Paleomicrobiology of Humans
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Michel Drancourt
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Paleomicrobiology is a new field that aims to identify past epidemics at the crossroads of different specialties such as anthropology, medicine, molecular biology and microbiology. Paleomicrobiology is facing several types of problems that are discussed in this book. On the one hand the recognition of human remains associated with epidemic outbreaks, the graves associated with disasters, demographic structures revealing the presence of epidemic moment (Chapters 1 and 2). On the other hand, paleomicrobiology, the history of epidemics, helps to understand the evolution of the history of human beings since now we can find the genetic markers associated with humans, like the gene HLA.LILR inherited from archaic hominids (Neanderthal or Denisovan man) in some populations that presumably have survived due to their resistance to some epidemic pathogens. Paleomicrobiology also helps to track the human migrations (3,4). The materials which can be used to make the diagnosis in paleomicrobiology include soft tissue when it comes to mummies, the arthropods, especially lice, bones and teeth. Use of the dental pulp as a source of genetic material was first used in paleomicrobiology before being used in human genetics (5). The utilization of the dental pulp as a source of DNA research by PCR molecular techniques was initially the subject of a controversy about the authenticity of the results. This controversy, which lasted more than 10 years, is resolved now. The polemics about the initial results concerning plague led to a general reflection on the plague pandemics, which in its turn led to a conclusion that the plague pandemics were probably provoked by the outbreaks of lice. Paleomicrobiology presents the evidence of common epidemics provoked by Bartonella quintana (which is known to be transmitted by lice) and Yersinia pestis which have perfectly demonstrated its role in epidemics and which was confirmed by contemporary plague cases (6). The dispute over the results of the paleomicrobiology led to outlining the identification and interpretation criteria (7). Then, paleomicrobiology developed in different research areas, particularly in the analysis of human coprolites (8), the identification of antibiotic resistance in ancient samples that preceded by several million years the use of antibiotic (9), the history of epidemic typhus (10), of Bartonelose (12) tuberculosis (13), leprosy (14), former intestinal parasites (15), malaria (16), smallpox (17), cholera (18) and finally the history of human lice (19). As a final point, the anatomical analysis of ancient samples also plays a role in the identification of past disease. Altogether, this is the first complete comprehensive book updating (reporting on) the approach of a new multidisciplinary scientific field.
Acknowledgments

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