in navigating the politics and intricacies of the host nation. Ultimately, most of the credit from the research conducted in economically developing nations goes to the lead researchers from wealthy nations with easier access to resources and publication rights (Go et al., 2021; Nature, 2022; Odeny & Bosurgi, 2022; Yukyi, 2022). This type of

power dynamic between colonial, wealthy-nation scholars and scholars from economically developing nations is often associated with foreign scholars monopolizing research projects and publications with little to no involvement from local scholars and students. This practice is called parachute science, also known as helicopter research or neo-colonial research (Asase et al., 2021; Genda et al., 2022; Minasny et al., 2020; Nature, 2022; Stefanoudis et al., 2021).

Parachute science is not a new concept; it has been practiced since the start of colonial times, in which powerful Eurocentric nations could step foot into countries that were deemed inferior (Genda et al., 2022; Yukyi et al., 2022). Another problematic consequence of colonialism found in research is ethics dumping, a phenomenon in which privileged wealthy-nation scholars conduct research in economically developing countries using unethical practices or looser ethical guidelines compared to their home countries (Marwick et al., 2020; Nature, 2022). Harmful research practices such as parachute science and ethics dumping only perpetuate colonialistic ideologies and values in international research.

This inequity in power and access to research is especially problematic and detrimental toward local researchers because it is a form of gatekeeping by privileged wealthy-nation researchers, who continue to benefit from maintaining such co-dependent dynamics with their local collaborators. Moreover, selective resource distribution and nepotism by foreign researchers can often create competitive and unnecessarily aggressive environments among local researchers. Even with the best intentions that international scholars may have going into host countries for research, it is crucial to understand that hundreds of years of colonialism have formed detrimental power dynamics that persist today. As such, international scholars should be aware of these power dynamics and factor them into their research plans, particularly to include the local community in their research.

Anthropology, including the subfield of forensic anthropology, is no stranger to parachute science and ethics dumping, with its history riddled with privileged, wealthy-nation anthropologists entering developing countries to study less privileged locals and benefiting from their studies (Halcrow et al., 2019; Marwick et al., 2020; Yukyi, 2022). Even worse, museums and laboratories in European and European-derived countries are filled with valuable items, biological specimens, and human remains from colonized countries that had been taken without consent. Although forensic anthropology mainly deals with recently deceased individuals, its foundations are largely based on racist and problematic research ideologies that are deeply intertwined with colonialistic values (Bethard & DiGangi, 2020; DiGangi & Bethard, 2021; Dudzik & Kolatorowicz, 2016; Hefner et al., 2016).

To address the harm that was imposed by colonial research practices, processes such as repatriation and intentional collaborations with native and Indigenous communities have taken place in museums and academic spaces (Aranui, 2020; Daehnke & Lonetree, 2010; Gilmore et al., 2019). Although the repatriation process is arduous and imperfect, these first steps are crucial to effectively decolonize anthropology.

3 Systemic Racism

Forensic science, including forensic anthropology, and race have been inseparable since the dawn of the discipline (Kruger, 2023) and forensic science is an essential element and deeply embedded within the criminal justice system. In criminal justice, nineteenth century pseudo-scientific practices such as phrenology and attempts to interpret criminal behavior from physical attributes have resulted in a view of race-related criminality (Kruger, 2023). Similarly, phrenological racial classifications were used to justify violent acts such as enslavement and colonization (Blakey, 1987, 2020; Hefner et al., 2016; Levine, 2010). The founding scholars of the discipline, like Aleš Hrdlička, professed overtly biodeterminist views, including the promotion of eugenics and scientific racism (Blakey, 1987, 2020).

Many biologists and social scientists have contested the legitimacy of racial classifications. However, these notions still appear in scientific literature regarding their potential utility for procedures and techniques, especially regarding forensic genetic technologies and typological approaches used to estimate ancestry in forensic anthropology (Bethard & DiGangi, 2020; DiGangi & Bethard, 2021; Dudzik & Kolatorowicz, 2016; Hefner et al., 2016; Kopec, 2014; Kruger, 2023). Specifically in the context of forensic anthropology, decolonizing and advocating for anti-racism in ancestry estimation has become an essential topic of discussion (Bethard & DiGangi, 2020; DiGangi & Bethard, 2021; Stull et al., 2021).

Racial bias in the legal system still persists. Persons of color are disproportionately represented in both the juvenile and criminal justice systems (Anderson, 2015; Gase et al., 2016; Puzzanchera & Hockenberry, 2015). Evidence for racial differences is most significant at the earliest point of contact, particularly at the stages of arrest, referral to court, and placement in secure detention (National Research Council, 2013). Black youths experienced more than twice the arrest rate in the United States than White youths. Data among adults show similar patterns (National Research Council, 2014). Individuals in the justice system are primarily from disadvantaged segments of the population: men who are marginalized, poorly educated, lacking work experience, and/or living with substance abuse disorders. Through the lens of critical race theory (CRT), researchers have argued that racism has become normalized in criminal justice and other social systems (Bracey, 2015; Byfield, 2019; Kruger, 2023). This model attempts to reveal and deconstruct the structures that maintain and perpetuate white supremacy and privilege (Bracey, 2015; Byfield, 2019; Kruger, 2023), challenging the idea that institutions are post-racial and color-blind.

Higher education perpetuates structural barriers of racial bias. Students from marginalized groups are poorly represented throughout higher education, and thus research, in the United States in the field of forensic sciences (Wagstaff & LaPorte, 2018; Yim et al., 2022) and in forensic anthropology specifically (Erhart & Spradley, 2022; Tallman & Bird, 2020). The Bureau of Labor Statistics (2021) predicts an 11% increase in the number of forensic science technician positions from 2021 to 2031. Additionally, there have been increases in the number of forensic anthropology-specific programs across the United States (Passalacqua et al., 2021). However, underrepresented groups are not matriculating into these programs nor joining the

forensic workforce (see *Professional Application* section). From 2010 to 2020, college enrolment from underrepresented groups had marginally increased (National Center for Education, 2022), but this was not seen in enrolment in the forensic sciences. The traditional Western, Euro-centric approach to forensic research and teaching does not meet the needs and realities of forensic scientists today (Chaussée et al., 2022; Go et al., 2021). Black, Indigenous, and People of Color (BIPOC) practitioners are underrepresented in forensic-related fields and as undergraduate forensic science degree recipients (Yim et al., 2022). As a result, marginalized students lack a sense of belonging in the field of forensic science (Goliath et al., 2023).

Moreover, the disproportionate underrepresentation of marginalized groups does not only affect students, but also those at the faculty level in both research and education. Most academic literature in anthropology has historically heavily cited and praised the works of Western, Euro-centric male scholars, while pushing aside the contributions of scholars from marginalized communities. For example, Bolles (2013) identified the problem of the under-citation of the works of Black women anthropologists compared with their white colleagues. Large research studies often do not reflect the racial identity, ethnicity, age, or sex of a given population (Editors and Rubin, 2021). Lack of diversity is a known problem in biomedical research that presents challenges in translating the benefits of research to the global population and limited diversity in education further exacerbates this problem.

4 Economic Disadvantage

As discussed above, there are many barriers in education and research for certain groups trying to enter the field of forensic anthropology. Many people around the world do not enjoy access to, and mobility within, academic disciplines, simply based on their membership in systematically excluded groups, including women (Wilson, 2022) and BIPOC (Tallman et al., 2022). The systemic nature of this exclusion is often also linked to, and compounded by, socioeconomic standing (Kent & Ricketts, 2023). Forensic anthropology exists within a cross-section of academic and professional spheres and access to these spheres is often dictated by access to wealth or, at the very least, economic stability (Braga et al., 2017; Kent & Ricketts, 2023). Individuals who come from systematically excluded groups, or are economically disadvantaged in other ways, have struggled to enter forensic anthropology and continue to do so (Tallman et al., 2022; Tegtmeyer Hawke & Hulse, 2023). Wealth inequality acts as a barrier to education (Baum & Flores, 2011; Tallman et al., 2022) even from a young age (Miller et al., 2021) and this presents further barriers to research success.

Wealth inequality has been shown to impact many areas of education including SAT scores (Baum & Flores, 2011; Tallman et al., 2022), access to primary and secondary education (Mutisya et al., 2021), entry into universities (Tegtmeyer Hawke & Hulse, 2023), and completion of degrees due to first generation higher-education status (Braga et al., 2017). In addition to these barriers, the cost of

education continues to rise, compounding these issues further (Hanson, 2022). Furthermore, to be a practicing forensic anthropologist, a minimum of a Master's degree is required (Tallman et al., 2022), which can be prohibitively time consuming and expensive (Tegtmeyer Hawke & Hulse, 2023).

In the United States, graduate level education is often unfunded or underfunded and students are required to work alongside their studies, which extends their degree time, and status as low-income earners for years. There seems to almost be an expectation that funding is limited (Erhart & Spradley, 2022) and student loans and assistantships (Tallman et al., 2022, Tegtmeyer Hawke & Hulse, 2023) are required to complete a Master's or PhD to enter the field of forensic anthropology (Passalacqua & Pilloud, 2020). This positions economically disadvantaged students, who do not have the time to work in underpaid positions or the money to pay tuition, at further disadvantage, even if they do manage to surpass barriers earlier in life (Mutisya et al., 2021) and complete their undergraduate degrees (Braga et al., 2017). Additionally, working to pay for education takes time away from studying, which can negatively impact grades and future academic success.

Even in countries like New Zealand, where education is subsidized and scholarships are available, a PhD scholarship pays at least $11,000 NZD (~$6700 USD) below the living wage (Soar et al., 2022) and, while PhD students can work to supplement this income, the terms of many scholarships limit work to 10–12 hours per week (Soar et al., 2022). Further, these scholarships are often limited to 3-year terms, when the average time to complete a PhD is around 4 years (Soar et al., 2022). The low wages and limits on time and paid work act to systematically undermine students who are unable to subsidize their PhD through access to independent wealth (Soar et al., 2022), providing an environment where economically disadvantaged individuals from systematically excluded backgrounds struggle to obtain advanced degrees.

Even when students are able to attend university, many opportunities within this space require funds that many from systematically excluded groups do not have. For example, field schools are often prohibitively expensive (Tallman et al., 2022; Tegtmeyer Hawke & Hulse, 2023) and internships and volunteer opportunities are often unpaid. Being able to pay to work (i.e. field schools) and work for free (i.e. internships) is a privilege that many people in economically disadvantaged situations cannot afford (Tegtmeyer Hawke & Hulse, 2023). However, these opportunities offer chances to gain experience and open doors for career advancement, leaving individuals with limited wealth less work experience and, likely, fewer job prospects.

Additionally, in forensic anthropology, research is, necessarily, conducted using human remains; however, skeletal collections are often developed using the remains of economically disadvantaged and otherwise marginalized individuals (Muller et al., 2017). This includes unclaimed bodies, which are often individuals from low-income backgrounds (Alblas et al., 2018; Campanacho et al., 2021; Muller et al., 2017), people who cannot afford burial or funerals (Alblas et al., 2018; Muller et al., 2017), or have been targeted by legislation that ensures cadaveric populations have often comprised economically disadvantaged individuals (Muller et al., 2017).In fact, many of the individuals curated in the most well-known skeletal

collections—including the Robert J. Terry Anatomical Collection and the Hamann-Todd Osteological Collection—are from vulnerable and impoverished populations (Muller et al., 2017; Stantis et al., 2023).

The wealth barriers to education and research in forensic anthropology discussed here paint the grim picture that the field is largely an exclusive pay-to-play space set behind a velvet rope (Tegtmeyer Hawke & Hulse, 2023). It is our responsibility, as a new generation of forensic anthropologists, to acknowledge and strive to change the wealth-inequality dynamic.

5 Policy and Professional Application

Forensic anthropology, similar to many areas of forensic sciences, sits within the intersection of academia and practical application, where training and research are often applied in forensic casework. Forensic anthropologists are often expected to have casework experience to practice forensic anthropology (Passalacqua & Pilloud, 2020) and, thus, advance in their career. However, as mentioned above, opportunities for work experience are often intimately connected to education and research access (Tallman et al., 2022; Tegtmeyer Hawke & Hulse, 2023), which leads to forensic scientists being generally whiter and less diverse than the US population they serve (Yim et al., 2022). Within forensic anthropology, most knowledge production and casework is conducted by scholars associated with previously colonial, Western, or European-derived, countries (Go et al., 2021). Additionally, the pioneers of forensic anthropology that are being celebrated in textbooks and cornerstone literature are mostly White males, even though a substantial number of non-White, non-male scholars contributed significantly to the development of the field (Go et al., 2022, 2023; Wilson, 2022). Non-BIPOC senior professionals may erroneously assume that the presence of BIPOC students and junior professionals in the field is equivalent to improved diversity, equity, and inclusion in the professional application of the science (Tallman et al., 2022).

As discussed above, criminal justice systems and forensic science are inherently linked, and both often magnify systematic inequity in society, which can be seen in practice and policy globally. For example, some of the largest police forces in the US are suddenly—and quickly—getting less diverse as two phenomena converge: a wave of Black officers are reaching retirement age, and recruitment efforts to replace them are ineffective (Graham, 2021). As forensic practitioners often interact directly with law enforcement, lack of diversity in both spaces compounds existing inequities. Despite substantial progress in achieving racial justice in the US over the past half-century, racial disparities in the criminal justice system have persisted and worsened (Pierson et al., 2020). There is a sense of distrust between law enforcement and various minority communities across the United States due to a history of oppression and discriminatory decision-making that have deliberately targeted people of color. Policies like stop and frisk have disproportionately impacted young men of color, increasing arrest incidences (Ghandnoosh, 2015). Police officers are

more likely to stop Black and Hispanic drivers for investigative reasons (Ghandnoosh, 2015; Pierson et al., 2020). Civilian and police leaders have long argued that departments that do not reflect the demographics of their communities are less effective and more likely to produce tensions. UN guidelines state that any effective police accountability system must increase civilian control over the police, investigate misconduct cases and act swiftly to address them and reduce corruption (United Nations Handbook, 2011). The forensic sciences mirror the criminal justice system in lack of diversity and both systems should make efforts to improve in this space.

The barriers to entering the field of forensic anthropology also have wide reaching negative impacts for the broader forensic sciences community and criminal justice system. It has been shown that workplaces benefit from a diverse workforce when different world views bring new perspectives (Wagstaff & LaPorte, 2018; Yim et al., 2022). When individuals are excluded from forensic anthropology, society as a whole suffers because it creates a disparity between the diversity of forensic anthropologists and the diversity of the populations they serve (Yim et al., 2022). As discussed above, racism, colonialism, and wealth inequality are known barriers to education (Baum & Flores, 2011; Tallman et al., 2022). These factors present further barriers to career and social mobility (Braga et al., 2017) by limiting access to work, including casework and other professional experience opportunities in forensic anthropology, such as conference attendance and board certification (Tegtmeyer Hawke & Hulse, 2023).

Further, individuals served by forensic anthropologists are often from marginalized communities, such as unidentified individuals in US border crossing deaths, and their perspectives should be represented in forensic anthropology (Tallman et al., 2022; Winburn et al., 2022). Forensic scientists, specifically forensic anthropologists, are tethered to, work with, and can be seen as accomplices to these biased systems. Without advocating for diversity and inclusion in forensic anthropology, we, in turn, become perpetrators of these systems.

6 Case Study: Lived Experiences in Decolonizing Research

Acknowledging the repercussions of colonialism, systemic racism, and economic disadvantage in academia and anthropology, although necessary, is only the first step toward decolonization. The problematic barriers discussed in this chapter often do not impede the success of economically advantaged, White researchers, who benefit from the status quo. In contrast, the stakeholders who feel the effects of these issues most profoundly are researchers and community members who belong to systematically excluded groups.

An example of benefits to the privileged and maintenance of the status quo is that many museums and laboratories in economically advantaged countries currently charge substantial ancillary laboratory fees on visiting researchers to fund the maintenance of these facilities. For instance, one of the chapter authors (NY) was required to pay a laboratory fee to collect data from human remains that were taken

illegally from her family's hometown and curated in a museum in the country of the colonizer over a century ago. However, after the author discussed the issue with the museum curator, the laboratory fees were waived. This interaction opened an opportunity for intentional conversations and collaborations in which privileged researchers from wealthy nations listened to and understood the issues faced by systematically excluded groups.

Overall, this case study illustrates several ethical issues that are associated with this type of laboratory fee. First, most items, specimens, and human remains used for research in these facilities found in colonizer countries were historically obtained forcefully and illegally from their respective countries. Second, all visiting researchers are often expected to pay these fees prior to their research trip, regardless of their background and/or affiliation. However, by setting laboratory fees, researchers and staff from wealthy colonial nations disregard any hardships or special circumstances that some visiting researchers may be facing. Likewise, in the case of human remains that were illegally and exploitatively obtained by colonizers, they may be asking visiting researchers of descendant communities to pay fees to research their ancestors, which is wholly inappropriate. As such, the onus is on researchers from colonizer nations who are committed to decolonizing the academy to do the extra work to recognize that not every researcher is privileged enough to pay the fees, nor is it appropriate to ask every researcher to pay (i.e., descendant community members).

7 Proposed Solutions

The following proposed solutions are just part of a long process we must navigate to break down barriers in the field of forensic anthropology. As forensic anthropologists, we must commit to positive change and insist on representation to help our field flourish as a diverse, inclusive, and safe environment for everyone.

1. Encourage each other as colleagues in forensic anthropology to make a habit of critically questioning our own practices. Example questions to consider:
   (a) How are my own lived experiences and unconscious biases impacting my perspectives? How can I incorporate others' perspectives to balance my own?
   (b) Is my practice a legacy of colonialism or a form of parachute science? And if so, how do I change it so that it is not?
   (c) Am I coming from a place of privilege? If so, how can I use this position to support and lift those around me who may not have similar privileges?
   (d) What are the power dynamics between myself and my students, research subjects (Muller et al., 2017), colleagues, host country, etc.? How can I best acknowledge these and ensure I am creating a safe environment for everyone?
2. Make practical steps to break down barriers to representation in forensic anthropology, for example:

(a) If in the position to do so, offer students and early career professionals paid work and avoid offering unpaid/uncompensated opportunities. Uncompensated work often only gives opportunities to individuals with access to independent wealth and excludes others. If funding is not available, offer work experience in lieu of, for example, an excused term paper, co-authorship on a publication, or assistance with a grant or scholarship application.
(b) Give students and early career professionals opportunities to publish as co-authors to increase employment opportunities in academia.
(c) Fund opportunities for students to attend field schools or take part in research activities. Research scholars running programs in the United States can, for example, apply to the National Science Foundation Research Experiences for Undergraduates (NSF REU) scheme, which financially support students doing research.

3. Expand conversations of engagement and inclusivity beyond the anthropological community, invite community perspectives, and encourage inclusion and representation for future generations, for example:

(a) Encourage multi-disciplinary and international work that incorporates broad perspectives and expands the work for representation beyond our field.
(b) Participate in community outreach to inspire young people from diverse backgrounds to pursue a career in forensic anthropology.
(c) Work to grow the next diverse generation of forensic anthropologists by creating new and inclusive opportunities in education, research, and professional application.
(d) Cultivate non-hierarchical mentorship opportunities for individuals who share similar intersectional backgrounds to increase retention and trust building for all participants.

In providing these solutions, we recognize they are not exhaustive, and they may not be achievable for everyone. Instead, we present them as a springboard from which we can have continued conversations and informed debate about how we can all work together to make forensic anthropology a more inclusive and diverse field.

As a final thought, we turned the lens on ourselves and asked the above question: "[Are we] coming from a place of privilege? If so, how can [we] use this position to support and lift those around [us], who may not have similar privileges?" We do understand that we are coming from a place of privilege, having all had opportunities to be trained and work as forensic anthropologists. We also acknowledge that this privilege has given us this platform to discuss these issues, even if we are not the most heavily impacted by them. However, in recognizing this, we hope that we can use this privilege to lift those up around us, be advocates and allies for the coming generations, and foster positive change in the field of forensic anthropology.

8 Conclusion

It is clear there are barriers for individuals trying to enter the field of forensic anthropology starting early with education opportunities and continuing well into the realm of career development in both research and professional application. This chapter has only covered a small fraction of these, from colonialism to systemic racism and economic inequality, to illustrate the difficulties faced by forensic anthropologists and associated individuals. There is a wide range of current literature that explores these issues in great detail (Adams et al., 2023; Go et al., 2022, 2023; Goliath et al., 2023; Stewart & Delgado, 2023; Tallman et al., 2022; Tegtmeyer & Hulse, 2023; Winburn & Clemmons, 2021) and our perspectives will not reflect all lived experiences. Nevertheless, we provide some ways in which these barriers may start to be broken and initial changes that need to be implemented for a more equitable discipline and practice.

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Cripping, Queering, and Transforming Education in Biological Anthropology

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1 Introduction

Diversity is lacking among biological anthropologists (Antón et al., 2018; Tallman & Bird, 2022; Tallman et al. 2022a, b; Yim 2022a, b). This homogeneity impacts the quality, ethicality, and future of the discipline. Diverse research groups produce more novel findings, technological innovations, and more frequently cited research by a wider audience (Bolnick et al., 2019; Ding et al., 2021; Jones et al., 2020; Rother & Grau, 2018; Wagstaff & LaPorte, 2018). Biological anthropologists within the United States (U.S.) have begun to reflect on historical reasons for this lack of diversity and increasingly call for coalitions and programs supporting diverse, equitable, and inclusive (DEI) engagement in scholarship and education (American Academy of Forensic Sciences, 2023; American Association of Biological Anthropologists, 2023; Antón et al., 2018; Brodkin et al., 2011; Dwyer et al., 2022; Go et al., 2022; Goliath et al., 2022, 2023). Inclusive transformation begins from the bottom-up and requires intentional, thoughtful, and meaningful DEI practices in the foundational spaces of our discipline—the classroom.

While higher education increasingly focuses on the enrollment of a diverse student body, minimal attention is devoted to retaining, supporting, and engaging with students once they set foot on campus. Even less effort is spent understanding the

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*, Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_5

intersections of students' identities to support their sense of belonging and equitable access to educational opportunities. This leaves marginalized students more vulnerable as they are required to adapt to an educational system with traditions and norms not designed with them in mind. These are facets of the campus experience where anthropology instructors can effectively make equitable change (Blum, 2019). In this chapter, we propose crip and queer theories as perceptual tools in designing inclusive learning spaces that center diversity. We explore how cripping and queering the biological anthropology (BA) classroom can help educators deflect cisheteronormative and ableist processes that impact *all* student/educator experiences. We suggest practices that foster a sense of belonging and promote the essential value of multidimensional identities as foundational to *all* learners in BA (Molina Roldán et al., 2021). Throughout this chapter, we also demonstrate the need for these practices through author positional testimonies.

2 The Visible/Invisible Student Bodymind

To promote inclusion, a student's "bodymind," the meshed/intersection of body and mind as one unit, not distinct physical: mental needs and experiences, must be recognized (Price, 2011). An estimated 33–45% of queer people have disabilities compared to 27.2% of the general population (Blumberg & Luke, 2021). Considering issues of over- and under-inclusion within marginalized groups and perceptions about being "disabled/queer enough," here we use expansive definitions of both. Throughout this chapter, the term 'queer' is a repurposed umbrella term encompassing a spectrum of gender and sexual expressions, physical/emotional attractions, and identities including LGBTQQIP2SAA (Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Intersex, Pansexual, Two-Spirited, and Asexual), gender fluidity, and overlap. Within the Disabled Archaeologists Network (DAN) and echoed by the American Association of Biological Anthropologists (AABA), "Disability is understood as inclusive of a range of identities and experiences, including but not limited to people with physical, sensory, cognitive, psychiatric, non-apparent, and non-visible disabilities; chronically ill, neurodivergent, deaf, blind, autistic, and mad people [mental health survivors]" (Disabled Archaeologists Network, 2023). Here, disability is not exclusive to formal diagnoses or measures as required by U.S. legislation or some educational institutions. We also use 'queering' and 'cripping' as verbs here, inciting proactive pedagogical and andragogical strategies to support, engage, and understand queer/crip issues, culture, and history.

The demographics of queer students who are disabled has not been documented, but the bodymind impacts of coping with macro- and micro-aggressions within higher education likely contributes to the higher incidences of disability among queer students (Cuxart et al., 2021; Harley et al., 2002; McAllan & Ditillo, 1994; Miller 2015a). Called "the invisible of the invisible" (Harley et al., 2002; Morgan et al., 2011), disabled, queer people face invisibility in both communities. In spaces focused on disability, queer people may not be accepted, while spaces focused on

queer people may not be accessible for disabled people. Often, the struggles faced by disabled and/or queer students are chocked-up to personal deficits rather than intolerant, under-resourced/served, or under-informed environments (Gwalla-Ogisi & Sokorski, 1996).

The number of U.S. college students identifying as queer or reporting physical and/or cognitive disability has risen each generation (Campbell & Wescott, 2019; Skomsvoid, 2014) (see Fig. 1). These numbers are likely underreported for a variety of reasons, including un(mis)diagnosed disabilities, queer/disabled-questioning, fear of stigma and hostility, emotional and conflicting toil of 'passing' as cisgender and/or abled, or other performative tensions/burnout (Horowitz et al., 2017; Meyer, 2003; Miller 2015a, b; Shaewitz & Crandall, 2020). In the U.S., prior to the passing of Section 504 of the Rehabilitation Act (1973), the Americans with Disabilities Act (1990), and popularization of inclusive teaching, the medical model of disability, focused on how physical and mental traits are disabling, influenced the structure of education (Valle et al., 2004). Conversely, the social model attempted to understand the world as designing disadvantages and disabling people (Oliver & Barnes, 2010; Oliver & Sapey, 2006).

Science, Technology, Engineering, and Mathematics (STEM) fields have consistently faced attrition of marginalized/minority students (Dewsbury & Brame, 2019; Passalacqua & Pilloud, 2020; Wilson et al., 2015). Lacking a sense of belonging and preparedness in scientific literacy are cited as reasons for this gap in STEM (Estrada

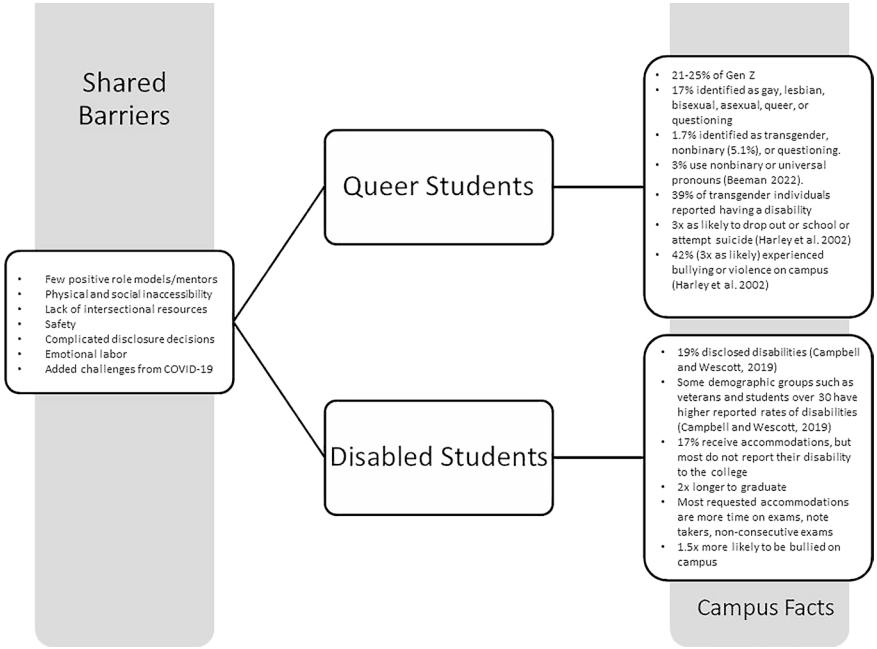


Fig. 1 Frequencies of queer and disabled students in the U.S. colleges and similarities of their barriers

et al., 2017; Seymour & Hewitt, 1997). The myth of total scientific objectivity in STEM fields further obfuscates diverse positionalities and development of culturally relevant research/teaching strategies (Adams et al., 2023; Winburn & Clemmons, 2021). Queer/disabled students report an unsupportive climate overall within STEM majors with feelings of isolation, lack of supportive faculty and physical accessibility, and 'bro-culture'-dominance (Miller & Downey, 2020). These systemic barriers to education are demonstrated in many ways, including curricular design. To support and balance representation for students, changes to pedagogical/andragogical and campus infrastructure are needed, such as engaging with queer/crip theory and designing inclusive learning environments to mitigate educational barriers (Accredited Schools Online, 2022).

3 Inclusion Mitigates Educational Barriers

Teaching environments, practices, and curricula supporting marginalized students include and normalize their perspectives and historic barriers. In an inclusive learning environment, educators and students perceive and portray their diverse backgrounds, abilities, and learning modalities as valued, contributory, and essential (UNESCO, 2017). Inclusive teaching refers to practices that incorporate diversity, promote self-reflection, and are proactive about the tensions and stressors associated with marginalisation. The quality of learning spaces relies upon centering the voices and experiences of students, encouraging self-development, and acknowledging the transformative and emancipatory power of education (Freire et al., 2018).

Incorporating the Universal Design of Learning (UDL) (CAST, 2023) enhances inclusive teaching (Meyer et al., 2014; National Academies Press, 2018; Rose et al., 2006). UDL guides educators to anticipate and plan for learner diversity before course design. UDL strategies mean to preserve the integrity of education while leveraging tools that deliberately remove unnecessary barriers for more students (CAST, 2023; Gernsbacher, 2015; Meyer et al., 2014; Novak & Rodriguez, 2018). This framework is based on three principles: Engagement ("Why of learning"), Representation ("What of learning"), and Action and Expression ("How of learning"). Overall, UDL prompts educators to integrate flexibility and options for student perception (access of information), expression (demonstration of knowledge), and comprehension (motivations and activities which engage them).

4 Beyond Add-and-Stir: Transformative Approaches

It is important to understand that inclusive approaches should go beyond "adding-and-stirring" diverse content. This inadvertently affirms the embedded oppressions of the education system when not accompanied by critique of these systems. Applying queer/crip theoretical lenses in teaching practice can produce greater

transformative impact for all students than inclusion alone. Crip theory intersects critical disability theory (CDT) (Burghardt, 2011; Ellis et al., 2018; Meekosha & Shuttleworth, 2009) with queer theory. Queer theory examines the nature of sexuality- and gender-based normativity and how society defines and polices concepts of cisheteronormativity and oppresses queer identities (McRuer, 2006). Able-bodied, cisheteronormative appearance, physiology, behavior, thinking, productivity, etc., is normalized and considered the "natural order of things" by which we judge ourselves, others, and embed personhood (McRuer, 2006). Crip theory highlights similarities between queer/disabled experiences, in their shared history of injustice, pathologising and aberrance of their bodyminds, and closeting/passing. Compulsory heteronormative sexuality (McRuer, 2006; Rich, 1980) is "contingent on compulsory able-bodiedness and vice versa" (McRuer, 2004, p. 489; Abes & Wallace, 2020; Butler, 1990, 2004; Foucault et al., 1978; Kafer, 2013; McRuer, 2006; Muñoz, 1999). Both examine perceptions, stigma, and oppression of individuals as a product of a society (Campbell, 2001) that interacts with colonialism, imperialism, racism, genderism, and capitalism (Campbell, 2009). Both center the voices of marginalized peoples, seek disabled/queer ways of knowing (i.e., cripistemologies) (Kafer, 2013; McRuer, 2004; McRuer, 2005, 2011, 2018), and problematise systems of oppression (Abes & Wallace, 2020; Butler, 2004; Rich, 1980).

Traditionally, experiences of college students based on their social identities have focused on singular axes of identity. Intersectionality references an individual's multiple social identities (e.g., race, gender, sexuality, socioeconomic status) that simultaneously interconnect and compound the lived experiences of marginalized peoples (Crenshaw, 1991, 2017; Runyan, 2018; Tegtmeyer Hawke & Hulse, 2023; Withers, 2012) (see Figs. 1 and 2). Intersectionality is a tool for identifying underlying oppressive structures and ideologies within society which reinforce or liberate identities (Hill Collins, 2000; Hill Collins & Bilge, 2016). Multi-identities are not viewed as additive and boxing each identity as a separate unit is eschewed, as is prioritizing or ranking identities (Hill Collins, 2000; Hill Collins & Bilge, 2016). Rather, identities are viewed as permeating and fluid (Cho et al., 2013). For instance, disability impacts the romantic/sexual partnerships of disabled college students (Goldstein & Johnson, 1997; Robillard & Fichten, 1983), so gender experiences can be tied to experiences of disability (McDonald et al., 2007; Peuravaara, 2013).

Focusing on one dimension of a student's identity prevents educators and policymakers from responding to the changing multi-dimensional landscape of higher education. By engaging with intersectionality and queer/crip theories, educators can understand the multiple identities/voices embodied by students and how these identities impact learning barriers and expand learning opportunities. Queer/crip approaches resist binaries (e.g., able/disabled, sex/gender, gay/straight, out/closeted, and intersectional/segmented), building on existing resources to decolonize teaching materials, and spotlight systemic privilege (Goliath et al., 2023). We propose that applying these lenses can broaden social approaches by which to model DEI teaching. While students may not view their identities as intersectional (Kimball et al., 2018; Miller, 2018), the division of university student services towards single

I am a graduate student who identifies as a transgender woman who is also neurodivergent and with diagnosed mental conditions. The intersectionality of these traits has been an issue throughout my academic career. When transition related problems arise, or the politics of the day weigh heavily against my (trans/queer) community, often this leads to the combined effect of exacerbating my mental health issues, for the negative, which then leads to issues related to neurodivergence becoming exacerbated; all culminating in a sharp decrease in academic performance.

When accessing supports through the various university structures (at all of the institutions I have worked in), these supports are highly segmented, dealing with only one aspect of the issue. Academic support often is only able to assist with the problems arising from the neurodivergent issues, while ignoring the mental health and queer side of the equation; on the opposite end, the behavioral health supports will focus on the mental health issues, yet ignore the root cause of queer issues or the ultimate end of academic setbacks.

I was just beginning my transition journey, and had a year previously started on a hormone–replacement regimen, when I began college. Additionally, I was just coming back from a severe mental health episode which included suicidal behavior and even an attempt; stemming from both societal non-acceptance of being transgender as well as mental illness issues such as bipolar disorder and borderline personality disorder. I was called into the deans' office one day as there were students who were apparently uncomfortable with a transgender individual at the school. This meeting triggered a deep depressive episode, again with further suicidal ideation, and even anger towards the dean, my fellow classmates, and the school. Not only was I misgendered several times despite explaining my name, pronouns, and gender, the attitude from this individual, as well as from my fellow students, was one of disdain and invalidation. These occurrences had such a negative impact on me, both mentally and emotionally, that upon completion of the program I left the field to pursue my present career path.

- Ashley C. Smith (She/Her)

Fig. 2 Author Smith's positionality and testimonial statement

identities fails to help them reconcile their learning development, while inclusive practices could curtail the slower administrative changes (Harper et al., 2011; Miller et al., 2019) (see Figs. 3 and 4).

5 Cripping and Queering the Classroom

Abelism and cisheteronormativity manifest strikingly in the experiences of biological anthropologists because of the emphasis, expectations, and prestige of field and lab work. When hard labor and harsh conditions that may exacerbate or create disability are considered a 'rite of passage,' where deadlines, keeping pace, and professionalism are forms of social conformity (Heath-Stout et al., 2022; Tegtmeyer Hawke & Hulse, 2023), a broader critique and acknowledgement of the intersecting barriers these systems impose is warranted as they impact educational/career goals (see Figs. 5 and 6). Though accommodations in the classroom or diversifying syllabi provide disabled/queer students more equity within the educational system, a social model could allow for understanding, normalizing, and valuing diversity within the educational inclusion movement (Garland-Thomson, 2002).

