

Human Diversity in the Ancient Americas:
The intersection of skeletal biology, archaeology and genetics

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The origins and diversification of people in the Americas continues to be a topic of lively debate. The broadly-selling publication of such recent books as Charles Mann's *1491* are reminders of public interest in this topic, as are Joseph Powell's *The First Americans* and the regular appearance of the topic in popular articles (for example, the March 2006 issue of *Time Magazine* discussing Kennewick Man). Much of the current scientific discussion is focused on the migration routes, timing, and relationships of founding populations (e.g., Anderson and Gillam 2000; Bonatto and Salzano 1997; Fiedel 2000; Kelly 2003; Kemp et al. 2007; Straus 2000). Less attention has been devoted to the amount of variation present among these early groups, biologically (as evidenced through skeletons and genes) or culturally (as evidenced through artifacts and site features). Research in this topic has only started to address the apparent variation, or lack thereof (for example, see Dillehay 2000; Gruhn 2005; Jantz and Owlsey 2001; Powell and Neves 1999).

Without understanding the biological and cultural variation in the Americas among more recent populations, for which we have more data (due to larger sample sizes and better site preservation), any attempt to understand the fragmentary patterns of skeletal and artifact remains presented by the earliest settlers will lack context. Moreover, the relative influences of culture and environment on biology are still debated (for a few of the many examples, see Auerbach 2007; Bernal et al. 2006; Holliday, 1997; Leonard et al., 2002; Ruff et al. 2006; Wescott 2001). There are, therefore, two issues at hand: documentation of biological and cultural diversity in the Americas, and understanding how these relate to each other and to the ecogeographic locations in which people settled. These are, undeniably, broad topics that have and will require years of research to develop comprehensive models.

Progress in this area of study has been made in the last few years to look at these issues. Two doctoral dissertations concerning variation in skeletal morphology among Native Americans in relation to biological and to environmental factors are currently nearing completion (Kathryn King, University of Tennessee, and myself). Archaeologists have continued to document diversity in lithic, ceramic and other technologies among American groups. For instance, variation in lithic technologies, and the relationship of these to subsistence economies of early settlers in the Americas, has shown a geographically widespread movement of raw material in North America, as well as regional specializations in tool technology (Anderson and Faught 2000; Tankersley 1998). Research among biological anthropologists continues to link cultural habits with variation in skeletal morphology. For instance, recent studies have shown that different habitual behaviors among hunter-gatherers are directly observable by comparing their skeletal robusticity (Stock, 2006). Researchers have also demonstrated group variation in laterality, which is most likely related to variation in handedness among populations (Auerbach and Ruff, 2006).

A general disadvantage of these and numerous other studies, however, is their theoretical separation from each other. This is primarily because the research is conducted in multiple contexts, published across dozens of peer-reviewed publications, and rarely is brought together. Yet, the integration of these areas of study is essential. How might the variations noted in stone tool technologies relate to differences in handedness among groups? Or, is the evidence

suggested by the long-distance movement of raw materials in the past corroborated by skeletal evidence, through morphological affinities or mechanical evidence in the bones of the lower limbs? In this one illustration, skeletal evidence could aid archaeological findings, demonstrating whether the widespread movement of raw materials was related to a single, nomadic population, or if they related to an extensive trade network among friendly, unrelated populations. Likewise, archaeological research would elucidate the patterns of variation observed in group affinities and the mechanical properties of skeletons. Additionally, the work of geneticists would aid in understanding the relationships and histories of these groups.

The appeal of a conference on human diversity in the pre-Columbian Americas would be the opportunity for direct conversation among these various areas of knowledge in a common format. It would bring together researchers working in various regions and time periods of the Americas together; scholars investigating human morphological variation in a region would have a chance to compare results with others analyzing variation in artifacts or site composition in the same region. In addition, with multiple regions under discussion simultaneously, new connections among them could be forged and avenues for future research developed.

