

# Book Review: Developmental Juvenile Osteology—2<sup>nd</sup> Edition

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## Abstract

This paper is a critical review of the newly published second edition of “Developmental Juvenile Osteology” by C. Cunningham, L. Scheuer and S. Black. It is extensively illustrated by Angela Christie portraying the developing human skeleton at varying stages of juvenile growth. A chapter on the dentition omits mention of attritional wear or identifies caries restorative materials. Despite an extensive bibliography, failure to provide reference sources detracts from an incomparable source of developmental skeletal enlightenment.

## Keywords

Review, Developmental Juvenile Osteology

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With a color cover embellishment of a juvenile skeleton portrayed in lateral and frontal perspectives, this 630-page tome updates its predecessor’s first edition of 16 years ago [1]. Forewords to the book by eminent paleoanthropologists Leslie Aiello and Bernard Wood indicate the wide breadth of coverage brought to bear upon the developing human skeleton in many contexts is not covered in standard human anatomy texts. The wide scope of disciplines incurred in the study of developing bones includes embryologists, skeletal biologists, forensic anthropologists, archeologists, paleontologists and evolutionary biologists. The inclusion of a chapter on the dentition by Helen Liversidge, an authority on dental development, brings an extended dimension to the scope of study of hard tissue components of the human frame.

The titles of the twelve chapters provide insight into the degree of description of the juvenile skeleton. The chapters range from an introductory guide to the text, an overview of skeletal development and ageing, a detailed commentary on bone development from osteoprogenitors to ossification, remodeling and the impact of ageing on the hard tissues. Early embryological development is given cursory coverage by a brief synopsis that cannot measure up to the several texts

cited, but are irrationally not properly referenced. The oversight is a detraction of this book as guidance to major reference sources.

The chapter devoted to the skull is unsurprisingly the longest and most detailed chapter comprising 102 pages. Every bone in the skull is described in great detail, accompanied by meticulous pen and ink drawings and photographs of the disarticulated bones. Further, tables of dimensions of each bone at different ages, from weeks to months, provide information unattainable elsewhere. The absence of radiographs is a serious deficiency and a surprising omission of significant radiological information of developing cranial bones that would provide insights into details of mineralization patterns of ossification. Much forensic and pathogenetic information can be extracted from Grenz and hard X-rays of bone specimens. Radiology of paleopathological specimens would provide insights into ancient and modern mechanisms of osteogenesis, bone morphology and bone destruction.

The chapter on the dentition logically follows that of the skull, with numerous author citations to dental articles or books, but regrettably, no reference information to journal titles, volumes or pages is provided.

Considering that teeth constitute the single most significant component of paleo-odontological, evolutionary and forensic evidence, the chapter on the dentition is one of the most important informative sources of age attribution of recovered skeletal material. Despite its comprehensiveness, the absence of any reference to dental restorative elements that constitute a major forensic identification component or any mention of congenitally absent or missing or malformed teeth is an unjustified oversight. Degrees and characteristics of attritional wear, so important in dietary and forensic identification of individuals, are totally omitted.

Individual chapters devoted to the vertebral column, the thorax, the pectoral and pelvic girdles and the upper and lower limbs fulfil the mandate of dealing with the whole skeleton at developmental levels extending from fetal through juvenile and even into old age. Intriguing footnote commentaries on the origins of anatomical terminology provide historical insights into the nomenclature of some skeletal components. Who knew the term “spine” arose from Roman chariot race courses, split by a central wall designated the “spina”, was applied to the vertebral column by early anatomists? Attribution to Greek mythology underlies much vertebral nomenclature, explaining “atlas”, “axis”, “sacrum” and “coccyx”.

Whimsical footnotes are peppered throughout the text, making amusing and sometimes informative observations. They lighten the otherwise heavy informative facts of detailed morphological markings.

Two appendices are attached. The first deals with chronology according to varying parameters of stages of biological development versus time and differing measurements of the first appearance of structures. The second appendix relates the time scales of embryonic and fetal development.

The terminal reference section of the book of 123 pages is a heroic attempt to list pertinent works of authors in alphabetical order covering references as early

as 1737 to admirably as recently as 2015. However, the absence of references cited in the text renders even this extensive list deficient, which sadly detracts from its full usefulness.

This work undoubtedly is an invaluable resource of osteochondritic morphology that has few peers. However, the omission of *in situ* reference locations regrettably detracts from its status as the ultimate source of desired information.

It is hoped that a third edition of this work might be foreseen with the suggested missing addenda added, and that it might not be delayed for another 16 years!

## References

- [1] Cunningham, C., Scheuer, L. and Black, S. (2000) Developmental Juvenile Osteology. 1st Edition, Academic Press, Amsterdam.



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