While there is no one-size-fits-all approach, case studies and reviews exploring inclusive teaching practices specifically in BA already exist. Blatt (2022) provides innovations for an introductory lab course for incorporating kinesthetic and auditory activities for vision-impaired students and their sighted peers. They also share training incorporating Indigenous/Two Spirit/Indigiqueering pedagogies into course

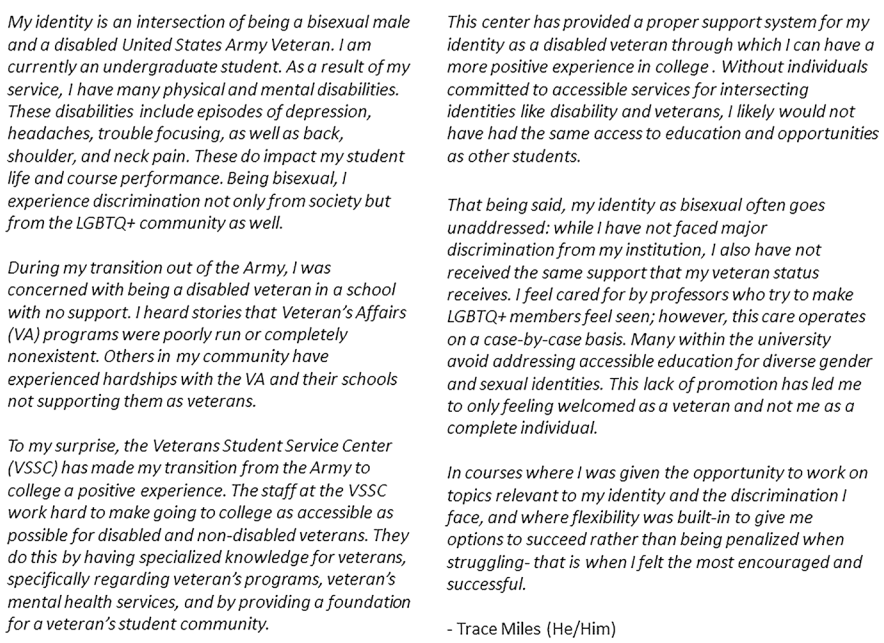


Fig. 3 Author, Miles' positionality and testimonial statement

content and policies (Blatt et al., 2020). Specifically, this work has incorporated Indigenous knowledge and traditions into curricular design and student assessment, terminology and scaffolding use, and other learning modes influenced by First Nations and Two Spirit pedagogical/andragogical guides (Blatt et al., 2020). Indigenized strategies, such as Missing and Murdered Indigenous Persons (MMIP) harm reduction, are also beginning to be used within forensic anthropology and can be incorporated into courses to support student belonging and promote culture-informed thinking (Bedard & Blatt, 2023, 2024).

Further, Clark and Gagich (2023) proposes artificial intelligence (AI) applications for supporting students of different neurotypes in constructing assignments, organizing and motivating, communicating with faculty, and coping with participation anxiety. Applications such as Goblin.Tools (De Buyser, 2023), for example, break down tasks and clarify communication tone to help focus and limit the feeling of being overwhelmed for neurodivergent individuals. Kissel and Blum (2022) demonstrate the value of unessays, ungrading, collaborative annotations, and course policies that deconstruct oppressive structures. Adams et al. (2023) and Goliath et al. (2023) discuss modernizing inclusive teaching practices for creating safe spaces and relevant, critical content about diversity in forensic anthropology. Scholars in the field have also begun including positionality statements and reflexive narratives in their works (Tallman et al., 2022b).

Literature discussing intersecting barriers to, and teaching strategies for, queer and disabled students within BA is virtually silent. However, Heath-Stout et al.

I am currently working on my masters degree. I am Two Spirit. I have some high risk health conditions, such as diabetes and high blood pressure, chronic pain, and requiring a CPAP. I am also in my late 30s and so older than most students in my cohort, returning to school after military and career experience. This means that international fieldwork has added considerations, challenges, and precautions that my peers do not face.

Although I was medically cleared to participate in the field, I've encountered an inability to access to filtered or distilled water for my CPAP or during work in over 100◦F heat. The field school handbook does specify heat related injuries or work related expectations during extreme conditions or in regards to health challenges. I don't want to appear as lazy, but need to advocate for my safety and welfare in ways not broached by the crew. In the field, the only mitigation for heat injuries is cover up, wear sunscreen, and bring at least 3 liters of water. For the cost of my field school program, they could have purchased a portable water filter capable of producing 15 gallons of safe drinking water an hour, relieving some of my physical stresses. From my military experience, the weather conditions we have worked under in the field have been consistently in the black, when all work would be required to be suspended under military guidelines.

Also, when attending field school for the first time I had to consider that nation's governmental/legal position and statistics on gender diverse persons. As it is, on campus and at home, disclosure is something I hesitate about and PDA is something we avoid. I have questioned how much to share with my peers and supervisors for my safety. That being said, there isn't much of a gay "scene" there, and PDA is discouraged. In fact, most contact among students and field instructors is discouraged, which leaves a student like me even more isolated and unsupported on multiple fronts.

It can be difficult to see my own reflection in the mirror of the academy. Allyship from my colleagues and professors in and out of the classroom and field is survival. Mentorship which has embraced my identity as influential in my research and that led me to a community in the discipline has been paramount. Course content with voices similar to mine offers safety and encouragement to be part of change in the discipline; but the discipline is in need of more inclusive change for the future where people like me do not have bat an eye about fitting in or not.

- Miles Hodges-DeLone Rhoads (He/Him)

Fig. 4 Author, Hodges-DeLone Rhoads' positionality and testimonial statement

(2022) and Wilkie (2023) bring together examples of ableism and sexism at archaeological field sites through interviews and their own stories of disability. They mention the choices that disabled archaeologists make about disclosure in order to receive accommodations but with the fear of stigma, internal dissonance, and retaliation. They also discuss how academia is inherently subsumed with hyperactivity and dismisses cripping time. Cripping time refers to the reorientation/reevaluation of time and expectations that constrain performance compared to ableist time (Kafer, 2013; McKinney, 2014). This may mean needing more time for mobility, comprehension, assignments, and participating in class; flexible options without penalties.

Within bioarchaeology and archaeology (Wilkie, 2023) there is great interest in understanding the causes, consequences, means of identifying, sociocultural and environmental contexts of disability, and experiences of disabled people in the past through materialization of health care, disparities, and traditions (i.e., the bioarchaeology of disability (BoD) (Blatt, 2017; Kinkopf, 2020). The same is true for queering the skeleton and identifying gendered markers in the past (Agarwal & Wesp, 2017; Winburn et al., 2022) and in forensic anthropology (Adams et al., 2023; Blatt et al., 2023; Isa et al., 2022; Winburn et al., 2022). Such research content and datasets should be used to build relevance and engagement among diverse student body-minds. Archaeologists have reflected on experiences and strategies with disability and/or queer identities in the field and classroom, sometimes intersecting the two, for decades (Blackmore et al., 2016; Fulkerson & Tushingham, 2019; Heath-Stout,

I am a cis-gender female faculty member with both visible and invisible disabilities. I have faced misunderstanding and disbelief and sometimes ridicule from colleagues in regard to my chronic pain and mental health challenges, which were deemed as abnormal and sometimes even labeled disruptive, abnormal, or noncollegial. I have been expected to perform and mask according to unspoken social norms and conformity and been victim to harmful assumptions by colleagues due to depression, anxiety, and lifestyle that threatened my career and isolated me. I questioned my role in the discipline in situations where disability jokes were shared in official meetings and when students were denied their pronouns.

As a teacher-scholar, my focus on accessibility, inclusion, and social justice has been unsupported at times and deemed less important than my other research or politically dangerous. Too few take-on the specific task of supporting and understanding queer/disabled students and colleagues in ways that can inhibit self-support because an infrastructure of student support does not exist in many spaces. I have been uplifted by the strength and brilliance of our students who drive my work and advocacy and make me a better teacher everyday.

As a professor, my disabilities go unnoticed when the distance or obstacles of classrooms are chosen, when as a female taking on greater service roles also means needing extra time to rest my mind and body, or when anxiety leaves me literally frozen in social settings that are required for networking, and when resulting awkwardness debilitates fitting in (exasperating thoughts of failure and depression and impacting productivity). As a caretaker of a disabled child, my stretched role there too, and its impact on my own challenges, is not acknowledged.

In the field, disability is isolating. The crew does not see how each day compounds your physical pain or how you try to hide it by pushing yourself to the point that it can take months to recover. They perceive you needing a chair, or a bucket to push up from to stand, or lagging far behind during a hike to the site as laziness or weakness or less passion. I think about the needs I have physically when going into the field and have anxiety and worry about how I will accommodate them in secret or if others will notice my struggles and out me. I worry that I will not have a place in the field if I do not push my body and if I am absent in the field that I may as well be absent from the discipline.

-Samantha H. Blatt (She/Her/They/Them)

Fig. 5 Author, Blatt's positionality and testimonial statement

2019, 2019, 2023; Heath-Stout et al., 2022; Hoggarth et al., 2021; Klehm et al., 2021; Moser, 2007; Nelson et al., 1994; O'Mahony, 2015a, b; Peixotto et al., 2021). DAN provides resources for inclusive assignments, excavation accessibility (Table 1), professional development, mentoring, navigating legalities, disclosure (Price et al., 2017), etc. Educators can develop ideas from publicly available syllabi and resources through The Association for Queer Anthropology (2022), Biological Anthropology Women's Mentoring Network, Queering BioAnth Reference Library (Flaherty et al., 2023), The Association of Black Anthropologists (2023), and others.

Outside of BA, there is growing literature highlighting the intersections of college student identities (Miller, 2015b, 2018; Museus & Griffin, 2011). Empirical and descriptive studies of college students identifying as queer and disabled highlight the diversity of self-expression, sense of self, and self-advocacy, but also rigid, inflexible institutional policies that lack space and time for them on campus (Gregg et al., 2016; Harley et al., 2002; Henry et al., 2010; Kimball et al., 2018; Miller, 2015a, 2018, 2020; Miller et al., 2017, 2019; Pearson & Boskovich, 2019; Vaccaro et al., 2020). Miller (2015a) and Miller et al. (2017) focus on microaggressions faced by disabled, queer students in the classroom (e.g., exclusion of disability/queer content, demeaning ableist language/descriptors, misgendering, faculty attitudes, emotional labor, etc.) and how these impact learning and engagement (e.g., related to course content, attitudes towards their other identities, identity

I am a cisgender, Hispanic/Latina woman with several invisible disabilities. Chronic pain in my knees, ankles, and hips due to past injuries, among other physical and mental health challenges. Some of which are due to drastic changes in my environment when starting school outside of my island home.

When I first started university as an undergraduate student, I sought help from the Vocational Rehabilitation Administration Offices. From my understanding, its mission is to help students with disabilities to be able to continue their studies and achieve their academic and professional goals, but my case was different.

When I went to get information and request help, one of the many questions asked of me was in regards to my professional goals. When I told them I planned to be a forensic anthropologist, they responded by saying that this could not be my professional goal since my disability was related to my knees and was not feasible. In other words, I had to change my career goals or I would not be able to participate in the program and receive benefits.

Although I was very discouraged at first and did change my professional goals initially, I have since continued with the desire to become an anthropologist. Now that I am pursuing a master's degree in anthropology, I decided to choose not to apply for the services for fear that they will try again to discourage my goals or not support me.

Although I think it is not the right thing to do, I can understand their concerns now that I have gained experience both in class and in the field. Field work is not the easiest when you have so many impediments. You can spend hours walking on difficult terrain, or crouching on uncomfortable floors or areas that cause body pain and make your day miserable. It may not be intense during the day while you are highly active, but when you finish, it is excruciatingly painful. You can't sleep, medications seem to have no effect, and you suffer for long days, even weeks and months for a single day in the field. I wish they had supported me or tried to accommodate and encourage me instead because I know there are other student like me that were not head strong enough to ignore administrative discouragement.

In the field, I always try to be prepared and bring the necessary medications and food to at least keep my sugar level and reflux problems under control, since most of the time I am in areas far from medical and health services. It is difficult for me since I like to participate, but I must maintain a neutral expression and not show pain in the field, since I fear that others will interpret it as a sign of laziness especially when I already feel like my identity as a Latina and native Spanish speaker limits me.

-Patricia Morales Lorenzo (She/Her)

Fig. 6 Author, Morales Lorenzo's positionality and testimonial statement

performance, strategies for identity disclosure or avoidance, and management of perceptions of their identities by others in the classroom, etc.). In fact, students' views of their identities as intersectional aided in their resiliency by allowing them to activate their experiences with one identity to reinforce, protect, or express another identity (Miller et al., 2019; Miller, 2018, 2020). Other studies have identified best practices in working with queer or disabled students (Gregg et al., 2016; Jones, 2009; Jones & Abes, 2013; Kimball et al., 2018; McKinney, 2014; Mizock et al., 2013; Morgan et al., 2011; Rose et al., 2006; Schmidt, 2022; Thurston et al., 2017; Wood, 2017; Yoder & Mattheis, 2016) and have outlined challenges (Miller et al., 2019). Educators like Wood (2017), apply crip time to writing composition assignments for all students, requiring educators to explore the effects of normative time frames in pedagogy/andragogy. Further, biological anthropologists may find it useful to apply Dewsbery and Brame's (2019) interactive map for inclusive teaching in life sciences education which includes examples of strategies in expandable nodes, a reference library, and an inclusion checklist. Additionally, the Enabled Archaeology Foundation (https://enabledarchaeology.com/friends/) has produced a series of cards to provide quick, on-the-spot applicable insight for outreach and field directors. Further, the Trans and Gender Non-conforming Fieldwork Alliance has produced an E-Zine with first-hand field safety tips, adapted in Table 1 (Kottler et al., 2023).

These scholars show that an inclusive BA classroom provides flexibility in activities and sources of information (culture, age, ability, racial/ethnic/gender relevant) (Newmaster et al., 2013). This includes designing activities so that learning

Table 1 Examples of inclusive field and lab access, fieldworker and principal investigator awareness and planning for queer/disabled fieldworkers

Awareness for Fieldworkers	Understand the personal risks and resources by speaking with colleagues and getting first-person accounts (e.g. equaldex.com) Educate yourself about local laws, socio-cultural norms, and political climate towards LGBTQ+/ disabled persons when considering whether to disclose (consider privatizing social media accounts if not disclosing and having a prepared story if questioned) Communicate your name and pronouns and be aware that not all languages have gendered pronouns Request information about codes of conduct and reporting for misconduct
Planning for Fieldworkers	Consider location, housing details, restroom facilities, comfort clothing, daily activity expectations, communication accessability (cellphones/satellite phone, hotspots), personnel Consider if your travel documents have a different name/gender marker that what you use daily and take steps to check if those would be recognized in the country of travel Prepare for medical prescription storage, access, amounts needed, and privacy of medication administration, have a medical buddy/advocate in case of medical emergency Consider how masking or disclosing may impact your mental health and pre-arrange to have accessible communication with trusted advocates, journaling ad personal reflection, or telehealth
Mobility	Earth ramps/steps into trenches Rough terrain attachments for wheelchairs Lowered sieves using tripods Consider comfort when assigning trench/excavation type Garden kneeler/seat Standing workstations and lowered workstation options Buckets nearby to help in getting up
Comfort	Cushions, pillow, heavy knee pads, stools Ergonomic gardening tools, long reach garden tools, ratchet pruning shears Back-saving handle attachment Rocker rolling seat Safe/private place Changing rooms
Loss of Limbs	Support cuff with swap system to attached trowels and other tools to forearm EX: Easi-Grip Arm Support Cuff (various add-on handles, tools, ergonomics, and long reach options)
Vision Impaired	Buddy system Tactile “seeing” (nitrile gloves) Braille and/or screenreader technology for lab safety, chemical hygiene, SOPs Make accessible communication and teaching materials Do not rely on color to display information Accessible technology EX: Talking tape measures, alt-text Use of AR/VR/3D printing technology (some can be used with kinesthetic technology) Processing and texture analysis of artifacts

(continued)

Table 1 (continued)

Auditory Impaired	Accessible technology EX: Closed captioning, sign language Make accessible communication and teaching materials
Invisible Disabilities	Low sensory space available Headphones/ ear plugs Encouragement/ camaraderie Ability for crew to request accommodations
Other	Secure refrigeration access for medications and foods Available, unlimited filtered water Clear expectations which consider flexible timing Dedicated extension cords and electricity accessibility for charging health equipment Flexible breaks and work hours Scheduling and communicative AI (e.g. Goblin.Tools)
Everyone	Clear guidelines and policies in support of physical rest, whole wellness, supporting all diversity and including consequences for breaching policies Crew awareness training Lab space orientation of organized spaces Clear routes of mobility through a lab space Nothing entirely color-coded reliant Regular check-ins Knowledge of regional resources and laws for the queer community/safety/ health needs Lectures which are inclusive of diverse ways of knowing and interpreting the world Support of field projects which engage diverse students and diverse research topics

Adapted and modified from O'Mahoney (2015a), The Queer and Trans Field Safety Workshop (2024), and the Trans and Gender Non-conforming Field Alliance Field Safety E-Zine (Kottler et al., 2023)

outcomes are authentic and communicate relevance. This can integrate storytelling instead of traditional lecture, matching new knowledge with that from previous lessons and other domains, and reciprocal roles in course discussions/leadership. Tasks should allow for active participation, exploration, and experimentation inviting personal response/interpretation, peer/self-evaluation, and self-reflection. Blatt incorporates built-in "choose your own adventure"-type activities that students can choose when they need to boost or replace points. Overall, strategies should foster imagination to solve novel and relevant problems or make sense of complex ideas in creative ways. Educators can intentionally engage in efforts to deconstruct restrictive norms by challenging individuals and systems with exclusionary thinking/ behavior, using inclusive language, queering/cripping (and decolonizing) curriculum, extra-curriculum, and policies (Chaussée et al., 2022).

We can also foster belonging by including community members in classrooms, promoting diverse leadership/mentors within the discipline, and investing in effective and horizontal mentorship (Adams et al., 2023; Goliath et al., 2023; Winburn et al., 2021, 2022) (see Fig. 7). Educators can spark discussions that level the

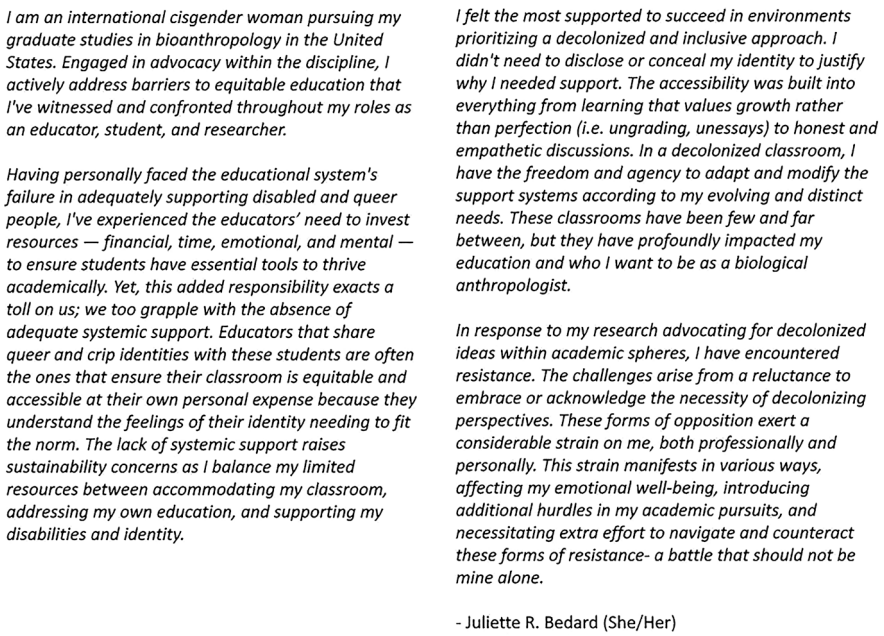


Fig. 7 Author, Bedard's positionality and testimonial statement

anxieties and "in the air" stereotypes of all students (without the need for identity disclosure) via peer discussion of academic adversity as normative and shared, resulting in higher attendance, course grades, and retention (Binning et al., 2020). It is also helpful to mitigate competition in classes and to evaluate and modify trauma-inducing activities. This can mean shifting normative logistics. For example, crip time can help break down the idea that the best student thinking can only occur within the first few moments in which the teacher waits for them to respond (Slow Science Academy, 2010). Educators can replace high-stakes assignments with multiple low-stakes activities or use virtual polling/chat, among other practices, to allow all students time to respond without making quickness a competitive advantage a source of anxiety. Centering the voices of queer students with disabilities, diverse scholars with diverse experiences, and student-centered dialogue in general, through inclusive practices heightens engagement and a sense of belonging (Miller, 2015a, 2018, 2020; Miller et al., 2017). For example, educator use of chosen names is associated with lower depression, suicidal ideation, and suicidal behavior (Russell et al., 2018; Testa et al., 2017; Whitley et al., 2022).

We propose a queer/cripped version of Evans and Knepper's (Adams et al., 2023; Evans & Knepper, 2021) four-tier Diversity Inclusion Model combined with UDL principles to inclusify course design and (1) engage and recruit students, (2) encourage expansive thinking about diverse identities, (3) develop equity in classwork through flexibility in knowledge obtainment and expression, and (4) normalize

diversity as essential. This model includes the following four tiers; examples of specific applications can be found in Table 2:

1. Tier 1- *Representation*. This involves foundational, surface-level, inclusion that is obvious to students, beginning with the syllabus. Including topics and authors from diverse perspectives and expanding from the discipline canon empowers students and increases their sense of belonging.
2. Tier 2- *Environment.* This centers on policies that establish a welcoming classroom environment, encourage inclusive participation, and proactively include diverse perspectives from the broadest range of students. By incorporating tier 4 strategies, this avoids an "add-and-stir" effect.
3. Tier 3- *Application* of tiers 1 and 2. This involves offering opportunities for student involvement in the creation of knowledge, self-reflection, and analysis of material through personal perspectives, as well as flexible options in the evaluation of learning.
4. Tier 4- *Transformation*. This pinnacle tier involves a lasting cultural shift in embedded pedagogical/andragogical and social messaging wherein inclusion becomes normalized, essential, and acknowledges and seeks to change oppressive systems.

6 Stepping In

Queering/cripping pedagogy/andragogy is not simply the dissemination of queer/crip perspectives. Instead, a queer/crip lens in pedagogy/andragogy interrupts binaries central to Western modes of meaning. These lenses incite novel ways of thinking and doing that challenge norms beyond disabled/queer bodyminds; rather, they multiply and fluidify possibilities of knowledge and transmission overall by focusing on questions, rather than answers as a learning philosophy. Diverse students are often retrofitted into collegiate spaces and traditions in ways which support an exclusionary system with preferred ideals. For instance, when disability or queerness is only talked about on campus as something that *needs* accommodation and access*ability*, this eradicates these identities. Considering 'inclusion' as 'accommodation' can further segregate people when they are in service of compulsory bodymindness. Ultimately, the futurity of inclusive education is in repairing space and academic culture for more people, rather than curative methods that support privileged experiences.

Cripping/queering BA is not as simple as accommodating and including students with disabilities or gender/sexuality diversity into existing curriculum and teaching approaches. Instead, it calls upon the introspection of educators/leaders to critically examine and reconstruct the ways in which the foundations of the field rest upon assumptions of disability as inability and diversity as adversity. It demands that we refuse to accept that knowledge, scholarship, and success in our field are possible

Table 2 Applying the diversity and inclusion model to BA (following Evans & Knepper, 2021)

Tiers of the Diversity and Inclusion Model	Application to the BA Classroom
Tier 1: Representation	Diverse voices in course materials, guest speakers (Queering Bioanth Reference Library; NYCEP Repository; Decolonizing Science Reading List [157]; Disability Studies eLibrary [158]) Include guest speakers from the community on course schedule Meaningfully include specific examples highlighting how diversity is represented Avoid biased language/pronouns, euphemisms Provide resources for diversity and disability on campus/in community and be knowledgeable of them
Tier 2: Course Environment	Create a welcoming classroom environment by outlining expectations for inclusivity and discussion and including students in development of expectations Statements of inclusivity, disability Proactive, immediate, and consistent anti-harassment. Bullying consequences Pronoun/name choices from day 1 or use "they/them" pronouns in discussion, activities, all course documents. Avoid forcing the sharing of pronouns. Use identity- or person-first phrases such as 'disabled people,' 'people with disabilities' and 'the disabled community' instead of pejorative phrases like 'handicapped,' 'challenged,' or 'differently abled' Disclosure awareness and sensitivity- understand that there are multiple ways a person can disclose their disability or queer identity and that there are multiple reasons that people choose not to disclose. Also be sensitive to not disclosing or tokenizing other's identities. Make content accessible (EX: AAA accessibility guide (2023); alt-text, closed-captioning, audio transcription, text/font readability, OpenDyslexic typeface) Use the accessibility toolkits to check for errors and improvements in Learning Management Systems which make using screenreaders more efficient.
Tier 3: Embedded Application	Encourage sharing of experiential knowledge Promote self-reflection for both students and instructor Commit to application of queer/crip theory in course design and instruction Design assignments that challenge binary conceptions Provide assignments options Integration of crip time Discussion of ethical statistical guidelines Integrate social theory with biology/statistics

(continued)

Table 2 (continued)

Tiers of the Diversity and Inclusion Model	Application to the BA Classroom
Tier 4: Acculturation	Acknowledge that language, visuals, terms, and phrases are often gender/able-coded and re-examine usage in the classroom and syllabi Avoid using images, quotes, and phrases that reinforce gender/disability stereotypes Critically examine all examples and images used in coursework to ensure that underlying messages are inclusive Challenge hetero-cis-normativity and ableism in readings, discussion, in the broader discipline and academy, and highlight the justice component of inclusion

without the diversity of our members and acknowledgement of inhibited diversity in our past.

While we attempt to encourage those theories and practices that foster greater diversity in both disability and gender/sexuality within the classrooms of BA, one cannot ignore the constraints that many educators face in the current political climate. We encourage educators and institutions to prevail despite these negative forces while accounting for the individual position of the educators. Students and early career faculty may not have the political capital to affect change and should not bear it alone. To that end, senior faculty, including those within the administrative sphere, need to step in and ensure that the most inclusive teaching practices are produced within the constraints of the law. Laws which unduly target constituent groups can weigh heavily on students' long-term, reflect in performance and motivation, and inhibit diversity growth in BA. It is in times like these that BA educators can call upon our passion for human diversity in welcoming and accepting this diversity in our students. As there are multiple ways to incorporate the models we suggest, we encourage educators to be intensely and intentionally creative, collaborative, and reflective in deconstructing and rebuilding their courses as a necessary step to mitigating barriers to entry and retention in BA.

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Structural Violence, Marginalization, and Systems of Colonialism

Institutionalization and Health in Past Populations: Social Justice Perspectives



Molly Zuckerman and Hannah Willis

1 Introduction

Vulnerability to poor health, disease, and death has long been primarily conceptualized in terms of biological vulnerability for both contemporary and past human populations. Biological vulnerability includes inherited and acquired biological characteristics, such as age (e.g., immunosenescence). Attention to the role of social factors in our vulnerability started in the early-nineteenth century in biological anthropology, social epidemiology, and social history medicine (Blakey & Watkins, 2022; Waitzkin et al., 2020). Health disparity populations refer to groups within society who have systematic differences in health status and/or access to health care, linked to social, economic and environmental factors.

Within social medicine and epidemiology, social vulnerability mainly encompasses susceptibilities to negative effects, like disease, and the resilience of communities in response to external stressors ranging from racism to pandemics and institutionalization. Social vulnerability is also profoundly context-dependent; communities' risks are determined by their group-level capacities and access to key resources in their cultural, historical, environmental, political, and social contexts. And in turn, these contexts are profoundly influenced by the social determinants of

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_6

health. The social determinants of health are the fundamental biological and social (biosocial), and environmental conditions experienced throughout the life course and in daily life and that directly impact health and resilience (Braveman et al., 2011a; WHO, 2022). Notably, social vulnerability and biological vulnerability can also intersect and compound. This can leave some populations deeply vulnerable to health risks, trauma, and elevated morbidity and mortality. Importantly, many forms of biological vulnerability like genetic predispositions, can be inefficient and expensive to relieve. This makes them challenging to prohibitive in regard to scaling up and expanding into public health interventions and clinical medical treatments and preventatives. But social vulnerability, especially those anchored in the social determinants of health, are more easily prevented and mitigated (Zegarra Zamalloa et al., 2022). And when it comes to social vulnerability, prevention and mitigation are social justice imperatives for public health, social and health care policy, clinical medicine, medical anthropology, and related fields (Braveman et al., 2011b; Gaynor & Wilson, 2020; Krieger, 2020).

In the US and internationally, contemporary people with disabilities (PWD) have high biological and social vulnerabilities to poor health, disease, and early death because they are at the confluence of multiple stressors, for example. This is especially true for PWD who are institutionalized. Here, institutionalization refers to being placed or kept in a large long-term residential institution (e.g., psychiatric hospitals).[1] Health amongst PWD is deeply under-researched, but existing studies show an increased likelihood of poorer overall health, higher all-cause mortality, and disparate health outcomes than the general population (CDC, 2024; Hirvikoski et al., 2021; McMahon et al., 2023; Park et al., 2017). Biological vulnerability contributes to some of these patterns. For instance, some serious mental and physical impairments, like epilepsy, are established risk factors for respiratory infections, such as influenza. Others, like spina bifida, can lead to secondary conditions, including injury. However, social vulnerability plays a bigger role. PWD are more likely to be in poverty, have less access to care, lower quality care, and reduced access to critical resources, like employment, and other social determinants of health than the general population. And poor health amongst PWD also includes many preventable conditions, including chronic and degenerative diseases (CDDs) (e.g., arthritis, cancers) (Campbell et al., 2009; CDC, 2024; Hirvikoski et al., 2021; Martínez-Leal et al., 2011; Park et al., 2017). The health of PWD in institutions is even more poorly studied, but the little existing research shows that these communities experience higher incidences of cause-specific and all-cause mortality and disease (e.g., infectious, CDDs) than PWD in all other settings (Hirvikoski et al., 2021; Kozma et al., 2009; Martínez-Leal et al., 2011; McMahon et al., 2023). This disparity is wholly attributable to social vulnerability; in institutions, PWD can experience social and physical isolation, reduced mobility and restricted environments, and reliance on others for health-related caretaking ('caretaking'), the effects of

[1] Versus living in small residential services, family homes or independent living within the community (Martínez-Leal et al., 2011).

which can be exacerbated by higher patient numbers and understaffing (Kozma et al., 2009; Martínez-Leal et al., 2011; McMahon et al., 2023). Broadly, these inequities are further compounded by health, economic, and social policies that marginalize PWD, especially those who are institutionalized, largely because of discrimination. As a result, there is emerging consensus that PWD, especially those who are institutionalized, are a health disparity population (Drum et al., 2009; Krahn et al., 2015). In the wake of the COVID-19 pandemic, which disproportionately harmed PWD (Landes et al., 2021), addressing health disparities for PWD, especially those who are institutionalized, and the role of social vulnerability in these disparities is an emergent concern in social justice in health initiatives in the US and internationally (Kuper et al., 2020; Landes et al., 2021; Sabatello et al., 2020).

Here, we explore intersecting social and biological vulnerabilities to poor health, disease, and death amongst PWD who were institutionalized in the mid nineteenth to early twentieth century Mississippi State Asylum (MSA). We review select established historical demographic and bioarcheological research on individuals who lived and died at the MSA, including those buried in its cemetery, the Asylum Hill Cemetery. Specifically, we consider findings surrounding influenza and tuberculosis, trauma, and caretaking and how these relate to institutionalization. Especially because of the social vulnerability of PWD who are institutionalized, research on health and institutionalization is embedded in multiple ethical and social justice issues. Importantly, anthropologists across the discipline have long argued that ethical anthropological research is that which addresses problems relevant to contemporary societies or which preserves cultural heritage and histories of past marginalized peoples who are at risk of erasure for their descendants (Armelagos & Gerven, 2003; Blakey, 1991; de la Cova, 2022; Walker, 2000; L. White, 1965). Research at the MIA can contribute to both of these ethical aims. First, this is because health surveillance and related research for PWD, especially in institutions, remains extremely scarce and has been historically (CDC, 2024; Martínez-Leal et al., 2011; McMahon et al., 2023). This scarcity limits health and health care research for PWD and therefore has direct, negative implications for them. Specifically, because of this scarcity, under-surveillance and under-research on health amongst PWD, especially those who are institutionalized and have the highest social vulnerability, is a social justice concern (Landes & Turk, 2024; So et al., 2022). Going deeper in time, without knowing the history of health for PWD, researchers cannot adequately comprehend the complex associations between environmental and biosocial conditions that may affect social and biological vulnerabilities to poor health, disease, and death—as well as access to critical resources—between PWD and the general population. Therefore, findings from the past can substantially contribute to the bodies of empirical evidence needed to inform and develop inclusive and social-justice health care and public health-oriented policies, interventions, and strategies that address disability concerns (Dimka & Mamelund, 2020; Mamelund & Dimka, 2021; Zuckerman et al., 2022; Zuckerman et al., 2023). Second, research on the health of MSA patients is central to the objectives for multidisciplinary research that the MSA's descendant community have generated through the Asylum Hill Project, the guiding organization for scholarship, stewardship, exhumation, and memorialization of patients at the

MSA (AHP, 2024). Third, there is relatively little bioarcheological and historical demographic research on the lives of past PWD in institutions, especially in the American South. Their narratives and biosocial lived experiences, like many of the most profoundly socially marginalized communities in the past, have largely been rendered invisible in the historical and archaeological record (de la Cova, 2020). Therefore, research on individuals at MSA, especially that which focuses on social justice, can help to preserve the histories of socially vulnerable institutionalized populations overall, and for those at the MSA specifically.

