

DIGITAL RADIOGRAPHY FOR ALVEOLAR BONE LOSS MEASUREMENT

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Book Review

RECENT CONTRIBUTIONS TO THE STUDY OF ENAMEL DEVELOPMENTAL DEFECTS. Edited by Alan H. Goodman and Luigi L. Capasso. Chieti (Italy): Journal of Paleopathology, Monographic Publication 2. 1992. 400 pp. 150,000 lira (approximately \$95.00) (paper).

The study of enamel hypoplasia (EH) and other enamel defects has been, and continues to be, a common method for estimating environmental stress within prehistoric and recent populations in both physical anthropological and dental clinical fields. *Recent Contributions to the Study of Enamel Developmental Defects* will be of interest to workers in both fields. The volume contains 29 articles (plus introduction) divided among three broad categories: (1) Fundamental Issues and Methodological Contributions, (2) Application to Studying Past Human Populations, and (3) Reviews and Applications to Studying Contemporary Human Populations. With 55 contributors from the US, Canada, Mexico, Europe, India, Hong Kong, Japan, Australia, and New Zealand, this book truly represents a broad-ranging international contribution to the study.

Section 1 contains nine articles. Berti and Mahaney attempt to determine confidence intervals in the estimation of the age at which hypoplastic defects occur; and they discuss different methods of age determination. Sciulli presents a new method for aging EH defects in deciduous mandibular teeth, noting that older methods may not be reliable. Skinner discusses the neonatal line and its formation; he relates that it occurs nearer to the occlusal surface in pre-term infants. Danforth and Giliberti present an assessment of inter- and intraobserver concordance—an aspect of enamel developmental defect study which has seldom been evaluated. Condon and Rose find some differences in EH defects within and between tooth types, but overall observe a great deal of similarity. They note that linear defects between teeth can be matched in the same manner as dendrochronology, allowing a record of stress throughout childhood. Marks reports similar findings utilizing SEM analysis. Capasso and Di Tota discuss the possibility that the lower molar buccal pit is actually an enamel developmental defect as opposed to a morphological variant. Eckhardt et al. describe vertical EH, a rare enamel defect, in Liberian chimpanzees. And, Goodman et al. state that surface and histological defects in the permanent canines of prehistoric Black Mesa, Arizona individuals suggest chronic stress.

Section 2 contains 10 articles. Mack and Coppa look at EH in 5000 year-old Arabian Peninsula hunter/gatherers; over 98% of the individuals exhibited at least one hypoplasia. Mittler et al. find a positive association between EH and cribra orbitalia in a study of Medieval Nubian sub-adult mortality. Larsen and Hutchinson find a decrease in hypoplasia from prehistoric through European Mission period times in Florida Native Americans, an apparent contradictory finding compared to several other stress indicator studies. Storey discusses enamel opacities and other better known enamel defects in deciduous teeth, whereas Whittington studies chronic and acute EH in permanent teeth from a Classic Maya sample. Ubelaker records EH in 15 samples, spanning 8000 years in coastal and highland Ecuador. He describes evidence for maternal stress in more recent samples based on defects in deciduous teeth. Marcsik and Kocsis observe a variety of enamel defects in prehistoric and historic samples from Hungary, and relate that the overall incidence of EH is low. Yamamoto notes variation in hypoplastic defects from Jomon through modern times in Japan. Kuhl looks at six cremated Bronze and pre-Roman Iron Age children, and records EH, Harris

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lines, and cribra orbitalia. And, Hall and Bowman study 12 dentitions from 18th-19th century children interred in a London Church, observing evidence of rickets and a 41% incidence of EH.

Section 3 contains 10 articles. Suga presents a histological and radiographic analysis of rat, monkey, and human tooth enamel for hypoplasia and hypomineralization. He recommends internal analysis of enamel in prehistoric studies as the most complete methodology. Eckhardt lists linear EH frequencies in the same Liberian chimpanzee sample noted above. He concludes that EH occurrences are "population-specific manifestations of a general facultative response that is part of our primate heritage." Duray studies the relationship between enamel developmental defects and dental caries in an 800-1100 AD sample from the Libben site; he finds a positive correlation between demarcated enamel opacities (hypocalcification) and caries, but a negative correlation between enamel hypoplasia and caries. Seow uses EH occurrence in deciduous teeth to discern perinatal and neonatal morbidity, and concludes that the prevalence of such defects shows a direct relationship to birth weight. King and Tsang describe tetracycline discoloration in the enamel and dentine of Chinese deciduous teeth. They find that some staining is apparent only under ultraviolet light. King and Wei provide a literature review of enamel defects in permanent teeth of modern humans. They also find a positive correlation between fluoride levels in the water and the number of enamel opacities. Lukacs and Joshi study three plaster cast samples from living northwest Indians (India), and find a 68-87.7% incidence of EH. Goodman et al. observe a negative association between linear EH and socioeconomic status, height-for-age, and weight-for-age in 296 modern Mexican children. They posit that their study will help in the understanding of the same factors in prehistoric samples. Hillier and Craig find systemic disease is associated with a greater number of prominent striae of Retzius in deciduous teeth of living British children. And, Suckling et al. use scanning proton microprobe analytical techniques to measure the levels of fluoride in human enamel and dentine before and after the introduction of fluoride in drinking water and toothpaste. The later sample's teeth contain higher amounts of fluoride.

Overall, the book represents a solid effort to consolidate the most recent and topical aspects of enamel developmental defect analysis. The editors are to be congratulated for assembling such a wide variety of articles on the topic. The book is appealing and professional in its appearance, and is well-illustrated (170, 31 in color). The first section is quite informative. All nine articles are well-written and interesting. I personally enjoyed the papers by Danforth and Giliberti, Condon and Rose, and Goodman et al. The 10 articles in the third section are equally well done. I found the studies by Duray, Seow, and Lukacs and Joshi to be of special interest. The second section begins strongly. Papers by Mittler et al, Larsen and Hutchinson, and Ubelaker are exceptional.

However, the last four articles in Section 2 are somewhat uneven in their content. The Marcsik and Kocsis study is nicely illustrated, and covers a wide variety of interesting defects. Yet, it could have been better organized and more tightly focused. Yamamoto's attempt to discern EH secular trends is interesting, but findings based on just four samples from a roughly 10,000 year span are questionable. The Kuhl study may be overly-detailed (15 text pages) for most readers, especially considering the small sample size (n=6) which consists of cremated individuals. And, Hall and Bowman's paper may also be too detailed for a sample consisting of 12 individuals. In addition, the first three of these articles are hindered by grammatical problems (e.g. one sentence paragraphs, syntax errors, incorrect spelling, etc.), which may contribute to their apparent organizational shortcomings. Such errors probably result from the use of English as a second language. These kinds of errors are understandable, but they should have been noted by the proofreaders and editorial staff.

Similar errors occur elsewhere in the book. There are a variety of misspellings, grammatical problems, and inconsistencies which are distracting. For example, Capasso and Di Tota's paper alternately cites the same reference as Miller 1889, 1898, and 1989; in Marcsik and Kocsis' article, a photograph is printed upside down and backwards; and one contributor's name is spelled two ways: Bowman vs. Browman. However, it may be possible that some of these problems occurred during typesetting, and were thus beyond the editors' control.

In spite of these few distractions, the book will provide a valuable addition to the library of all workers interested in the study of dental pathology. Nowhere else will one locate a single source presenting such a comprehensive compilation of recent diverse studies on the topic of enamel developmental defects.

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