This conference would logically continue a dialogue initiated by a symposium, co-chaired by Karen Weinstein and myself, which will take place at the Annual Meeting of the American Association of Physical Anthropologists in March 2007 (Weinstein and Auerbach, 2007). The symposium, titled “Biological Variation and Evolutionary Dynamics in Ancient Populations of the Americas,” involves contributions from fourteen biological anthropologists, whose research spans the Americas temporally and regionally, examining variation among human groups from the perspective of dynamic responses to environmental factors. Namely, the presenters are examining climate, mobility, and nutrition through morphometrics (body shape and proportions), non-metric skeletal traits (dental traits), and isotopic analyses. Although this symposium promises to initiate a fruitful dialogue among biological anthropologists studying human diversity through skeletal biology in the Americas, it will be missing an important part of the holistic picture of the past—the information that archaeology can contribute, such as group relationships as evidenced by material culture, mortuary analysis, and habitation patterns. The participants of the symposium will aggregate information they can glean from published accounts concerning these factors, but this approach is limited.

With such a potentially broad topic as the one proposed, it will be essential to include participants whose research compliments each other. Useful contributions would be made by skeletal biologists, archaeologists, and anthropological geneticists, with emphasis placed on the first two disciplines. Workers in a number of other fields could be valuable contributors—ecologists, geologists, physiologists, to name a few—but would draw the focus of the conference away from the interaction of culture and skeletal biology, and how this contributes to the variation among the peoples of the Americas. Preferentially, specialists in these areas whose research already addresses diversity would be chosen, using data derived from archaeological contexts (e.g., artifacts and skeletons). This alone greatly reduces the potential group of participants, though the conference topic would remain of great interest to researchers in general among all of these fields.

Previous conferences and publications on the subject of diversity in the Americas are limited, and so this conference and its associated edited volume have the potential to be valuable additions to the available literature on this topic. As mentioned already, Charles Mann’s popular *1491* and Thomas Dillehay’s *The Settlement of the Americas* are general introductions to the subject. Although not explicitly about variation in the Americas, the 1999 Clovis and Beyond

Conference held in Santa Fe, New Mexico, involved participants from multiple anthropological disciplines, and resulted in two edited volumes: *New Perspectives on the First Americans*, published in 2004, and *Paleoamerican Origins: Beyond Clovis*, published in 2005. Both of these volumes, however, are focused only on the earliest inhabitants of the Americas. Of course, there are also the long-standing *Handbooks* (of the South, Middle, and North American Indians), which broadly cover all anthropological topics in multiple volumes. They do not integrate these topics, however. There are precedents for the general topic, then, as well as for interdisciplinary volumes on the Americas, but there are no edited professional volumes that directly address the subject of variation among archaeological groups in the Americas. The conference presents a unique opportunity to introduce this subject to the market.

Topics for discussion

As implied by the discussion above, a plethora of potential topics could potentially be covered by the conference. The final list of topics would rely on the conference composition, but participants would be encouraged to address these topics with their research:

- Documenting regional morphological variation, and relating this to cultural spheres as established by archaeology and to known genetic diversity
- Examining the intersection of environment, physical variation, and material culture
- The relationship between trade networks and morphological diversity
- Secular changes in observed diversity in morphology and in artifacts
- Comparing mobility for archaeological populations, as interpreted from human skeletal remains, with cultural spheres established through archaeological investigations
- The impact of lifeways, as understood through material culture, on pathologies, trauma, and mortality
- The use of archaeological evidence to establish hypotheses that can be tested using human biological data, and vice versa

Conference structure and preliminary list of invitees

Depending on the available resources (namely, space), the conference would be most effective if it involved invited speakers, discussion chairs, and professional attendees who are welcome to attend for a small registration fee. As researchers who do not often directly interact with each other will participate in the conference, the emphasis for the meeting will be on the promotion of an open dialogue among those presenting research and the other attendees. A meeting organization that incorporates short podium presentations and organized, long

discussion sessions would provide the best balance of the needs of presenting original research and encouraging interdisciplinary discussion.