2 Background

2.1 The Mississippi State Asylum

The MSA provided care for 30,000 patients diagnosed with acute and chronic conditions in suburban Jackson, MS, between CE 1855 and 1935 (Fig. 1). Most patients were poor to laboring-class Mississippians, though some were middle-class to elite (e.g., planter class) (Mitchell, 1933; Mitchell, 1901). During the nineteenth century, most patients were White and/or European American (EA) but by the early twentieth century, the number of Black and/or African American (AA)[2] patients rose to constitute approximately half of patients. Living conditions varied throughout the MSA's operation. Patient health was worsened by insufficient infrastructure and

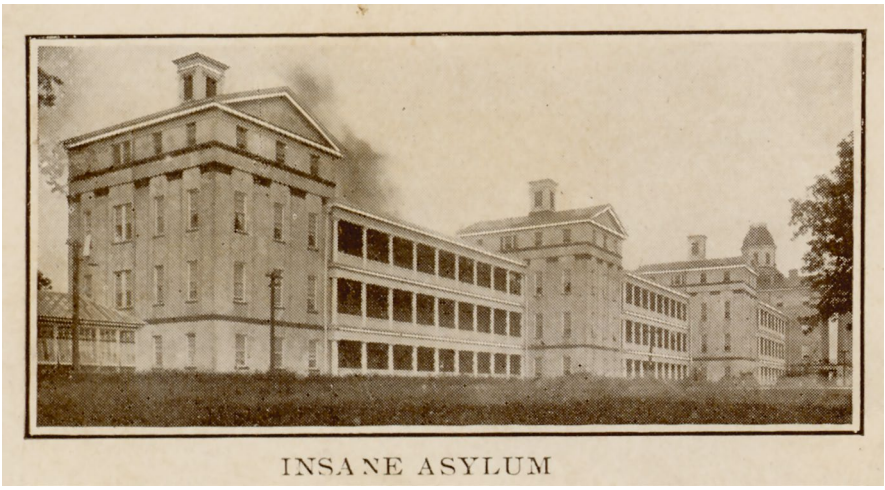


Fig. 1 The MSA, c. 1915. (Image source: Mississippi Department of Archives and History (MDAH))

[2] This is a version of the terms used for social race in the MSIA and other contemporary US vital statistics records.

housing in the early twentieth century, resulting in progressive overcrowding and worsening hygiene (Mitchell, 1919, 1926). Indeed, Dafoe's (2020) investigation of skeletal frailty (i.e., age-adjusted vulnerability to death) and resilience amongst individuals buried in the Asylum Hill Cemetery in the early twentieth century found higher frailty and lower resilience compared with contemporaneous and demographically similar skeletal assemblage. This is likely attributable to especially insalubrious environments at the MSA. Further, while MSA Superintendents' biennial reports maintain that Black/AA patients received the same care as White/EA patients, they also confirm that these burdens fell disproportionately on Black/AA patients; the MSA had gender- and social race-segregated wards (Fig. 2a, b). MSA records also reveal increased, disproportionate mortality amongst Black/AA patients, particularly from tuberculosis (TB) and pellagra, a nutritional deficiency. Superintendents typically attributed these disparities to 'racial influences'—in effect, racial biological vulnerability—especially for TB. But they also attributed them to overcrowding in the wards, poor diet pre-admission, and insalubrious conditions in the local jails where many Black/AA patients awaited admission (Mitchell, 1919; Stewart, 1911). Indeed, undernutrition and endemic TB were widespread amongst Black/AA communities in the early to mid-twentieth century American South. These and other aspects of poor health and disease were driven by systemic poverty and race-based structural violence, including inadequate health care systems (Daniels-Hill, 2021; de la Cova, 2011; Franklin & Wilson, 2020; Sano, 2010).

2.2 Guiding Research Questions for Research Surrounding the MSIA

Research on social and biological vulnerabilities to poor health, disease, and early death amongst individuals at the MSA is directly related to the guiding research questions of the Asylum Hill Research Consortium, the research arm of the Asylum Hill Project; both were founded in 2016.[3] The Asylum Hill Research Consortium's mission is "to preserve, rigorously investigate, and promote the public history and scientific value of the [MSA] and to honor the experience and legacy of the individuals who were its patients" (AHP, 2024). Amongst other guiding principles, the Asylum Hill Research Consortium is committed to research guided by the descendant community. These 'guiding research questions' were developed in consultation with direct descendants of individuals buried at the Asylum Hill Cemetery (i.e., descendant community), members of the Asylum Hill Research Consortium and members of the Asylum Hill Community Advisory Board. They revolve around learning more about the lives and experiences of MSA residents before and after admission (AHP, 2024). They include, "what evidence exists for causes of death among the burial

[3]The AHP: https://asylumhillproject.org and the AHRC: https://www.asylumhillproject.org/Asylum_Hill/About-Project/Research-Consortium-Hom.html

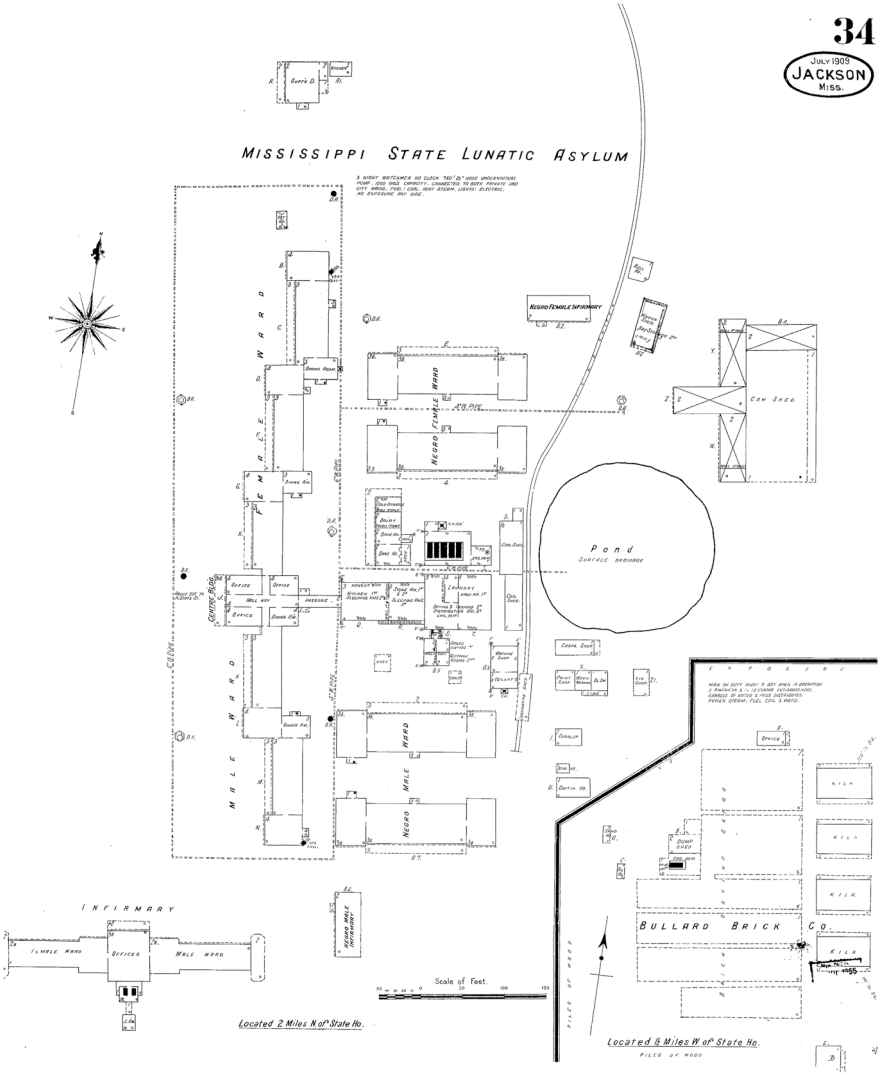
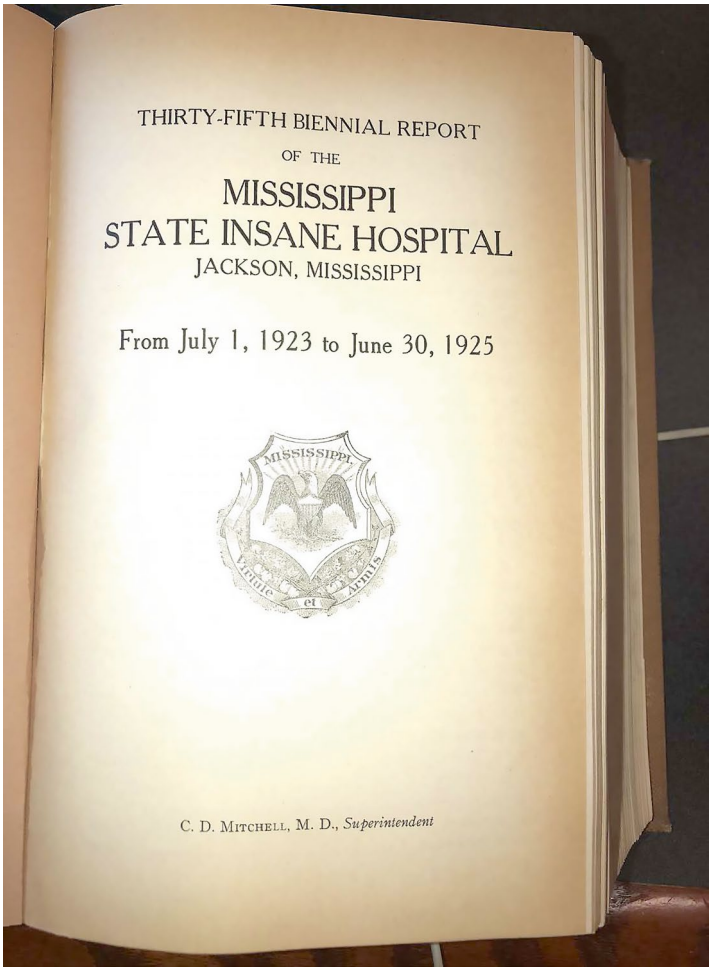


Fig. 2 (**a**) A map of the MSIA from 1909, showing the social race- and gender-segregated wards. (**b**) Superintendent's Biennial report for the MSIA. (Image source: MDAH)

population?" and "are there instances of unusual trauma or advanced disease affecting the bones?" (Mack et al., 2024). Additional questions address health, morbidity, mortality, proportions of individuals with skeletal pathologies, disability, frailty, and the lived experiences and narratives of the residents as well as the contemporaneous general population of Mississippi (Mack, 2024). To meet these aims, at the very least this chapter will be made available to the Asylum Hill Community Advisory Board and the descendant community through Asylum Hill Project leadership.


THIRTY-FIFTH BIENNIAL REPORT
OF THE
MISSISSIPPI
STATE INSANE HOSPITAL
JACKSON, MISSISSIPPI

From July 1, 1923 to June 30, 1925

MISSISSIPPI
Virtute et Armis

C. D. Mitchell, M. D., *Superintendent*

Fig. 2 (continued)

3 Research on Social and Biological Vulnerabilities to Poor Health, Disease, and Death at the MSA

Select established work on individuals at the MSA has cumulatively highlighted differing aspects of social and biological vulnerabilities that likely impacted their health and susceptibility to disease, early death, trauma, and need for caretaking. These studies have examined health outcomes amongst these individuals from the perspective of several different vulnerability factors both pre-admission and during institutionalization. They have also explored how these factors can change and influence social and biological vulnerabilities over the life course.

3.1 Influenza

Over the past two decades, research in biodemography, history, and biological anthropology has increasingly revealed that socially marginalized communities (e.g., BIPOC) experienced disproportionately high mortality during the 1918–1920 influenza pandemic (Gamble, 2010; Mamelund & Dimka, 2021). However, we still know relatively little about its impact on PWD who were institutionalized during the pandemic (Dimka & Mamelund, 2020). Analyses of influenza mortality rates derived from mortality data within MSA biennial reports[4] and patient death certificates of those who were buried in the Asylum Hill Cemetery (Fig. 2b), revealed that both gender and social race were profoundly associated with influenza mortality. Specifically, compared to White /EA patients, White /EA Mississippians, and both Black/AA and White/EA national mortality rates, Black /AA MSA patients experienced significantly higher mortality rates from influenza and respiratory disease during the pandemic, as well as before and after. Interpreted through the biocultural approach, syndemic and ecosocial theory, and intersectionality, Black/AA patients' frailty to influenza and respiratory disease likely reflects compounding biological and social vulnerabilities. Specifically, their greater vulnerability was likely driven by localized social determinants of health. These likely included insalubrious, segregated pre-admission conditions, such as endemic undernutrition and comorbidities, and factors such as segregated and overcrowded wards during institutionalization. These may have exacerbated the pernicious effects of high allostatic loads from larger societal social determinants of health operating throughout their life course and intergenerationally. These likely included systemic poverty, racism, and inadequate health care systems in the antebellum and Jim Crow South (Zuckerman et al., 2022, 2023).

3.2 Mortality and Tuberculosis

Research on morbidity and cause-specific and all-cause mortality risk amongst past PWD in institutions relative to the general population is even rarer than for contemporary PWD who are institutionalized (White, 2023). To explore heterogeneity in frailty to death and disease, Emery (2023) examined all-cause and cause-specific mortality risks in the MSA relative to the general Mississippi population between 1910 and 1935 using US Census Records and MSA biennial reports and death certificates. For the latter, Emery focused on TB, a top cause of death in the nineteeth and early twentieth century US, including in Mississippi. Emery assessed mortality risk relative to factors that likely increased biological and social

[4] Superintendent's Biennial reports were provided to the Mississippi State Legislature to summarize patient conditions and outcomes, as well as expenses and justify requests for additional funds

vulnerabilities. Specifically, these included institutionalization—*versus* residing in general population, as well as social race (i.e., White/EA *versus* Black /AA), sex (i.e., female *versus* male), and age-at-death. Emery found that Black /AA patients, especially females, had lower survivorship than their counterparts, all White/EA patients and male Black/AA patients. She also found that all institutionalized individuals had lower survival rates than non-institutionalized Mississippians. Interpreted through ecosocial theory, these findings suggest that the same compounding biological and social vulnerabilities from local and societal social determinants of health that drove elevated influenza mortality had similar effects on overall mortality and TB. Sex- and social race-segregated wards, with differential living conditions, such as overcrowding and access to outdoor leisure time, may have further driven social vulnerability relative to mortality, social race, and sex (Emery, 2023).

3.3 Trauma in the MSA

Elevated vulnerability to injury and trauma, whether accidental or intentional, is one of the few long-established and relatively well documented perils for some PWD in institutions. Both biological and social vulnerabilities contribute to this vulnerability for patients in institutions past and present (de la Cova, 2020; Martin et al., 2012; McMahon et al., 2023). However, the role of injury *before* admission in increasing biological and social vulnerability to institutionalization—and therefore to the elevated vulnerabilities to injury that institutionalization poses for patients—is not well understood for the past. For the MSA, Adams and Goliath (2023) examined relationships between violence, traumatic brain injury, and the social vulnerability potentially experienced by a single adult individual buried in the Asylum Hill Cemetery, likely in the early twentieth century. They interpret the single cranial depression fracture this individual shows within a structural vulnerability framework. Doing so enables analysis of socioeconomic and sociocultural factors that may have affected the individual's social vulnerability across their life course. According to Adams and Goliath (2023), the cranial depression fracture may have been associated with a traumatic brain injury; clinical evidence shows that such an injury could have caused neurological and developmental issues with major symptoms (e.g., language difficulties) for the affected individual. In addition to physical impairment, these symptoms could also have been stigmatized by the community of the affected individual. Overall, both factors could have increased their social vulnerability to institutionalization. That a biological profile for the individual reveals no evidence of early life physiological stress strengthens Adams and Goliath's interpretation that the affected individual's biological and social vulnerabilities changed over their life span. Adams and Goliath (2023) further suggest that living conditions within the MSA, particularly in the early twentieth century, could have increased the structural violence and thus social vulnerability that this individual and other patients were susceptible to, such as through repeated injury (i.e., injury recidivism).

3.4 Health-Related Caretaking in the MSA

Independent of conditions within institutions for PWD, whether nineteenth century mental asylums or contemporary psychiatric hospitals, they are fundamentally health-related caretaking institutions. However, we have relatively little direct evidence for caretaking and its efficacy in past institutions (Tremblay Critcher, 2017), including the MSA. To explore the efficacy of caretaking at the MSA, Badon, Zuckerman, and Osterholtz (2023) applied the Bioarcheology of Care (BoC) framework to an adult female individual also buried in the Asylum Hill Cemetery in the early twentieth century. This individual also shows multiple cranial depression fractures. All are above the 'hat brim line', which is strongly associated with interpersonal violence. Badon et al. (2023) propose that at least some of the cranial depression fractures caused traumatic brain injuries. If so, they potentially produced sufficiently profound physical impairment (e.g., neurological and musculoskeletal symptoms) for the affected individual that they became disabled. Amongst other effects, this could have left them with heightened social vulnerability to institutionalization. If any of the cranial depression fractures instead occurred post-admission, possible traumatic brain injuries and associated symptoms may have increased their caretaking needs and left them more vulnerable to injury recidivism. This would have been especially true if they lived in overcrowded wards. Indeed, cranial trauma, possible traumatic brain injuries, and associated symptoms may be broadly linked to elevated biological and social vulnerabilities to repeated injuries in some past institutions, like the MSA. Banks and Osterholtz (2022), for example, noted high frequencies of cranial depression fractures in a small sample of contemporaneous individuals from the Asylum Hill Cemetery, including the two aforementioned individuals, as well as evidence of frequent repeated injuries among them. They suggest that the MSA may have been less efficacious in providing care for those with the highest preexisting social vulnerability, namely Black/AA patients, especially females.

4 Discussion

While biological vulnerability and other biological factors, like the characteristics of pathogens and genetic predisposition, affect health, disease, and early death within human populations, the social determinants of health and the social inequality and social vulnerability they create have profound impacts on human well-being. This is especially true for the most vulnerable members of any given society, like PWD in institutions. Studying these dynamics in the past can reveal their otherwise obscured and invisible narratives and lived experiences. It can also reveal how compounding biological and social vulnerabilities played out across their lives and their deaths. For instance, Badon et al. (2023) and Banks and Osterholtz (2022) argue that applying the BoC to individuals from the Asylum Hill Cemetery could reveal

wider associations between social identity, pre-admission disease and trauma, and social and biological vulnerabilities to institutionalization, as well as disability paired with patient agency in caretaking. Further, Adams and Goliath (2023) suggest that combining a structural vulnerability framework with a biological profile represents a novel approach for illuminating how social inequality can affect past individuals' lived experiences in ways that affected their social vulnerability specifically over their life course.

Additionally, studying these dynamics is vital for identifying the long-term historical roots that drove health disparities for populations institutionalized in the past. Importantly, there are limits to the parallels that can be drawn between biological and social vulnerabilities, as well as poor health, disease, and early death in past PWD in institutions and those in the present when employing historical and bioarcheological data. These range from the theoretical and material complications common to all skeletal data from archaeological contexts to historiographic issues and incompleteness in historical records (Tremblay Critcher, 2017; White, 2023; Zuckerman et al., 2023). However, following the biocultural approach, when historical roots are found, they often have shared ultimate or deepest causes. These include the social determinants of health, as well as poverty and prejudice. And while secondary, proximate causes for patterns of poor health, disease, and early death may vary over time and space, the ultimate cause rarely do (van Doren, 2021). Indeed, many PWD who are institutionalized or even reside in larger congregate settings experienced disproportionate harm, morbidity, and mortality during the COVID-19 pandemic (Landes et al., 2021). Much of this was preventable, as it was attributable to vaccine shortages, understaffing, vaccine hesitancy amongst staff, and reduced priority for vaccination for PWD relative to other groups with high biological and social vulnerabilities, such as nursing home residents and those with major medical conditions (Goldsmith, 2021; Musumeci & Chidambaram, 2021). Even today, individuals in Mississippi with mental illness who are awaiting mental health evaluations or beds at treatment facilities are often held in local jails, enduring the same treatment as inmates (Taft et al., 2023). Lessons from past experiences of PWD in institutions, such as those at the MSIA, make clear what the consequences for poor health, disease, and death amongst contemporary PWD in institutions will be when their social and biological vulnerabilities are heightened by discriminatory policies and inadequate access to health care and other critical resources. That these lessons are not yet incorporated into health, economic, and social policies, public health interventions, and practice in clinical medicine to reduce the foreseeable and preventable harm PWD in institutions experience during crises, such as pandemics, or daily life, such as injury, is deeply unjust.

Knowledge gained from studies of the health, disease, and death experiences of PWD in institutions, like those at the MSA, should be applied to policy and practice for contemporary PWD in institutions. This is true for Mississippi as well as more broadly. Evidence of the negative impacts of past pandemics and infectious diseases like influenza and TB, on institutionalized populations should be incorporated into tailored social justice-oriented public health responses and pandemic

preparedness. The same is true for recent disproportionate harm that PWD, especially in congregate residential facilities, experienced during COVID-19 (Zuckerman et al., 2022; Zuckerman et al., 2023). Amongst other history-informed policy aims, legislative reform to prohibit individuals with mental illness and mental healthcare needs from being held in carceral settings should be a social justice priority. Social justice concerns should also be embedded into medical practice and health policy guidelines for treating individuals with cranial trauma, so that individuals' biological and social vulnerabilities to repeated injury, downward health spirals, and early death does not change if they suffer a traumatic brain injury. Efficacious health related caretaking is also vital to guaranteeing a high quality of life for PWD; when social justice is not prioritized in health care for PWD, heightened social vulnerability to institutionalization, poor health, repeated injury, and early death can follow (Adams & Goliath, 2023; Badon et al., 2023). Further, elevated social vulnerability to trauma for PWD, both pre-admission and during institutionalization, especially when coupled with ineffective caretaking in understaffed and resource-strapped institutions, make clear the need for equitably structured and adequately resourced community care for PWD (Banks & Osterholtz, 2022). Finally, strong parallels between past and contemporary social determinants of health and health experiences of PWD in institutions clarify the need for greater health surveillance, reporting, and health care research for contemporary PWD in institutions (Emery, 2023).

5 Conclusion

Due to the complex interactions between systemic historical injustices for socially vulnerable and marginalized communities, such as PWD who are institutionalized and BIPOC communities, contemporary social justice imperatives are inherently shaped by their historical roots. Many contemporary social justice movements, such as the Disability Rights and Black Lives Matter (BLM) movements are to correct health and social inequities generated by generations of additive abuse, neglect, and structural violence. Reconstructing the lived experiences of PWD in institutions in the past, such as at the MSA, and interpreting them within their historical, economic, social, political, and environmental contexts brings once forgotten personal narratives to light. These personalized narratives also make the contemporary persistence of the same structural violence, prejudice, and devalued quality of life for contemporary PWD in institutions harder to ignore and tolerate. Further, identifying the specific social vulnerabilities and underlying social determinants of health for patterns of poor health, disease, and death amongst PWD in institutions in the past gives us an empirical evidence-base for generating tailored corrections to contemporary practice and policy. We can use these specifics on social vulnerability and social determinants of health to ameliorate their negative effects in current societies and reduce or prevent them in the future, in Mississippi and more widely. When it comes to applying research on PWD in institutions in the past to those who reside

in them in the present, we can think of "the past" as "guid[ing] us; the future needs us" (Solnit, 2013). Only with knowledge of past injustices can future injustices be prevented or lessened.

Amongst other works, future research aims to expand our understanding of health-related caretaking in the MSA by further illuminating relationships between social vulnerability, disability, caretaking, and institutionalization experienced by multiple past individuals from the Asylum Hill Cemetery. This research can continue to prioritize individual patient narratives while also producing fine-grained conclusions about social vulnerability, disability, and health in the past that can be generalized and applied to contemporary socially vulnerable and marginalized populations. One of the aims of social justice in health initiatives should be to render factors that have historically increased social vulnerability across various contexts—such as social race, gender, and mental illness—less impactful for the health outcomes and life courses of contemporary communities. By continuing to learn about the lived experiences, lives, health, caretaking and treatment, and death of individuals at the MSA, social justice in health initiatives could widen the depth and scope of their evidence base. These promise diverse benefits for contemporary PWD and the general population alike in Mississippi and more broadly.

Acknowledgments Thanks go Jennifer Mack, Lida Gibson, Ralph Didlake, and the Asylum Hill Research Consortium at the University of Mississippi Medical Center for their support and all information provided.

Research reported in this publication was directly facilitated and supported by the Center for Bioethics and Medical Humanities at the University of Mississippi Medical Center, of which the Asylum Hill Project is a signature program. The content of this publication is solely the responsibility of the authors and does not necessarily represent the official views of the Center for Bioethics and Medical Humanities or the University of Mississippi Medical Center.

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The Unborn in Bioarchaeology: Personhood, Care, and Pregnant Person-Infant Health Through a Structural Violence Lens

Siân E. Halcrow, Tracy Betsinger, Stephie R. Lončar, Eileen Murphy, and Gwen Robbins Schug

1 Introduction

The study of fetal remains in bioarchaeology has long been marginalized, reflecting broader societal attitudes toward the role of women and children. Yet, these remains offer critical insights into the lived experiences of pregnant people, social determinants of health, and structural violence embedded in both past and present systems of care (Halcrow et al., 2017). In the past 20 years, the accelerating development of methods for infant and child aging and pathological observations, and the recognition of infancy and childhood as an important part of archaeological interpretation

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*, Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_7

of past societies, has resulted in an increased interest in childhood bioarchaeological research (Beauchesne & Agarwal, 2018; Gowland & Halcrow, 2020; Lewis, 2007, 2017).

Recent work has moved beyond "finding the child" as was emphasized in foundational works in bioarchaeology and archaeology (Kamp, 2001; Lillehammer, 2010) to conceptualizing infants and children and their relationships to the family, defined in diverse ways (Kendall & Kendall, 2021), and their health, care, and treatment in relationship to societal structures (Halcrow et al., 2020; Halcrow & Robbins Schug, 2023). Research investigating the intricate relationship between the fetus, pregnant person,[1] and overall population health is also gaining traction. The proliferation of bioarchaeological work investigating fetuses[2] over the past few years (e.g., Ellis, 2020; Halcrow et al., 2017; Gowland & Halcrow, 2020; Gowland, 2015; Morrone et al., 2021; Murphy, 2011, 2021; Solari et al., 2020; Ullinger et al., 2022; Zhou et al., 2020) has arguably been precipitated by the publication of *The Anthropology of the Fetus: Biology, Culture, and Society* edited by Han, Betsinger, and Scott (2017).

This chapter not only reconstructs the fetus in the past, but actively engages with their contemporary implications, embodying the scholar-activist framework outlined in this volume. By centering active engagement and criticality, we challenge normative practices in bioarchaeology—from the curation of fetal remains to the interpretation of mortuary contexts and traces on the skeleton—while advocating for ethical reforms that address historical harms. We focus on how this research can inform topical issues for social justice and activism through the deconstruction of structural violence that pregnant people and the unborn faced in the past and today. We consider the use of fetuses in museums and other institutional collections and their related marginalization. We interrogate the representation of pregnancy loss in the past including societal attitudes and reactions, debates on reproductive rights and personhood, and the criminalization of pregnancy loss. We call for bioarchaeology of fetal remains to explicitly connect past and present in a human rights framework. Our approach also operationalizes the Scholar-Activist model (see Halcrow et al., chapter "Introduction: Bioarchaeologists Should Be Activists Too", this volume) by targeting institutional and systemic reform, including museum and repatriation policies that acknowledge fetal remains as ancestral kin; ethical guidelines co-developed with communities; and pedagogical shifts for osteological

[1] Terminology is important for creating a space accessible to all. Although in the past we often used the terms mother-infant (e.g., Gowland & Halcrow, 2020), in this chapter we attempt to use non gender-specific terminology such as "pregnant person", rather than "pregnant mother" or descriptors such as "maternal". Although we acknowledge limitations of binary definitions of gender, it has been argued by some that the removal of the term "woman" may limit gender-based justice (reviewed by Ross & Solinger, 2017). We include gendered terms if relevant to descriptions in legislation and laws that are being discussed. In any case, the development of inclusive language is a changing endeavor to which we should be acutely attuned.

[2] We acknowledge debate on the term fetus, largely related to arguments surrounding ethical issues of abortion (Manning, 2017). We use 'fetus' for an individual from nine weeks gestation until before the time of birth.

training that includes trauma-informed practices for students engaging with sensitive remains. This chapter thereby exemplifies how bioarchaeology can move beyond analysis to activism—dismantling legacies of harm while fostering equitable futures.

2 Finding the Fetus

Clinically, the human fetus is defined as aged from 9 weeks gestation until prior to birth (Cunningham et al., 2016). Although most fetal loss occurs in the first trimester—largely from spontaneous miscarriage often because of fatal genetic issues—the individuals are rarely recovered archaeologically as their skeleton only starts to ossify from around 8 weeks (Cunningham et al., 2016; Maltin et al., 2021). Bioarchaeologists commonly use long bone lengths to estimate fetal age, which generally have a strong relationship with gestational age (Blake, 2019; Sherwood et al., 2000).

Bioarchaeologically, fetuses can be defined into different "types": those who died and were buried still in utero, those who were "born" postmortem ("coffin"), and those who were preterm but died after live birth (Halcrow et al., 2017; Lewis, 2007; Murphy, 2021). We use these categories because they may provide further insights into potential causes of death. When fetal bones are found within the pelvic cavity of an adult person, it indicates the individual died in utero (Halcrow et al., 2017). Health or birthing complications may be deduced from the gestational age of a fetus. For example, a preterm fetus may indicate health issues of the pregnant person, while full term fetal death may suggest birthing complications (Halcrow et al., 2017). Bioarchaeologists also use the term "fetus" to refer to post-birth preterm infants, where the fetus is found on its own or placed either alongside or on top of an adult. This could possibly represent a fetus/perinate (i.e., 28 weeks in utero—7 postnatal days (Lewis, 2007)) and birthing person who died from complications during childbirth, although this relationship cannot be assumed. Postmortem or coffin births occur when the fetus is expelled postmortem due to buildup of gas within the abdomen of the pregnant person (Halcrow et al., 2017; Lasso et al., 2009; Schulz et al., 2005). Archaeologically, these are rare since they require sufficient voids to be present in the burial to facilitate the birth (Sayer & Dickinson, 2013) as well as particular environmental conditions (Viva et al., 2020).

The analysis of fetuses in bioarchaeology is now seen as a sensitive barometer of overall population health, given that the fetal development period is arguably the most critical time in a person's life due to increased energy requirements (Halcrow et al., 2017). Furthermore, pregnancy can have a negative effect on the health of pregnant people (and their fetuses), already compromised by malnutrition and disease, and can increase susceptibility of the pregnant person and fetus to new diseases. Recently, the bioarchaeology of pregnancy and the fetus has focused on the Developmental Origins of the Health and Disease (DOHaD) hypothesis, early life

histories, and the potential for assessing inter-generational health impacts within the field (Gowland, 2015; Hodson, 2021; Hodson & Gowland, 2020).

Recent advances in bioarchaeological methods have revolutionized our ability to interrogate the pregnant person-fetus nexus, offering insights into the embodied effects of stress and structural violence (see Halcrow et al., 2017). Stable light isotope analysis ($\delta^{15}N$) of deciduous teeth and bone has revealed how physiological stress in utero leaves enduring isotopic signatures, exposing inter-generational cycles of malnutrition and deprivation (Beaumont et al., 2015; King et al., 2018). Paleopathological techniques now allow us to diagnose metabolic disease like scurvy in perinates (e.g., Snoddy et al., 2018), while bioarchaeological growth studies trace the stark imprint of social inequality, linking growth retardation to maternal infection, poverty, and systemic neglect (Hodson & Gowland, 2020; Robbins Schug & Goldman, 2014).

Emerging methods further sharpen this lens. Cortisol extraction from dental tissues in archaeological individuals (Quade et al., 2021) may soon permit direct measurement of prenatal stress during critical developmental windows, while protein analysis of enamel challenges assumptions about fetal personhood by enabling sex chromosome identification even in the youngest remains (Gowland et al., 2021). Even taphonomic processes, such as bacterial bioerosion (Booth et al., 2016) are being leveraged to confront persistent and ethically fraught questions—distinguishing stillbirth from infanticide.

3 Fetuses in Mortuary Archaeology

Mortuary archaeology tends to privilege adult burial rites as the normative standard, rendering fetal and infant interments invisible, atypical, or aberrant. Yet, when centered in analysis, fetal remains reveal how communities negotiated personhood, grief, and the life-course. Increasing interest in the study of archaeological fetuses and infants in mortuary contexts has revealed the diversity of funerary practices that were afforded to these individuals; diversity in the legal definitions of personhood through time; and ways in which social institutions honor or weaponize burial treatment (e.g., Halcrow et al., 2008; Murphy, 2011; Murphy & Le Roy, 2017, 2023; Scott & Betsinger, 2017).

The under-representation of pregnant people in bioarchaeology reflects both taphonomic challenges and sociocultural practice. While high rates of pregnancy loss occurred historically (McFadden & Oxenham, 2019), practices like postmortem cesarean (Bednarski & Courtemanche, 2011), or the disposal of unbaptized fetuses (Murphy, 2011) removed these individuals from conventional burial spaces. When a pregnant person and fetus do not die simultaneously, the recently pregnant state of the adult will be missed. Archaeothanatological approaches offer tools to reclaim their narratives: skeletal markers of pregnancy (Le Roy & Murphy, 2020) and fetal positioning can distinguish obstetric deaths (Murphy, 2021) and aspects of

personhood (Halcrow et al., 2012). This method could increase visibility of pregnant individuals and embodied risks of reproduction in archaeological burial grounds. The diversity of fetal burial treatments cross-culturally and through time challenges assumptions that pregnancy loss was universally stigmatized.

4 Bioarchaeology of the Unborn: Social Justice and Activism

Social determinants of health refer to the various non-medical factors and societal conditions that encompass the health of individuals and communities; these include living environment, socioeconomic status, education, employment opportunities, access to healthcare, social support systems, and cultural and societal expectations (Ataguba & Ataguba, 2020). Understanding the significance of these determinants is essential for addressing health disparities, improving population health outcomes, advancing more equitable healthcare systems, and understanding structural violence. Structural violence is harm perpetuated against individuals or groups through the systematic normalization of inequalities embedded within social structures and institutions, primarily targeting the marginalized and disadvantaged (Galtung, 1969; Rylko-Bauer & Farmer, 2017; Singer & Rylko-Bauer, 2020).

Biological anthropological work on the placenta (e.g., Abrams & Rutherford, 2011; Thayer et al., 2020) reveals how colonialism disrupted traditional birthing knowledge—such as placental massage—leading to preventable adverse outcomes (Bacciaglia et al., 2023; Dennis et al., 2007; Shaw, 2011). The loss of traditional practices of placental massaging leads to greater risk of placenta retention, potentially resulting in pregnant person and infant death (Abrams & Rutherford, 2011). Indigenous communities globally face elevated birthing-person mortality rates when deprived of ancestral practices, despite frameworks like the United Nations (UN) Declaration on the Rights of Indigenous Peoples and the UN Sustainable Development Goals (SDGs) (Hayward & Cidro, 2021). Systematic oppression of traditional knowledge exemplifies how structural violence operates through cultural deprivation. Maintenance of traditional birth ceremonies and rituals is thus a human rights issue.

To ensure bioarchaeological practice can contribute to, and is informed by, social justice issues we must be cognizant of the main themes of structural inequality embedded in health issues for pregnant people and the unborn. The increased interest in the bioarchaeology of the pregnant person-fetus nexus and the social determinants of health has occurred through engagement with social theory and the application of new methods to assess health deprivation (Gowland, 2015; Gowland & Halcrow, 2020). Using this social bioarchaeological lens coupled with modern data on the intersection of identity, social determinants of health, and structural violence, we can make our work more relevant to contemporary societal and environmental issues and inform ethical practices in teaching and research (Halcrow & Robbins Schug, 2023).

In bioarchaeology, using intersectionality (Collins, 2015; Crenshaw, 1989, 1991) in the analysis of the pregnant person-fetus nexus is essential to a more nuanced understanding of health status and lived experiences (de la Cova, 2020; Mant et al., 2021). There is a plethora of research on racial and gender disparity in maternal and infant health outcomes today (e.g., Hemphill et al., 2023; Koenig et al., 2023; Mehra et al., 2020; Okojie, 1994; Owens & Fett, 2019). For example, qualitative research by Mehra et al. (2020) explored gendered racism and the impacts on maternal and infant health outcomes among Black pregnant women in the United States. They found that racialized pregnancy stigma is a significant source of stress from less access to health care, social services, and social support, contributing to racial disparities in maternal and infant health.

