INTRODUCTION

The Machines are Winning: Essays in Honor of Stephen D. Ousley (1961–2022)[1]

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ABSTRACT: Stephen D. Ousley left us too damn early. We were not expecting it, so the hole he left is felt, in one way or another, nearly every day. The many words you are about to read cover only a hair's breadth of his contributions and only scratch the surface of his enormous influence on a wide variety of topics in the field and the many research methods used by forensic and biological anthropologists today. To honor Steve Ousley, his friends and colleagues, former students, and family members produced this collection of papers. This *Festschrift* should have been while he was alive—to thank him, honor him, and recognize his many and varied contributions. But that was not the case, so here we present a posthumous honor to our friend.

KEYWORDS: forensic anthropology; FORDISC; history of science

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Ousley's contributions to biological and forensic anthropology, at first glance, seem to have no central theme. He published on a variety of issues, topics, and methods in the field and never seemed to limit himself to any one scholarly pursuit. At least not overtly. He pursued every question with enthusiasm and gazelle-like intensity, striving to better the field through the robust, quantitative analysis of data. Data, more than anything else, drove him. As a developing scholar, he was drawn to data applications; first in his position as manager of the Armed Forces Institute of Pathology's (AFIP)

FIG. 1—*Steven D. Ousley (left) and Richard L. Jantz (right), ca. 2006, collaborating, thinking, and expounding at the University of Tennessee, Knoxville, TN.*

brain data base, then through his graduate student days. His attraction to data and what they could tell us only intensified as he progressed through his career.

In the 1990s, chance, luck, and fortune handed him something we should all hope for: a mentor with a keen sense of Ousley's abilities, a mentor who had the wherewithal to help Ousley hone his budding interests in human skeletal biology, quantitative methods, and computer programming. I (RLJ) immediately saw Steve's fluidity with data and what it could tell us. Throughout the development of the Forensic Anthropology Databank (FDB), FORDISC, and all of our subsequent collaborations, Steve was always a source of new ideas to further our understanding of the questions at hand.

As his journey from a budding enthusiast to a pivotal figure in the field unfolded, Ousley's contributions were not

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1. This article is part of the *Festschrift* for Stephen D. Ousley.

just milestones documenting his journey, but beacons for the entire forensic anthropological community. This evolution from the individual to the collective is encapsulated in this *Festschrift* dedicated to his work. The special issue stands not only as a testament to Ousley's profound influence, but also as a platform to further his legacy by those he inspired and mentored. Herein the full scope of his impact should come into sharp focus, bridging the personal narrative of a mentor and innovator with the collective endeavor of advancing forensic anthropology.

Each of the papers in this *festschrift* highlights, we hope, the breadth and depth of Ousley's work. Many of the authors are former students of his, who have gone on to lustrous careers of their own. His voice, his mentoring, his nagging and honing, are clear in many of them. As one never willing to back down from a fight and always willing to take on a challenge, he encouraged, he goaded, he agitated, and he inspired.

The papers in this *Festschrift* honoring Steve Ousley are grouped into two broad categories. Several are biographical because they describe how he contributed to the authors' professional development and/or Steve's impact on the field of biological anthropology. Other articles are more /applied. These papers present scientific analyses of populations or statistical questions. Steve contributed to all these papers, either directly or indirectly, but either way they would not have been possible without his contribution.

Biographical Papers

Steve's brother, sister, and wife, joined me (JTH) to frame Steve's childhood and development as an anthropologist, exploring the roots of his lifelong love of travel, armored tanks, beer, and data. Born on March 10, 1961, in Cheverly, MD, he carved a distinguished career after earning degrees from the University of Maryland and the University of Tennessee. Steve contributed significantly to our field: as Laboratory Director at the Smithsonian's Repatriation Osteology Laboratory, and as a professor at Mercyhurst University and the University of Tennessee. Perhaps best known for codeveloping FORDISC, his work greatly impacted practice and research in forensic anthropology, but these days he is best remembered for his generosity, humor, and passion for life.

