

Preface

The object of this work is to provide sets of images of taphonomic modifications of vertebrate bones during their preservation in the archaeological and fossil record. The correct identification of taphonomic modifications is the first step in understanding the processes by which they are formed and the agents behind the processes (Weigelt 1927). The book is arranged in such a way as to facilitate comparisons of taphonomic modifications so that each modification produced by one process or agent can be compared with similar modifications produced by other processes and agents. *Modifications* are what are actually observed on recent and fossil bone, and modern simulations can reconstruct the *processes* by which they are formed. The third step is identification of the *agent* responsible. Thus, the modification of a rodent tooth showing the enamel partly dissolved away has undergone a process of solution which may be due to enzyme or acid attack; distinguishing the actual process requires experimentation to show which it is; and finally the agent responsible for the process can again be estimated by experimental work, comparing corrosive forces such as animal or bird digestion, soil corrosion or physical breakage.

In order to keep the book to a manageable size and yet illustrate it with high-quality images, we have opted for a minimum of text and text figures to organize the taphonomic modifications described and displayed here. We do not aim to update the literature published on vertebrate taphonomy. Many scientific papers have tackled specific taphonomic problems, and there are comprehensive books such as those of Shipman (1981), Brain (1981), Binford (1981), Lyman (1994a), Pickering et al. (2004), and Bell (2012) which describe and summarize the literature on vertebrate taphonomy. We aim here to show a broad range of images of most aspects of vertebrate taphonomy with identifications of causality which are largely the product of our own research, based on complete taphonomic analyses of a given site, long term field monitoring and experimental work. The text outlines the different modifications, processes and agents important in vertebrate taphonomy. Modifications are illustrated at the end of each chapter as Atlas images, and the essential parts of the book are the comparisons between images displayed in high resolution. The entire volume is available as a downloadable pdf file, as described on page 5 below.

Our interest in taphonomy goes back to 1971, when PA was introduced to the subject by Judy Van Couvering (now Judith Harris), an inspirational field worker and a good friend. This led to the establishment of a long-term monitoring project at Neuadd in Wales (see description in Chap. 2), the results of which have not yet been published. The taphonomy of small mammals complemented this with several projects on fossil faunas and on collections of modern predator assemblages (Andrews 1990; Andrews and Evans 1983), all of which were brought together in the book *Owls, Caves and Fossils* (Andrews 1990).

YFJ was encouraged to go into the field of taphonomy by Prof. Emiliano Aguirre in 1985 and was formally introduced to taphonomic modifications and interpretations of bone remodelling by T.G. Bromage, which was of great value for her training. She was also soon involved in the analysis of taphonomic and environmental information that small mammals could provide, and she started collaborating with PA on the fossil sites at Atapuerca and Olduvai (Fernández-Jalvo and Andrews 1992; Andrews and Fernández-Jalvo 1997; Fernández-Jalvo et al. 1998). She also recognized that the taphonomic modifications could be important in other areas of research, such as pollen analysis, and she has widened her approach to include diverse processes and agents of fossilization, including DNA preservation and experimental taphonomy. We have pursued together on our common interest in taphonomic studies of site formation and patterns in taphonomy, and on anthropological studies of human behaviour based on taphonomic evidence.

To a limited extent we have used images from the work of others, and we thank the following for permission to use their work: Luis Alcalá, Saleta Arcos, Graham Avery, Kay Behrensmeyer, Jill Cook, Isabel Cáceres, Arzu Demeril, Christiane Denys, Emma Jenkins, Peter Jones, Tania King, Dores Marin-Monfort, Theya Molleson, Dolores Pesquero, Ana Pinto, Tony Sutcliffe and Jim Williams. We also thank the following for providing specimens: E. Aguirre, G. Avery, A.K. Behrensmeyer, B. Brain, A. Cuadros, M. Domínguez-Rodrigo, E-M Geigl, G. Haynes, D. Fisher, C. Finlayson, P. Jones, J. Martínez, T. Molleson, S. Parfitt, S. Ripoll, A. Rosas, B. Sánchez, B. Sanchiz, C. Smith and D. Western. We are especially grateful to the late Anthony Sutcliffe, one of the early collectors of modern taphonomic specimens. He donated his extensive collection to the Natural History Museum and facilitated our taphonomic work. We are also grateful to the following for use of their figures: M. Antón, M. Bautista, S. Bello, I. Cáceres, J. Carrier, C. Denys, J. Fernández-Jalvo, G. Gómez, T. Jorstad, A. Louchart, F. Njau, Z. San Pedro, D. Pesquero, M. Salesa, C. Stringer, M. Wysocki and H. Tong.

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