These contemporary disparities are not unique to the present but rather manifestations of enduring structural violence that has targeted historically marginalized pregnant people. Bioarchaeological evidence reveals analogous patterns of neglect and discrimination across diverse temporal and social contexts. Perhaps the most revealing examples of the dehumanization of marginalized communities is found in the presence of marginalized infants in anatomical collections, disproportionately sourced from impoverished, institutionalized, and/or unmarried women, whose autonomy over their bodies was eroded by systemic power imbalances (Bednarski & Courtemanche, 2011; de la Cova, 2019; Mant & Holland, 2019; Murphy, 2011; Nystrom, 2017; Southorn et al., 2024).

4.1 Pregnant Person, Infant, and Fetal Health and Mortality

Perinatal mortality has long served as a barometer of societal priorities, with disparities in stillbirth rates (Flenady & Sexton, 2022) and maternal health outcomes (de Bernis et al., 2016) reflecting systemic neglect or marginalized communities. In some cases, infant and child death and stillbirth rates have served in broader calls for social justice (Bachelet, 2019; Kelley et al., 2010). This is reflected in policy priorities, such as the UN SDGs, which place significant priority on maternal and in utero health and later life outcomes and their social determinants of health (WHO, 2023a). The concentration of more than 98% of global stillbirths and neonatal deaths in low- and middle-income countries is not a biological inevitability but a direct consequence of structural violence—where systems of power ration healthcare access while weaponizing stigma (Farmer, 2004). The staggering global burden of preterm births and stillbirths represents more than a demographic or medical statistic; these figures index systemic failures to value marginalized lives. Yet there is a relative silence around stillbirths and a dearth of systematic reviews of social justice issues related to them.

This pattern has echoes in bioarchaeology. Bioarchaeological case studies substantiate that human communities exhibited varied responses to environmental stresses including historical, sociocultural, and biological factors (Robbins Schug,

2011, 2020). Bioarchaeology of the fetus can provide insight to the extent that deprivation during pregnancy can have on health outcomes and survivorship of infants (e.g., Hodson & Gowland, 2020; Robbins Schug & Goldman, 2014). Climate and environmental stressors influence the development and health of the unborn (Halcrow et al., 2017). Paleopathological evidence for perinatal scurvy expands what is documented in medical literature, adding to understanding of maternal social deprivation today and how climate change may affect fetal health (Robbins Schug & Blevins, 2016; Snoddy et al., 2018). Understanding deep-time adaptations can inform strategies to mitigate the impact of climate change on fetal health today (Robbins Schug et al., 2023).

A holistic model for conceptualizing the social and environmental determinants of antenatal and postnatal care and health for pregnant persons and their fetuses in bioarchaeology has been presented (Halcrow, 2020; Halcrow et al., 2020). Anthropological schemas like these may be a useful example of culturally and socially grounded models in the development of interventions to improve health outcomes for pregnant people and their infants. This model considers the reconstruction of care in the context of several facets, including information on social inequality, gender, community support and alloparenting, pregnant person health and diet/resources, family and social structure, and environmental factors such as pathogen load.

5 Fetuses in Anatomical Collections

Much early historical knowledge of embryology came from studying animals. A famous depiction of fetuses by Leonardo da Vinci (Fig. 1) was developed from his knowledge of animal and human embryology. A small number of studies have assessed the history and ethical implications of the procurement and continued use of human fetal remains in legacy anatomical collections (Aumüller & Lenk, 2022; Dittmar & Mitchell, 2016; Southorn et al., 2024; Wilson, 2015). Historically, adult male bodies were preferred for most anatomical research due to their availability and default as the anatomical 'norm'. In the UK, the Act for Regulating Schools of Anatomy (1832) meant that bodies legally available for dissection were executed felons or those who had died in workhouses, hospitals or other charitable institutions, who had no family to claim their body. Although women and children's bodies were legally available for dissection, their availability was closely guarded by the wardens of the institutions (Dittmar & Mitchell, 2016), and pregnant people were typically spared from execution until after the birth, meaning fetuses and pregnant bodies were rarely accessioned into collections. Evidence from anatomical skeletal collections from around the globe suggests that the rarity and importance of fetuses and infants in obstetric education has been a major incentive for the continued holding of these remains (Dittmar & Mitchell, 2016; Southorn et al., 2024). This is a topic that demands a lot more attention in bioarchaeological research.



Fig. 1 Studies of the Fetus in the Womb, c. 1510–1513, by Leonardo da Vinci (public domain)

5.1 Ethics and the Consideration of Structural Violence in the Treatment of Fetal Remains in Anatomy and Bioarchaeology

Marginalized groups tend to be overrepresented in anatomical collections (de la Cova, 2019; Lans, 2021; Muller & Butler, 2018; Southorn et al., 2024). Fetal remains in anatomical collections and the burial treatment of fetuses can give insight into the intersections between gender, class, religion, marginalization and structural violence affecting pregnant people and their babies during their lives and after death. Investigation of the history of fetal anatomical collections is important for consideration of ethics of teaching, research, and display of these human remains. This is directly relevant to issues of social justice for the ethical treatment of these families and the remains of their babies who were likely not collected in a way that may be deemed ethical today (Hodson, 2021; Southorn et al., 2024; Wilson, 2015).

Recent research has investigated fetal and infant remains from the W. D. Trotter Anatomy Museum at the University of Otago in Aotearoa New Zealand who were acquired in the late ninteenth and early twentieth centuries (Southorn et al., 2024). Southorn et al. (2024) assessed the osteological and historical information of this collection to establish the provenance and social context of the collection of these remains. It was found that these infants were predominantly obtained from working class families and single mothers, or were deemed to be medically "interesting" cases with birth defects or cases of premature birth and therefore useful as examples of fetal development. In this context, the physicians had considerable power, and legislation at the time allowed for the acquisition of these remains (Southorn et al., 2024). The historical context and legislation governing body donation at the time of acquisition suggested that stigma and structural violence played a significant role in institutions obtaining these remains from mothers from marginalized groups (Southorn et al., 2024). Although middle class and wealthy women in the nineteenth century could afford to give birth at home with midwives and doctors in attendance, women from marginalized groups had to give birth without medical care or attend public hospitals (Southorn et al., 2024). As a result, these women were likely powerless to decide what happened to their child's remains if they were stillborn or died shortly after birth, leading to their acquisition by medical schools.

Teaching and research with fetal human remains from museum collections is an ethically contentious subject, yet there is a lack of research on this issue (Southorn et al., 2024; Squires et al., 2019). Today, in most countries, donors and their families are consulted when acquiring human remains for teaching and research. However, how institutions approach the ethics of historically obtained skeletal material is complex and varies throughout the world (Caffell & Jakob, 2020). In fetal developmental osteology education, it is important to be mindful that working with these remains may be challenging, such as being a particularly sensitive topic for students and teachers who have experienced fetal and infant bereavement. It is also pertinent to consider the diverse cultural needs of students who may be working with these

remains. Informed consent for students including the provenance of these remains prior to working with them is important (Smith et al., 2023).

Research on the burial grounds of fetuses and infants can also inform the marginalization and structural violence experienced by unmarried mothers and their babies. Efforts are under way to document all these types of burial grounds in Ireland; the best known are the children's burial grounds or *cillíní* that developed in Counter Reformation times when the Catholic Church required unbaptized fetuses and infants to be buried in thousands of unconsecrated burial grounds dotted around the Irish countryside. Their locations are not always within ancient monuments, and they can also occur at natural points in the landscape, making them vulnerable to development activities. Local history groups have demonstrated a huge interest in and affinity with these poignant burial grounds and are heavily involved in their documentation (Fig. 2).

These children's burial grounds must be viewed within the context of a patriarchal, church-dominated society where pregnancy out of wedlock had harsh consequences such as social ostracization and placement in a Mother and Baby home or Magdalene Laundry, and the regular event of forced adoption. In 2014, a spotlight was shone on the cruelty towards such individuals after a substantial number of human remains were discovered in a septic tank at a Mother and Baby Home at Tuam, Co. Galway. These were found to be the remains of documented children aged from 35 weeks gestation to 3 years who had died between 1925 and 1961 (Corless, 2021). This led to an apology from the Irish *Taoiseach*, who acknowledged that babies born out of wedlock had previously been considered an "inferior sub-species". The Irish Catholic Bishops' Conference also issued an apology for the Church's role in the "isolation and social ostracising" of those who became pregnant and were not



Fig. 2 (**a**) *Tóin an tSeanbhaile cillín*, Achill Island, Co. Mayo, with a commemorative plaque (**b**) dated to 1997 when mass was said at the burial ground (E. Murphy)

married (Garrett, 2017). A government commission of investigation was created to investigate practices at Tuam and in Mother and Baby Homes throughout Ireland. This process involved the excavation and bioarchaeological analysis of remains, with further excavations and analyses planned (Commission of Investigation into Mother and Baby Homes, 2021). Adequate bioarchaeological training provided by fetal anatomical collections will help improve the success of such investigations. Many of the pregnant people and their children who experienced these institutions are still alive today and efforts that have been made to address the wrongs of the past have involved a strong element of social justice (Corless, 2021).

These historical injustices mirror today's inequalities. As discussed, Black and Indigenous pregnant people globally face elevated maternal mortality due to systemic biases in healthcare access, just as their counterparts in the past were overrepresented in anatomical collections or excluded from consecrated burial. Today, the criminalization of pregnancy loss—whether through abortion restrictions or prosecutions of miscarriages—echoes the same punitive logic that once denied marginalized women bodily autonomy. The stigmatization of pregnancy loss in historical contexts (Donley & Lens, 2022; Murphy, 2011) persists in modern legal systems that surveil and punish pregnant people, particularly those from marginalized communities (NPR, 2022; Ross & Solinger, 2017).

Bioarchaeology compels us to confront the root causes of disparities: unequal access to healthcare, economic precarity, and systemic devaluation of marginalized lives. By exposing how structural violence has operated across centuries, our evidence challenges narratives that frame reproductive oppression as a contemporary phenomenon (Halcrow & Robbins Schug, 2023), underscoring how structural violence perpetuates cycles of harm in ways that remain consistent through time, and amplifying calls for reparative justice in maternal healthcare. We can use our data to explicitly call for reproductive healthcare models that center community needs over institutional control, policies that reduce economic barriers to pre- and post-natal care, and decolonized approaches to maternal health that honor ILK (Indigenous and Local Knowledge).

5.2 Social Attitudes Towards Reproductive Rights, Fetal Death and Personhood

Bioarchaeology illuminates how reproductive rights—including abortion and fetal burial—have been contested across time, revealing that personhood is neither biologically fixed nor universally defined. Evidence of abortion exists in ancient Egyptian papyri (3500 BP), Greco-Roman texts (Kapparis, 2002; Yarmohammadi et al., 2013), and even Benjamin Franklin's *The American Instructor* included instructions for at-home abortions (Farrell, 2022), underscoring its historical ubiquity. Yet modern debates hinge on shifting constructs of fetal personhood (Donley & Lens, 2022), amplified by technology that redefines viability (Kitchner, 2018). It is critical that bioarchaeologists work to tie our evidence to current debates about

reproductive rights as ethnographic and bioarchaeological research demonstrate that personhood of the fetus is ascribed and negotiated and thus varies over time and place (Han et al., 2018).

With the US Supreme Court overturning the constitutional right to an abortion, there is increased scrutiny of pregnant people, their bodies, and infant loss; this has led to some people being prosecuted due to infant death from miscarriage, stillbirth, and abortion (NPR, 2022). Many states have vague wording in legislation around harm that can cause fetal demise, originally developed for use in the prosecution of people who harm a pregnant person, resulting in death of the fetus. However, groups tracking these prosecutions today argue that this weaponized legislation will disproportionately criminalize marginalized pregnant people for miscarriage, stillbirth, or substance use and addiction under vague "fetal harm" statutes (NPR, 2022).

Despite the frequency of pregnancy loss (1 in 4 pregnancies results in miscarriage; WHO, 2023b), stigma persists. Discussions of pregnancy loss within many societies remain a highly sensitive and taboo subject. When celebrities such as Megan Markle (2020) talk about pregnancy loss, we get hints of an increased acceptance to discuss this subject in Global North societies. Despite this, pregnancy loss is still often met with silence, as people fear discussing their loss due to grief, stigma, shame, guilt, fear of prosecution, or other cultural attitudes (NPR, 2022; WHO, 2019), compounding the grief and psychological pain parents may experience (Gowland, 2020; Layne, 2003; WHO, 2023b). Pregnancy loss can result in serious psychological impacts, including post-traumatic stress disorder (Farren et al., 2016).

Bioarchaeologists have used a critical social justice lens to destabilize the basic tenet of ethnocentrism and misinterpretation of infant marginalization, grief after pregnancy loss, and fetal personhood (Murphy, 2011; Han et al., 2017). Early studies tended to assume that grief for fetal deaths was different or less in the past due to high levels of infant mortality (e.g., Ariès, 1973; deMause, 1974). However, more recent work has challenged some of these assumptions, arguing that in specific cases, infants lost through miscarriages and stillbirths were considered individuals with identities and that grief was keenly felt (e.g., Murphy, 2011). This is supported by both private (e.g., diaries) and public-facing historical literature (e.g., poems and death notices in papers (e.g., Fig. 3)), which demonstrate parental grief both for loss of "who the fetus would become" and the loss of anticipated parenthood (Pollock, 1983; Woods, 2006).[3]

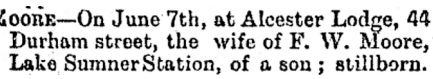

MOORE—On June 7th, at Alcester Lodge, 44 Durham street, the wife of F. W. Moore, Lake Sumner Station, of a son; stillborn.

Fig. 3 Notice of a stillbirth in a public New Zealand newspaper in 1893 (Press, Volume L, Issue 8531, 10 July 1893, page 3)

[3] Similarly, there has been an arguable misinterpretation of "infanticide" at various historic sites. However, given the focus on fetuses, these arguments are not reviewed here (see e.g., Mays, 1993, Gilmore & Halcrow, 2014; Gowland & Chamberlain, 2002 for reviews).

The Medieval Church taught that baptism was key to the inclusion or exclusion of fetuses and newborns from church grounds. However, fetuses and likely stillbirths are found in such contexts. In some countries, respite sanctuaries existed where the dead fetus or infant was placed on a warm altar so that it miraculously 'breathed' and could then be baptized and buried in church grounds (Carron, 2016). Parental concern and intervention are also evident in relation to the *cillíní* in Counter Reformation Ireland. Although families did follow Church teachings (the dominant narrative), they attempted to circumvent these using formerly sanctified sites and affording the infants the same burial rites as those interred in communal grounds (Donnelly & Murphy, 2023; Murphy, 2011). Similarly, examination of perinates recovered from a seventeenth to eighteenth century cemetery in Poland indicates burial treatments comparable to others interred there (Scott & Betsinger, 2017) and the youngest fetus recovered archaeologically (9 weeks in utero) was interred in the wall of Gällared Parish Church (1831) in Sweden. Although the fetus in Sweden at the time was not legally recognized as a person, it is argued that their hoped-for future and potential role in the afterlife entitled them to burial in sacred ground (Maltin et al., 2021).

6 Towards an Activist Stance in Fetal Bioarchaeology and Anatomical Science: A Personal Reflection (*Author SH)*

To be genuinely aligned with activist practice, we must interrogate how our academic work can embody the scholar-activism model (see chapter "Introduction: Bioarchaeologists Should Be Activists Too", Fig. 1). This involves pursuing "active engagement" through authentic community collaboration, public outreach, and "criticality". Criticality, in this context, requires confronting normative assumptions embedded within burial practices, curatorial policies, and the use of human remains within museum and educational settings.

Working through this model has helped me reflect on my activism and identify areas in which I can further advocate for change with a focus on fetal and infant remains held in anatomical collections. One actionable pathway that we are working on involves engaging with local communities—students, curators, and the general public—on the appropriate use, curation, and potential repatriation of these remains (e.g., Metzger & Halcrow, 2025; Smith et al., 2023). These conversations must consider the specific historical and institutional contexts in which such materials were acquired.

Foundational to this work is research to ascertain the provenance of remains, through osteological and archival analysis (e.g., Southorn et al., 2024). However, it must be acknowledged that some scholars and community members view such analyses as constituting a re-objectification of the individuals. This raises important ethical tensions: while understanding context is crucial, it may also reinscribe the

same extractive logics that originally enabled the collection and retention of these bodies.

In pedagogical contexts, transparency is paramount. Regardless of whether complete contextual information is available, students should be informed about what is known of the acquisition history of the individuals they study. They should also be given the option to abstain from working with such remains if they feel discomfort or ethical opposition and, where possible, have access to alternative teaching resources. Emotional responses are not uncommon when engaging with infant and fetal remains, particularly in museum or institutional contexts (Warren, 2024). Such transparency enables informed decision-making and fosters a learning environment grounded in care, respect, and ethical awareness. It also invites broader reflection on positionality, both individually and institutionally (see Halcrow et al., chapter "Conclusions/Afterword: Towards Becoming an Activist Academic").

I have taught using human remains from anatomical contexts for over two decades. I acknowledge my professional reliance on these remains in the teaching of developmental anatomy and fetal bioarchaeology. Yet, this position is fraught with complexity. The more I learn about the acquisition of these remains—often linked to gendered, medicalized, and colonial systems of control—the more I am compelled to reflect critically on my own complicity.

These ethical tensions are heightened by my role within an institution, where systemic constraints may limit the scope of action. Nevertheless, this discomfort has driven my deeper engagement with these collections, motivating new research that aims to inform future ethical practice (e.g., Southorn et al., 2024; Smith et al., 2023; Metzger & Halcrow, 2025). Of particular concern are more recent collections within the university, some dating from the late twentieth century, which may be linked to identifiable individuals and living relatives. In some cases, archival records may provide enough information to trace familial connections. It is also now widely acknowledged that many fetal and infant remains were acquired without consent, as demonstrated in well-publicized cases such as Green Lane Hospital in New Zealand where it has revealed that it took organs without family consent from babies who died with congenital heart defects from 1990 to 2000.

This personal reflection is, itself, a form of critical praxis. It signals a commitment to not only recognizing the need for ethical reform, but also to enacting it through frameworks such as the Theory of Change (see chapter "Introduction: Bioarchaeologists Should Be Activists Too", Fig. 2). This includes advocating for practical and policy-level transformations in museum ethics related to fetal and infant remains. Future progress depends on deepening our engagement with affected communities through qualitative research and co-developed strategies. Equally essential is identifying and dismantling the institutional barriers and power dynamics—particularly within university environments—that inhibit more equitable approaches.

7 Conclusion

The bioarchaeology of the fetus reveals a fundamental premise: human variation—in lived experience, vulnerability, and forms of care—is the cornerstone of human history and contemporary social justice work. Examination of the pregnant person-fetus nexus across diverse contexts, bioarchaeology exposes how structural violence has always operated intersectionally, compounding marginalization through gender, race, class, and coloniality. From the stigmatization of unbaptized infants in *cillíní* to the disproportionate use of marginalized infants in anatomical teaching, these patterns mirror modern inequities in reproductive healthcare, abortion access, and pregnancy criminalization. Yet bioarchaeology also uncovers resistance, communal grief, subversive burials, and the enduring personhood of the unborn.

This is not just academic. To advocate for reproductive justice today, we must confront how systems of power manipulate and weaponize difference. By centering intersectional frameworks, bioarchaeologists can reveal entrenched structural violence, provide deep-time perspectives on social determinants of health and dismantle narratives that erase, homogenize, and exploit. We can illuminate and create lasting change to address the harms of our own discipline's history of ethical issues in the use of fetal remains in legacy collections. The fetus, through its historical and cultural complexity, compels us to fight for a future where equity is non-negotiable.

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Marginalization in Life and Death: Moving Towards Re-humanization of Archaeological Bodies

Anne Marie E. Sohler-Snoddy and Ellen J. Kendall

1 Introduction

Identification of marginalized individuals and groups in modern society, and initiatives to ameliorate conditions which lead to marginalization, are major concerns for researchers, governmental policymakers, and non-governmental organizations. However, key priorities are typically set by those in positions of power, and rarely represent the voices of the marginalized themselves (Crewe & Young, 2002; Sénit & Biermann, 2021). These disparities in representation risk compounding existing injustices towards marginalized people, through subversion or misrepresentation of their interests.

Such risks are also present for marginalized past populations and individuals and should merit careful attention from archaeologists and historians, who wield a unique form of power as architects or deconstructors of narrative (Bernbeck, 2008). While documentary history derives its sources from surviving written records left behind by past societies, these are definitively the domain of the privileged literati, rather than the historically illiterate majority in human populations. Oral histories too, provide context for past populations, using testimony to connect successive generations over long periods beyond the limits of first-hand memory, and may serve as a counternarrative to existing written histories (Beard, 2017; Binney, 1987). Both written and oral histories are indisputably valuable sources, but as all narratives must make overt choices about what is important and desirable to pass into legacy, these are necessarily partial. Additionally, as hierarchies may exist within

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_8

marginalized groups, in some cases narratives may be not only filtered through the interests and values of extant power superstructures, but also through the interests of within-group microstructures and intersecting identities (May, 2024; McLeod & McLeod, 2023; Ward, 2023). In consequence, the individual life experiences of the most marginalized—those with vulnerabilities relating to age, poverty, illness, or disability alongside aspects of gendered, ethnic, or racialized identity—are at highest risk of being underrepresented in memorialization.

Marginalization has been defined as the reduction of individuals or groups to a peripheralized "other" in ways that create disadvantage, through the privileging and centering of a dominant class (Hall & Carlson, 2016; McIntosh, 2006). This dominant class is often, but not always, the population majority. Marginalization is typically used to refer to socio-political inequalities; however, social realities have material consequences (i.e. poor nutrition, diseases of poverty, toxin exposure), and material physicalities (e.g. bodily differences) in their turn may have social consequences. It is difficult to tease these relationships apart and every individual needs to be considered as an embodiment of their social, political, and natural environment (Klaus, 2019; Mant & Holland, 2019). Marginalization, of either individuals or groups, inevitably functions in practice as a form of dehumanization. Marginalized peoples are typically perceived as, and often actively portrayed as, having less intrinsic value than the social majority or power-holders. Mechanisms of marginalization have been categorized in various ways, but in aspects relevant to bioarchaeology and to this chapter, these may be best focused on issues of structural and discursive violence (cf. Perez, 2012; Zuckerman et al., 2014).

Structural violence, first defined by Galtung as 'violence…built into the structure…[which] shows up as unequal power and consequently as unequal life chances' (Galtung, 1969, p. 171), broadly refers to *avoidable* suffering caused by systematic exclusion of persons from social, economic, or political resources or rights necessary for their wellbeing and fulfillment of potential (Bernbeck, 2008; Dilts, 2012). These may be physically manifest in bodily harm, through denial of basic material resources or safety, or may represent more indirect forms of social injustice affecting long term outcomes, such as unequally distributed educational access at a systemic level. Discursive violence is a related concept and refers to a lack of narrative autonomy among marginalized people leading to harm or stigma, which may be externalized or internalized; for example, portrayal of an "othered" minority as morally or intellectually inferior by a social majority (Jones et al., 1997; Ormond, 2006). It is difficult to untangle these concepts in practice for two main reasons. Firstly, both forms of violence tend to afflict the same groups of people. Secondly, discursive violence is commonly perpetuated to justify and legitimize structural forms of social injustice, as "discursive violence obscures the socio-spatial relations through which a group is subordinated" (Jones et al., 1997, p. 394). In the context of structural and discursive mechanisms of marginalization, bioarchaeologists occupy a seat of unique narrative power, as they have access to a singular and independent source of information about individual past lives: the material bodies of the individuals themselves.

Social marginalization leaves its signature in the body's tissues, including skeletal tissues. Analysis of skeletal markers of nutritional status, infectious disease, and growth can provide information on the lived experience of marginalization in past populations. For example, work by Geber and colleagues has shown a high prevalence of Harris lines, a skeletal indicator of systemic physiological stress during growth, delayed growth, and scurvy in victims of the Great Irish Famine (Geber, 2014; Geber & Murphy, 2012). Those who died in the Kilkenny workhouse represented some of the most deprived of Ireland's poor during a period of nation-wide resource stress. Wilford and Gowland (2019) found an observable increase in skeletal markers of nutritional disease and trauma in individuals from lower socioeconomic assemblages in London who died following The Poor Law Amendment of 1834, which tied poor relief to workhouse internment, heavy labor, and a calorically insufficient diet. This was a period when poverty in Britain was viewed as evidence of potential biological and moral "inferiority" (Gowland, 2018) rather than the product of social denigration. Although direct theoretical engagement with the concept is relatively recent, decades of bioarchaeological research has shown that, on a fundamental level, the lived experiences of structural violence are embodied and often identifiable in human remains (de la Cova, 2020; Klaus, 2012; Mant & Holland, 2019; Tremblay & Reedy, 2020).

As multiple scholars have pointed out, 'the dead do not bury themselves' (Pearson, 1993; Mant & Holland, 2019). Marginalization can be continued in burial—as in cases of anatomization or unmarked burial—and, in consequence, a society's collective memory. Misrepresentation of past peoples may be considered to constitute erasure. However, the burial record itself also reminds us that representation is complex and may challenge preconceived ideas derived from historic tradition. For instance, multiple studies have found evidence of broad inclusion of individuals with skeletal evidence of stigmatized diseases such as leprosy or syphilis within medieval and postmedieval community burial grounds (Filipek et al., 2021; Roberts, 2021; Zuckerman, 2017). In the case of one seventh century bed burial at Edix Hill, containing a young woman with skeletal signs of leprosy, there is not only evidence contrary to exclusion in death, but also positive contextual evidence of high social status in the manner of burial (Malim & Hines, 1998).

Beyond the control of narrative and image imposed by the living upon the dead, several scholars have also embraced the concept of postmortem agency; that is, the idea that the dead continue to exert active or passive, but nonetheless real, social influence over the behavior of the living (Arnold, 2014; Crandall & Martin, 2014; Geller & Suri, 2014). This proposed ability to influence the behavior of the living can range from attribution of conscious or active (primary) agency, as in the case of vampires (Betsinger & Scott, 2014), to passive or effective (secondary) agency, such as the "afterlife" of Richard III of England's remains on his legacy since their discovery (Arnold, 2014). Indeed, it has been proposed that, actively or effectively, some may exert more power in death than they did in life, with social personhood transcending the grave (Robb et al., 2009). In the context of marginalization during life, recognition of this continued personhood (in contrast to the objectification of bodies traditionally offered by Western scientific discourse) and the ability of the

dead to "speak" through their continued materiality, arguably offers a means to address aspects of discursive violence. Thus, bioarchaeology may help to problematize and critique simplistic assumptions about past experiences of marginalization and offer us more complex ways of understanding and re-humanizing experiences of life (and death) in the past.

In this chapter we provide two examples of dehumanization of marginalized bodies. The first of these is from England's wetlands during the longue durée between the Roman and Victorian periods. The second is a more recent case from twentieth century Ireland. While Indigenous and racialized populations have suffered egregious abuses from narrative and structural dehumanization via colonialist regimes, these injustices are more eloquently written of elsewhere (e.g., Kawelu, 2014; Lans, 2021; Pitblado, 2022). Here, acknowledging the importance of narrative autonomy in historically marginalized populations, as well as the potential redundancy of bioarchaeology where Indigenous knowledge may far outstrip what bioarchaeology can offer, we limit ourselves to general principles of marginalization and to discussion of non-Indigenous cases. The case studies provided in this chapter are ones to which the authors have familial or cultural connections. We demonstrate how bioarchaeological methods may play a part in the reparative justice process in both situations.

2 'Brigands and Bandits' on a 'Frontier' Landscape: Embodiment and Dehumanization in England's Wetlands Over Nearly 2000 Years

Landscape, it has been argued, *"is a subject of study that belongs to nobody"*, being alternately the domain of geographers, ecologists, archaeologists, anthropologists, historians, and geologists (Tilley & Cameron–Daum, 2017, p. 1). However, dominion over landscapes and their resources has arguably been a primary motive for historical conflict among and within human societies (Berman et al., 2021; Dow et al., 2017). In recent decades scholars have also begun to examine the intertwining of bodies and landscapes: as human bodies alter and shape the landscapes they live in, so they, too, are shaped by how their material environment alters their genetic, social, environmental, and individual realities (Guthman & Mansfield, 2013; Niewöhner & Lock, 2018; Petteway et al., 2019). The scholarly concept of landscape embodiment therefore provides a useful theoretical framework through which to navigate and understand the complex relationships and interactions between the materialities of people and place.

Unfortunately, *symbolic*, rather than material, ties between people and place have historically been used to justify structural and discursive marginalization of people deemed "other", particularly where these people inhabit contested landscapes. Gesler (1998, p. 17) suggests that 'places achieve…reputation because people perceive that they do or do not fulfill basic needs such as providing security, a

feeling of identity, material wants or aesthetic pleasure'. These same perceived qualities of landscapes may, in turn, be projected onto the inhabitants of such landscapes as a form of symbolic embodiment. Where these projections are negative and stigmatizing in nature, these can become central to instituting or continuing power imbalances.

Linked symbolic stigma of people and place is characteristic of the historic attitudes towards wetlands and their inhabitants in Britain, particularly towards the largest of the former natural wetlands, the Fens. Prior to their drainage in the early modern period (sixteenth to ninteenth century), this patchwork of freshwater and silt fens, estuary, and coastal saltmarsh accounted for an area of over 1300 square miles, covering large areas of the English counties of Lincolnshire, Norfolk, Cambridgeshire, and Suffolk and draining a watershed of over 6000 square miles (Ash, 2016; Miller & Skertchly, 1878). While the region is now multiply-designated a protected area of national character, conservation, and scientific interest (Natural England, 2015), this environment was not always similarly valued by past power holders. Rich in resources, the landscape provided a bounty of fish, waterfowl, edible plants, peat, thatch, and grazing land that offered its inhabitants a unique way of life (Fig. 1). This led one nineteenth century critic to say disdainfully of the historic link between the character of people and place,

> …the land literally overflowed with food, and as a consequence the people degenerated into a thriftless race, whose only strong passion was a love of freedom (Skertchly, 1877, p. 17).

Living in such a landscape, however, required specialized understanding of its management and strengths, leading many outsiders lacking this understanding to regard wetlands and their people as an affront to civilization, industry, and profitability.



Fig. 1 The Fenland way of life before drainage (found in Wheeler, 1868, between pp. 90–91, public domain)

From the Roman period onward, a succession of external rulers sought to transform, tame, and exploit the Fens. Roman negativity towards both wetlands and their inhabitants is well documented (Huisman, 2017; Walsh et al., 2014). Writers such as Vitruvius, Livy, and Pliny the Elder viewed wetlands as unhealthy, unproductive, and liminal "no-man's land" inhabited by "miserable races" in need of civilizing intervention (Borca, 2000, p. 74; Rackham, 1952, pp. 387–389; Walsh et al., 2014). Ambivalence towards *Britannia*'s wetlands was exhibited through extensive land reclamation and drainage, alongside dense settlement and intensive use of wetland resources in the colonized Fens (Huisman, 2017; Rippon, 2000). Paternalistic rationales for wetland colonization and transformation among the Roman elite are significant for a range of reasons. Firstly, because they are consistent with the ideology of global colonization in the nearly two millennia which followed. Secondly, because they perfectly express the conflict between desire and disdain which was characteristic of wetland colonizers throughout history.

Following the withdrawal of Roman governance of Britain, the Fens and its people were again subject to discursive attack from the outside. Roman attempts to tame the landscape gave way to more straightforward outsider exploitation, as monastic estates were established within the Fens. These estates were some of the wealthiest in England, enriched by the verdant seasonal meadows and the flocks and herds which grazed upon them (Sayer, 2009). In stark contrast to this wealth and abundance, the monk Felix wrote that at the time of the arrival of St. Guthlac in the eighth century, the region contained

> …a most dismal fen of immense size…no settler had been able to dwell alone in this place before Guthlac…on account of the phantoms of demons which haunted it…they were ferocious in appearance, terrible in shape with great heads, long necks, thin faces, yellow complexions… (Colgrave, 1985, pp. 87–89, 103).

Felix makes his attitudes clear: the Fens, he tells us, were a waste infested by the inhuman and diabolical. Here, an unambiguous example of discursive marginalization and active misrepresentation of people and place. Abundant evidence of the consistent human occupation of the 'dismal' Fens is present in archaeology and in historical linguistics (Oosthuizen, 2014, 2017). Furthermore, it is clear from Felix's account that Guthlac encountered human, and not demonic, inhabitants. In addition to indicating that the 'demons' spoke Brittonic—the language of the area at the time–his description of 'yellow complexions' is a characteristic feature of Fenlanders who historically suffered from chronic anemia secondary to malarial infection. Colloquially known as "ague", the ubiquity of endemic malaria was described the postmedieval period:

> Agues and coughs are epidemicall;
> Hence every face presented to our view
> Looks of a pallid or a sallow hue (Dobson, 1989, p. 3).

A careful reading of Felix's medieval account re-affirms the humanity of Fenlanders, while highlighting the very literal demonization of people, and stigma of place.

The low regard in which Fenlanders and their landscape were held continued throughout the medieval period and into the early modern and modern periods.

Indeed, they accelerated as ideologies of unilineal "progress" and landscape "improvement" created a national appetite for landscape transformation in England (Mulry, 2021; Tarlow, 2007). By the seventeenth century, speculators calling themselves "Adventurers" had a single aim: drainage and enclosure of some 350,000 acres with the support of the king, in exchange for significant grants of the newly-drained land (Ash, 2016; Knittl, 2007). As in earlier periods, there was heavy weaponization of stigma towards people and place tied to ideas of "improvement", with rationales for internal colonization closely mirroring those used overseas (Lindley, 1982), primarily accusations of wildness and sloth. William Camden described with evident disgust "…a kind of people *according to the nature of the place where they dwell* rude, uncivill, and envious to all others…" [emphasis added] (Camden, 1772, p. 491). Here, again, we see the intentional alignment of people and place–a definitive example of landscape embodiment used to stigmatize and defame.

Despite significant resistance from Fenlanders, drainage was completed by the early nineteenth century. Together with a series of enclosure acts between the 18th and 19th centuries, depriving Fenlanders of previous access to the Fen commons and their resources, drainage and the destruction of Fen wetlands resulted in severe impoverishment of ordinary working people. Humphries (1990) noted the key roles of rural women and children in English family economies prior to enclosure, and the supplementary income and resources brought by women's self-employment in gathering and pastoral activity on common lands. These economic activities were typically undertaken alongside, and balanced with, family labor, such as the demands of mothering (Humphries, 1990). With the loss of common lands, household economies were fractured, as women and children were forced to undertake waged labor away from their families to compensate for lost income (Fig. 2). By the mid-nineteenth century, structural violence towards Fenlanders compounded. Severe poverty and parent-child separation were influential factors in appallingly high infant mortality in the Fens (Hinde & Fairhurst, 2015, Sneddon, 2018).

Moral outrage ensued: not on behalf of Fenlanders, but in judgement *upon* them. Following an 1861 medical commission to investigate the causes of infant mortality, the economist Karl Marx wrote in horror of the results of "immoral" female agricultural employment, implicating infant opium dosing, and even infanticide, in the



Fig. 2 *Potato Harvest in the Fens* (1877) by Robert Walker Macbeth. Public domain

high infant death rates in these "Sodoms and Gomorrahs" (Marx, 1976; p. 315, 852). The syndemic effects of malaria and poverty (cf. Perry & Gowland, 2022) as contributing factors in child mortality were *not* considered, as, to paraphrase an aphorism, reports of malaria's demise in the Fens were greatly exaggerated.[1] Instead, deaths were attributed to the "immoral" tendencies of Fenland women undertaking economically necessary, physically demanding work. Pascoe (2017) identifies women's employment as transgressive and subversive of domestic Victorian gender roles for women; for Marx and others, these "monstrous" Fenland mothers were assigned otherness and subjected to dehumanization not merely for the loss of their children, but due to their "unnatural" behavior (Pascoe, 2017, p. 605).

