

## BOOK REVIEW

*The Tales Teeth Tell*. By Tanya M. Smith. MIT Press. 2018. 296 pp., \$29.95 (hard cover). ISBN: 978-0262038713.

The *Tales Teeth Tell* is an introduction to dental anthropology interwoven with its author's own experience of research and discovery. It takes the considerable expertise in tooth histology and imaging methods of the author and embeds them in the larger world of tooth growth and development, detailing processes at both the cellular and population level, introducing avenues of research and the questions that face the field. Professor Tanya Smith, now of Griffith University, has had a remarkable career trajectory thus far, moving from her PhD to prestigious fellowships at the Max Planck Institute for Evolutionary Biology and the Radcliffe Institute at Harvard University. Her work has concentrated on advancing histological research through innovative imaging projects. This work involved long-term collaborations with Paul Tafforeau on synchrotron imaging of dental tissue, and through other methods of understanding early life tooth growth and development, such as the collaborations with dental researchers Manish Arora and Christine Austin looking at breastfeeding signals in tooth chemistry. Her considerable expertise in dental growth and development and its evolution in our lineage has allowed her to offer a uniquely bottom-up approach to introducing dental anthropology, specifically by introducing the structure and growth of dental tissues as a way to approach questions of import to primate evolution as well as health and well-being in modern human societies.

The book is comprised of nine chapters, grouped into three sections covering major concepts in dental development, evolution, and what teeth reveal about behavior in addition to an introduction, conclusion, index, and a uniquely formatted 'notes' section that occupies a useful halfway house between endnotes (collected by chapter, though placed at the end of the text) and a formal bibliography. The flow of the book follows a path that might be expected from the author's special interest in dental structures. From

Chapter one we are immediately immersed in the complications of tooth biology, and while it is a daunting subject, the explanations are clear and concise. Chapter two ties the structure of teeth to their development, while chapter three introduces the obverse of development in the form of growth disruptions and other features that reveal information about past lives such as carious lesions and malocclusion. Chapter four begins the section on evolution, and we follow from fish through to hominin fossils by Chapter five, which presents major arguments in hominin dental evolution (enamel/dentine thickness, size reduction) without being overly dogmatic. Chapter six is perhaps the most interesting of the book, as it deals directly with the author's subject of expertise, dental growth and development and the evolution of our species. The potential for new research in this area is immense, and the treatment here allows the reader to sense this.

The final section is devoted to how dental anthropology can be used to examine behavior, with a nuanced discussion in Chapter seven of what is (and isn't) possible to say about past diet from teeth alone. While some of the discussion of the interpretation of barium stable isotope ratios as a weaning signal may eventually need to accommodate a wider range of elements to fully describe the trophic dietary processes revealed in dental tissue, this chapter clearly introduces fascinating and important applications of developmentally focused dental anthropological research. Chapter eight continues with an up-to-date discussion of the possibilities and pitfalls of biomolecular analyses as well as a very brief look at a variety of other subjects including morphology, wear, and sexual dimorphism. Finally, Chapter nine introduces the many ways teeth can be culturally modified, such as for display, with wear making a reappearance in the discussion. In closing, Smith considers the future of teeth, offering a glimpse into the changing evidence of life history and adaptation to new lifestyles teeth reveal.

The main strength of this book is that it asks the reader to begin at the beginning by foregrounding the developmental process of dental tissues, an approach that provides a solid foundation for dental anthropological research. In addition, it addresses several of the bugbears of dental anthropology, with very careful attention paid to theories which may have been taught as current for decades but within narrow subfields are being challenged, such as the

idea that molar eruption in primates maps directly onto life history stages such as age at weaning or reproduction, or that the dental (and facial) reduction seen in our species in the last ~10,000 years is completely understood. It is a comprehensive and detailed introduction to dental anthropology, so much so that it is possible to wonder if the work is targeted to a public or professional audience. It is of considerable utility to the advanced student or non-specialist seeking to broaden their knowledge, but the author's willingness to share her love of anthropological science and discovery suggests a hope that it will fall into the hands of someone who does not (yet) know the fascination of dental anthropology.

It speaks to the depth of subject matter in the field that Smith's foray into accessible writing about dental anthropology comes so close on the heels of the excellent volume by Peter Ungar but still offers much of unique interest. While some basic descriptions of tissues or processes might repeat those in other texts, Smith's volume maintains a distinctive voice while uniquely presenting a cell-up perspective on dental tissues. A nuanced understanding of the processes of tooth development allow the author to relay the complicated and, frankly, difficult to digest, patterns of enamel and dentine formation in a comprehensible way. Very few undergraduates come to dental anthropology with a developmental perspective, but given the potential for research in this area to answer big questions about evolution and behavior, this seems like a timely reframing of what is necessary for the anthropologist to know about teeth. It is a rather large ask to take microhistology and make it into something that inspires wonder, but I do hope that of the many anthropology students who will eventually pick up this book at least a few catch the sense of excitement and possibility Smith so clearly feels for the tales teeth can tell.

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