The conference would take place over two days: one day for discussion of North America, and the other for South America. Invitees who agree to attend will be requested to provide a presentation title when they accept; these titles will be posted online when the conference is officially announced. I envision a general structure in which participants speak during the mornings and early afternoons, followed by a break period, after which an organized question-and-answer discussion session would occur led by discussion chairs. Two months prior to the conference, all invited speakers will be required to submit a draft of their conference paper and a 300 word abstract. Abstracts will be made publicly available online. The paper drafts will be posted electronically for the invited participants (speakers and discussion chairs), who will be asked to develop questions based on the papers and submit these prior to the conference. I would encourage researchers from different disciplines to provide questions for each other, and that question topics focus on integrating multidisciplinary perspective and “big picture” issues. The questions would be sent to the appropriate participant(s) in advance of the meetings, to allow time for speakers to develop answers. These questions would also be assigned to two discussion chairs—one archaeological, and one bioarchaeological in focus. On the conference meeting days, researchers would present their papers and have short question-and-answer periods, open to the general audience, immediately following their presentations. Papers will be presented according to regional and temporal commonalities (e.g., the early Pueblo Southwest), rather than by research area (i.e., genetics, skeletal biology, or archaeology). Discussion among the participants would be put off until the discussion session following the research presentations. After the podium session is finished, the speakers will reconvene as a panel for a discussion session. The discussion chairs will be given a few minutes to summarize the research presented, and then initiate a dialogue among the members of the panel using the pre-submitted questions. It will be left to the discretion of the chairs how much time will be permitted for answers by participants to the questions. The goal will be to maintain a structured but open conversation, and to keep the discussion moving forward with the aid of the submitted questions.

There are a number of qualified, active researchers who would make effective contributions to this conference. Among biological anthropologists—both those working with genetics and those examining skeletal remains—there is a relatively finite number when compared with the large number of active archaeologists in the Americas. For this reason, the following list of potential participants mostly presents researchers active in biological anthropology; the choice of archaeologists most appropriate as conference participants will be decided with the consultation of the staff of the Center for Archaeological Investigations and the faculty of Southern Illinois University:

Deborah A. Bolnick, University of California, Davis
 Jerome S. Cybulski, Canadian Museum of Civilization
 Paula N. Gonzalez, National University of La Plata
 Rolando González-José, University of Barcelona
 Richard L. Jantz, University of Tennessee
 Jay K. Johnson, University of Mississippi
 Brian M. Kemp, Vanderbilt University
 Marta M. Lahr, University of Cambridge
 Cecil M. Lewis, University of Michigan

Walter A. Neves, Institute of Bioscience, University of São Paulo
Joseph F. Powell, University of New Mexico
Andrea K. Ribeiro-dos-Santos, University of Para
Theodore G. Shurr, University of Pennsylvania
Jay T. Stock, University of Cambridge
Christopher M. Stojanowski, University of New Mexico
Lynne K. Sullivan, University of Tennessee
Richard C. Sutter, Indiana University-Purdue University Fort Wayne
Alan C. Swedlund, University of Massachusetts-Amherst
Karen J. Weinstein, Dickinson College
Daniel J. Wescott, University of Missouri

Discussion chairs:

Jane Buikstra, Arizona State University
Thomas Dillehay, Vanderbilt University
Clark Larsen, Ohio State University
Brian Fagan, University of California – Santa Barbara

Structure of the edited volume

As participants will be providing drafts of their papers prior to the conference, this will aid in the timely assembly of the conference's edited volume. Just as the conference is divided between North America and South America, the edited volume will use the same division. Ideally, a format similar to *Current Anthropology* will be used, in which researchers' papers will be published alongside comments from other participants, generated during the conference in response to submitted questions and the ensuing dialogue. In addition, the discussion chairs would be asked to provide short discussion papers covering the topics of the participants' submissions, which will also be aided by their early receipt of the drafts. I would contribute a short introduction to the volume, as editor.

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