The perceived otherness of Fenland people continued long into the twentieth century. Folklorist Ethel Rudkin enquired of upland Lincolnshire Wold residents whether they were familiar with a custom of their Fenland neighbors and reported receiving a stiff and emphatic reply: "*We* wouldn't know that: *they* are strangers!" (Rudkin, 1955, p. 389). As late as 1997, an episode of Jonathan Meade's program *Even Further Abroad* sardonically described Fenlanders as incestuous and enjoying pursuits in common with poor US communities, where "hick has spoken unto hick, and white trash unto white trash" (Turner, 2022, p. 13). While such naked contempt may no longer be palatable in mainstream media, lingering peripheralization suffuses even polite discussions of the Fens. A 2022 reviewer of Derek Turner's "love letter" to the Fens, *Edge of England,* was startled that "Lincolnshire turns out to be surprisingly varied in landscape, fauna and history", describing it as a "part of the country that the rest of us have forgotten" (Smith, 2022). Nor has structural marginalization vanished in the two centuries since drainage. The Fens are still considered a poor area: the most recent government indices for Cambridgeshire rank Fenland as its most deprived district, with several areas classed in the 10% most deprived nationally, and with worsening metrics since 2015 (Dunn & Leeman, 2019).

The legacy of injustice towards the "forgotten" and historically disenfranchised populations of the Fens prompts a knotty question: who can speak for the dead regarding past wrongs? Crandall and Martin (2014) suggest that it is the dead themselves who may, in cooperation with archaeologists, provide a necessary check on damaging narratives:

> Corpses… "speak" in predictable ways (whether they are the tools of others or not) once an emic perspective is taken…bioarchaeology can speak truth to power and recover the agency and subjectivity of the dead… (Crandall & Martin, 2014, pp. 432–433).

The potential of ethical bioarchaeology (cf. Halcrow et al., 2019; Squires et al., 2019) to act as a means of reparative justice is immense. Regarding the Fens, research by bioarchaeologists, alongside medical historians, demographers, and landscape historians, is beginning to illuminate this "forgotten" region and its people. For instance, multidisciplinary work that re-evaluates the role and chronology of malaria in Fen health has begun to bring necessary nuance to understanding

[1] For a reappraisal of malaria's continuing role in nineteenth century infant mortality in the Fens, see Kendall and Kendall (2021).

disease impacts prior to drainage (e.g. Bankoff, 2018; Gowland & Western, 2012; Kendall & Kendall, 2021; Kendall et al., 2020; Nicholls, 2000; Sneddon, 2018; Williamson, 2006). Beyond malaria, a new project hopes to challenge past narratives about wetland life—including the Fens—through analysis of childhood health during the first millennium AD using a range of osteological, biomolecular, and isotopic methods (Kendall, 2022).

3 'Who Will Restore the Dignity of Their Names?' The Magdalen Laundries and Marginalization Through Moral Stigma

> They died in secret. They were buried in secret. Nobody walked behind their hearse to the graveyard, not even a cross put on each of those graves with an RIP on them. Those who did that did not stop to think. They were at least worthy of that bit of dignity. Maise K., Survivor of the Sisters of Mercy Laundry, Galway (McGettrick et al. 2015)

"Stigma" has multiple, nuanced scholarly definitions but common to all of them is the idea that it ties the identity of a person to an attribute perceived as negative by the community majority (Kleinman & Hall-Clifford, 2009). Stigmatization is a fundamentally dehumanizing experience as it reduces a complex, multifaceted-lived experience to a single property, action, or attribute that reduces their moral status. A poignant, contemporary example of dehumanization of mothers and children through moral stigma comes from twentieth century Ireland, a context in which illegitimacy and female sexual activity outside of wedlock were profoundly stigmatizing attributes (Garrett, 2016). It is important to note that this situation is raw in the public consciousness of the country, that there are living survivors, and that the reparative justice process is ongoing. The topic is touched on by Halcrow and colleagues in their chapter "The Unborn in Bioarchaeology: Personhood, Care, and Pregnant Person-Infant Health through a Structural Violence Lens", this volume. Here we use the example of the Magdalene Laundries to discuss how moral stigma can be a powerful marginalizing force, how dehumanization of bodies is not confined to the distant past, and how bioarchaeology is helping to restore the dignity of the dead.

The history of Ireland's Mother and Baby Homes has been covered comprehensively elsewhere (e.g. Corless, 2021; Buckley & McGregor, 2018). Briefly, in 1921 Irish Statesman Sir Joseph Glynn campaigned for a solution to Ireland's perceived unwed mother problem in the form of a 'combined hostel and factory', which would ultimately be realized as a laundry service. Although the day-to-day management of the Laundries was undertaken by religious sisters (e.g. the Sisters of Our Lady of Charity of Refuge, Congregation of the Sisters of Mercy), their oversight was exclusively the remit of doctors, priests and philanthropists—that is, men with intellectual, social, and monetary capital (Garrett, 2017). These paternalistic institutions had existed independently in Ireland since the late eighteenth century. However, 10 of

these institutions would formally create ties with the Irish-Catholic government between 1921 and 1955 (McAleese, 2013). Here, women who became pregnant outside of wedlock would be institutionalized with their child for a period of time, at least partially proportionate to their perceived culpability; those who were supposed to have been seduced had a shorter stay than 'less hopeful cases' who were considered repeat fornicators (Garrett, 2017). The period of internment was officially 2 years for most, although there are accounts of women from wealthier families shortening their stay to as little as 10 days, following a generous donation (Garrett, 2017).

The situation around who was in these homes was complex. In addition to unwed mothers, they contained older girls rejected from foster homes or removed from abusive situations, cases referred onwards by industrial schools, and some women who were deemed unable to care for themselves due to disability (McAleese, 2013). However, all were part of what O'Sullivan and O'Donnell (2007) term Ireland's 'culture of coercive confinement', which arguably began with famine workhouses in the mid-nineteenth century and came to include industrial and reformatory schools, public and private institutions for the mentally or physically disabled, and the Magdalen Laundries (Buckley & McGregor, 2018). In 1951, only 443 people were held in prison nationwide, vs 7827 in industrial schools or homes for unwed mothers (Garrett, 2017). Survivors of the Laundries report not being told in many cases why they had been remanded there or how long they were to stay (Garrett, 2017). They were usually denied contact with family and friends and assigned "house" or "class" names to maintain their anonymity (Garrett, 2017; Sebbane, 2021). In all, it was an incredibly isolating experience, with inmates stripped of agency and identity and made to work long hours without remuneration (Fig. 3). By the time the last of the Laundries closed in 1996, over 11,000 of Ireland's women had passed through them (Simpson-Kilbane, 2021).

More than 23,000 children were born in the Laundries during their operation (Buckley & McGregor, 2018). Infant mortality was incredibly high, and as early as



Fig. 3 Girls in an Irish Magdalen Laundry, *ca*. early twentieth century. Public domain

1933 the Department of Local Government and Public Health noted that 1 in 4 children were dying in their first year, most from preventable diseases and malnutrition associated with poor quality of care. In fact, the disparity in mortality rates between legitimate and illegitimate children in mid-twentieth century Ireland was higher than any country in the United Kingdom (Garrett, 2017), signaling the deep-seated structural violence associated with birth outside of wedlock. Gastroenteritis and respiratory diseases were drivers of infant mortality in the Laundries and the lack of hygiene resources (e.g. access to basic washing facilities) and overcrowding were probably major contributing factors (Murphy, 2021). Breastfeeding, which would have provided an important layer of protection against infection, was actively discouraged (Murphy, 2021). There is credible evidence that children in these homes were used in medical trials without parental consent (Dwyer, 2014; Ó Fátharta, 2016). Many children were also adopted out without parental consent, and between 1950 and 1980 alone 2000 were sent to the United States (Buckley & McGregor, 2018). "Sarah", who was resident in Seán Mac Dermott Street Laundry circ. 1977–78, recalls the trauma of forced separations:

> I was in constant fear of them taking my baby, having to walk up them stairs every night to bed and listening to the girls screaming when the babies were gone, and then the other girls telling me, 'no, that's them only having their babies, they're alright,' but that screaming, that wasn't them having babies. (O'Donnell et al. 2013)

These adoptions, although common, were illegal as legislation for the protection of parental rights over institutionalized children had been in place in Ireland since the late nineteenth century (Buckley & McGregor, 2018).

In 2014 the world was rocked by reports of the remains of hundreds of children in a series of septic chambers beneath the old St. Mary's Mother and Baby Home, Tuam, Co., Galway, which was in use between 1925 and 1961. The presence of a clandestine mass grave here had been known by the community in Tuam since the 1970s when one of the chambers was opened by playing children; however, it was blessed by a priest and quietly resealed (Belfast Telegraph, 7th June 2014). This course of action is reflective of the ingrained cultural stigma surrounding the Laundries—many of the women who were remanded to these places never spoke of their time in them to their families (Simpson-Kilbane, 2021). It was only following the relentless advocacy of amateur historian Catherine Corless, who found that there were no burial records for 796 child deaths registered over the course of the home's operation, that the wider world became aware of the Tuam children (Corless, 2021). This ultimately sparked a government enquiry into conditions in Ireland's Mother and Baby Homes, the findings of which are still being scrutinized (Condon, 2022; Gallen, 2022).

Work on exhumation of remains has only just begun, in what has been called one of the "most complex forensic investigations in the world" (Duggan, 2023). Analysis of infant and child skeletal remains is extremely challenging in single inhumations due to their small size and incomplete mineralization and epiphyseal fusion. Isolating and identifying nearly 800 commingled bodies ranging from the late fetal period through early childhood will be an extraordinary undertaking, pushing the

limits of current anthropological methods. However, it is necessary work, as surviving relatives—parents, siblings, nieces, and nephews—await their identification and return. Here bioarchaeologists and forensic scientists are taking an active role in what is likely to be a long and difficult reparative justice process.

Tuam was not the first scandal involving clandestine burial associated with the Magdalen Laundries and seems unlikely to be the last. In 2003, journalist Mary Raftery found that the Sisters of Our Lady of Charity, who ran one of the country's oldest Laundries at High Park, Drumcondra, had failed to provide death certificates for 58 of the 133 women they had exhumed, cremated, and reburied in 1993 in order to sell the land for redevelopment (Raffery, 2003). It has also become apparent that 23 of these women, who now have no possibility of forensic identification, were acknowledged in death by the Sisters under their house names (e.g. "Magdalen of St Cecilia", "Magdalen of Lourdes", "Magdalen of St Teresa") (Raffery, 2003; Sebbane, 2021). Some of these women died as late as the 1960s and will certainly have living children who now have no hope of connection to them or their burial place (Sebbane, 2021). The anonymity imparted to them in life and death is a powerful example of marginalization through discursive violence. Buckley and McGregor (Buckley & McGregor, 2018) reflect on the enduring stain of the Laundries and similar institutions in Ireland:

> The greatest shadow and discourse that has permanently shaped a history that cannot be rewritten is the evidence, stark and extensive, that for many children who grew up in institutions in Ireland, their experience was objectification, lack of power and absence of a champion for their human rights.

They could, of course, equally be speaking of these children's mothers. Anthropological analysis of the remains of some victims of the Laundries will be key in restoring their humanity in the public consciousness.

4 Conclusion: Bioarchaeology, Re-humanization of Bodies, and Social Justice

> Stories matter. Many stories matter. Stories have been used to dispossess and malign, but stories can also be used to empower and humanize. Stories can break the dignity of a people, but stories can also repair that broken dignity. Chimamanda Ngozi Adichie

We have shown in both these examples how bioarchaeology has the potential to contribute to, or is actively contributing to, reparative justice today. Bioarchaeological research can change narratives and restore reputations, making a small but valuable contribution to confronting acts of discursive violence from many generations ago. This has implications for not only the dead but for their living descendants and communities close to their memories. Bioarchaeology can also bring to light, in a way that other disciplines cannot, the embodiment of forgotten or obscured structural violence in the long dead. Bioarchaeology cannot act alone as an agent of social justice, but it is a vital part of an interdisciplinary endeavor involving historical and

socio-political work, and collaboration with associated communities. We close here by proposing three action points for all those involved in bioarchaeological research:

1. Research on historically marginalized populations can either support legacies of injustice or ameliorate harm. Bioarchaeologists must reflect on the effects of their research: either to perpetuate existing injustice, or to actively subvert unjust power structures. *There is no ethically neutral option*. The ongoing recovery of human remains from Ireland's Catholic Laundries is a powerful example of how bioarchaeological work can expose structural violence and demand accountability for it.
2. Bioarchaeologists must be appropriately critical of the historical sources they use to contextualize and interpret their research. As with the history of largely unchallenged stigmatizing narratives concerning Fenlanders, it is essential to recognize documentary sources as expressing subjective views held by their narrators, and the views and prejudices of their times and places–*not* objective truths to be taken at face value. Commitment to not unwittingly perpetuating discursive violence in research requires that researchers be able to identify the rhetorical or subjective elements inherent in historical sources. Consequently, bioarchaeologists–who often work on a chronologically and geographically diverse range of populations–must be willing to step outside of their own specialism to become conversant with the wider historical context of marginalized populations beyond a superficial level.
3. Above all, bioarchaeologists must affirm the complex humanity of *subjects*, not *objects*, of study. This ethos actively and mindfully considers the role of the researcher as an agent or counteragent of historic injustice and acknowledges the dignity inherent in every human person.

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The Past, Present, and Future of Eating Animals

Sabrina C. Agarwal

1 Introduction

The historically popularized image of "Man the Hunter" and the belief that meat consumption drove human evolution remains deeply embedded in public consciousness. The anthropological record has been called upon to imply a "naturalness" to eating meat and used to highlight the nutritional benefits of meat consumption by humans (Cordain & Cordain, 2011; Croney & Swanson, 2023; Leroy et al., 2023). While recent paleoanthropological work has shown that the role of meat consumption in the human diet and in human evolution was complex (Barr et al., 2022; Ocobock & Lacy, 2023), early studies suggested the hunting of animals and consumption of meat was fundamental to the cognitive and social evolution of our species. The adoption of fire, development of language, division of labor and social hierarchies have all been linked to hunting and eating meat (Aiello & Wheeler, 1995; Gorbunova, 2024; Lee & DeVore, 1968). Similarly, the earliest human settlements are typically linked with the domestication of not only plants but also animals, which gave a regularized and human-controlled diet of meat and eventually animal products (such as dairy products). While the tropes of eating meat are still called on as a justification for meat-intensive diets, the procurement and type of meat that humans eat in Western consumer cultures, and now in many developing countries, is nothing at all like the meat obtained and consumed during early human evolution and prehistory. There is nothing natural about the meat we consume in the globalized world today. Domesticated animals we consume today are primarily factory-farmed, genetically engineered, with different nutritional compositions (Croney & Swanson, 2023; Nelson et al., 2014; Ritchie, 2023). The profound changes in the type of meat consumed in the past and present is often cited in studies

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_9

that seek to promote a more realistic "paleodiet" (Cordain, 2002). At the same time, present-day meat production has been linked to environmental impacts, threats to human health including the rise of global pandemics and has prompted increased concerns for animal welfare (Agarwal, 2022). Despite the dire consequences of current global meat production practices, animal protein consumption is culturally embedded in our contemporary food systems, and conversations on the ethical issues surrounding eating meat remain polarized.

While evolutionary studies have focused on what our species evolved to eat or try to calculate the nutritional differences of prehistoric meat as compared to meat consumed today, what is equally important to think through is *why* meat and meat consumption in contemporary humans is so different than in our past. Meat means more than just food, calories, and nutrients to modern humans. The history of animal domestication and meat consumption in the modern world is entangled with the changing relationship between humans and animals (Sykes, 2014), but also with colonialism, imperialism and empire (Chatterjee & Subramaniam, 2021). Meat was and is linked to racism, masculinity, and sexism. This evolutionary and historical context is critical to appreciate how and why we got to a place where most of the animal protein we consume globally is industrialized and intensively produced yet removed from our everyday lives. This paper considers what animals and meat meant to our early and prehistoric ancestors, how domestication of animals changed that relationship and the zoonotic transmission of disease, how meat fits in colonial and imperial histories, and how the relationship to the animals we eat so drastically changed in the last century. This chapter offers an anthropological examination of how human relationships with animals and meat have transformed over time, revealing how violence against nonhumans intersects with the broader arc of colonial, imperialist, and capitalist systems rooted in white masculinity and supremacy. Understanding these connections carries profound ethical implications for how we might reimagine our future relationships with animals as food. Anthropological scholars and students have an individual and academic responsibility to engage with the contemporary understandings of our relationship with meat, and to reflect on how this has manifested in the disregard of animal cruelty and suffering. This is critical to make ethical interventions to reimagine the future of eating animals and the sustainability of our planet.

2 Human Evolution and the Early Human Diet

Our earliest Paleolithic hominin ancestors in Africa, and those that began to roam and expand outside of Africa, lived as nomadic or semi-nomadic hunter-gatherers (foragers). During this period, roughly 2.5 million years ago up to 10,000 years ago, the hominin diet and what we think of as the diet of earliest human species, was highly generalized and omnivorous. Despite this, the popularized idea of early man-the-hunter as the cornerstone of human evolution permeates popular culture. Even biomedical opinions suggested a natural and evolutionary need for humans to eat

meat. For example, the idea of the benefits of a "stone age diet" was first coined in 1975 by a gastroenterologist who argued that humans should eat like their pre-agricultural ancestors for optimal health (Voegtlin, 1975). This concept gained wider popularity through the work of evolutionary medicine researcher Loren Cordain (2002), who wrote "The Paleo Diet" and popularized the modern paleo-movement. The "paleolithic diet" was loosely based on the work of Eaton and Boyd (Eaton et al., 1997; Eaton & Konner, 1985, 1986) who proposed a "discordance hypothesis" by which the mismatch between modern diet and human biology gave rise to lifestyle diseases, such as obesity and diabetes (Eaton et al., 1988; Eaton & Konner, 1986). However, Eaton and Konner (1985, 1986) never suggested the diet of early humans was predominately meat based. Although lean protein was argued to be central and important, it was always considered proportionally a smaller component of total energy intake. Nonetheless, researchers continue to frame the positive nutritional aspects of meat consumption alongside the early and outdated narrative that meat formed the evolutionary diet of early humans (Cordain & Cordain, 2011; Croney & Swanson, 2023; Leroy et al., 2023).

Another narrative was that hunting of animals and consumption of meat was fundamental to the biological (in particular brain development) and social evolution of our species. Lee and DeVore's (1968) seminal ethnographic research on hunter-gatherers, set the early focus on how anthropologists approached human evolution, hunter-gatherer studies, and the relationship between subsistence and social organization. Perhaps most influential to biological anthropologists was the "expensive-tissue hypothesis" by Aiello and Wheeler (1995) which theorized that the large brains of humans would have needed to evolve without causing a huge increase in our metabolic rate. They specifically hypothesized that this was accomplished by decreasing the size of the liver and gastrointestinal tract, and the eating of a high-quality diet, specifically meat (Aiello & Wheeler, 1995). Paleoanthropologists continued to develop the "man-the-hunter" theme as central to the evolution of formative human social behaviors. Most notably Lovejoy (1981) proposed that bipedalism developed because males who could walk upright and carry meat back to females had greater reproductive success. This created a division of labor where males hunted while females remained at home bases caring for young, eventually forming nuclear family units. The theory was known as the "Male Provisioning Hypothesis"(Lovejoy, 1981) and has continued to be used with small variation in the interpretation of behaviors and the evolution of early humans (Lovejoy, 2009). The male-provisioning theory put eating meat as a central component in the evolution of our species and essentially erased any active role of females in the story of human evolution. Unsurprisingly it was widely criticized (Conkey & Spector, 1984; Dahlberg, 1981; Gero & Conkey, 1991; Slocum, 1975). Several competing hypotheses were developed that instead centered the equally or more important "woman gathering" activities and plant foods in the development of larger brains and social development, and alternative hypotheses for the evolution of hunting that de-centered provisioning and instead suggested more complex models that acknowledged female agency, alternative food sources, and complex sharing networks (Bird & Bird, 2008; Gurven & Hill, 2009; Hawkes, 1991; Hawkes et al., 1997; Tanner &

Zihlman, 1976; Zihlman, 2012). Recent work has continued to demonstrate that the role of meat consumption in the human diet and in human evolution was complex (Barr et al., 2022; Ocobock & Lacy, 2023). Ocobock and Lacy (2023) present significant evidence from exercise studies that demonstrate that women are physiologically better suited than men to endurance efforts, including activities like pursuing prey on foot over long distances. Ethnographic studies of contemporary hunter-gatherers, together with the fossil and archaeological record, show that women have a long history of hunting game (Anderson et al., 2023; Ocobock & Lacy, 2023).

More recent studies have continued to challenge the idea that meat eating was central to the biological evolution of humans. For example, using data from 100 mammalian species (including 23 primates) Navarrete et al. (2011) found that brain size is not negatively correlated with digestive tract mass or any other expensive organ when controlling for fat-free body mass, refuting the required trade-off between a gut suited to meat eating and brain evolution. Further, Alger et al. (2023) have argued that even before the evolution of the *Homo* lineage, early foraging hominins such as Australopithecines, would have had diets with nutrient-dense extracted foods (such as roots and tubers), suggesting the possibility that early hominins shared such foods across different mating systems long before the reliance on meat, fire, or increased lifespan (Alger et al., 2023). Lastly, quantitative analysis of early fossil sites show no sustained increase in the relative amount of evidence for carnivory after the appearance of *H. erectus,* despite increase in brain size, which challenges the primacy of carnivory in shaping its evolutionary history (Barr et al., 2022). Since the "man-the-hunter" was coined, numerous studies and data have definitively demonstrated that diet and social behaviors would have been both complex and varying over the millions of years of human evolution.

While meat-eating was likely not the defining behavior of humans, obtaining and eating meat was still an important aspect of early human life. During the millions of years of evolution of our species, animals would have been central to human cosmology and orientation in the world. The understanding of hunter-gatherer worldviews that emphasize the interconnectedness of the natural and human world has been noted by many formative anthropological scholars (Bird-David, 1990; Descola, 2014; Ingold, 1998) and scholars of Indigenous ontologies (Hallowell, 1976; Viveiros de Castro, 2012). Rather than positioning themselves as observers of an external natural world, hunter-gatherers understood themselves as environmentally embedded participants within the wider relationships they had with their surroundings (Ingold, 2021). Termed an animistic worldview, traditional hunting and foraging societies could be described as "plurispecies communities" where humans lived in a community of local beings who are mutually present (Bird-David, 1990, 2018a, b). For early humans, animals were not external resources to be exploited but kin with whom they shared ancestral origins, social protocols, and ongoing reciprocal relationships (Bird-David, 1990, 2018a). The literature shows that hunter-gatherer worldviews challenge the Western nature/culture divide. For hunting and foraging societies, humans and animals participated in overlapping kinship systems, with both groups recognized as beings with agency, intention, and social lives

(Bird-David, 1990, 2018a). It is profound to realize that this relational ontological way of being is likely the ancestral human condition, one that defined the existence of our human ancestors for millions of years. Historic and modern Western ontologies of human-animal separation mark a decisive rupture from the evolutionary foundation of human-environment relations.

3 Domestication and the Revolution in Human-Animal Relationships

Sometime around 1000 years ago humans began a significant transition in how they lived and procured food. Humans began to settle down and produce their own food through the domestication of plants and animals (Barrett et al., 1998; Harper & Armelagos, 2010). When (bio)archaeologists think about the first human settlements where our ancestors would have started to domesticate plants and animals, we often focus on timing (when and where this happened first), the change in diet that occurred (what kinds of plants or meat increased in diets) and whether this was a successful adaptation for early human populations or not (Cohen, 2008; Cohen & Armelagos, 1984; Larsen, 1995, 2003; Larsen et al., 2013, 2015). Less attention has been paid to the change that the domestication of animals would have had to human-animal relationships (Sykes, 2014). In his groundbreaking essay, Ingold (1994) emphasized how domestication was part of the larger narrative of human exploitation and control of nature, and a shift to thinking and treating animals as "slaves" to be dominated. He theorized this was a transformation from the world of hunter-gather populations where relationships with animals are based on trust without hierarchy (Ingold, 1994). Since Ingold's early work (1994), scholars have more recently emphasized relational ontologies and multispecies entanglements as alternative to domination paradigms of human-animal relationships (for example Haraway, 2003, 2024; Kirksey & Helmreich, 2010; Kohn, 2013; Tsing, 2013).

More importantly, the domestication of animals and the human relationships with animals in early civilizations was nothing like modern domestication practices. Early zooarchaeological analyses emphasized the changes in human hierarchical relationships that emerged with the ability to have domesticated animals as property (Russell, 2002). However, Sykes (2014) suggests that the move of bringing animals in closer proximity to human communities would have required trust and mutual relationships, and that rather than property, in many instances the perception of domesticated animals might have been considered closer to kin. Sykes (2014) notes the work of Armstrong-Oma (2010) who emphasizes how early domestication of animals would have brought animals and humans into new and intimate relationships, literally sharing aspects of their daily lives like living spaces and food. Armstrong-Oma (2010) has argued the human-animal relationship in domestication is better thought of as a social contract with trust and reciprocity at its core, where humans give care/food and animals give in return docility (Larrère & Larrère, 2000; Lund et al., 2004). Armstrong-Oma (2010) has also noted that animals in many

instances would have lived with humans for years before being slaughtered and eaten, forming long time bonds with the pastoral peoples they lived with. Sykes (2014) notes that animals raised for secondary products like wool can be thought of as community members that contribute to a society in giving wool and familiar companionship. In early pastoral communities it is not surprising for tended animals to be important and familiar, and intimately linked to prehistoric life. In later domestication, animals were not just passively used by humans, but also exerted in many instances their own agency. Sykes (2014) notes that in many instances animals would have initiated their own domestication. This is likely not just for animals such as cats and dogs, but also animals such as chickens. Zeder (2012a, b) has outlined how domestication can emerge organically from opportunistic relationships rather than through deliberate human control, whereby animals form at first commensal relationships with humans (the classic example being dogs that are generally thought to have started domestication after wolves were drawn to human settlements to scavenge on human refuse). In the case of domesticated chickens, recent studies suggest that rice agriculture likely preceded the domestication of wild fowl, by drawing them to human communities, only later being fully domesticated and dispersed globally (Peters et al., 2022). Further, while we think today of chickens as the most ubiquitous domesticated food animals, Sykes (2014) also notes that fowl were not domesticated first for food, but for secondary products such as feathers, cockfighting or ritual/cosmological motivations, emphasizing how the shift to animal domestication would have created significant cultural changes in early human populations beyond food. Sykes (2014) uses multiple case studies to demonstrate how the spread of domesticated livestock, horses, chickens, and hares would have brought new changes in socialization and community, and cultural behaviors defining gender ideals, status and authority. Human-animal relationships would have been very different following the Neolithic revolution as compared to the relationship for early hunter-gatherers.

4 The Colonial and Imperial Histories of Meat

The history of animal domestication and meat consumption reflects humanity's evolving relationship with animals (Sykes, 2014). However, from the pre-industrial period through the rise of twentieth-century industrial agriculture and factory farming, meat production became increasingly entangled with colonialism, imperialism, racism, masculinity, and sexism (Chatterjee & Subramaniam, 2021; Chiles & Fitzgerald, 2018). Most people are generally unaware of why meat is so important in Western history and culture, and why certain meats became available, popular, or how their tastes have been shaped over centuries of colonial, imperial and capital influences.

Conversations in critical animal studies, feminist, colonial, and postcolonial studies have sought to elucidate the historic and changing relationships with

animals, and the politics of what constitutes meat. These studies have demonstrated the importance of cultural meaning in shaping meat consumption (Chiles & Fitzgerald, 2018), including how the meaning of meat changes through time, and across political and cultural boundaries (Chatterjee & Subramaniam, 2021). Capitalism in early modern Europe created urban wealth, but degraded land through overgrazing, which drove colonization for cheap territory. From the sixteenth century forward, European settlers transported livestock to colonized territories throughout the Americas, Australia, and New Zealand. The exploitation of Indigenous lands fueled the development of a global economy that transformed these nations into leading centers of meat production and consumption (Chiles & Fitzgerald, 2018; Cronon, 1983; Ogle, 2013). In the United States, colonial livestock systematically destroyed Indigenous ecosystems and food sources, spreading disease to Native communities (Chiles & Fitzgerald, 2018). This environmental devastation was underpinned by racist ideologies that framed meat production as "civilizing" and "improving" the land, providing moral cover for territorial appropriation (Chiles & Fitzgerald, 2018). Ogle (2013) notes that Americans were eating meat on a scale the Old World could neither imagine nor provide. While an average European was lucky to see meat once a week, even a poor American man ate about two hundred pounds a year, with meat consumption and reliance continuing to increase in the nineteenth and nineteenth century American Frontier (Ogle, 2013). In the post-Revolution Era growing urban populations and export ambitions drove federal investment in transportation infrastructure, with further aggressive territorial acquisition from Native Americans to support the large-scale meat production and distribution networks (Chiles & Fitzgerald, 2018). The introduction of cattle (and the decimation of bison) in North America was the most influential colonial and imperial strategy that has shaped global meat production of beef and land use today. Numerous scholars have shown how the introduction of European livestock to North America was a fundamental tool of colonization that systematically dismantled Indigenous societies, food systems, and relationships with the land (Chiles & Fitzgerald, 2018; Cutting-Jones, 2024; Ficek, 2019; Fischer, 2015; Specht, 2020; Taschereau Mamers, 2020). Cutting-Jones (2024) notes that at least 30 million bison roamed the western United States in 1800, but by 1890, 60 million head of cattle had taken their place (Fig. 1). Cattle and the deliberate decimation of bison served as instruments of territorial control, cultural erasure, and economic domination (Specht, 2020; Taschereau Mamers, 2020), with direct causal links between nineteenth-century colonial policies and contemporary Indigenous food insecurity, economic inequality, and ecological degradation (Feir et al., 2022; Taschereau Mamers, 2020).

The invention of refrigeration and freezing also opened a new ability to control and produce meat as part of imperial economics and empire that eventually created a global industry of frozen food. Hamilton (2021) examines the imperial and colonial dimensions of the reindeer meat industry in Alaska, focusing on how domesticated reindeer were introduced to Alaska Native peoples to essentially establish a commercial enterprise that displaced Indigenous communities from their traditional



Fig. 1 Photograph from 1892 of a pile of American bison skulls in Detroit (MI) waiting to be ground for fertilizer or charcoal. Original taken at Michigan Carbon Works, Rougeville, Michigan. 1892. Author unknown, originally Burton Historical Collection, Detroit Public Library. Public Domain. At least 30 million bison roamed the western United States in 1800, but by 1890, 60 million head of cattle had taken their place (Cutting-Jones, 2024)

practices. Hamilton (2021) traces how the Alaskan Native peoples, especially in the Seward Peninsula, were alienated from the land, only briefly allowed to be herders, and transformed into laborers within an imperial economic system. Hamilton (2021) outlines how the freezing and transit of frozen meat in the late nineteenth century produced new modes of consumption and the larger politics of empire. In the case of the establishment of the Lomen Reindeer Corporation in Alaska this transit of frozen meat was successful through a narrative of modernity and the disregard and eclipse of indigenous epistemologies (Hamilton, 2021). Hamilton (2021) also draws attention to the striking use of tropes of Native Americans in advertising specifically for meat products, linking settler imaginaries of Indigenous ways of being and meat protein with ideas of civilization and racialized ideas of evolution (Hamilton, 2021). For example, Hamilton (2021) shows a 1880 trading card for Libby cooked corned beef that depicts two dead men killed by arrows and two Native American men raiding a box of canned beef (implying their desire to move to civilized foodstuffs), and similar advertising trade cards were made for the canned ham industry (Fig. 2). These advertisements demonstrate how meat consumption was central to narratives linking indigeneity with evolutionary progress and civilization, while also providing ideological justification for westward expansion and imperial conquest (Hamilton, 2021; Huhndorf, 2016).



Fig. 2 "Chief Joseph & his tribe discussing the merits of the Royal Hams". Nineteenth Century American Trade Cards, Chief (1870). Retrieved from https://ark.digitalcommonwealth.org/ark:/50959/gq67k334w). Trading cards such as these were produced to promote the new canned meat industry, while linking narratives of Indigeneity with evolutionary progress and civilization, allowing the ideological justification for westward expansion and imperial conquest (Hamilton, 2021; Huhndorf, 2016)

As more immigrants came to the United States in the 1800s, meat's cultural value was used to further fuel racism, along with the same early ideas of civilized people eating more animal protein (Chiles & Fitzgerald, 2018; Ogle, 2013). Immigrants from China and Ireland whose native diet predominantly comprised plant food (rice and potatoes respectively) were stigmatized, and those that were vegetarians or did not eat meat were ostracized from society (Chiles & Fitzgerald, 2018; Iacobbo & Iacobbo, 2004; Ogle, 2013). Beef became a cornerstone of American identity. Cutting-Jones (2024) notes that in 1900, the average American consumed over 100 pounds of beef per year, almost twice the amount eaten by Americans today. Importantly, we see the growing intersection between meat consumption (particularly beef) and White masculinity. Scholars argue that beef production and cowboy mythology, encompassing idealized frontier values of self-reliance, strength, and independence, became foundational to American identity through frontier expansion and Indigenous displacement (Zaraska, 2016). There have been numerous growing interdisciplinary studies that have examined how food choices, particularly meat consumption and hunting practices, intersect with gender identity construction, power relations, and cultural narratives about masculinity, not just in the United States but different societies and historical periods (Adams, 2000; Kimmel, 2006). Carol Adams' foundational work argues that meat consumption was seen as a way to revitalize masculinity at the turn of the twentieth century (Adams, 2000), and today's demand for cheap and convenient meat has continued to help maintain its deep links to conventional notions of masculinity (Chiles & Fitzgerald, 2018). Meat consumption in contemporary society continues to be culturally associated with masculinity, power, and linked to "natural" gender roles (Adams, 2000; Franklin, 1999; Mertens & Oberhoff, 2023; Rogers, 2008; Rothgerber, 2013).

5 Modern Meat and Disease in the Accelerated Anthropocene

Throughout human evolution, opportunities for animal-human contact have facilitated disease transfer between species. The domestication of animals beginning in the Neolithic period increased favorable conditions for zoonotic transmission. However, contemporary systems of food production and consumption, characterized by industrialized factory farming, environmental degradation, and global travel, have created unprecedented opportunities for animal-human disease transfer. Modern human food production has had significant consequences for human welfare and raised serious ethical concerns regarding animals raised for food.

A "Neolithic Revolution" landscape facilitated the evolution of pathogens and our exposure to infectious disease, creating conditions that were particularly favorable for zoonotic infections. The close living conditions with domesticated animals would have increased zoonotic transmission from animal hosts to human hosts, large settlements would have allowed pathogens to propagate between human

groups more easily, and an increase in waste would have fostered conditions for parasitic and gastrointestinal infections (Cohen & Armelagos, 2013; Harper & Armelagos, 2010). In addition, the cultivation of stable crops would also have led to a reduction in dietary diversity and reliance on foods with poor nutrition that would have exacerbated host vulnerability in these early human settlements (Cohen & Armelagos, 2013). This has been supported by numerous bioarchaeological studies of skeletal remains in early agrarian societies with agricultural intensification, and numerous epidemics and pandemics have been historically noted or hypothesized to have occurred, such as cholera, outbreaks of viral infections like smallpox, and vector-borne disease such as tuberculosis, and the plague (Cohen, 2008; Cohen & Armelagos, 2013; Harper & Armelagos, 2010). Our modern age is characterized by a re-emergence of infectious diseases that were previously thought to be under control, as well as the rapid rise of novel diseases and the existence of antibiotic-resistant pathogens (Harper & Armelagos, 2010). Human population movement has consistently served as a primary driver in pathogen spread and re-emergence through migration, long-distance trade, warfare, and colonization (Gamble et al., 2021; Green, 2020; Gutiérrez & Cameron, 2021).

