TEETH

Second Edition

Archaeological discoveries of teeth provide remarkable information on humans, animals and the health, hygiene and diet of ancient communities. In this fully revised and updated edition of his seminal text Simon Hillson draws together a mass of material from archaeology, anthropology and related disciplines to provide a comprehensive manual on the study of teeth. The range of mammals examined has been extended to include descriptions and line drawings for 325 mammal genera from Europe, North Africa, western, central and northeastern Asia, and North America. The book also introduces dental anatomy and the microscopic structure of dental tissues, explores how the age or season of death is estimated and looks at variations in tooth size and shape. With its detailed descriptions of the techniques and equipment used and its provision of tables and charts, this book is essential reading for students of archaeology, zoology and dental science.

SIMON HILLSON is Professor of Bioarchaeology at the Institute of Archaeology, University College London. His previous publications include *Teeth* (Cambridge, 1986), *Mammal Bones and Teeth* (1992), and *Dental Anthropology* (Cambridge, 1996).

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Second Edition

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PREFACE

The first edition of *Teeth* was published in 1986. This second edition, which became affectionately known as *Teeth II*, has very largely been rewritten. One of the main changes is an expansion of the taxonomic range. The first edition included 150 genera of mammals from the western Palaearctic (Europe, western Asia and North Africa). This made it possible to keep the size of the job down to manageable proportions, and also kept the book down to the intended size but, as the largest sales were in North America, this approach did not fit well with its main readership. In 1996, I published *Dental Anthropology*, also with Cambridge University Press, which duplicated a good deal of specifically human material in *Teeth*. This made it possible to give less emphasis to the human component in *Teeth II*, leaving space to include a total of 325 genera, representing the Holarctic in its entirety, including Europe, North Africa, Western, Central and North-east Asia, and North America. Humans are still included, but the level of detail is closer to that of the other mammals. The other changes in *Teeth II* are more to do with changing my mind about various issues, and updating references, rather than dramatic developments in the subject. One of the striking things about returning to the text almost 20 years later is how few of the fundamentals have in fact changed.

It would not have been possible to write this book without access to the great zoological collections of the world. I am very lucky that one of these is here in London, at the Natural History Museum, and I am very grateful to Paula Jenkins and Richard Sabin for allowing me to use this magnificent collection, and helping me during weekly visits over a period of a year or more. Another wonderful collection is at the National Museum of Natural History, part of the Smithsonian Institution in Washington DC. There, I must particularly thank Don Ortner for helping me to organise my visit, Linda Gordon and Charlie Potter for access to the Mammals collections, and Bob Purdy for access to the Vertebrate Paleontology collections. The third great collection is at the Field Museum in Chicago, and I thank Michi Schulenberg (Mammals) and Bill Simpson (Fossil Vertebrates) for their help.

The figures in this book have taken me longer than the writing. It is my first attempt to illustrate a book entirely using computer graphics. Many new drawings were needed, and all the figures from *Teeth I* were redrawn, in order to keep the style consistent. Previously, my artwork has all been pen and ink, and I am grateful to Phil Walker, of University of California, Santa Barbara, who first suggested the kind of thing that is possible with computers. I made the original drawings in the museum, with pencil and paper. For large specimens, they were based on

measurements, and the axonometric projections were constructed on tracing paper over a grid. Small specimens were drawn using a drawing tube attachment and an excellent Leitz stereomicroscope. For axonometric projections, the specimen was mounted on a small plinth that tilted it into the correct position, and the focus of the microscope had continually to be adjusted whilst tracing along the tooth row. It was very tiring on the eyes – one eye follows the pencil and the other the specimen, and the brain merges the two together! At museums in the USA, photography was permitted, so some specimens were recorded either with a Pentax 35 mm SLR film camera fitted with a macro lens, or with Nikon or Sony digital cameras. It took a lot of experimentation to find a digital drawing technique that produced results like pen and ink. The crucial piece of equipment is a really good pressure-sensitive graphics tablet, in this case a Wacom. It can be a small one and, coupled with a laptop computer, this is very portable. Most of the drawings were done on a large desktop computer, but some were done by the sea on a small island in Greece, and others in a hotel room in Lima. Pencil drawings and photographic negatives were scanned so that, along with digital images, they could be used as the templates over which the final drawings could be made. These drawings were traced as a separate layer in Adobe Photoshop. After the original template layer had been deleted, these digital images were converted into vector graphics with Corel Trace. These were imported into Corel Draw, in which they could be scaled, shaded and labelled. The original drawings were many times larger than their final size, because the reduction 'tightens' them up and makes them much crisper and cleaner.

I had a lot of support from colleagues and family during the writing and drawing of *Teeth II*. In particular, I would like to thank Daniel Antoine, Louise Martin and Tony Waldron from the Institute of Archaeology in University College London for their advice and discussion. I am also grateful to Peter Ucko, Director of the Institute, for allowing sabbatical leave which helped a great deal. He has always been supportive of my research interests, as well as getting me involved in new research directions which have provided a great deal of interest and enjoyment. As always, I gratefully acknowledge my teachers, Don Brothwell, Alan Boyde and Sheila Jones. Other colleagues, part of a loosely defined 'London' group, who have always been there for dental discussions include Chris Dean, Leslie Aiello, Don Reid, Charles FitzGerald, Fred Spoor, Louise Humphrey and Chris Stringer. Most patient of all have been my family, Kate, William, James and Harriet, my father and sister, who have tolerated my eccentric interest in teeth, and have helped in many ways. In particular, my sons helped a great deal with computing, and James even allowed me to include an illustration of his cusps of Carabelli. Finally, I thank my editors at Cambridge University Press, Simon Whitmore and Tracey Sanderson.