

Some Achievements and Challenges of Dental Anthropology

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Abstract: *Dental Anthropology has produced a huge amount of information in the last decades, covering many different aspects of human biological and cultural life. For the last twenty years, a process of diversification and specialization occurred, that sometimes precluded the development of macroscale comparative studies, except for a few exceptional cases. Some reflections and critical debate have to be done to overcome these limits and to arrive to more consensual methodological procedures. The generation, analysis and conservation of new and previously known documented human osteological collections, and the use of compatible methodologies continue to be fundamental to obtain proxy data and generate adequate protocols to carry out comparative studies involving research projects from different parts of the world.*

Keywords: *Dental Anthropology; Worldwide perspective; Interdiscipline; Consensus; Reference collections; Conservation.*

Dental Anthropology is a scientific discipline of great development in the last decades, which deals with studies of sexual dimorphism, paleodemography, oral health, lifestyle, evolutionary trends, paleodiet, biodistance and paleopathology through the analysis of the dentition of extinct and modern human populations [1-22, among many others]. It is an important way of investigation that allows access to knowledge sometimes avoided by other kind of research. The microscopic structure of osseous remains is more fragile than that of teeth, and therefore tend to be more easily deteriorated, so that the latter usually form an important part of the evidence available because of the much tougher constitution of the tissues, both in archaeological cases and in the unfortunately increasing number of mass disasters, like aircraft accidents, natural catastrophes or terrorist attacks [e.g. 23-27]. Considering that tooth structure is not remodeled during life, they offer a large amount of information for understanding the biological and social dynamics of past populations [3, 14, 28, 29] and assist in the identification of missing persons through forensic anthropology procedures [30-32].

Modern Dental Anthropology is the result of systematic efforts carried out by research teams for decades in order to strengthen the scientific nature of the discipline and tried to explain the enormous biological diversity of human populations. The vast amount of information generated by scholars such as A. Hrdlička, A. Dahlberg, S. Garn, R. Potter, G. Townsend, E. Harris, J. Irish, K. and T. Hanihara, J. Kieser, A. Goodman, K. Alt, S. Hillson, H. Liversidge, C. Turner, P. Walker, Y. Mizoguchi, G. Gustafson, L. Richards, H. Smith, R. Corruccini, R. Cameriere and their investigation teams are good examples of comprehensive and sustained programs that included specific and holistic investigation designs. These detailed and numerous studies were initiated during the first half of the twentieth century, and significantly diversified since the 1970s. The prolific development generated a huge amount of data about dentition, which contributed to improving knowledge about the issues mentioned above; its impact is seen in the growing interest on the subject and the increasing incorporation of specialists in archeological and bio anthropological research groups all around the world.

At present, dental anthropology is immersed in a complex scenario that requires that the multiple current analyses in force, most of which offer significant heuristic potential for improving the anthropological science, be reflexively evaluated so as to arrive to methodological consensus that allow performing macroscale comparative studies. The definitions of the variables studied, their categorizations and the recording procedures are issues that should be clearly stated and necessarily discussed within the academic community in order to reach general consensus among scholars, so as to produce comparable data and allow developing studies in large spatial and temporal scales [33]. In this way, several survey protocols and systems of nomenclature have been generated to unify criteria of analysis in other disciplines, such as bio archeology, paleodemography and paleopathology [34-38]. Dental Anthropology still needs this kind of general agreement.

Related to that issue, another challenge of Dental Anthropology refers to the importance of increasing research programs on a worldwide scale to address problems such as the processes of dispersion, colonization and biological diversification of modern humans, first in the Old World and later in Oceania and America, departing from a consensual perspective for evaluating synchronous processes that took place in distant areas. This pretentious goal necessarily requires the interaction between multinational teams, with distinct socioeconomic contexts, topics of interest, histories of academic formation and heterogeneous theoretical backgrounds. The significance of this diversity lies in the possibility of each of that research programs to offer their previous knowledge and expertise in order to generate and test models about biological, migratory and adaptive dynamics of the populations that lived in different areas of the world. Dental Anthropology has much to offer to this issue in the near future, especially if basic criteria of recording and interpretation are agreed. In addition, the need for registering large and well-documented dental samples using similar recording forms should be put forward as a primary aim, so that each of them can be statistically treated and hence interpretations with solid empirical backgrounds can be assured.

Another aspect that must be highlighted relates to the importance of deepening the interdisciplinary spirit of Dental Anthropology. The knowledge and skills of dentists, physicians, bio archaeologists, forensic anthropologists, biochemists, biologists, historians and social anthropologists can exponentially enhance the scope of the interpretations in the frame of the discipline. This statement, firstly proposed about 40 years ago and sustained to the present as an essential pre requisite to modern bioarchaeology [39-42], remains highly effective and needs to be reconsidered in each analysis performed. Only the interaction of scholars from different areas of science will continue to produce high quality research. An example of great validity are the achievements of the Argentine Forensic Anthropology Team (EAAF) in its invaluable and uninterrupted work during more than 30 years that managed to lift the veil of the institutionalized military concealment and to offer irrefutable evidence of numerous human rights violations in Argentina and many other countries all around the world. The studies of Dental Anthropology played a key role in identifying disappeared people during the military regime, in interaction with a plethora of related specialists [e.g. 43-45].

Finally, we should never stop emphasizing the extreme value that each dental element has for identification purposes and for understanding the ways of living and the biological dynamics of past populations. This is why explicit and detailed conservation projects should be developed for the management of osteological and dental collections, in order to minimize deterioration and bequeath well documented and preserved samples for future generations. In addition to the most worldwide known and analyzed osteological samples, such as the Hamman-Todd, Terry, Huntington, Dart, Coimbra, Luis Lopes, Maxwell, Spitalfields and Vienna collections [46-55], several other osteological reference collections of contemporary and documented human remains are being formed in different parts of the world, such as in Greece [Athens Collection, 56], Spain [Granada Collection, 57] and Argentina [Chacarita and Rómulo Lambre Collections, 58-59]. All of them emphasize the value of maintaining each osseous and dental element recovered in association with any contextual information available (name, age, sex, pathology, date and cause of death, etc.), highlighting the principles of confidentiality and respect for the individuals who represent, to contribute with proxy data to the testing of forensic techniques usually applied by forensic anthropology, to the development of new methodologies to address unusual cases, and to the process of paleopathological differential diagnosis.

It is clear that by the linkage of these aspects it will be possible to produce a discipline that brings together research teams throughout the world and develops rigorous, consensual and long-termed programs. Considering the progress of today Dental Anthropology, one of the main objectives should be to generate information of global processes, in which the similarities and particular characteristics of the different pathways traveled by past populations can be addressed. This modest contribution may help to the generation of multidisciplinary models about the history of humankind, which will in turn help to understand and confront current processes of social inequality, relegation of ethnic groups, food shortages and territorial expulsion. Undoubtedly, it is in the knowledge of our own particular history as social beings where we can identify the roots of the problems, ambiguities, discursive naturalizations and inequalities prevailing in the current post-capitalist world. This is the contribution that the discipline is required to offer, as a way to help recognizing and alleviating some of the injustices that currently afflict human societies. Dental Anthropology can provide tools to help

minimize some of the deleterious effects of contemporary Western society, but to do so, it must overcome its current limitations, and identify and transcend some operational limits.

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