Nearly all modern zoonotic infections are rooted in the global capitalism of our current food systems. An estimated 60% of all human infections and 75% of all new or remerging infectious diseases are of animal origin (zoonotic) (Recht et al., 2020; Slingenbergh et al., 2013). While the COVID-19 pandemic is the most recent in history, it is just one of many recent zoonotic epidemics that demonstrate the linkage between human health, animals and ecosystems, and the fabric of social inequality that contributes to its spread and cost. The majority of recent, and likely future pandemics are caused by viral zoonoses with mammalian disease reservoirs, followed by avian hosts (Morse et al., 2012), with birds, rodents, bats, and camels' natural reservoirs in a number of recent viral zoonoses (Recht et al., 2020). Well known examples include HIV/AIDS, Zika, SARS-CoV, H5N1 bird flu, and MERS-CoV (Recht et al., 2020; Rulli et al., 2021).

The extreme anthropogenic modification of contemporary food systems renders all modern pandemics fundamentally different from historical precedents. Climate and environmental changes, including global warming and natural disasters such as floods, wildfires, and droughts, influence the global incidence of zoonotic diseases. These effects have been significantly accelerated by anthropogenic land-use changes characterized by intensive livestock production, extractive agricultural practices, and forest fragmentation with accompanying habitat destruction that reduces biodiversity (Mishra et al., 2021; Karesh et al., 2012; Rulli et al., 2021).The trade of live animals, live animal markets (or "wet markets"), and bushmeat trade also contribute to zoonotic disease emergence (Mishra et al., 2021; Rohr et al., 2019; Rulli et al., 2021). Agribusiness factory farms, designed to maximize yields of animal products, create artificial ecosystems that displace natural habitats and facilitate viral spillover from previously isolated wild animal populations into the food system (Wallace et al., 2015). The confined rearing conditions characteristic of these operations serve as artificial amplifiers for disease emergence and transmission (Jones et al., 2013). Twenty percent of the world's population consumes 80 percent of its

resources, with continuing encroachment by agribusiness on deforestation (FRA 2020 Remote Sensing Survey, 2022). Agricultural expansion brings wild species in greater contact with humans and domesticated animals with an increased opportunity for spillover. Numerous "spillover" events of infectious disease that are spread from wild animals to domesticated animal and human hosts have occurred in recent decades, spurred by agricultural expansion and expansion into wild habitats. This includes examples such as the various avian influenza pandemics (including the H5N1 genotype) and Nipah virus (Recht et al., 2020; Rulli et al., 2021). These events often occur in tropical and developing countries already besieged with poverty and morbidity related to infectious disease (Rohr et al., 2019). Further, the farm animal meat production sector is the single largest anthropogenic user of land, with rearing and slaughtering of farm animals, and feed grain production (HSI Report, 2011), with the animal agriculture sector reported to be responsible for approximately 18%, or nearly one-fifth, of human-induced greenhouse gas (GHG) emissions (Steinfeld et al., 2006).

Wallace (2020) has argued for a collective global acknowledgment and reaction to global capitalism as the structural causation for pandemics, and action against the deforestation and agribusiness is the only response for long lasting change in the face of increasing pandemics. Global initiatives like the "One Health" program that emphasize the relationship between humans and animals as essential for ecosystem health was designed to have multiple and interdisciplinary sectors work together on improved health outcomes (FAO, OIE (now WOAH), WHO, UNICEF, UN System Influenza Coordination, World Bank, 2008), though it has seemed to fall short in unpacking the local and social determinants that lead to zoonotic spillovers. Responses such as testing, tracing, biosurveillance at factories, culling, cures, and vaccination only serve to sustain the food systems or offer emergency solutions in the moment of a pandemic with little engagement into structural causation.

6 What Is the Role of Anthropology in the Future of Meat?

Throughout human evolution, our relationship with animals has developed gradually alongside changing interactions with the natural world, from early scavenging to adept prehistoric hunter-gatherers, to early pastoralists. However, what occurred to our relationship with animals during the colonial and imperial expansion to the industrialized era of meat production represents an unprecedented departure from our long evolutionary trajectory. The past century's transformation of animal agriculture stands as an extreme rupture, with profound consequences for human health, ecological systems, and animal welfare. No development in human history has more grotesquely and violently altered our fundamental relationship with animals than the industrial mechanization of meat production (Fig. 3a–c).

Anthropological perspectives are key to highlight the deep history of human-animal relationships that demonstrate the stable adaptive strategies that served our species for millions of years, but also highlight how and why the dramatic change



Fig. 3 (**a**–**c**) Concentrated animal feeding operations are an intensive animal feeding operation where over 1000 animals (measured by weight) are kept in confined spaces for most of the year. They are documented to have environmental impacts, associated public health issues, and animal welfare suffering and harm. (**a**) Cow confined headlock feedlot. Image Public Domain, United States Department of Agriculture. (**b**) Hens in battery cages in Bastos, São Paulo, Brazil. Image licensed under the Creative Commons Attribution 2.0 Generic license. Secretaria de Agricultura e Abastecimento do Estado de São Paulo Agricultura. (**c**) Interior of a hog confinement barn. Image public domain, US Environmental Protection Agency

in meat production and consumption occurred in a short historical period. The entanglement of our relationship with animals and meat within the context of colonialism, imperialism and empire show a long trail of racism, sexism, and violence. Anthropologists have already elucidated the broader socioeconomic contexts of contemporary pandemics and inequality in contemporary food systems. For example, anthropologists have provided insight into the ways zoonotic diseases are socially mediated across multispecies human and nonhuman primates in places such as Kibale National Park (Thurber et al., 2013), and recent studies have also shown the ways that pandemics expose health disparities and syndemic expressions that reflect structural violence linked from the past to present (Gamble et al., 2021; Gutiérrez & Cameron, 2021; Singer & Rylko-Bauer, 2021). The violence and inequality of contemporary food systems is evident both globally and locally. In the US, factory farms are situated in low-income communities of color, where they pollute the environment for their residents, and employ local workers in underpaid jobs that have high risk to physical and mental health (Lowry, 2021). During the COVID-19 pandemic, a CDC disparity report found that 87 percent of COVID-19

cases at slaughterhouses occurred among racial minorities, reflective of the structural racism endemic to meatpacking plants and a nation where the marginalized are cast as expendable front-line workers (Waltenburg et al., 2020). This should not be surprising when we refer back to the colonial and imperialist territorial control of Indigenous lands and cultural erasure that fueled the development of the global economy of meat production and consumption, discussed earlier (Cutting-Jones, 2024; Feir et al., 2022; Mamers, 2019; Taschereau Mamers, 2020). As an example of just one historical parallel, in 1884, just 1 year after bison vanished from the northern Montana plains and left the Blackfeet facing starvation, the U.S. Office of Indian Affairs constructed a slaughterhouse on the Blackfeet Reservation (Wise, 2011). This facility operated as a tool of colonial control, forcing tribal members to labor in exchange for processed meat, a deliberate strategy to subjugate the Blackfeet as colonial subjects while systematically dismantling their traditional foodways (Wise, 2011).

The anthropological lens should also be called on to demonstrate that the industrialized treatment of animals we consume represents a continuation of this arc of violence, an extension of the same colonial and imperial logic that has historically dominated both "other" human communities and the natural world. Posthumanist approaches that have emphasized the interconnectedness of the natural and human world have been instrumental in anthropology (Bird-David, 1990, 2018a; Descola, 2014; Ingold, 1998; Kohn, 2013) as has the recognition of Indigenous ontologies that challenge the Western nature/culture divide (Hallowell, 1976; Viveiros de Castro, 2012), and calls for the inclusion of Indigenous and traditional knowledge that are important in conservation science and natural resource management (Chew, 2024; Gonet, 2024; Hird et al., 2023; Jolly & Stronza, 2025; Reed et al., 2024). The importance of relational ontologies and multispecies entanglements as an alternative to domination paradigms brought forward in multispecies ethnography (Donna Haraway, 2003; Haraway, 2024; Kirksey & Helmreich, 2010; Kohn, 2013; Ogden et al., 2013; Tsing, 2013) have moved animals into anthropological discourse. Scholars that have focused on the intimacies of animal-human relationships have also brought attention to the reciprocity of potential relationships and the role of agency by animals (Armstrong-Oma, 2010; Sykes, 2014). Finally, environmental anthropological perspectives (Kopnina & Shoreman-Ouimet, 2011; Shoreman-Ouimet & Kopnina, 2015) and ethnoprimatological studies have demonstrated the complicated relationship between humans and nonhuman in the modern world (Fuentes, 2012; Palmer et al., 2015).

However, while posthumanist approaches do recognize the entanglement of humans in the natural world and offer ontologies that show the nonhuman world with agency and intentionality, studies are often set and focused on local place-based anthropological studies of specific communities (Kopnina, 2017). Kopnina (2017) notes anthropological critiques of biodiversity conservation that have defended traditional or Indigenous practices such as hunting or whaling as "cultural survival" (Einarsson, 1993; Kalland, 2009), even though they harm and threaten natural resources. While Indigenous ontologies are valuable and informative, in the modern world traditional lifeways are no longer immune from global food systems,

or always sustainable in a planet facing ecological devastation (Kopnina, 2017). Some anthropologists have also criticized humanist approaches as anthropocentric giving precedence to human rights over other species and have highlighted how human exceptionalism is central in these approaches (Haraway, 2008; King, 2013; Kopnina, 2016; Mullin, 1999; Sodikoff, 2011). Further, while approaches have called for attention on the interconnected and mutualistic aspects of human-animal relationships, they still do not recognize the rights or agency of nonhumans. For example, Sykes et al. (2020) explore the human-dog relationship throughout time and space to demonstrate the role of this key relationship in global history, as an example to mitigate future global challenges. However, this interdisciplinary study only highlights how the relationship between humans and our closest nonhuman animal is still *non-reciprocal*, the domesticated dog in the contemporary world has served humans, with no consideration of nonhuman rights or welfare.

Kopnina (2017) notes that despite theoretical and ethical discussions and anthropological musings of the place of humans in the natural work, multispecies investigations that remain depoliticized do little to recognize animal welfare. Despite contemporary anthropology's ongoing concern for the colonial and imperial roots of the field (Asad, 1973; Gough, 1968; Gupta & Stoolman, 2022; Jesús et al., 2023; Lewis, 1973; Pels, 1997) and gender roles and equality in the past and present (Adams & Gruen, 2014; Joyce, 2008; Nelson, 2007; Voss, 2008), there has been limited anthropological engagement with the ethics of human-animal interactions (Kopnina, 2017). I have often wondered how my colleagues that are deeply engaged in issues of colonialism, sexism, racism, and social justice are either unaware of the linked historical trajectory of violence and oppression in which our current animal food systems have been born, and/or are simply invested in *not* engaging in issues of nonhuman violence as it is relates to food production and consumption. Perhaps it is not surprising when we consider again that meat production and consumption is entangled in the politics of race, gender, nationality, and sexuality (Chatterjee & Subramaniam, 2021), both as political vestiges of the past and current political ideology. Carol Adams (Adams, 1995, 2000) argued 30 years ago that gender politics is deeply linked to how we think of the animals we eat. As discussed earlier, meat eating became the symbol of colonial power, of virility, and military prowess, but was also deeply embedded within a patriarchal society that is colonialist, racist, and committed to a gender binary (Adams, 2000). Male connotations associated with eating meat highlight species inequality, but Adams (1995, 2000) goes further to demonstrate how they define distinct gender roles, with meat signifying male dominance over females. Numerous studies have continued to demonstrate how meat consumption in contemporary society is culturally associated with masculinity, power, and linked to "natural" gender roles (Mertens & Oberhoff, 2023; Rogers, 2008; Rothgerber, 2013) (Fig. 4). Nearly all readers will recognize this association from their own lived experiences, moments when meat consumption signaled or reinforced masculine identity (for example the expectation that men order steak or burgers, the BBQ grill as a male space, male hunting trips, male vegetarians being questioned for their masculinity, or female vegetarians discounted as inferior or weak).



Fig. 4 Edited image of a contemporary sidewalk restaurant food sign taken by the author in Australia, 2025 that demonstrates how eating beef is still associated with masculinity

Adams' (1995) use of the "absent referent" in meat consumption (a psychological mechanism that enables both meat consumption and various forms of oppression by making the victim disappear conceptually) continues to demonstrate "unthinking consumption, lack of knowledge as to the origins of the flesh, and its sexual politics" (Chatterjee & Subramaniam, 2021, p. 6). Animals are literally absent referents, as meat they are literally dead, but also definitionally when we talk of meat as beef or veal, as opposed to cows or baby cows (Adams, 1995). For most consumers in the Global North meat is presented with clean packaging and hidden violence, entirely removed from the animal, its death in a slaughterhouse, or its

preparation in a butchering facility (Chiles & Fitzgerald, 2018; Specht, 2020; Vialles, 1994). Several public writers in recent decades have brought to light how the industrial food system conceals the origins of meat from consumers, disconnecting consumers from food origins (Foer, 2010; Ozeki, 1998; Pollan, 2006). Anthropologists are not immune to the absent referent. Further, those who study contemporary traditional or Indigenous societies, or the material aspects of their historical lifeways, often measure their own modern meat consumption against an idealized standard derived from these cultures. The traditional archaeolgical field projects of generations of White male scholars have centered eating and often hunting meat in field projects, as not just a celebration of traditional food ways but also masculinity. Finally, people develop psychological strategies to manage the contradiction between their emotional connections to animals and their awareness of animal consciousness and intelligence, while simultaneously consuming them as food (Croney & Swanson, 2023). Melanie Joy (Joy, 2009) introduced the term "carnism" to describe the invisible belief system that conditions people to eat certain animals. Her work centers around what's known as the "meat paradox" and why we express affection towards certain animals (like house pets) while eating others, and the cognitive dissonance this entails. This dissonance is at odds with our core human values as we are naturally empathic beings, but go against feelings of compassion and justice by eating animal products. As Joy outlines (2009) humans need to justify eating animals as normal, natural, and necessary. These same arguments have been used to justify other oppressive systems, such as those that give rise to male dominance and heterosexual supremacy (Joy, 2009).

Kopnina (2017) has argued that the anthropology of nonhumans must recognize the ethical and legal rights of animals or it "will remain depoliticized and disengaged" (2017, p. 350). Calls for a radical and engaged anthropology in medical experimentation and habitat destruction (Ferdowsian et al., 2022) must similarly engage with animal ethics and rights in the food industry (Kopnina, 2017; Nelson et al., 2014). While animal liberationists brought forth the need for animal rights in response to realization of large-scale violence to animals, the recent increase in environmental degradation and pandemic risk underscores not only the ethics of animal welfare but our own. In the case of animal rights in relation to specifically meat and the ethics of mechanized industrial slaughterhouses, the argument for social justice is set against the global demand for affordable cheap food (Kopnina, 2017). Scholars have questioned the feasibility of food security without affordable animal protein and argued for the need for compromising strategies (Croney et al., 2018; Croney & Swanson, 2023; Haraway, 2008). As so many of the posthumanist, multispecies ethnographies, and environmental anthropological studies have shown the relationship between humans and nonhumans is complex. As such solutions that expect animal rights to be applied universally, particularly in the Global South, cannot easily succeed. Recent studies in critical race studies and transdisciplinary postcolonial studies have highlighted the importance of contextual and transnational understanding of meat eating and production to better frame ecological and ethical consequences (for example see the volume by Chatterjee & Subramaniam, 2021). By the same token Adams' (2000) work on absent referent theory reveals how

different systems of oppression reinforce each other, suggesting that liberation movements must address these interconnections rather than working in isolation.

7 Conclusion

If anthropologists aim to be politically engaged in issues of colonialism, sexism, racism, social justice, and environmental degradation, the historical trajectory of violence and oppression in which our current animal food systems are situated is central to this endeavor. Anthropologists must no longer avert their gaze from animal suffering and welfare. They play a critical role in identifying the intersection of colonial violence, racism and sexism that is formative to contemporary meat production and consumption, and interrogating the unexamined cultural assumptions that legitimize meat eating and animal suffering. Similarly, global solutions to food demands require the unique anthropological approach to understand and navigate ecological and ethical solutions that can meet culturally and politically-specific contexts, particularly in the Global South. This call for action requires something more difficult than eating less meat as individuals, but for anthropologists to recognize their own inherent personal and professional cultural biases, to shift the narrative on the "naturalness" of eating contemporary meat and the violence towards animals it entails.

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Community Bioarchaeology, Stakeholders, and Ethics

Engaging the Public: Anthropology's Power to Impact Communities



Myeashea Alexander

"Hey, sis."

I heard a whispered voice approach my left shoulder as I leaned over a table that contained a human skeletal femur, an osteometric board, and some laminated sheets that included a few equations and conversions designed to estimate the height of an individual. I was in the middle of my shift as an Explainer—a museum employee or volunteer who connects and engages visitors with the exhibitions through demonstrations or interactive activities—in the public lab at the National Museum of Natural History in Washington, DC for the 'Written in Bone' anthropology exhibition.

The exhibition featured a series of artifacts, tableaus, and multimedia to highlight the use of modern forensic anthropological and archaeological methods used to examine human remains and material objects found at historical sites—more specifically, the excavation of seventeenth-century Jamestown, Virginia, and other nearby early colonial sites. As part of the public display, before guests exited the somewhat appropriately lugubrious exhibition, they were invited to experience what it would be like to solve a case by developing a biological profile using methods that forensic anthropologists would apply to a set of human remains and context materials.

I was one of several university students within this public lab, studying anthropology, medical history, criminology, archaeology, or some variation of these subjects who would don Smithsonian lab coats and spend a few hours a week walking guests through the hands-on experience and answering questions about the exhibition. When we were selected for these roles, the museum made sure that we felt prepared to engage deeply with the science and methods highlighted within the exhibition and that were integral to the actual research. The museum staff, including some of the top archaeology and forensic anthropology experts, made a great deal of effort to guarantee we were confident and encouraged to interact with the larger

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_10

research and excavation project. However, it would become curious, more social, sometimes personal, not always specifically scientific questions and conversations that would shape a great deal of my relationship with public engagement, science, and anthropology.

"Hey sis," the voice whispered again more urgently. I turned around to see a Black woman with an uneasy look on her face as I casually held a ziplock bag containing a mummified bear's paw. Seeing her discomfort, I lowered the bag, greeted her warmly, and welcomed her to the lab.

She then looked at the human femur on the table in front of me and said, "Sis, are you a doctor or somethin'? Girl! How can you stand all these dead things?"

I looked down at the ziplock bag in my hand, replying, "I understand why people can be uncomfortable with this. Occasionally I come across things that can be disturbing, but over time you get accustomed to certain aspects of the work and I think it helps when your purpose and reason are driving your studies."

Her family, who accompanied her, also turned around and began to crowd around the table as I gave my casual response, and acknowledged it's okay to be uncomfortable. They leaned in closely with concerned looks on their faces. One of them held up the darker side of his hand, raised an eyebrow, and with his other hand tapped the skin's surface as he cocked his head at me inquisitively. There was a lot of conversation happening within his movements. I knew what they were asking and why they had chosen me to have this discussion. They didn't want a sanitized, academically polished response about the importance of examining the intersections of scientific inquiry, anatomy, and history. They were asking a question that assumed a shared socio-cultural relationship and experience as African American people and our relationship with spirituality and the dead, and skepticism between primarily white scientific and academic institutions and Black communities.

I leaned in, adopted a more relaxed demeanor, and acknowledged the subtext of the conversation with a gesture simply known in the Black community as 'the nod.' Then, I invited them in the same manner as a friend into my academic journey, shared insights about my mom's thoughts about my choice of career, encouraged their questions, addressed their fears, misconceptions, and ideas, and commiserated over the historical realities of racism, discrimination, and medical violence that our shared identity specifically as African-Americans led to a general mistrust of institutions and systems. Furthermore, I didn't completely filter my concerns regarding the acquisition of artifacts within the overall collections, ethical handling of materials, and the types of conversations that were increasing across the field and within institutions. They seemed to display a kind of relief that as a representative of the space we were in, I encouraged and in many ways shared their scrutiny. Then, I explained all the tools on the table. As their guard lowered and they felt more comfortable, I saw one family member point to the femur without the same hesitation that he entered the room with, and say, "This is a thigh bone, right?!" As I affirmed his declaration, his family smiled and laughed. I brought over a bone cast that featured surgical interventions. They found this fascinating and quickly recalled surgeries and broken bones acquired by friends and family they knew.

Finally, they allowed me to walk them through the case. They approached each section with curiosity and enthusiasm, asking question after question, and decided they wanted to walk back through the exhibition again with their new perspective. As the family excitedly walked out of the lab, the woman turned to me and said, "Thank you so much! I didn't know *our* folks did this kinda thing."

Public engagement is opportunity and access. It's the space where research and information interact with the general public or specific communities in discussions and decision-making processes on matters that affect them or can shape or clear pathways towards societal benefits such as increased public interests and support for scientific research and literacy, dynamic education, and more robust, community-centered policymaking. Effective public engagement should at least clarify and demystify data, foster transparency, and help communities understand its significance. "Public engagement describes the myriad of ways in which the activity and benefits of higher education and research can be shared with the public. Engagement is by definition a two-way process, involving interaction and listening, with the goal of generating mutual benefit" (National Co-ordinating Centre for Public Engagement, NCCPE, n.d.).

Public engagement aims to create opportunities for an exchange of knowledge and offer the public a chance to contribute their perspectives and experiences to inform policy development and resolutions. The New York African Burial Ground project "invented archaeological public engagement at New York's African Burial Ground…[Dr. Michael Blakey led] the first ethical bioarchaeology, using principles of informed consent, to pursue the organized community's own research questions with material evidence. The resulting sophisticated reports, U. S. National Monument and rapid growth of publicly engaged archaeology are testament to the efficacy of our "clientage model," [showcasing] a successful example of the plural democratization of science" (Blakey, 2020).

It's also where experts, practitioners, researchers, and educators can transform and enhance perspective and possibility. When paired with experts who embody the lived experiences of communities that have been underrepresented, marginalized, and often negatively or incompletely depicted, public engagement becomes a powerful pathway toward addressing misconceptions and preconceived notions about a field, centering the voices and experiences of marginalized communities, and deemphasizing harmful assertions of race science that continue to influence and impact daily life. It can promote equity, empowerment, community engagement, and research development that addresses specific needs and experiences. "Meaningful community engagement… often involves partnerships and coalitions that help mobilize resources and influence systems, change relationships among partners, and serve as catalysts for changing policies, programs, and practices" (CDC, 2011).

Science and anthropology as academic and professional disciplines have complex relationships with many facets of the human experience that have not only contributed to but have assisted with the perpetuation and maintenance of many harmful ideologies including genderism and racism (Blakey, 1987; Gould, 1996; Watkins, 2020; Geller, 2025).

Now, as many field experts and researchers actively work to challenge and critique these beliefs and practices and to inform more just and equitable applications, there are other crucial ways in which public engagement is necessary to destabilize and eliminate the harmful outcomes forged in these disciplines' development. Works such as Harriet Washington's (2006) *Medical Apartheid: The Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present*, brilliantly order key moments in scientific and social history such as the Africans displayed in anthropological exhibitions, that illustrate some of how science, medicine, and anthropology have contributed to the aforementioned ideologies.

Public engagement offers an opportunity to address and counter contributing factors and historical events that have left a lasting impact on the vulnerable populations affected by damaging practices, ranging from ethical medical experimentation to cultural exploitation, within the field. As researcher, Amy Lonetree points out "museums can be very painful sites for Native peoples, as they are intimately tied to the colonization process" (2012). Historical medical abuses supported by cultural institutions such as the exhibition of Saartjie Baartman, a Khoikhoi woman treated as a biological oddity for Western audiences, and later in her death dissected and displayed at Paris' Museum of Man (Berry, 2017); or the controversy at the University of Pennsylvania Museum of Archaeology and Anthropology that intensified in 2020 "over its continuing possession and display of the Samuel G Morton Cranial Collection. The nineteenth-century collection of more than 1300 human skulls provided 'scientific evidence' used to promote white supremacy" and scientific racism (Lawrence & Lederer, 2023).

The impact of these practices has led to a sense of suspicion and mistrust toward medical and scientific establishments that have actively and passively reproduced racial and ethnic hierarchies. Now intentional long-term sustainable reparative action is required. Trofanenko and Segall (2014) explain that to begin "to understand the pedagogical mandate of public museums, one must understand the colonial practices that aided in their creation." This is all a necessary exercise in trust building. This is where I believe critical, creative, and inclusive public engagement has power.

Museums, labs, and traditional institutions where research happens can and should continue to evolve and develop inclusive community-based learning and engagement opportunities. However, public engagement does not need to be, and shouldn't be, relegated to just those buildings or events. In many significant ways, these community-centered spaces that seek to inform, preserve, educate, and encourage curiosity have been at the center of navigating friction and supporting reparative practices between the public and experts. Yet, with several centuries of skewed, inaccurate narratives that embraced detrimental representations of communities, and collections that disconnected cultural and material artifacts from purpose, researchers and experts need to be creative and flexible about finding non-traditional opportunities for public engagement. Additionally, over the decade spanning my trek from student to science communicator and professional, the exhibitions where I began to learn how to engage with the public would no longer be considered acceptable standards of practice regardless of how dynamic or exciting

they were. Many artifacts and remains on display, such as the collection of South American Shuar tsantsa, or shrunken heads, that once drew huge crowds at the Pitt Rivers Museum in Oxford, UK, lacked consent from the individuals or descendant communities represented. These types of cultural items were often unethically acquired or misrepresented which ultimately undermines the purpose of the exhibition and furthers deleterious impacts between scientific and academic establishments and the public. In a statement about the changes being made to the exhibits, Dr. Laura Van Broekhoven, Director of the Pitt Rivers Museum stated, "Rather than enabling our visitors to reach a deeper understanding of each other's ways of being, the displays reinforced racist and stereotypical thinking that goes against the museum's values today. The removal of the human remains also brings us in line with sector guidelines and code of ethics" (Pitt Rivers Museum, n.d.).

Broekhoven's statement is an example of how cultural institutions are responding to attempt to adapt to more inclusive practices and changing landscape of the museum experience and reckoning with harmful pasts. It is important to highlight that these shifts in landscapes are also a result of dedicated decades of community activism. For example, the team that was led by Dr. Michael Blakey in the excavation of the NY African Burial Ground project serves as a success model of collaboration and research co-design with descendant communities that resulted in mutually beneficial and respectful archaeological work that included a database, memorial and public museum for continued learning (Blakey et al., 2018). Native activists have worked to change museum practices through protesting displays and exhibitions that oversimplify Native American history and culture, calling for the repatriations of ancestral remains, pushing for legal policy protections such as the Native American Graves Protection and Repatriation Act (NAGPRA), and challenging the authority of Western museums to represent Native American communities without including the Native perspective (Erikson, 2019). The Field Museum in Chicago established a Center for Repatriation after removing some exhibitions featuring cultural objects of Indigenous coastal Northwest and Arctic peoples. The American Museum of Natural History closed two large halls featuring Native American artifacts.

In these shifts, we also get to reimagine these institutional spaces of community learning and engagement and collaborate our encounters with cultural heritage, natural sites, and identities beyond the lens of "the colonial practices that aided in their creation" (Trofanenko & Segall, 2014). "...[T]he sector needs to actively embrace new ways to co-design, co-produce, and co-curate, thereby engaging with the complex relationships between cultural heritage, identities and belongings" (Habib, 2021).

My interaction with the woman and her family at the Smithsonian was one of many that changed my relationship with how I believe science can be communicated to the public and the critical engagement between science, anthropology, and the community. During my time working in the lab, visitors would use the opportunity to compare Hollywood storylines to actual practice, ask for advice about working in the field, and question us about issues of clothing and hair as certain communities interested in science are often more scrutinized or deemed less serious

unless they conform to established clichés of professionalism—an issue that eventually would launch the social media hashtag #ThisIsWhatAScientistLooksLike promoting thousands of diverse scientists and students to post images of themselves challenging the stereotypes regarding who was allowed to participate in science. The campaign itself was an excellent bit of public engagement.

With the thousands of people I interacted with over that time, I learned that as interesting and important as the content is, who I am in proximity to that content also played a role in how the public engaged with the information. Public engagement isn't just about the 'what.' As representatives of the institution and the information, public engagement is also about 'who' gets to share the content, connect the meaning, and own the narratives.

The woman's salutation, "*Hey sis*," was my clue of the expectation she had of me, another Black woman, that she wanted me to '*keep it a buck, keep it a hunnit*'—unapologetically honest; to provide the insight that community and culture required of me rather than any masks I might need to wear for the sake of the institution. With those two words, '*Hey sis,*' there was a hope that I would not regurgitate the polished, ivory tower-approved jargon, and she'd be met with authenticity and familiarity in conversation. My recognition of this unspoken understanding was to make slight linguistic adjustments to my tone, word choice, and even body language in acknowledgment of our shared identity, language, and connection.

Spaces like museums, with their complicated pasts and contentious presents, can, directly and indirectly, feel like intimidating and exclusive atmospheres, even as the institutions move toward less damaging practices. Interactions with diverse, culturally sensitive, underrepresented experts can also provide connection and belonging and serve as models for potential unexplored career pathways. Through these types of conversations within these spaces, I began to understand that as a Black woman, my very existence as an expert in these spaces, challenged several stereotypes. Providing access to diverse practitioners and role models is also potent public engagement.

I don't feel the need to be inside a museum or academic institution to create meaningful learning experiences in science and anthropology for the public. Growing up the daughter of an itinerant preacher and schoolteacher, I was taught that if you had information or a message worth hearing, it was critical to meet people where they are—not just as a practice of empathy, but physically (Fig. 1). When I teach a science communication workshop, I usually start off by asking the participants where they encountered science in a way that piqued their interests and drove their curiosity to the point that they wanted to be involved as professionals. Many talk about a collection of moments over time that impacted and nurtured them. Often these experiences don't start in a museum or more formal higher education setting. They begin with a novel, movie, television show, comic book character, favorite teacher, video game, toy, or family pastime. Next, we discuss how public engagement provides an opportunity to translate our skills and leverage our strengths into meeting a community of people where they are and becoming a moment.



Fig. 1 The Rockstar Anthropology Bone Lab at the Troy, NY Summer Street Market

1 Case Study of the Rockstar Mobile Lab

The Rockstar Anthropologist started as a blog while I was in college as a way to share science and culture information and news with science and culture enthusiasts who weren't necessarily anthropologists or scientists. After volunteering and interning at museums, experiencing the power of public engagement and interactive learning as the facilitator of these types of activities, I decided to expand the blog into in-person events and launched the Rockstar Anthropologist Mobile Bone Lab. The mobile lab started as a mobile hands-on learning experience that demonstrates real forensic anthropology and archaeology methods through history and storytelling to solve fictional cases (Figs. 2 and 3).

The concept was built from the exercises at the Smithsonian that were part of the 'Written in Bone' exhibition that guided visitors through the process of creating a biological profile from skeletal remains and context clues. I leaned on my skills as a creative professional, to create flexible and adaptable content for the Rockstar Anthropologist, offering a range of activities including a YouTube series, podcast interviews, corporate team-building exercises, science communication workshops, anthropology-themed merchandise, community events, and curricula. At its core, the mobile lab is a chance to learn about anthropology and archaeology, but I want to be sure I offer an opportunity for participants to have a meaningful moment with the discipline regardless of where we meet.



Fig. 2 First graders at P.S. 3 Elementary, learning skeletal anatomy through storytelling, Brooklyn, NY

When I started the mobile lab, based on my academic journey and my experience communicating science and tech to the public, I developed some core values and beliefs that I wanted to be true for my public engagement projects.

1. If I believe there is value in scientists and experts communicating their research to the public, then I believe we need to be prepared to go to the public. With this in mind, I conceptualized the bone lab experience as mobile. I would bring the field trip to the audience or space.
2. Who was my audience? When I first developed my blog, I didn't consider my target audience deeply. I knew I wanted to have a more conversational and informal tone with my writing style, thus being very careful and thoughtful with how I used jargon and technical terms. However, I had a more deliberate approach with the Rockstar Anthropologist Mobile Bone Lab. Develop your approach with your audience in mind. I thought about the children who got to visit the museums I worked in, the questions they asked, and the excitement on their faces as they explored the exhibitions. I also thought about those who didn't and wouldn't have the opportunity. I set my sights on working specifically with elementary schools in New York City (NYC) that were considered underfunded and failing. These were the schools in the communities my friends and I grew up in and attended. My lived experience played a significant role in this decision. Statistically, these



Fig. 3 The Rockstar Anthropology Bone Lab at the Troy, NY Summer Street Markets

schools served Black and Latino communities and were less likely to have the support needed for regular field trips to places like museums or science shows. I connected with local community organizations that provided academic and socio-emotional services to schools and neighborhoods. With their guidance and introductions, I met with the teachers and administrators to hear more about their needs and to pitch my ideas. I also utilized my alumni network to reach out to classmates who had become teachers and were given placements in under-resourced community schools. After hosting two or three labs, positive word-of-mouth led to more schools and organizations finding me. Additionally, I purposely build the labs around non-Eurocentric experiences and narratives.

3. Hands-on is required. Interactive learning methods actively involve learners in the learning process, promote better retention and understanding of concepts, and keep them engaged. If I only had a short time with my groups, it needed to be memorable. I created a relay race that introduces the process of excavation through play (Fig. 4). I have coloring sheets and puzzles for kindergarteners (Fig. 5). My mobile bone lab features 6 stations designed for the participant to complete the steps of a biological profile through the guided examination of bone casts, artifacts, and historical storytelling (Fig. 2). For each station, students are encouraged to pick up the bone or artifact, solve stature estimation equations, use Munsell charts to match the color of the soil in tubes and run their fingers over casts that feature healed and unhealed bone pathology. When teaching a science communication workshop, I include speed rounds as a form of



Fig. 4 Elementary students playing "Archaeo-Tag", a relay race Alexander created for teaching archaeological methods

practice immediately after introducing the methods. Most of the activities I develop begin with the understanding that there will be an interactive component.

4. Establish rules of engagement. Working with the teachers and principals in the schools I visited, I learned that many of the kids I would address had experienced real violence and death. I needed to be careful with how I presented the information. I established rules for using bone casts and framing the narratives around the cases we solved. For example, I never present bones or cases that have evidence of gunshot wounds, even if the case could be a hunting incident. According to a Johns Hopkins Center for Gun Violence Solutions report (2022), firearms remained the leading cause of mortality for young people in the United States. The realities of schools and gun violence can be very triggering and scary for students navigating these daily realities. However, accidents that aren't likely to occur in their daily reality, such as being hit by a horse and buggy and not recovering from those injuries due to a lack of modern medicine, are not likely to stir up an emotional response. A historical incident featuring antique objects still can illustrate the skills needed to assess trauma or pathology. However, if I were to address a classroom in a horse-and-buggy community, I would likely develop a



Fig. 5 The Rockstar Anthropology Bone Lab at P.S. 3 Elementary, Brooklyn, NY

different case. Shape the subject matter to the audience aiming for a positive interaction.

