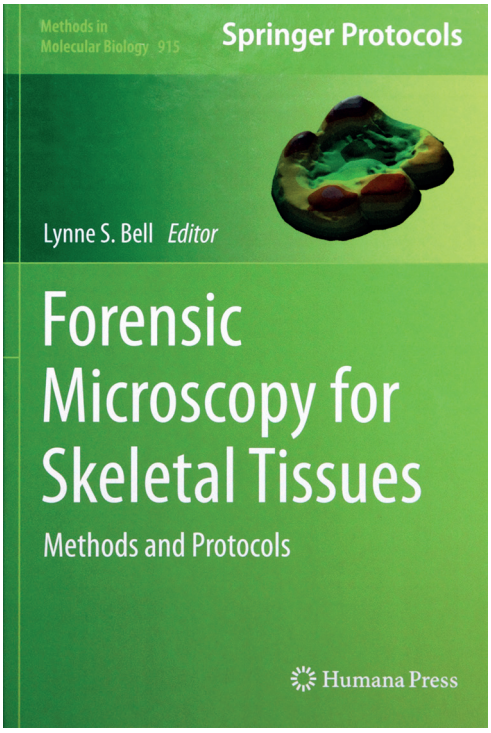
Anthropological Review • Vol. 76 (2), 241–243 (2013)
Available online at: https://doi.org/10.2478/anre-2013-0025

Forensic Microscopy for Skeletal Tissues: Methods and Protocols

Elżbieta Żądzińska

Department of Anthropology, Faculty of Biology and Environmental Protection, University of Łódź, Poland

Lynne S. Bell (ed.). 2012. Forensic Microscopy for Skeletal Tissues: Methods and Protocols. Methods in Molecular Biology 915, Springer Protocol. Humana Press, New York, 269 pp. ISBN: 978-1-617779-9976-1.



Analyses of skeletal material using modern microscopic techniques (optical microscopy, electron microscopy, scanning microscopy) have lately been performed more and more often, not only in research in the field of forensic anthropology, but also in studies in the area of historical anthropology, odontology and bioarchaeology.

The book *Forensic Microscopy for Skeletal Tissues: Methods and Protocols* edited by Lynn S. Bell and published in 2013 by Humana Press is the first "manual" familiarising the reader in detail with methods of preparing histological specimens from teeth and bones for use in anthropological research. The book consists of fifteen chapters presenting fifteen scientific issues (important for physical anthropologists, forensic anthropologists, odontologists and bioarchaeologists) that require the use of microscopic techniques. Each chapter

Book Review: Received December 10, 2013
DOI: 10.2478/anre-2013-0025

begins with a brief introduction covering the characteristics of the presented research method. Subsequently, the reader is informed about the equipment of a research laboratory that is necessary for work with the specific technique. This is followed by a detailed description of the way of preparing a biological specimen. The first chapter is devoted to scanning microscopy. The second chapter concerns the correct plastic embedding and polishing of bone for reflected light and electron microscopy, which is crucial to the success of any analysis using microscopy (especially electron microscopy). The third chapter presents a detailed description of the correct preparation of hard, mineralised structures (bones, teeth) for observation under an optical microscope. The fourth chapter contains examples of bone and tooth pathologies (among others fibrous dysplasia, aneurysmal bone cyst, Paget's disease, adamantinoma, osteochondroma, osteosarcoma, dentigerous cyst and odontogenic keratocyst) together with a description of the possibilities of observing lesions characteristic of a specific disease in x-ray images and in histological specimens. The following four chapters focus on the issue of assessing the age of an individual on the basis of microscopic observation of enamel and cement of permanent teeth as well as on the basis of the rib cortical microstructure and histomorphometry. The ninth chapter concerns the possibilities of assessing the diet of primates on the basis of 3-dimensional dental topography of permanent teeth. The subsequent chapters focus on chemical, molecular and electron techniques (enzyme-linked immunosorbent assay, sodium dodecyl sulphate polyacrylamide gel electrophoresis, western blot, attenuated total reflectance infrared spectroscopy and backscattered electron imaging in scanning electron microscopy) of distinguishing natural components from components of diagenetic origin in the analysed skeletal material (bones, teeth) and of identifying traces of heat processing as well as perimortem injuries, among others cut marks.

The book edited by Lynn S. Bell is thus not only a collection of methodological instructions for technicians and laboratory assistants who prepare microscopic specimens from skeletal and odontological material (although it fulfils this function without any doubt), but it is also an excellent synthesis pointing out the possibilities of using modern techniques of chemical, molecular and microscopic analyses in anthropological research, written by specialists (anthropologists, palaeobiologists, odontologists) who work with these methods. These specialists include Christopher Dean and Peter Ungar, among others. An additional, unquestionable asset of the book is the photographs showing images of the analysed objects, among others enamel, bone fragments, pathological changes of the skeleton, obtained with the use of the described microscopic techniques. This is especially important for beginning researchers who have not worked so far with the techniques of microscopic imaging of biological material described in the book under review.

In my opinion, the only thing that the book lacks is a chapter or a few chapters presenting the basic features of biological development of the structures that are analysed in it: bones and teeth.

I warmly recommend the book to all anthropologists who analyse both skeletal and dental tissues.

Corresponding author

Elżbieta Żądzińska Faculty of Biology and Environmental Protection, University of Łódź, Banacha 12/16, 90-237 Łódź, Poland.

e-mail address:
e.zadzinska@biol.uni.lodz.pl