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Tooth development in human evolution and bioarchaeology

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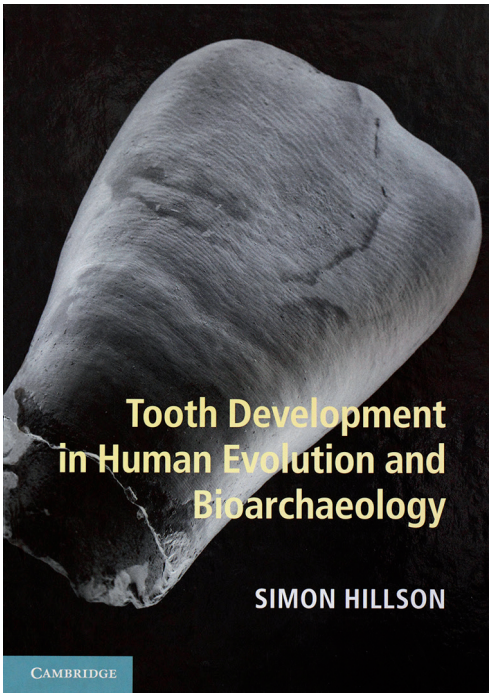
Hillson S. 2014. Tooth development in human evolution and bioarchaeology. Cambridge University Press, Cambridge, UK, 307 pp. ISBN: 978-1-107-01133-5.



The analysis of the development of human dentition, from the moment of initiation of deciduous tooth germs through processes of developing of tooth tissues (dentin, enamel, root cementum) gives huge scientific possibilities for auxologists studying contemporary living populations, for anthropologists analysing skeletal samples, for specialists in forensic anthropology and medicine as well as for primatologists.

The presented book *Tooth development in human evolution and bioarchaeology* written by Simon Hillson and published in 2014 by Cambridge University Press is an excellent expanding of the previous book of this Author – *Dental Anthropology* – first published in 1996 (reprinted in 1998).

The book consists of nine chapters presenting seven scientific problems

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covering almost all the complex issues of the specificity of human developmental processes analysed through the phenomenon of human dental development. These parts are preceded by a first short chapter entitled *Why development and why teeth?*, in which the Author explains the genesis of the form of this book. The last, ninth, chapter contains general conclusions. This chapter is followed by a two-part appendix, in which the Author placed 36 tables – all of them are very useful for readers. These tables present, among others: a relevant classification of Hominidea containing (which is very valuable) both living and extended species; selected standards of gingival emergence in deciduous and in permanent teeth in contemporary living humans, chimpanzees, gorillas, orangutans and rhesus macaques; developmental stages of tooth completion (first appearance of mineralized tissue in deciduous tooth germs, crown and root initiation time, ages of completion of tooth crowns estimated from enamel histology) in pig-tailed macaque, baboon, orangutan, gorilla, chimpanzee, as well as in living and fossil members of the genus *Homo*. The second part of the appendix is full of important technical information covering basic laboratory and microscopic techniques useful in odontological labs.

The second chapter – the first regular scientific chapter – is devoted to the basic characteristics of the specificity of the human developmental schedule (prenatal, postnatal growth, puberty, adolescent growth and variability, environmental effects on the growth pattern) in comparison to non-human primates. The third chapter concerns the stages of dental development and their variation in human and in non-human primates with special attention paid to the evolution of methods for assessment of tooth formation time. The fourth chapter (and the chapter which is the most interesting to me) presents human development through an enamel and through a dentin regular short-period (*circadian*, 24-hours) and long-period microscopic incremental structures. All these structures in both tissues (enamel and dentin) are precisely defined and visualised in good quality and properly self-explained photographs. The fifth chapter contains both the principles and the methodological instructions which are required for building accurate dental development sequences based on enamel prism cross striations and short-period dentine lines (representing approximately the 24-hour development rhythm). The sixth chapter contains an interesting scientific discussion regarding slow, human-like pace of dental development as the specific "biological answer (adaptation)" for the characteristic (evolutionary explained) features of human life history. The following two last scientific chapters focus on the dental markers of malnutrition, health/diseases and stressful environment, especially important for anthropologists studying past populations.

All the chapters are enriched with useful definition boxes and end with a handy, short summary.

I warmly recommend the book to all human biologists.

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