5. Make it matter to the group being addressed. In my own academic experience, I have never had the experience of studying a historical site where African Americans lived and worked. Surprisingly, I have also never taken a New York archaeology course even though I attended undergrad and graduate school in New York. It has only been through self-motivated curiosity that I encountered this interesting archaeological research. For the cases that I create, I do a lot of research to pull data and information about the area near the communities that I plan to work with because the familiarity deepens the connection with the information. I've based cases on true historical events in locations like Flatbush, Brooklyn, Weeksville, Philipsburg Manor (Fig. 6), and of course, the African American Burial Ground in New York's Financial District, and I almost always focus the narrative on Black, immigrant, or Indigenous communities within the area.
6. It needs to be interdisciplinary. Anthropology is interdisciplinary. These public engagement events provide the perfect landscape to encourage multiple perspectives and make connections across subjects. 'SmARTs Night,' a community



Fig. 6 Middle schoolers at RSHM Life Center work on solving a Bone Lab case, Sleepy Hollow, NY

event held at a bar in NYC, boasted an evening of short lectures by experts in arts and culture. As one of the speakers and the only anthropologist, I chose to explore anthropologist, Clifford Geertz's essay "Art as a Cultural System," which examines the relationship between art and culture, reasoning that art as a communication tool is deeply embedded in social contexts (1983). Focusing on representations of Western art in the 1930s, I guided the audience through the varied representations of art such as *Guernica* painting by Picasso and the choreography of dancer Martha Graham's *Steps in the Street*, connecting the turbulence, angularity, and drama of the pieces to the socio-political tumult of the times. Knowing I was in a room full of creatives, using a variety of artistic styles and artists to share the work of an influential cultural anthropologist and discuss symbolic anthropology adds richness and layers to theory while also providing the audience with multiple points of access to the subject matter.

7. Make it a community event. When I am asked to bring the bone lab into classrooms, I always make sure that I communicate that I welcome teachers and family members to join the workshop. I block off several hours so that I can also be available for additional conversations and socialization. This is a valuable com-

ponent when working in non-traditional spaces. Within these spaces, my availability has helped teachers organize local field trips (another benefit of highlighting a historical site within reach of the community), I've been asked to join a parents' night to help highlight the importance of taking youth to museums and libraries or setting time aside to watch educational programming as a family, I've had teachers come up and tell me that they were unaware that slavery had existed in New York until they participated in my bone lab. As a child primarily educated in NYC schools, I was unaware of it, so I am not surprised. However, I am saddened that throughout the United States, there are increasing pressures and legislation geared toward suppressing and limiting vital components of history in schools and public institutions. This fact makes opportunities for public engagement even more necessary and critical.

When we consider some of our most salient influences, especially within our professional and academic decisions, many of us will likely find individuals or events that made a significant impact on us specifically via public engagement. I think of public television when I recall the first time I heard the phrase 'anthropology'. I remember the trips to natural history museums, kindergarten nature walks at the local science center, and running through the human heart model at the Franklin Institute—places that influenced me so deeply that I would one day return to their halls to provide similar meaningful experiences to the kids who now excitedly roam those exhibitions. I also consider the social situations that shaped me—underfunded schools, the effects of the crack epidemic on my neighborhood, the expectations of my civil rights activist mother, the racist taunts for being considered a nerd, and the words of my sister who once watched me nervously flip through my presentation cards as I practiced for my first research symposium. She listened, bored and uninterested, until finally stopping me to say, "Myeashea. This is your research and you know the data, right? Why does it matter? Tell me the story of the data."

So, now, that is what I do.

Public engagement is an occasion for presenting our research, and it's a chance to encourage collaboration, allyship, and solidarity. It's an opportunity for individuals and communities to participate in public dialogue, challenge perceptions, and contribute to public discourse. When experts can connect research, narrative, and why it matters in collaboration with the community, public engagement can strengthen collective efforts within many facets of social life and amplify the impact of social justice movements. As a researcher, scientist, or professional, what is your 'why'? Why does your work matter? What is at stake and how can you leverage community involvement to further that purpose, hopefully, in service toward a greater good?

Within anthropology and its many approaches to understanding human experience, through public engagement, we have skills and training to curate experiences that amplify the voices and experiences of marginalized communities and our shared humanity. We can foster intercultural dialogue, raise awareness, encourage individuals and communities to question and push back on oppressive systems, and develop and uplift models that help address complex societal challenges from

multiple angles. For example, anthropologist and physician, Dr. Paul Farmer (1999, 2003), paired his acute anthropological perspectives with his medical training to tackle global health crises, and anthropologist Genevieve Bell worked with Intel to understand and inform the future of technology.

Public engagement fuels the empowerment of communities, offering them unparalleled opportunities to actively shape decision-making processes that profoundly shape their existence. As experts and researchers, we should be designing spaces and going to places where our research and knowledge can encourage active participation, facilitate community organizing, and nurture the growth of grassroots initiatives. In these ways, our work is given meaning and a chance to become an indispensable force in the pursuit of social justice. This transformative power ensures that affected communities possess agency and wield significant influence over the very issues that have a bearing on their lives—past, present, and future.

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Human Remains as 'Conflict Antiquities' and How Bioarchaeology and Forensic Anthropology Can Change the Narrative

Damien Huffer, Katherine Davidson, and Shawn Graham

1 Introduction

There is a substantial unregulated global trade in human remains that has persisted for decades, if not centuries. In its recent historic and contemporary manifestations, human remains have been sought for the purposes of medical education (e.g., Agarwal, 2024), curation and display by museums to further early concepts of 'race science' or pique public curiosity (e.g., Redman, 2016, 2021) and for private collection and commerce. What used to be a 'niche' collectors market is today a globally dispersed phenomenon, in large part because of the internet. We can only estimate the scale of today's human remains trade, on or offline, but annual snapshots on just one platform (Instagram), for those public accounts bold enough to state prices at the time, suggest global commerce in the hundreds of thousands of dollars (Graham & Huffer, 2020; Huffer & Graham, 2017). It is frequent enough that, in the United States, online platforms like eBay and Etsy have tried to address it by banning sales (e.g., Hugo, 2016; Kim, 2012; Vergano, 2016). This effort has only been partially successful because of limited human resources devoted to the challenge. Even if it were addressed on these major sites, smaller regional platforms attempt to fill the

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*, Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_11

void (e.g., Huffer et al., 2022). Much of the global traffic has now moved to social media, for example Meta's platforms Facebook and Instagram.

The unrelenting fight against human remains trafficking is constantly evolving as the interconnected network of platforms and public and private spaces in which collectors form networks and make sales also evolves. This chapter is focused on the phenomenon of human remains marketed via evidence for trauma and/or violence to the remains. We argue that marketed 'origin stories' which describe real or imagined violence inspire certain 'niche' collectors to buy, sell, trade, or show off human remains where osteological indications of ante-, peri-, or postmortem trauma are present. We explore the notion that this violence is *the* selling point and conclude by discussing what bioarchaeologists and forensic anthropologists can do when encountering the trade.

The fight against human remains trafficking has also been made more difficult by media sometimes all-too ready to support no-questions-asked collecting (Mufson, 2018; Schwartz, 2019). Standing against it has, however, fostered collaborations between academics, law enforcement, curators, and descendant communities (e.g., Halling & Seidemann, 2016; Huffer et al., 2019; Huffer & Chappell, 2014; Huffer & Charlton, 2019; Huffer & Graham, 2017, 2018; Huxley & Finnegan, 2004). Bioarchaeological and genetic research is not immune from critique when samples derive from contentiously sourced remains (e.g., Dorador & Harrod, 2018; Halcrow et al., 2018).

This chapter also provides a discussion of what bioarcheologists and forensic anthropologists can do when encountering this phenomenon online. It is our intention to enlist assistance from this large community of researchers and provide guidelines for how to become part of a valuable global collaboration between academics, law enforcement, curators, and descendant communities working to end this practice (Halling & Seidemann, 2016; Huffer et al., 2019; Huffer & Chappell, 2014; Huffer & Charlton, 2019; Huffer & Graham, 2017, 2018; Huffer & Charlton, 2019; Huxley & Finnegan, 2004).

2 A Global, Growing, Problem

In January 2018, Customs agents in Bali, Indonesia, seized 24 human skulls bound for an unidentified collector based in The Netherlands (Associated Press, 2018). Media reports indicated that the original consigner claimed they were replicas, but subsequent osteological analysis by Indonesian experts determined they were real crania affiliated with the Dayak and Asmat cultures. How cultural affiliation was ascertained was not stated in the media. The destination of the remains being The Netherlands, a former colonial superpower, indicates that the South-North flow of human remains continues.

The stories that make the news (e.g., Bailey, 2006; Beiter, 2016; Choi, 2011; ICE, 2011; Killgrove, 2016a, b; McNab, 2015; Mills, 2018; O'Connor, 2013; Press Trust of India, 2017) are only the tip of an iceberg. The skeletal remains trade is but one part of a global "red market" for products derived from living or recently living individuals (Carney, 2011; Graham et al., 2020; Jafar, 2009; Nahman, 2011). A substantial proportion of the skeletal human remains trade consists of so-called "medical specimens" that belie a history of exploitation and illicit export out of primarily India, or the poor houses and asylums of Europe and the United States, from at least the late 1800s until the 1980s (Agarwal, 2024; Breda, 2023; Carney, 2011; Davidson, 2007). Rhetoric transforms them into something "for study purposes only" (Halling & Seidemann, 2016; Huxley & Finnegan, 2004; Pokines, 2015). It is a dehumanizing practice that allows traders to sell remains that retain clear evidence of prior burial—primary deposition in soil, a coffin, or water—that should warn buyers of potential grave robbing (e.g., Tibbett & Carter, 2008).

Human remains trafficking also includes individuals removed from archaeological context, or with some degree of antiquity (Pearce, 2013; Huffer & Chappell, 2014; Sledzik & Ousley, 1991). Remains glossed as "tribal art" usually refer to Indigenous Ancestral remains (often skulls or partial crania) decorated, carved, or otherwise modified for diverse uses during the colonial past *c.* early 1800s—to mid-1900s; remains which are often still venerated (Hayflick & Robbins, 2020; Huffer & Chappell, 2014; Pashby, 2024). Numerous cultures modified the remains of Ancestors or enemies for different purposes. A special kind of trade in culturally modified remains (e.g., carved or smoked Dayak crania, overmodelled skulls from Vanuatu, or *tsantsa* "shrunken heads") has evolved due to romanticism about the exotic "other," particularly in cases where colonial powers suppressed the modification of human remains and where these practices were later revived and commercialized for tourists (Becker, 2015; Dobratz, 2008; Jacobs, 2011; Rubenstein, 2007). It is this fascination with real or imagined violence that inspires certain 'niche' collectors to buy, sell, trade, or show off such remains.

3 Human Remains as 'Conflict Antiquities' by Proxy?

There is a growing body of scholarship focused on defining, understanding, and mitigating the flow of so-called 'conflict antiquities' out of conflict zones such as from Iraq and Syria under ISIS control, Afghanistan during the Taliban's ascension to power in 2001, Cambodia during the Khmer Rouge regime, or the ongoing war in Ukraine. Conflict antiquities are obtained and exported before, during, and after the conflicts themselves, and go primarily into the hands of Western collectors (e.g., Brosché et al., 2017; Fabiani, 2016; Hardy, 2021; Novak, 2017). Whenever and wherever conflict erupts, and regardless of who is involved, the risk to archaeological sites, monuments, museums, and other repositories is pressing. As Hardy (2015, p. 21) points out in a wide-ranging overview and general history of terminology, an important distinction is made between 'blood antiquities' (cultural property

extracted through violence by politically motivated armed groups) and 'conflict antiquities' (cultural property sold and exported to finance politically motivated human rights abusers).

While most research into conflict antiquities has focused on the acquisition and movement of *artefacts*, especially from the Middle East and North Africa (MENA) region, as well as whether, and how much, the antiquities trade funds terrorist organizations (e.g., Yates & Brodie, 2023; Weirich, 2021), there has been little to no research investigating whether human remains of any type are exported out of active conflict zones. This is due to the extreme difficulty of collecting real time data, whether by non-participant observation or interviews with combatants or intermediaries after the fact. However, it is worth asking to what extent certain human remains circulating in today's market are 'conflict antiquities' by proxy; not only tangible remains of once living people who may or may not have met violent ends but dehumanized 'things' that attract buyers and sellers of a certain mindset.

We argue that human remains trafficked precisely because of clear or supposed evidence for ante- or peri-mortem trauma illustrate the intersection between the 'desirescapes' that drive up-market collecting and the continued attraction of 'dark heritage' places and material (Hanson, 2011; Herva et al., 2016; Huhák & Szécsényi, 2023; Koskinen-Koivisto, 2016; Yates & Mackenzie, 2021). For example, in Huffer and Graham (2023, p. 14–15) we describe a public photo album posted to an Instagram account that documents an individual's looting and cleaning of a skull, likely removed from a grave somewhere on World War II's Eastern Front. It is unknown if this skull was sold or meant to sell, but there is a real concern that examples such as this (and those below) derive from recent looting.

4 "I brought this beauty back from Vietnam…"

In Huffer and Graham (2023, p. 131), we describe another public post from Instagram, captured in June 2017, that illustrates one way that real or perceived violent origins for remains can be attractive. This seller claims that a skull on offer was "brought back from Vietnam by an American soldier." Attested to be in "amazing condition", the seller requests prospective buyers' direct message for more information and states that worldwide shipping is available. We do not know how many individuals replied, or whether anyone purchased this skull. This post begins a section in Huffer and Graham (2023) discussing how it may one day be possible to discern the most probable ancestry of trafficked remains when only photographs from sales posts are available, and when the original poster and subsequent commentors are demonstrably uncertain about basic aspects of the demographic profile of the remains for sale (see Graham et al., 2020). We must stress here that, as discussed in Huffer and Graham (2023) and Graham et al. (2020), machine learning or neural networks of any type is not yet able to positively discern genetic ancestry from cranio-facial morphology from photographs alone. What it is beginning to be able to do is cast doubt on dealer-provided ancestry estimations, especially where

the seller admits to guessing or not knowing how to discern key demographic criteria such as age or sex estimates.

The four examples from private Facebook groups discussed below further demonstrate how trauma and violence can sell. When users post content to non-public social media, research ethics requires that we undertake steps to maintain individuals' privacy. Accordingly, we divided the data collection process into three phases. Firstly, one of us collected posts through manual screen capture (not 'scraping' or web crawling) within buying/selling groups accessed via use of a 'lurker account,' a common approach within 'covert digital ethnography,' especially when criminality is known or suspected (Bryman, 2012, pp. 433–436; Huffer, 2024). All identifying information linked to the original user was removed. Text was transcribed using locally hosted OCR (Optical Character Recognition) software by the second author and assigned an index number in a spreadsheet. Then, the third author paraphrased the content and any subsequent comments. The original unmodified screen captures are kept in secure external hard drives in the first author's sole possession. As part of our ethics board approved protocol, we will only describe the posts and summarize the nature of the discourse.

4.1 Example 1

This is a post by a group administrator, welcoming new members. It shows a darkly stained cranium stacked on top of two mandibles and the maxillo-facial portion of different individuals, all on a glass shelf viewed in closeup. Other remains are just visible on a shelf below. The original poster's text suggests that the dark stained skull might be Roman (possibly Gaul), with what they refer to as "numerous wounds" all allegedly located on the occipital, left parietal or sphenoid, or basicranium, and thus not visible in the original post itself. The winking emoji in the text and emojis conveying surprise or joy in the three comments posted at time of screen capture attest to the nature and condition of the remains being exceptional. Realized price, if any, is unknown, as the post at the time of capture seems intended to show off a prized "item" in the admin's collection.

4.2 Example 2

This post is an even more direct example of foregrounding the excitement of owning remains from an individual likely to have met a violent end. The original poster deliberately refers to a "trauma skull" with an alleged "bullet hol [*sic*]" and takes pains to clearly emphasize availability, draw attention to the post with red exclamation marks, and state a price directly, while also encouraging price negotiation. Whether the stated price went up or down or any sale happened is also unknown.

4.3 Example 3

This post presents one of the clearest examples we have seen of real or alleged violence being central to a successful online sale "a few years back" (if the seller is taken at their word). The post dates to 2018 and shows six skulls arranged face-on on a shelf, with a *tsantsa* (a so-called "shrunken head" created by the Amazonian Shuar, Achuar, Awajún/Aguaruna, Wampís/Huambisa and Candoshi-Shapra [SAAWC] People for ceremonial and, later, commercial purposes) in the background (see Houlton & Wilkinson, 2016). Five of the foregrounded skulls are numbered 1–5, from left to right. In the original text of the post, each number identifies the skull as the victim of either "head hunting" (in this case, by the Asmat), or of recent genocides around the world. In two comments, the seller highlights (but does not show) the presence of bullet hole entrance wounds in the occipital. Two individuals ask if anything like this is available now. One individual requests photos of the back of the skulls to see the bullet holes. Another individual asks how one of the victims died, to which the seller references the bullet holes as probable cause of death, highlighting that "bones and parts of their uniforms" were allegedly associated with the skull upon recovery.

4.4 Example 4

The fourth post illustrates that the acquisition and sale of so-called 'medical specimens' also at times emphasizes the violence that influenced these individuals becoming 'specimens' in the first place. This example is sold as an 'antique medical study skull' with alleged healed (rather, healing) trauma to the frontal bone. A price of $1000 is stated for select shipping within the US. One commentator mentions that they "normally like a darker patina" but love this particular skull. Others mention how great or amazing 'he'/ 'it' is, but to one, the skull "almost looks cartoonish." Previous studies (e.g., Halling & Seidemann, 2016) have suggested average prices for 'teaching' skulls to be in the few hundreds of dollars USD, while more high-profile vendors sell such remains for thousands and run cross-platform PR campaigns to 'destigmatize a stigmatized industry' (Anders, 2021; Toledo, 2021).

5 Violence as a Selling Point?

These examples are but four from among many other examples seen posted across several platforms. The appeal to violence in these images is *the* selling point, which stands in contrast to how heritage professionals and professional codes of ethics show care and respect for human remains. For example, while researching the Rwandan genocide and the removal of victims to Berlin, cultural heritage researcher

Annalisa Bolin was denied access to human remains being stored in museums because she did not "have a reason to see them" (Bolin, 2022). Bolin (2022) nevertheless refrained from displaying images of human remains in her ensuing publication, opting to paraphrase and describe them, explaining that the discourse around display is that it perpetuates violence against already victimized people.

She contends that observation is a double-edged sword, where on one hand, viewing is validating the lives of the victims, but on the other, viewing is violating the dignity of the victims. She notes that the atmosphere around observing remains of the dead or places of mass destruction has undergone a substantial tone shift within the last decade; for example, she describes not being allowed to photograph a memorial site in Rwanda from far away, despite being permitted to in the past. Whether through genocide (as described by Bolin, 2022 and Racher, 2023), graverobbing (as in Davidson, 2007), or warfare and trafficking (see Graham & Huffer, 2023), they become "second class in life and even in death" (Racher, 2023). In acknowledgement of the complicated origins of human remains in their possession, museums such as the American Museum of Natural History and the Penn Museum are beginning to remove human remains from display, signaling a mainstream shift in awareness around the treatment of victimized communities (Crimmins, 2023; Hicks, 2020; Pitt Rivers Museum, 2024; Schrader, 2023).

Whereas museums are increasingly held to high ethical standards by researchers, activists and the public, today's human remains trade operates through underground or subaltern groups (Davidson et al., 2021). As might be expected, ethical contentions with the history of violence against marginalized or victimized peoples often take a backseat when there are deals to be made and status from one's peers to gain by owning and displaying the so-called 'best pieces'. Even when a poster is questioned about how and why they have a particular individual's remains, we have observed that sellers can always eventually find buyers if the price and "story" is right. This story is often connected to narratives of violence (such as colonial fantasies about exploration or the fetishization of an exotic 'other'), which underpins a uniquely macabre 'desirescape' (Huffer & Graham, 2023, p. 33, 153; Yates & Mackenzie, 2021). The taboo nature of 'owning' a person further adds to the notoriety of the buyers and sellers, and thus every sale adds to the violence of the narrative around the remains (Huffer & Graham, 2023: p. 52).

6 How Bioarchaeology and Forensic Anthropology Can Change the Narrative

As social media and e-commerce continue to evolve and new platforms are launched, the human remains trade will find new venues. It does not need to rely on the Dark Net or more hidden platforms such as Telegram and Viber; the affordances of 'regular' platforms are more than enough (Graham & Huffer, 2023). Of course, Dark Net spaces are not necessarily devoid of evidence for trafficking (e.g., Al-Azm, 2023;

Paul, 2018), and recently, dealers on social media linking to photo albums in Telegram have been observed. Without enough individuals to regularly monitor activity, or new automated tools to do so securely, mapping and understanding the entire depth and breadth of the trade will remain challenging. The question also remains of how to obtain and present useful anonymized information from social media when investigating everything from product marketing to diverse forms of organized crime (e.g., Kleinberg, 2007; Zhou et al., 2008).

Furthermore, collectors and dealers readily negotiate by "DM" (direct messaging). In late 2023, in fact, Meta converted their Messenger and Instagram apps to full end-to-end encryption, with immediate outcry from law enforcement and NGOs working to, for example, mitigate the spread of Child Sexual Assault Material (CSAM, see Crisan, 2023; Milmo, 2023). Therefore, the exact price realized, shipping method, current location of the remains purchased, or even details of provenience or ownership history crucial to ascertaining legality or authenticity, can now be shared in full secrecy. Indeed, the full story behind a skeleton (e.g., Huffer & Graham, 2023) is often discernible only to law enforcement agents investigating cases or conducting depositions. Academic scholars bound by university and funding agency codes of ethics will never have the same power to elicit and cross-check information from participants in trafficking networks.

However, bioarchaeologists and forensic anthropologists, students and professionals alike, can still meaningfully contribute to efforts to change the societal and media narratives that give oxygen to the human remains trade, as well as aid law enforcement investigations and potential prosecutions. Specifically, professionals can:

- *Report any human remains sales posts to the platforms themselves*: While most social media platforms ignore such reporting or do little to prevent offenders from returning, the more reports received, the less such violations of many platforms' terms of service can be ignored.
- *Screen capture such posts and all associated comments and report them to relevant authorities*: Such authorities might include medical examiners offices, local police, or State Historic Preservation Offices (in the United States). Even though civilian researchers can only provide 'intel' ('intelligence') and not initiate investigatory action, the context provided from even a general analysis of photographs can prompt further attention or long-term monitoring of specific buyers or sellers.
- *Make yourself known as a subject-matter expert available to consult on cases*: This is crucial, as criminal trafficking investigations at all levels rely on expert testimony, and in many jurisdictions, go-to experts might be hard to locate. If one feels comfortable doing so, then students and professionals who proactively nominate themselves can also benefit from new research opportunities if permission is granted to undertake research (including potentially isotopic or DNA analysis) in aid of investigations.
- *Where comfortable, make your own response videos on platforms more likely to go 'viral', such as YouTube or TikTok* (see Graham et al. (2022) for discussion of

what this could look like). Regardless of why an individual uses social media, influence and attention are key end-goals. This applies especially when commerce (licit or not) is the goal. As more individuals begin to question how and why private human remains collecting exists, there will be more individuals receptive to hearing expert voices. Graham et al. (2022) discuss examples of why some platforms better facilitate push-back than others. Any push-back against dealers on the same platforms they operate on must include a clear discussion of ethics and blur any examples of the human remains being discussed, if they are displayed at all. This should only be undertaken when safe to do so, i.e., when one's personal social media profiles are secured as much as possible.

As both beneficiaries and vocal critics of past institutional collecting practices, practices that inspire many 'niche' collectors today, bioarchaeologists and forensic anthropologists can lead efforts to unravel the relationships between collectors and institutions in the past and present (e.g., de la Cova, 2019; Stantis et al., 2023), and the numerous ways that human remains are acquired and sold today. It is a realm in which bioarchaeologists can both apply our skills to immediate effect and continue to speak out against media narratives that still all-too-often "both sides" the ethical and moral issues underpinning collecting or oversimplify the legal landscape. The case study sales posts discussed above demonstrate that today's human remains trade is quite literally not a 'victimless crime.'

Acknowledgements The authors would like to thank the editors for the invitation to participate in this volume. The authors also thank their respective families for their continued support and encouragement. This chapter draws on research supported by the Social Sciences and Humanities Research Council of Canada.

Ethics Approval The research protocols were approved by the Carleton University Research Ethics Board, in alignment with the 'Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS2' from the *Social Science and Humanities Research Council of Canada*.

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The Road to Hell Is Paved with Good Intentions: Queering Biotechnical Analysis of Sex Estimation



Pamela L. Geller

1 Introduction

This chapter is a meditation on doing and thinking. Bioarchaeology tends to approach the two as mutually exclusive—that is, the methods used to generate a data set operate independent of the theory used to make sense of it. Instead, I see method and theory as entangled, as existing in a feedback loop. Here I consider advances in doing and thinking as they relate to the bioarchaeological study of socio-sexual lives,[1] as well as the degree to which estimation of sexual dimorphism allows us to say something about gender and/or sexuality.

I begin with a discussion of recent *biotechnical (or biochemical) advances* that reveal molecular Truth. These techniques are exceedingly useful, though a material-discursive analysis reveals them as a modern way of "making sex" (Laqueur, 1990). How then might they be applicable to the ancient peoples we study? *Conceptual advances* in feminist and queer scholarship, which continue to chip away at hetero-normative truths, prompt the same question. Specifically, I consider how conversations about "intersex" and "non-binary" are germane to bioarchaeological investigations. The final type of advances discussed are *technological advances in*

[1] Elsewhere, I have used socio-sexual, to capture the interrelatedness but not the interchangeability of sex, gender, and sexuality (Geller, 2017a). The term also refers to identities as intersectional—the complex outcome of biocultural entanglements, contingent on context, and cross-cut by multiple variables (i.e., gender, sexuality, age, race/ethnicity, class, etc.).

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_12

communication, digital media that morph psychological perspectives and cerebral functioning. As brain scientists began documenting soon after the internet's invention, some four decades ago (though this origin point is debated [Naughton, 2016]), our interactions—or intra-actions, as I explain—have positive and negative outcomes.

What happens when these moving parts collide—when the biotechnology used to examine ancient bodies destabilizes narratives portraying heteronormativity as universal, and then this information is disseminated globally on myriad, online communication platforms? What I have found is that the road to hell, which in this case extends from the ancient past to the politicized present, is paved with good intentions (though sometimes bad ones). In pointing this out, my aim is not to assign culpability to any one group. Rather, when done and thought about in a deep and transdisciplinary way, culturally contextualized investigations of socio-sexual lives can challenge a priori assumptions about human nature. Accordingly, bioarchaeologists will produce scholarship that is ethically responsible and politically attuned.

2 Biotechnical Advances

When analyzing skulls and pelves to estimate sex, multiple confounders can arise. Dicey preservation. An accuracy rate of 88% for the skull (Walker, 2008) and 90–95% for the pelvis (Phenice, 1969). Incompatibility between ancient case studies and modern reference samples. Regular and systematic bias (i.e., sexism) that overinflates the number of males (Weiss, 1972). Given these obstacles, biotechnical and biochemical innovations that materialize chromosomal sex have advanced bioarchaeologists' estimation of sex. Over the past 10 years, ancient DNA (aDNA) analysis has benefitted from major technical biochemical improvements; notably, next-generation sequencing (NGS) (in comparison to Polymerase Chain Reaction (PCR) approaches) is more cost effective, requires less source material, and efficiently extracts millions of loci (Jones & Bösl, 2021; Orlando et al., 2021). More recently, proteomic studies that examine dental enamel to detect chromosomal sex-specific peptides are breaking new ground. Researchers are finetuning recovery methods as they proceed (e.g., Buonasera et al., 2020; Parker et al., 2019, 2021; Štamfelj, 2021; Stewart et al., 2017). They are using dimorphic enamel peptide analysis to revisit decedents whose bodies and burials have generated gender confusion (Haas et al., 2020; Lugli et al., 2019). Researchers are also applying the method to deciduous teeth to explore the implications for studies of infancy and childhood (e.g., Gowland et al., 2021; Lugli et al., 2020).

These methods are modern ways to make sex. I have made this case for aDNA studies in prior publications (Geller, 2017a, b), and it is no less relevant to dimorphic enamel peptide analysis. To review briefly, scholars have demonstrated that a two-sex model—a rigidly dimorphic vision of anatomy and physiology—gained hegemony in scientific and medical circles during the Enlightenment (Cadden,

1993; King, 2013; Laqueur[2] 1990; Park, 2010; Schiebinger, 1993). Prior to the eighteenth century, medico-scientific practitioners (e.g., physicians, anatomists, midwives) advanced multiple and competing models to explain sex differences. Rather than recognizing sex as a stable category, a historic analysis instructs us in how western ways of knowing the biological body are mutable, multiple, and informed by sociopolitical circumstances. To be clear, this understanding of sex is not the same thing as saying there is no biological basis for it. The latter is an oversimplification that represents the materiality of bodies as divorced from the discourse used to describe them. But, as the theoretical physicist and feminist scholar Karen Barad (2007) stresses, the material and discursive are entangled; they intra-act.[3]

Intra-action is distinct from interaction. Interaction assumes entities pre-exist or exist independently of each other. Intra-action, in contrast, encapsulates how entities are relational—"they help constitute one another," writes Barad (2007, p. 239). Central to intra-action for her is biotechnical innovation, like "apparatuses of bodily production" (2007, p. 140) that are instrumental in becoming. These, Barad continues, "are not mere observing instruments but boundary-drawing practices—specific material (re)configurings of the world—which come to matter." As an example, she has looked at piezoelectric crystals used in *ultrasonic* transducers to generate acoustic waves. More familiarly, she is talking about an apparatus that turns sound energy into a fetal image, or sonogram. In the case of ultrasonography, human bodies, ultrasound waves, piezoelectric transducers, and computer screens all intra-act to produce a phenomenon, i.e., a "fetus," which is made meaningful in a historical moment and sociopolitical context. In contemporary American society, for example, such intra-action brings a human into being and anoints her or him with a sociosexual identity, a right to life, and citizenship.

As legislators have argued, and then politicized by banning abortion, once an ultrasound detects a heartbeat, being and anointing occurs as early as 6 weeks in utero, well before viability outside of the womb. Intra-action involves a dynamic and layered process that simultaneously constitutes what it observes and limits the meanings that can be construed. This is not to say that matter is not real or purely a social construction. But there are two points to underscore. The first pertains to one's research aims. The information your apparatuses produce is dictated by the ends you hope to achieve with it. What question are you asking and why? Epistemology is at issue here. The second point pertains to ontological framings. Biotechnology approaches the body at the nanoscale. A vision of the body at this

[2] While Laqueur's work has been highly influential, writers more recently have identified its major shortcomings. Helen King's (2013) critique, for example, finds his analysis insufficiently researched (it neglects more feminist-oriented case studies and narratives) and reductive (i.e., a one- vs. a two-sex model).

[3] Barad builds on Donna Haraway's (1991, 2003) ideas about the fluidity and impermeability of boundaries—between nature and culture, human and non-human, subject and object—and Judith Butler's (1993, 1999) discussion of performativity, which explain how discursive iteration can produce and reinforce material (or bodily) phenomena.

level presents a different understanding than observations conducted at the macroscopic scale, and it contrasts markedly with sensual, embodied ways of knowing one's self while pregnant or otherwise.

This same kind of intellectual exercise can be applied to genomic and proteomic approaches. To estimate the sex of ancient individuals, these analyses involve multiple stages and a host of apparatuses (e.g., incubators, amplification kits, purifier kits, spectrophotometers). In thinking with Barad, human bodies (or their fragments) intra-act with machines that quantify the organic while computer screens next represent (or translate) these data. For aDNA analysis, the apparatus most appropriate is the DNA sequencer. This machine reads a DNA sample and then generates an electronic file with symbols representing the sequence of its bases—adenine, guanine, cytosine, and thymine (Heather & Chain, 2016; Hunkapiller et al., 1991; Huo et al., 2021; Shendure et al., 2017). For proteomic studies, a liquid chromatography mass spectrometer (or LC-MS) is used to analyze peptides, like amelogenin, extracted from dental enamel (e.g., Lugli et al., 2019; Parker et al., 2019; Stewart et al., 2017). (Amelogenin has two isoforms that are linked to sex chromosomes, AMELX is present in both sexes and AMELY is only in males.)

This intra-action—a convergence between molecular fragments extracted from a body, biotechnical apparatuses, and computers that read data—produces chromosomal sex. In our historical moment, one in which a genetic revolution has instigated a molecularization[4] of identity (as connected to race, ethnicity, citizenship, gender, sexuality), such intra-action is not neutral. There has been deliberation about an emergent (or resurgent) ontology that sees biology as destiny (i.e., human nature) and genetics as the "blueprint," as well as the bioethics of conducting this work (McGonigle & Benjamin, 2016; McGonigle, 2021). But what does such an ontological framing, a turning to the molecular, *mean* for ancient and historic communities who did not have the biotechnical ability to peer into bodies at so nano a scale? Not much, I maintain.

At this intellectual stage, it may be overly optimistic to claim that the majority of bioarchaeologists who use molecular methods to estimate sex recognize a difference between it and gender. (The latter is learned, not innate, and formed, or transformed, throughout a life course, mostly through societal imposition but also with the possibility of subjective identification.) The few who broach sex and gender in their analyses offer oversimplified reviews of quite complex concepts (e.g., Gasparini et al., 2022; Kimsis et al., 2023). More egregious are population geneticists who wield considerable influence in these conversations (and with influence should come responsibility, especially when communicating to non-specialist audiences). As they travel down this path of inquiry, aDNA analysts conflate sex and gender. They miss the nuance between "estimation" and "determination." Dichotomy

[4] Molecularization shares conceptual kinship with geneticization as coined by Abby Lippman (1998, 2000), but it encapsulates biotechnical innovations, more broadly. McGonigle (2021:128) defines the former as "the privileging of the molecular realm as a site for authoritative articulations of ethnonational identity and belonging." I see the concept as applicable to other facets of identity, like gender and sexuality.

is assumed, as is human nature (one understood as heteronormative in its composition). They are disinclined to assess the political or ethical consequences of their work, although this is changing (e.g., Bardill et al., 2018; Fleskes et al., 2022; Tsosie et al., 2020). The culture-historical contexts of samples are often omitted since crafting grand-scale narratives about human groups, space, and time is the aim—for instance, mobility, which is argued to be propelled by males, over centuries and millennia.[5] There is a reticence to engage with feminist and queer writers, who have authored significant ideas about sex, gender, and sexuality.[6]

A molecularization of our ontological frames also disconnects genotypic sex from the physical and behavioral traits, or phenotype, displayed by an individual. Casimir Pulaski is a great example (Fig. 1). A biohistoric analysis suggests that he may have had an intersex condition, possibly congenital adrenal hyperplasia (CAH) (Geller, 2017a, p. 149). Archival documentation placed his Catholic baptism in the family's home, atypical for eighteenth century Warsaw, Poland where he was born. In explanation, records state "sine coeremoniis ob debilitatem," an indication that the infant was baptized without ceremony on account of an infirmity or debility.[7] Portraits depict him with hairline recession at the temples. His pelvis expressed female morphology, his skull a mosaic of female and male traits, and he was of short stature (5 feet 3 inches). But, more recently, I have reflected on the Pulaski case study. Even if biochemical studies found he had XX chromosomes,[8] thereby confirming an intersex condition, what difference would it make for our understanding of how he navigated and experienced his world? (The same critical query is applicable to recent aDNA analyses by Anastasiadou et al. (2024) of three individuals from ancient Britain who display sex chromosome aneuploidies, i.e., intersex conditions.) Knowing this molecular fact would not change that he lived his life as a man and performed a type of masculinity defined by warfare. He was famed for his miliary prowess in Europe and America during the revolution, and he is still celebrated as a war hero in the U.S.

