

Book Review

Digging for Pathogens: Ancient Emerging Diseases—Their Evolutionary, Anthropological and Archaeological Context.

Charles L. Greenblatt, editor. Balaban Publishers, Rehovot, Israel, 1998.

Digging for Pathogens presents the proceedings of the first conference held by the Center for the Study of Emerging Diseases, convened in Jerusalem in May 1997. Specific areas of interest of the Center include parasite adaptability and evolution, human genetics and behavior, vaccine and antibiotic development. The subject of this monograph is “paleo- and prospective parasitism,” or ways in which knowing the causes of ancient diseases contributes to our understanding of emerging ones.

The book is divided into three sections. The first two—The Evolutionary Context and The Anthropological and Archaeological Context—provide a strong background for understanding the respective roles of parasites, arthropod vectors, vertebrate hosts, and humans in affecting disease outcomes. This book is the first to focus on the isolation, characterization, and interpretation of ancient DNA (aDNA) in relation to infectious disease and pathology (1). The titular third section, Digging for Pathogens, expertly summarizes the technical and practical aspects of paleopathology, including the fate of biologic markers (Eglington, chapter 15), aDNA (Herrmann and Hummel, chapter 16), and arthropods as reservoirs and vectors of pathogens, both ancient and modern (Spigelman and Greenblatt, chapter 17).

Each chapter presents enough original ideas to fuel a new generation of graduate students. Martin and Rothschild (chapter 3) authoritatively cover the history of infection, bone diseases, endocrine disorders, and tumors in vertebrates. Cano (chapter 5) discusses how aDNA sequences provide insight into molecular evolution and the evolution of virulence, exemplified by bees and *Bacillus* symbionts fossilized in amber. Schlein and Jacobson (chapter 7) and Halevy (chapter 8) discuss the evolution of the Trypanosomatidae, based on common cellulase and ergosterol profiles. Ewald (chapter 4) suggests that cholera was responsible

for the decentralization and migration of the Harappan civilization. A more compelling argument for the migration of the Harappan civilization, however, is drought. Satellite images of northern India and Pakistan show the ancient course of the Sarasvati River, which dried up during the global climatic change climaxing in the great drought of 2200 to 2000 BCE (2,3). Severe aridity and wind turbulence led to the abandonment of great civilizations from the Aegean Sea, Egypt, Mesopotamia, and northern India (3). The Harappan civilization, originally clustered along the length and tributaries of the Sarasvati, migrated east toward the Ganga, with “asynchronous but sustained abandonment of different cities” (Ewald, chapter 4).

The book would have been improved by providing a straightforward subject index and pairing terms in the Keywords section with page numbers. As expected of a book with multiple authors, the articles range unevenly from research papers to excellent comprehensive reviews. Martin and Rothschild's *Earth History and the Evolution of Sickness* (chapter 1) and Ubelaker's *Ancient Disease in Anthropological Context* (chapter 10) are examples of the latter. As editor, Greenblatt has successfully smoothed most transitions.

Digging for Pathogens deserves a wider audience than infectious disease specialists, evolutionary biologists, and parasitologists. For university students of microbe-host interactions, who are increasingly trained in molecular biology but may have scant grasp of evolution or organismic biology, this book should be required reading.

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References

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3. Weiss H, Courty M-A, Wetterstrom W, Guichard F, Senior L, Meadow R, et al. The genesis and collapse of third millennium North Mesopotamian civilization. *Science* 1993;261:995-1004.