Hollinger, Dudar, and Jones discuss the importance of Steve's contributions to the Smithsonian's Repatriation Laboratory. It was there that some of Steve's software packages were born, including Osteoware and 3Skull, both still widely used today. With literally tens of thousands of human remains, Repatriation required agile data management and data collection resources. Steve managed all the moving parts required for data collection, management, standardization, and analysis, as well as outreach to descendant communities. The authors take the reader through Steve's scientific contributions to the Repatriation Office and what it meant for repatriation in the United States more generally.

Seguchi and Best discuss Steve's role as an educator and distill the basic way Steve approached scientific questions. Adhering to these simple but important rules is recommended for researchers in biological/forensic anthropology. Seguchi and Best highlight Steve's dedication to data as the essential element in addressing scientific questions. They also highlight his role in repatriating human remains to claimant groups, illustrating his moral responsibility. Readers will come away from this paper with an appreciation of Steve the scientist and Steve the person.

Pawaskar and colleagues present a remarkable picture of Steve. This picture emerges from Steve's 7000-mile road trip visiting colleagues and institutions around the country. Steve was attempting to implement his vision of what a 21st century forensic anthropology should look like. The story is told by colleagues Steve visited during his road trip, sometimes incorporating his own words from email communications. This paper lays out Steve's vision of how forensic/biological anthropology should go from the traditional quantitative techniques of the 20th century to machine learning and artificial intelligence. Readers will also see Steve as his colleagues saw him: easy going but with a side of science, and occasionally a Belgian ale, but always at the forefront of our field. From these reminiscences we learn there was no better colleague.

Edgar et al. detail the impact Steve had on the evolution of their scientific careers. They place Steve's contributions in historical context, and how Steve provided the impetus to move beyond traditional techniques and theory. They illustrate in exquisite detail what the move to virtual osteology would look like and the central role Steve played (and would have continued to play) in the transition. Readers will come away from this paper with a deeper understanding of the breadth of Steve's abilities, his insight, and dedication to the advancements of our science.

Theoretical/Applied

Mintz et al. deal with the intractable problem of identifying individual vertebrae. While this has traditionally been accomplished morphologically, the authors apply a multivariate statistical approach based on measurement data. The classification rate is not perfect, but the method provides probabilities unavailable using the traditional morphological methods. The authors also provide an importable Fordisc data set allowing the method to be readily implemented.

Manthey et al. address the question of differentiation of the frontal bone between Euro-Americans and Germans, two populations of European ancestry. They use geometric morphometry and semi-landmarks to quantify curvature of the frontal. The differentiation between these two European

derived populations emphasizes the need to distinguish population specificity from ancestry in forensic applications.

Hefner, Ousley, and Richardson place macromorphoscopic traits in the historical context of racial typology, then proceed to demonstrate how that is no longer the case. They demonstrate that macromorphoscopic traits have a role to play, alongside metric traits, in estimating population affinity. They provide detailed description of the traits, their distribution in the world samples, and an extensive statistical analysis. A program performing the analyses is provided, along with an invitation to provide feedback.

Stull et al. specifically address the question of the relationship between morphological traits (MMS) and metric traits. The analysis is supported by statistical procedures capable of handling both data types. The analyses are couched in terms of mode of ossification, anatomical regions, and functional modules. In general, relationships between the two types of traits is low, emphasizing their combined use will lead to better estimates of population affinity.

Spiros and Nakhaeizadeh present a picture of how machine learning (ML) and artificial intelligence (AI) will be integrated into forensic decision-making. They illustrate the potential ML and AI have for forensic applications well beyond estimation of population affinity or sex, and the increased interaction between forensic anthropological researchers and other disciplines such as computer science and ethics. Most importantly, they demonstrate why ML and AI should be used to enhance human decision-making, rather than replace it.