Indeed, western scientists and physicians did not create a classificatory category for intersex conditions—or, per their now archaic verbiage, "hermaphrodite"—until the mid-nineteenth century (Fig. 2). Alice Dreger (1998) argues that such categorization begins by the late-nineteenth century. But physicians' fascination with James

[5] David Reich being interviewed by Sean Carroll on the *Mindscape* podcast: https://www.preposterousuniverse.com/podcast/2022/01/10/179-david-reich-on-genetics-and-ancient-humanity/.

[6] I am reminded of a conversation I participated in with archaeogeneticists from Max Planck that touched on aDNA, ethics, and socio-sexual lives. They were adamant that "reproduction" and "mating" had nothing to do with sexuality, a concept that has as much to do with procreation as it does with pleasure, violence, and commerce. This conversation, which occurred in October 2021, made it clear that geneticists and feminist and queer scholars must first engage in translational work.

[7] See https://www.poles.org/birth.html, and for an image of the original archival document see https://www.poles.org/Pulaski/Pulaski_2013.html. I have included both because the website's transcription of the original, which is pictured in the latter link, has mistakes.

[8] DNA analysis was conducted to determine his ancestry but not sex; see https://www.smithsonianmag.com/smart-news/was-revolutionary-war-hero-casimir-pulaski-intersex-180971907/.



Fig. 1 A portrait of Casimir Pulaski. (Jones, Charles Jr. 1873. *Casimir Pulaski: An Address Delivered before the Georgia Historical Society*. Savannah: The Morning News Office)

Carey suggests an earlier inception, one concomitant with the rise of biomedicine. Carey, a "hermaphrodite" and Irish-born immigrant who lived in Philadelphia as a man, for instance, was the subject of an 1839 treatise co-created by physicians, who dissected his disinterred corpse, and artist James Akin. As evidenced by the former's words and the latter's images, nascent biomedical practitioners regarded Carey's and comparable bodies as categorically pathological, his person anti-social. (Philadelphia's medical institutions and their physicians were at the center of the field's consolidation in the United States at this juncture in history [Geller, 2024]).

More recently, queer scholars have recognized this historic medical treatment for what it was…traumatizing (Dreger, 1998; Karkazis, 2008; Mak, 2013). Ethnography,

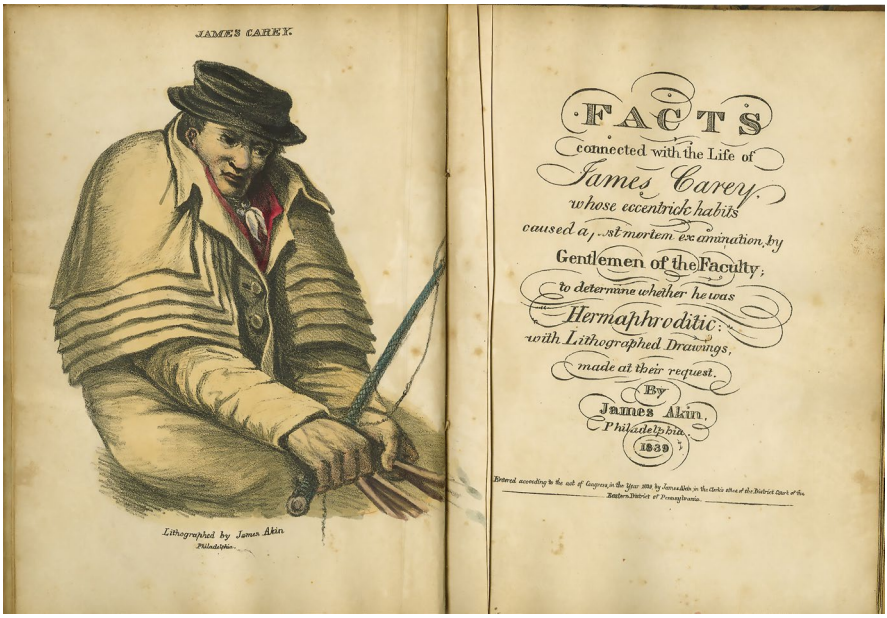


Fig. 2 Frontispiece and title page from *Facts Connected with the Life of James Carey Whose Eccentrick Habits Caused a Postmortem Examination by Gentlemen of the Faculty; to Determine Whether He was Hermaphroditic: With Lithographed Drawings Made at Their Request*

questionnaires, and memoirs also indicate that the gender identities of people with intersex conditions are variable (e.g., conforms to gender rearing identity, self-selected but normative, non-binary) and shift over time (Jacobson & Joel, 2021; Karkazis, 2008; Preves, 2003). Physicians' and parents' responses inform gender presentations and identities, as do individuals' body types, diagnostic conditions and treatment specifics, embodied experiences, and social interactions throughout a life course (Karkazis, 2008, ch. 7). For this reason, it is troublesome that some archaeologists continue to investigate or make visible "intersex" in their ancient case studies without considering if these conditions—of which there are numerous, naturally occurring ones—were phenotypically obvious or had any pertinence within the cultures they study (e.g., Moilanen et al., 2022; Power, 2020). A researcher should attempt to flesh out an emic bodyscape that underpinned understandings of gender and anatomy, physiology, nudity, and intimacy, among other things. The intellectual and political danger of not doing so in the present is an issue to which I return.

3 Conceptual Advances

"Intersex" instructs us to think more deeply about the language evoked to call socio-sexual lives into being. Most LGBTQ+ terms get lost in translation in non-English speaking contexts for reasons that are linguistic, cultural, historical, and/or political; Indigenous or local words are always best to use when known (e.g., Africa [Matebeni et al., 2018]; Native American [Driskill et al., 2011]). In ancient contexts, I would go as far to argue that most (maybe all) LGBTQ+ terms have no relevance. Contemporary labels may approximate identities and experiences, but it is naïve to think we can use these terms uncritically to describe past phenomena. The fallacy of "transgender" in bioarchaeological contexts is one example I have already discussed (Geller, 2019). Here I turn to the concept of *non-binary*.

Queer writers argue that non-binary circulates at the twenty-first century's outset as an abstract idea and finds more formal usage by 2016 (Amin, 2022; Richards et al., 2017, pp. 2–6). But they also find it challenging to pin down a definition since its meanings range from socio-sexual identity category to, in the words of Kadji Amin (2022, p. 117), "a vast umbrella with no positive social content." It simultaneously encapsulates a gendered sense of self (an internalized or psychological position) and a societally imposed identity observable through the public expression of clothes, bodily gestures, appearance, etc. Some individuals who identify as non-binary may still express gender in a socially conforming way. Others may perceive their identity as fluid and dynamic. An individual's non-binary identity may also incorporate masculinity and femininity, or may renounce both.

There are takeaways for bioarchaeologists who labor to apply queer theorizing about non-binary to their ancient case studies. First, I question the use of a concept that is so semantically complex and recent in origin. It should not function as a placeholder for a "gender identity" category; such usage may prove too reductive while failing to grapple with present-day factors (e.g., politics, religion, culture, medicine) that impinge upon understandings of sex, gender, and sexuality (cf. Moilanen et al., 2022). Nevertheless, I do see a potential contribution. Second, putting aside "the uniqueness of individual psyches" (Amin, 2022, p. 117), which are archaeologically unrecoverable, bioarchaeologists uncover the raw evidence for thinking masculinity and femininity otherwise. They study cultures that do not recognize, or only loosely, approximate western ways of knowing and being. Rather than rely on available words and images, which can constrain, investigators may look to the past to sketch out myriad, alternative sex/gender systems. In this regard, as a social science, bioarchaeology may emulate science fiction and aim for world-building. Third, non-binary (the cultural or psychological) should not be confused with non-dimorphic (the biophysical). Intentional conflation shows how some roads to hell are paved with bad intentions.

"There's no such thing as a nonbinary skeleton," opined Elizabeth Weiss (2022). Agreed, it is a fallacy like the "transgender skeleton" (Geller, 2019). But Weiss' commentary includes neither definition nor nuance, thereby eliding the concept's complexity. Instead, she evokes the term to advance the idea that queer-oriented

scholars no longer believe in biological facts. "Trans activists," "woke archaeologists and anthropologists," and "woke ideologues," she writes, "are trying to erase the reality of biological sex." Listen closely and you will hear the dog whistle of transphobia. When blown by a tenured (albeit controversial) bioanthropologist in *spiked*, a libertarian online magazine, it is crucial to explore how material-discursive bodies intra-act with or are produced by digital media and to what effect.

4 Technological Advances in Communication

Digital media (e.g., social media, blogs, podcasts) have become a prevalent and normative mode of communication, as well as a source of information and news. What are the repercussions of this communication revolution for humanity? "Emerging scientific evidence," neuroscientists relate, "indicates that frequent digital technology use has a significant impact—both negative and positive—on brain function and behavior" (Small et al., 2020, p. 179). First, the good news. Digital technologies generate, store, process, and share enormous amounts of information, at ever greater speeds, increased volumes, and myriad formats. Second, brain scientists' findings suggest that for older individuals, conducting internet searches and playing games online or on apps can function as brain neural exercise (Small et al., 2020). Third, these technologies allow for interactions when environmental or epidemiological impediments prohibit direct contact. Fourth, social media makes it easier for political activists to organize locally and globally. Finally, and pertinent to this chapter, these communication platforms have long offered a safe and anonymous space for LGBTQ-identified individuals to explore their gender and sexuality (Boellstorff, 2008; McGlotten, 2013). Accordingly, community is fostered and information about gender diversity shared and made accessible.

But there are also drawbacks to digital technologies. The negative impacts include "heightened attention-deficit symptoms, impaired emotional and social intelligence, technology addiction, social isolation, impaired brain development, and disrupted sleep" (Small et al., 2020, p. 179). Profound are concerns raised by social media platforms.[9] Image-heavy ones, like Instagram, are linked to depression, body image concerns, self-esteem issues, and social anxiety (Cohen et al., 2017; Fardouly et al., 2017; Sherlock & Wagstaff, 2019; Wick & Keel, 2020). Disinformation on these platforms, which undermines faith in science and democratic institutions, spreads like an oil slick (Iosifidis & Nicoli, 2021). Facebook, YouTube, and Twitter (now X) create the conditions for virality, especially for sensationalized, outrageous, and/or controversial content (Gillespie, 2018).

Here I describe an example germane to bioarchaeology that brings together biotechnical advances in sex estimation, conceptual advances in LGBTQ+ issues, and

[9] In the US, as of 2021, 72% of adults use social networking platforms (Auxier & Anderson, 2021); this is a 7% increase since 2015 (Perrin, 2015).

technical advances in communication. This story begins in early July 2022 when a graduate student tweeted (in 10 parts) about the bioarchaeological investigation of sex, gender, and sexuality.[10] Two weeks later, Breitbart (a far right "hyperpartisan media" outlet [Rae, 2021]) reported on the Twitter posts, replete with screenshots and hyperlinks (now defunct).[11] "LGBT Activists Push to Bar Anthropologists from Identifying Human Remains as 'Male' or 'Female'," read the headline. Breitbart fans the flames of identity politics at the heart of the culture wars, and has been criticized for misogynistic, xenophobic, racist, populist, and just plain false reporting. Any mention in these forums should disquiet researchers (or students) whose politics are progressive and not populist. Comments will abound (most of which spew hate, phobia, and idiocy). Then the news report will go viral in the mediascape, getting picked up by a host of other outlets. Inevitably your work will be politicized as "woke," as well as grossly oversimplified or misrepresented entirely. Indeed, this sequence of events unfolded following Breitbart's coverage of said graduate student's tweets. The article generated 5329 comments and received a total of 11,000 shares, comments, and reactions on Facebook.[12] Variations on Breitbart's original article then traveled through the mediascape.[13]

There is an important lesson for all to learn about the Sturm und Drang that these original tweets engendered, especially amongst students who are more likely to engage with social media.[14] Most platforms make for an inadequate mode of disseminating complex ideas—whether they are a consequence of biotechnical advances, conceptual ones, or both. One radical solution is that we take our brains off social media entirely. The suggestion comes to us from Jaron Lanier, the author of *Ten Arguments for Deleting Your Social Media Accounts Right Now* (2018). He sees something less transparent and more nefarious in the sharing, posting, tweeting, advertising, friending, etc. that occur on social media. Lanier—a computer philosopher and computer scientist who helped create the Internet in the 1980s and coined the term "virtual reality"—is deeply skeptical of social media for many reasons. Among the ones that should concern anthropologists and archaeologists are its "algorithmic behavior modification" (Lanier, 2018, p. 5), its "tricky degradation of context" (ibid, p. 69), its rewarding of our inner demons (or "assholes") and muting of our angels, and its model of monetizing that enriches the few at the expense of the multitudes.

[10] See https://web.archive.org/web/20220705105837/https://twitter.com/EmmaPalladino/status/1543800316352667648.

[11] See https://www.breitbart.com/tech/2022/07/18/lgbt-activists-push-to-bar-anthropologists-from-identifying-human-remains-as-male-or-female/.

[12] Calculated using https://www.sharedcount.com/.

[13] See https://www.opindia.com/2022/07/woke-concepts-gender-activists-stop-anthropologists-from-marking-human-remains-as-male-or-female/; https://www.thecollegefix.com/gender-activists-push-to-bar-anthropologists-from-identifying-human-remains-as-male-or-female/; https://dailycaller.com/2022/07/19/gender-scientists-identify-skeletons-male-female/.

[14] A 2021 Pew Center Report found that 84% of adults 18–29 years use social media sites, the most of any age demographic (Auxier & Anderson, 2021).

5 Conclusion

When disseminating information about past socio-sexual lives and the biotechnical advances used to study them, bioarchaeology needs more translators, public intellectuals, and, above all, collaborators—between scientists and feminist or queer scholars, archaeologists and journalists, specialists and lay audiences. Where social media is concerned, however, we should proceed with an abundance of caution. Before posting, it is advisable to favor deliberate statements over knee jerk reactions. Read extensively and deeply, especially scholarly resources within and beyond your subfield. Include links to scholarly citations, for further reading and to give credit where it is due. Anticipate the consequences of publishing a journal article on the ancient decedent you argue had XXY chromosomes (or sex estimation more generally when it involves the intra-action of body parts, biotechnical apparatuses, and computers). Choose your words wisely in interviews when science reporters come calling. For the article about "intersex" or "nonbinary" will assuredly be sensationalized and go viral on online news sites with varying levels of journalistic integrity. Social media, Lanier and other writers warn us, is undermining truth. Which means that when our scientific research and expert knowledge flow through hyperpartisan mediascapes, they are increasingly delegitimated. We need to do and think smarter. Or at least smarter than the bots and the trolls and the haters.

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Ethics and Exhibition of Historical Human Body Casts: A Brief Case Study from Pompeii, Campania Region, Southern Italy with an Activist Lens

Dario Piombino-Mascali and Sara Sablone

1 Introduction

Is it ethically acceptable to exhibit casts of human corpses in a museum context? This question is not merely academic—it is a moral imperative that demands we confront archaeology's complicity in systems of dehumanization and structural violence. As scholar-activists we must move beyond asking whether we should display human remains to interrogating why we do so, whose interests are served, and what structural inequalities are reproduced in the process (Blakey, 2020; de la Cova et al., 2024)? Casts of human bodies at the moment of catastrophic death are not just archaeological artifacts; they are the preserved anguish of individuals, whose vulnerability became cemented in volcanic ash and later commodified for scientific and public gaze (Petrone, 2021). The ethics of displaying human remains cannot be divorced from the consideration of social justice; respect for cultural sensitivities, collaboration with descendent communities, and the risk of re-traumatization are critical considerations. When interrogating structural inequalities in museum contexts questions include but are not limited to: even for ancient remains, how do we honor potential descendant claims; were there social hierarchies that influenced

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*, Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_13

who died in Pompeii's most exposed spaces, and can exhibition of the remains of these deceased individuals become activist pedagogy, exposing systems of oppression rather than sensationalizing suffering? The plaster that filled the voids left in the solid volcanic ash after the decay of the cadavers' soft tissues does more than preserve a human form. This chapter applies the "ethics of responsibility" model (chapter "Introduction: Bioarchaeologists Should Be Activists Too", this volume), treating the casts as a case study, which whilst an exceptional example, can shine a spotlight on the broader ethical imperatives that concern the display of mummified and skeletonized human remains. Volcanic ash froze Pompeii's victims in postures of anguish, in their final moments of a violent death, but activist bioarchaeology challenges us to build the tools to find ways to provide dignity for the dead and in so doing, contribute towards social justice for the living. We ask not just how to display human remains, but how to restore agency to victims through community-guided narratives. In doing so this may expose systems that may have made their deaths inevitable, and transform museum displays from extractive, sensationalist monuments, to spaces of restorative justice (Watkins, 2020).

2 Historical Background

In a letter published on February 13, 1863, in the *Giornale di Napoli*, Fiorelli who was excavating at site, first described his technique for creating plaster casts from the bodily voids left behind from those who died in the catastrophic eruption almost 2000 years ago. While his method was later refined it remains in use today (Osanna, 2021). Fiorelli's systematic approach to casting (1863) revolutionized archaeological practice and created a human face for the tragedy of Pompeii in a way that has grasped the public imagination for the past 150 years.

Archival excavation reports show that most of Fiorelli-era casts derive from atrium-peristyle houses (versus those from workshops/taverns), per the Pompeii Archaeological Park's 2019 inventory (cited in Alapont et al., 2023, Supplemental Data 1). In common with biased historical narratives, Fiorelli's approach further served to compound the invisibility of everyday Romans in favor of the wealthy. Fiorelli's early plaster casts of human forms quickly sparked strong reactions from both public and scientific communities. Initially, the casts were preserved and exhibited in the houses from which they were recovered in Pompeii, displayed on specially designed supports. In 1874, with the inauguration of the Pompeian Museum, some casts were subsequently relocated for exhibition within. Excavations continued, and additional casts were made after Fiorelli left his position to assume a higher role at the Ministry in Rome. During World War II, in 1943, many of the

Pompeian Museum's casts were severely damaged due to a bomb explosion. In 1948, archaeologist Amedeo Maiuri oversaw their restoration and the museum's reopening, which displayed the surviving casts as an ongoing attraction. For decades, this remained unchanged until the launch of the *Great Pompeii Project* in 2014. The project's first phase involved cataloguing all preserved material, which had never been systematically surveyed. A new display approach was introduced, emphasizing the recontextualization of casts at their original discovery sites whenever possible, following the best available standards. The policy now is to relocate them to the areas where they were found (and died). When *in situ* curation was not feasible due to exceptional national or international interests, conservation issues, or logistical, economic, or territorial constraints, casts were displayed in the new Antiquarium (CNR, 2019a) (Figs. 1, 2, and 3).

Critical review. It could be argued that the eighteenth century fascination with Pompeii's deceased—preserved in hardened volcanic ash from the eruption of Mount Vesuvius in 79 CE—emerged not from scholarly altruism but as an extension of the colonial gaze of Europe and the UK, where southern Italy's ruins became another territory for intellectual extraction (Dhindsa, 2024). As an Inspector of the Pompeii Excavations from 1860 to 1875, during Italy's tumultuous unification, Fiorelli wielded archaeological authority to reshape Pompeii's narrative. The application of his technique could be argued to have perpetuated exiting social hierarchies. He prioritized the preservation of Roman elites over the enslaved and working-class victims whose contorted forms would later become tourist attractions (Ellis et al., 2023). Fiorelli's pioneering efforts at Pompeii undeniably advanced archaeological methods and captured the public imagination—but they also reflect colonial-era power dynamics (Ellis et al., 2023). The decision to primarily preserve and display individuals perceived as elite victims—those in opulent villas or dramatic poses—while laborers, enslaved people, children, and the urban poor were often neglected, reinforces class biases deeply embedded in early archaeology. Victims from modest dwellings, or those buried in less visually compelling contexts were frequently overlooked. Post-WWII restorations further entrenched these biases by privileging aesthetic and elite narratives over a comprehensive social history. This selective preservation itself is a form of structural violence, where social inequalities are reproduced through decisions about whose bodies are recovered, studied, and exhibited. The public display of these remains, often stripped of their social context, risks aestheticizing suffering while erasing the everyday realities of class, servitude, and marginalization in Roman society. Today, activist archaeological frameworks challenge these legacies, advocating for more inclusive interpretations that center marginalized voices and interrogate whose stories are preserved—and why.

Excavation activities in Pompeii continue today, with new casts being made using advanced techniques and materials. Today the accepted process for bioarchaeological excavation is to retrieve as much as possible of the human remains including all bone fragments, so that the final cast does not contain human remains at all. Recent bioarchaeological analyses have helped reconstruct the circumstances surrounding the preservation of the deceased. It is also worth noting that contained



Fig. 1 Three of the four casts made following the 1956 excavation led by Maiuri. (Image Dario Piombino-Mascali)

within volcanic voids are the preserved skeletal remains of the victims and these now remain embedded within the plaster corporeal outlines. Further research on the remains of victims recovered from the nearby, and almost as famous, site of Herculaneum has revealed that they were possibly exposed to temperatures exceeding 500 °C, which caused cadaveric spasms and rapid deposition of volcanic ash that preserved their body positions. It has been hypothesized that the intense heat vaporized fluids and tissues, resulting in skull explosions and bone fractures, followed by rapid cooling that solidified the volcanic material (Petrone, 2021; cf. Martyn et al., 2020). In contrast, individuals who sought shelter inside buildings during the eruption often perished due to structural collapses (Petrone, 2021) and exposure to high temperatures.

Activist Questions and Approaches for Museum Professionals
We pose the following questions drawing on the scholar-activist framework in chapter "Introduction: Bioarchaeologists Should Be Activists Too" integrating aspects of criticality, normative orientation, and active engagement, and those of Black and Indigenous scholarship frameworks central to this volume (Tuhiwai Smith, 1999; Collins, 2000). We must ask questions of how dominant narratives are challenged or reinforced, what ethical values guide the interpretation and presentation of the remains, how can our work connect with communities, activism, or public debate, and the centering of cultural sovereignty, structural violence and reparative practice:

1. How do current curatorial practices represent the human remains that are displayed and interpreted — as individuals, social subjects, or scientific specimens — and what power dynamics shape these representations?
2. What ethical considerations guide the public display of human remains, and how do these choices reflect broader values about memory, dignity, and historical responsibility?
3. In what ways do exhibitions of victims engage with or overlook issues of social inequality and structural violence — such as class, gender, slavery, or imperial power?
4. Working together, how can curators, scholars, and communities actively reshape the interpretation of human remains from disaster contexts to promote ethical remembrance, public engagement, and dialogue around disaster, vulnerability, and historical accountability?

Following Blakey's model of engaged scholarship (2010), we suggest that bioarchaeologists studying the Pompeii casts can play an active role in reshaping museum practices. This involves moving beyond ethical display toward reparative action—using these remains to reveal any evidence for historical systems of oppression that made victims vulnerable in 79 CE, while remaining mindful of how contemporary choices in exhibition and interpretation shape public understanding. As this volume illustrates, our work is rarely neutral; through our engagement with human remains, we may either challenge or inadvertently reinforce interpretations of past inequalities.

3 Ethical Concerns

A significant ethical question arises: how should the exhibition of these casts be viewed in the context of ancient human remains research? Replicas of historical casts are excluded from this discussion, as they appear initially to lack a direct



Fig. 2 Detail of two casts from the area between the tombs and the city walls. (Image Dario Piombino-Mascali)

connection to the original human remains. Here we discuss original casts, some of which still contain preserved osteological material, even if sometimes fragmented or disarticulated. In Italy, archaeological human remains are legally recognized as cultural heritage and are protected under the *Codice dei Beni Culturali e del Paesaggio* (Legislative Decree No. 42/2004). This legal framework ensures that such remains are preserved, studied, and managed with due respect. Specifically, Article 29 of the Code mandates that conservation activities—including study, prevention, maintenance, and restoration—are carried out to safeguard the integrity and cultural value of heritage assets. The Ministry of Culture provides guidelines for the proper handling of human remains, from excavation to museum display, emphasizing their informative value and the need to consider the wishes and sensitivities of potential descendant communities (Riga, 2022).

In Pompeii, the techniques used to recover and study these remains represent significant milestones in the history of archaeology itself. Therefore, these casts have dual significance: as a direct link to ancient history and as evidence of the evolution of archaeological practices in Italy. Although this article does not delve into debates over the value and controversial "humanity" of ancient bioarchaeological remains (Frerking & Gill-Frerking, 2017; Licata & Monza, 2017; Dellù & Sciatti, 2021; Thomas & Krupa, 2021), it is essential to identify ethical standards within museum studies to guide exhibition decisions.

Research suggests that ancient human remains often hold a different emotional weight for museum visitors compared with other non-human artifacts (Arizza, 2023). Stakeholders in exhibiting human remains from the Vesuvius eruption



Fig. 3 International visitors observing the casts with great interest in the Spring of 2024. (Image Dario Piombino-Mascali)

include descendant communities, activist groups, and heritage professionals. While direct descendants may be unknown, local Italian communities and cultural institutions should be involved as stewards of the region's heritage. The New York African Burial Ground project offers a strong model, showing how respectful collaboration with descendant communities can guide research, interpretation, and public display (Blakey, 2010). Applying this approach ensures that human remains are treated with care, context, and community input. According to Arizza (2021, p. 9), ethical reflection in pluralistic societies may be approached through forms of agreement that emerge across heterogeneous moral positions. Within this account, attention is directed toward the practical consequences of actions and their potential effects. In this context, multiple stakeholders have a vested interest in the exhibition of ancient casts: archaeologists work with communities to showcase tangible evidence of the

catastrophic eruption of Vesuvius; biological anthropologists collaborate to build nuanced understandings of the victims' daily lives and final moments; the broader scientific community engages with these casts and related research to advance collective knowledge; and the wider public—including local communities and those who see themselves as cultural descendants of the deceased—participate in and benefit from museum research, interpretation, and communication efforts.

Balancing these interests requires a collaborative ethical process in dealing with human remains. The rights and sensitivities of museum visitors—as active participants in interpretation—must be respected. In line with the Faro Convention, which emphasizes community rights and shared stewardship of heritage, exhibition design should emerge through dialogue with diverse audiences, especially when addressing emotionally impactful materials. The Archaeological Park of Pompeii has begun to address these concerns not only by continuing archaeological investigations and diagnostic analyses to reconstruct the history of individuals, but also by engaging with communities in shaping exhibition strategies. Favoring the use of cast replicas over originals reflects both conservation priorities and a commitment to ethical responsibility, seeking a balance between scientific inquiry and social accountability.

Recent research continues to reshape our understanding of these individuals and their contexts. A 2024 DNA study by Pilli et al., for example, challenged long-held assumptions. In the "House of the Golden Bracelet," four individuals previously believed to be a family were found to be genetically unrelated. Moreover, analyses of other remains revealed that a significant portion of Pompeii's population had genetic origins tracing back to recent immigrants from the eastern Mediterranean. These findings highlight Pompeii's central role in ancient Mediterranean exchange networks. In presenting such emotionally charged artifacts, exhibition choices are carefully considered. Protective measures including the use of display cases that prevent close-up photography, as well as recommendations for audiences for whom such displays may carry particular cultural, religious, or emotional significance, reflect a commitment to inclusive and respectful interpretation. These considerations culminated in the 2019 international conference "Human Remains. Ethics, Conservation, Display," organized by the Archaeological Park of Pompeii (https://www.humanremains.org). This event brought together researchers, anthropologists, and archaeologists to share methodologies and best practices. A further attempt in this direction occurred in the recent exhibition in Pompeii "The other Pompeii. Common lives in the shadow of Vesuvius," whose catalogue (Bertesago & Zuchtriegel, 2023) contains general methodological reflections on the exhibition criteria relating to the casts, on the set-up project and, finally, on the history of the technique of making casts. As the *Great Pompeii Project* evolves, additional steps could enhance public engagement further, with the aim of designing shared solutions and measuring their impact and results with a view to ethical sustainability. For example, the Egyptian Museum in Turin conducted a visitor questionnaire in 2019 on the display of human remains. This initiative led to a scientific publication and a podcast, "In Search of Life," which explores ethical approaches through stories shared by museum professionals (www.museoegizio.it/esplora/notizie/alla-ricerca-della-vita-il-nuovo-podcast-del-museo-egizio). Implementing similar

initiatives at Pompeii could strengthen community relations, demonstrating mutual accountability to civil society and future generations.

4 Concluding Remarks

In light of the arguments presented, the question of whether it is ethically appropriate to exhibit the casts of Pompeii must be considered within a broader and more nuanced ethical, social, and scientific framework. This issue extends beyond Pompeii and should be addressed in other exhibitions through an 'ethical laboratory' involving all relevant stakeholders as applied to the case of the Egyptian Museum of Turin. Engagement with practical ethical issues can contribute to reinforcing the relationship between science and society, with potential benefits for ethical robustness and overall system functioning (Caporale 2021).

To illustrate, the Pompeii case exemplifies this dynamic ethical process in practice: key stakeholders—including archaeologists, biological anthropologists, and museum professionals—have been systematically identified and consulted; diverse perspectives concerning preservation, scientific inquiry, and respect for the deceased have been critically evaluated; shared solutions such as the exhibition of replicas and *in situ* display of casts have been implemented. While mechanisms for involving the community and visitors in evaluating the outcomes of these decisions are being developed, such engagement remains at a nascent stage.

This iterative process, guided by principles of transparency, accountability, social responsibility, and stewardship towards future generations, demonstrates how ethical considerations can be progressively integrated within museum practice. The most appropriate way forward is to ask: How can these findings be exhibited while respecting the legitimate interests of all actors involved in this significant scientific endeavor (Alapont et al., 2023)? A dynamic and inclusive process can be considered for approaching ethical decision-making in museum contexts. This process may involve identifying relevant stakeholders, considering a range of perspectives, developing shared approaches through forms of convergent agreement, monitoring the outcomes of these actions, and adapting practices in response to feedback.

Such a process is typically discussed alongside established frameworks of ethical research principles (CNR 2019b), including freedom of inquiry, accountability, honesty, rigor, objectivity, transparency, cooperation, diligence, responsible use of resources, social responsibility, and attention to future generations. In the context of Pompeii casts, these principles provide a reference for balancing scientific inquiry, public engagement, and the preservation of cultural heritage, without implying prescriptive or authorial mandates.

Acknowledgements We are grateful to Professors Gwen Robbins Schug and Siân E. Halcrow for their insightful comments and constructive suggestions, which greatly improved this chapter. We are also grateful to Drs. Marco Arizza and Cinzia Caporale for their valuable comments and thoughtful input.

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Conclusions/Afterword: Towards Becoming an Activist Academic

Siân E. Halcrow, Sabrina C. Agarwal, Carlina de la Cova, Rebecca Gowland, Gwen Robbins Schug, and Jamie Metzger

The world is facing multiple existential threats, from climate change, political and economic instability and rising nationalism, increased risk of pandemics, widening social inequalities, overpopulation, and rapid advancements in artificial intelligence. The future of our discipline—and our planet—demands activism. Anthropology is a unique discipline, encompassing the spectrum of knowledge from the hard sciences to philosophical approaches; it routinely grapples with complex social injustices, ethical dilemmas and provides holistic perspectives on topics as diverse as climatic fluctuations, the co-evolution and impacts of pathogens, technological developments, and colonization. This volume, conceived of a few years prior (in what now seems like a different era) emerges into a world transformed by

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S. E. Halcrow et al. (eds.), *Bioarchaeology, Activism and Social Justice*,
Bioarchaeology and Social Theory,
https://doi.org/10.1007/978-3-032-10354-3_14

genocide, AI-driven misinformation, and the deliberate dismantling of progress in DEI, human rights, and academic freedom; in some cases, the dismantling of the rule of law and even the architecture of entire nation-states. These upheavals amplify the importance of this activism work.

This book has provided a wide range of rich examples, showcasing some of the ways in which biological anthropologists can engage with and contribute to some of these key challenges. We cannot remain passive observers. This volume bridges a critical gap between scholarly bioarchaeological research and related disciplines and tangible social transformation, offering frameworks to transform scholarship into action, which assists marginalized and at-risk communities. This work is not exhaustive; important gaps remain. As noted in the introduction, one significant area that we regrettably noted is not adequately represented here is the important work of Indigenous scholarship and authentic engagement with Indigenous Local Knowledge in biological anthropology. Indigenous voices, knowledge, and contributions must be centered in current and future scholarship on this topic. The discipline has abused their ancestors for far too long. This cycle of violence and apathy must stop. Another area that biological anthropology has a lot to offer that was not developed in this volume is understanding climate change and human health, and how we can use knowledge from the past to provide priorities for sustainability in the future (e.g., Robbins Schug et al. 2023)

Each author was asked to identify points for action in their chapters, and we urge readers to reflect on these and how they might be incorporated or adapted to their own practices. Here we conclude by highlighting some general strategies from the themes that have emerged that bioarchaeologists and other scholars can consider in their scholarship and practice to effect positive change.

1. **Interrogate Positionality**. Acknowledge throughout different phases of your research and/or describe how your identity/ies shape your research questions, perspectives, methods, interpretations, and potential biases. Reflexivity is the foundation of ethical practice.
2. **Center Communities**. Develop relationships and authentic collaborations with descendant groups *before* developing research projects (e.g., Agarwal et al., 2024; National Trust for Historic Preservation, 2018). Ultimately, all research should be engaged and serve to benefit the communities and descendant groups associated with the research.

    - Engage in preliminary discussions with and invite participation from communities with direct ancestral or geographic ties to the region where bioanthropological, bioarchaeological, and archaeological research is taking place.
    - Co-produce knowledge through shared labor, from project development to the production of knowledge and dissemination of research.
    - Create research as a set of relationships and sharing of resources, hospitality, information, spaces (e.g., laboratory visits/workshops), etc.
    - Communicate results in ways that are meaningful for community beneficiaries and other non-academic stakeholders.
    - Challenge extractive research models in your reviews and other service work.

3. **Dismantle Hierarchies**. Collaborate with activists and communities broadly to identify, address, confront, and overcome existing power relationships (Came et al., 2015). Consider published frameworks such as horizontal activism (Hale, 2008; Rasch et al., 2022).
4. **Include diverse and representative voices** to ensure a holistic understanding of the issues and to promote more effective actions toward change.
5. **Critique Systems**. Use an intersectional lens (Mintz, 2024) to reject "neutral narratives" and expose how structural violence manifests in skeletons and institutions.
6. Wherever possible and without untenable detriment to your own personal well-being, **support colleagues and students when they actively strive for social justice**. Our phrasing of this point acknowledges the risk of significant political turmoil, impacts on our wellbeing, and our emotional capacity.
7. **Institutionalize Change**. Participate in professional development to better understand DEI issues in research, teaching, and service. Advocate for policies that value community-engaged work for graduate students and in tenure/promotion guidelines. Join academic, local, and national DEI efforts to reshape our institutions.
8. **Protect the Vulnerable**. Actively advocate for the ethical treatment of all human remains, informed by a socially and culturally engaged framework. Ask for an ethics oversight committee, develop guidelines for your campus, and work with your office of research, university attorneys, and to write policies for the enforcement of those guidelines. Be bold about proposing new institutional structures on your campuses, asking for and writing policies that promote progressive values in our professional associations, maintaining a high standard for inclusive ethical publishing practices as a reviewer or on the editorial boards of journals.

These strategies and suggestions serve as a starting point for scholars to consider how to ethically engage in their research and inspire change at the social, academic, institutional, and disciplinary levels.

This book is not the end of the conversation—but a call to action; a spark that ignites a movement.

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