

Table of Contents

Foreword

Contributors

SECTION I: INTRODUCTION

1. Paleohistology: An Historical – Bibliographical Introduction

Armand J. de Ricqlès

SECTION II: MORPHOLOGY AND HISTOLOGY OF THE SKELETON

2. An Overview of the Embryonic Development of the Bony Skeleton

Vivian de Buffrénil and Alexandra Quilhac

3. The Vertebrate Skeleton: A Brief Introduction

Michel Laurin, Alexandra Quilhac and Vivian de Buffrénil

Methodological Focus A: The New Scalpel: Basic Aspects of CT-Scan Imaging

Damien Germain and Sandrine Ladevèze

4. Microanatomical Features of Bones and Their Basic Measurement

Vivian de Buffrénil, Eli Amson, Alexandra Quilhac, Dennis Voeten and Michel Laurin

Methodological Focus B: Basic Aspects of 3D Histomorphometry

Eli Amson and Damien Germain

5. Bone Cells and Organic Matrix

Louise Zylberberg

6. Current Concepts of the Mineralization of Type I Collagen in Vertebrate Tissues

William J. Landis, Tengteng Tang and Robin DiFeo Childs

7. An Overview of Cartilage Histology

Alexandra Quilhac

Methodological Focus C: Virtual (Paleo-)Histology Through Synchrotron Imaging

Sophie Sanchez, Dennis F. A. E. Voeten, Damien Germain and Vincent Fernandez

8. Bone Tissue Types: A Brief Account of Currently Used Categories

Vivian de Buffrénil and Alexandra Quilhac

Methodological Focus D: FIB-SEM Dual-Beam Microscopy for Three-Dimensional Ultrastructural Imaging of Skeletal Tissues

Natalie Reznikov and Katya Rechav

SECTION III: DYNAMIC PROCESSES IN OSSEOUS FORMATIONS

9. Basic Processes in Bone Growth

Vivian de Buffrénil and Alexandra Quilhac

10. Accretion Rate and Histological Features of Bone

Vivian de Buffrénil, Alexandra Quilhac and Jorge Cubo

11. Bone Remodeling

Vivian de Buffrénil and Alexandra Quilhac

12. Remarks on Metaplastic Processes in the Skeleton

Vivian de Buffrénil and Louise Zylberberg

SECTION IV: TEETH

13. Histology of Dental Hard Tissues

Alan Boyde and Timothy G. Bromage

SECTION V: PHYLOGENETIC DIVERSITY OF SKELETAL TISSUES

14. Introduction

Michel Laurin

15. Finned Vertebrates

Jorge Mondéjar-Fernández and Philippe Janvier

16. Early Tetrapodomorphs

Sophie Sanchez, François Clarac, Michel Laurin and Armand de Ricqlès

17. Lissamphibia

Vivian de Buffrénil and Michel Laurin

18. Early Amniotes and Their Close Relatives

Aurore Canoville, Michel Laurin and Armand de Ricqlès

19. Testudines

Torsten M. Scheyer and Ignacio A. Cerdá

20. Lepidosauria

Vivian de Buffrénil and Alexandra Houssaye

21. Sauropterygia: Placodontia

Torsten M. Scheyer and Nicole Klein

22. Sauropterygia: Nothosauria and Pachypleurosauria

Torsten M. Scheyer, Alexandra Houssaye and Nicole Klein

23. Sauropterygia: Histology of Plesiosauria

P. Martin Sander and Tanja Winrich

24. Ichthyosauria

P. Martin Sander

25. Archosauromorpha: From Early Diapsids to Archosaurs

Armand de Ricqlès, Vivian de Buffrénil and Michel Laurin

26. Archosauromorpha: The Crocodylomorpha

Vivian de Buffrénil, Michel Laurin and Stéphane Jouve

27. Archosauromorpha: Avemetatarsalia – Dinosaurs and Their Relatives

Kevin Padian and Holly N. Woodward

28. Nonmammalian Synapsids

Jennifer Botha and Adam Huttenlocker

29. Diversity of Bone Microstructure in Mammals

Vivian de Buffrénil, Christian de Muizon, Maiténa Dumont, Michel Laurin and Olivier Lambert

SECTION VI: INTEGRATIVE QUESTIONS

30. Phylogenetic Signal in Bone Histology

Jorge Cubo, Lucas J. Legendre and Michel Laurin

31. Cyclical Growth and Skeletochronology

Vivian de Buffrénil, Alexandra Quilhac and Jacques Castanet

32. Aging and Senescence Processes in the Skeleton

Catherine Bergot and Vivian de Buffrénil

33. Basic Principles and Methodologies in Measuring Bone Biomechanics

Russell P. Main

34. Interpreting Mechanical Function in Extant and Fossil Long Bones

Russell P. Main, Erin L.R. Simons and Andrew H. Lee

35. Bone Microanatomy and Lifestyle in Tetrapods

Aurore Canoville, Vivian de Buffrénil and Michel Laurin

36. Bone Histology and the Adaptation to Aquatic Life in Tetrapods

Alexandra Houssaye and Vivian de Buffrénil

37. Bone Histology and Thermal Physiology

Jorge Cubo, Adam Huttenlocker, Lucas J. Legendre, Chloé Olivier and Armand de Ricqlès

38. Bone Ornamentation: Deciphering the Functional Meaning of an Enigmatic Feature

François Clarac

39. The Histology of Skeletal Tissues as a Tool in Paleoanthropological and Archaeological Investigations

Ariane Burke and Michelle S. M. Drapeau

40. A Methodological Renaissance to Advance Perennial Issues in Vertebrate Paleohistology

Alexandra Houssaye, Donald Davesne and Aurore Canoville

Extended Table of Contents