Konigsberg and Frankenberg get into a highly technical consideration of the F test typicality probabilities as calculated by Fordisc. Their point of departure is the ongoing discussion the authors were having with Steve concerning how the F typicalities should be calculated. They argue that Fordisc's calculations are incorrect and present the proper calculation, which can hopefully be included in the next version of Fordisc 4.0. Readers will come away with an appreciation of Steve's command of complex issues and his love of a good argument.

Milner et al. take up the intractable question of age estimation, especially in older adults. They compare results from transition analysis based on expanded age markers, known as TA3, to maximum likelihood methods based on an expanded, international data set. The authors emphasize Steve's commitment to all areas of the project, from trait identification to data acquisition to analysis. The authors emphasize that there is still progress required to improve age estimation, and unfortunately Steve will not be part of it.

Jantz et al. round out the theoretical and applied papers in an analysis of African migrants, who died in a tragic 2015 shipwreck off the coast of Libya. Analyzing over 300 crania, the authors explore cranial morphometrics in light of African cranial variation. Their robust and intriguing analysis of those data allowed a thorough reconstruction of cranial morphology and ship demographic structure.
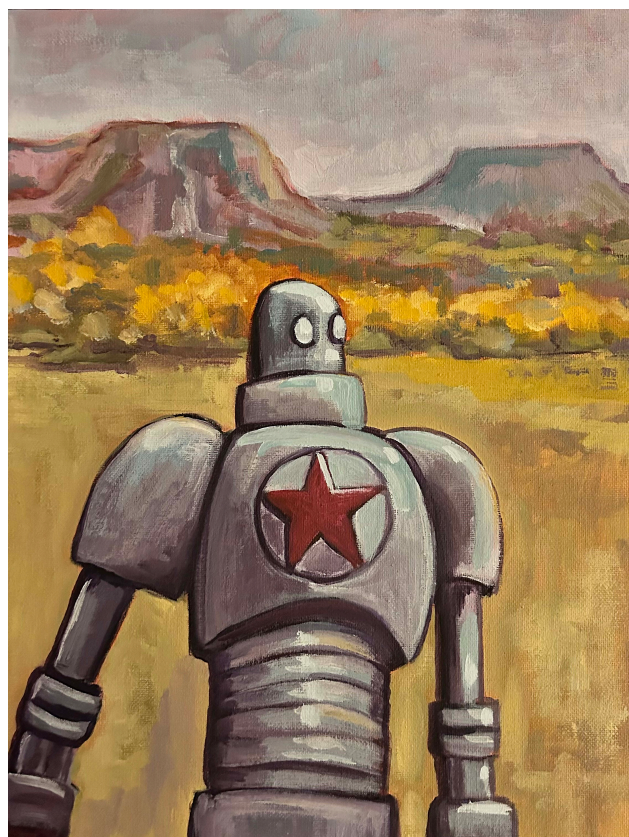

FIG. 2—*Robot painting by Gudrun Richter, Steve's wife.*

Finally, we round out this Festschrift with a select bibliography, outlining not only Steve's scholarly contributions, but also his data collection trips, student mentoring, and more generalized contributions to the field of forensic anthropology. Steve's work left an indelible mark on the intersection between biological anthropology and statistical approaches to the study of human variation and has enriched our understanding of population affinity estimation. With a career characterized by rigor, innovation, and a passion for discovery, his insights will remain a constant part of our work for the long term.

Within this collection of papers, memories, and research endeavors lies a testament to the profound and enduring influence of Steven D. Ousley, PhD. With heartfelt affection and our deepest appreciation, we dedicate this compilation to his memory. Steve, your absence is keenly felt, and your contributions continue to resonate within our scientific community. You are missed. Robot Roll Call (Fig. 2).

Reference

Ousley SD, Jantz RL, Hefner, JT (2018). From Blumenbach to Howells: The slow, painful emergence of theory through forensic race estimation. *Forensic Anthropology: Theoretical Framework and Scientific Basis* Wiley:2018:67–97).