Book Reviews

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Human Evolutionary Genetics: Origins, Peoples and Disease. By M. A. Jobling, M. E. Hurles, and C. Tyler-Smith. New York: Garland Science, 2004. Pp. 523. $59.95 paperback.

This is an absolutely superb book! I have been recommending it enthusiastically to professional colleagues, graduate students, and even the occasional highly motivated undergraduate student ever since it was published last year, and the response to the book has been overwhelmingly positive. Not only is the book unique in terms of topical coverage, but it is also extremely well executed. In fact, it is one of the best textbooks on any subject that I have read. It belongs on the shelves of everyone interested in the genetic aspects of human evolution. There is also much of value in it for paleoanthropologists, historical linguists, archaeologists, and human biologists (biological anthropologists), as well as for geneticists with various complementary specialties and interests.

The book's 15 chapters are organized around six focal questions: Why study human evolutionary genetics? (chapter 1), How do we study genome diversity? (chapters 2–4), How do we interpret genetic variation? (chapters 5 and 6), Where and when did humans originate? (chapters 7 and 8), How did humans colonize the world? (chapters 9–12), and How is an evolutionary perspective useful? (chapters 13–15). Chapter 1 sets the tone for what follows by discussing the limitations of human genetic data in terms of the kinds of questions that can be addressed effectively and those that cannot. Chapter 2 then presents a short overview of basic genetics, emphasizing molecular aspects of the human genome. Chapter 3 explains the various kinds of data that can be used to assess genomic diversity and discusses the genetic processes that produced the different classes of variants. Chapter 4 gives an overview of laboratory methods appropriate for molecular genetics data collection and concludes with some useful cautionary notes about ancient DNA. Chapter 5 focuses on the population genetics processes that originate and shape human genetic variation, whereas chapter 6 details the panoply of mathematical and statistical methods used to make inferences from molecular data.

The rest of the book is devoted to data presentation and interpretation. By use of a palimpsest metaphor, different chronological strata are successively encountered and are explicated by an analysis of human genetic-diversity data. For instance, chapter 7 explores human phylogenetic relationships, primarily within the order Primates. Chapter 8 reviews scenarios for the origin of our species by synthesizing paleoanthropological, archaeological, and genetic data. Prehistoric migrations that trace the dispersal of humans from Africa to Asia, Australia, Europe, the Americas, and the Pacific are covered in chapters 9–11. Chapter 12 concentrates on historic migrations and admixture phenomena. The genetics of human adaptation and disease are investigated in chapters 13 and 14. Chapter 15 concludes the book with a demonstration of how molecular genetic data can be usefully applied to genealogical studies and individual identification.

Overall, the text is clearly written, and the illustrations are excellent. The boxed supplementary text is especially informative, whether just explanatory information or an opinion piece by an outside expert. There is a real richness to the mtDNA and Y-chromosome data presented in a phylogenetic/phylogeographic framework in the three chapters on prehistoric range expansion and global colonization. Students have found chapters 3–6 (about genome diversity) quite helpful and have deemed the text's brief excursions into the realm of mathematics to be effectively presented and not overly technical. Appropriate Web sites are mentioned throughout the book, to foster independent research. I must confess that I learned something new (and important) from every chapter in the book!

As the authors opine, many of the interpretations, conclusions, and scenarios advocated in the book will serve as flash points of contention and disagreement. This is another positive attribute of the book. The ensuing discussions and debates can provide a didactic forum for helping students learn to sort through arguments and form opinions based on evidence when faced with conflicting interpretations and viewpoints. To wit, a few of the "big picture" questions I have successfully used for class discussion that were derived from statements and/or positions adopted by the authors include Are species *really* discrete units? (p. 374), Is anagenesis *really* a form of speciation? (p. 433), and Is genetic transmission *really* an exclusively vertical process? (p. 419).

Although the text is remarkably free of typographical errors (for a first edition), the occasional glitch did sneak through during the reviewing and proofing process (especially in the illustrations). For instance, the correct spelling of the generic name of the ~6-million-year-old possible human ancestor from Kenya is *Orrorin* (pp. 15, 237, 238, and 519). The terms "Platyrrhine" and "Catarrhine" should be reversed in figure 7.2 (p. 204), and figure 8.11 confuses geological "periods" and "epochs" (p. 246). Also, "skull" is not an exact synonym for the term "cranium" because the skull includes the mandible, whereas the cranium does not (p. 236). But enough nongenetic nits! It is far more accurate and appropriate to close this review on a resoundingly positive note.

Ten years elapsed between the publication of the magisterial tome of Cavalli-Sforza, Menozzi, and Piazza, *The History and*

Geography of Human Genes, which detailed our collective knowledge about the distribution of traditional serogenetic variation within a holistic anthropological framework, and the appearance of *Human Evolutionary Genetics*. This new compendium emphasizes the enormous explosion in knowledge derived from human haploid systems and molecular genetic markers, and, as such, it is a most worthy successor. It should quickly become *the* book to consult for genetic information pertinent to the evolution of our species. To the authors, I offer both a sincere thank you and a hearty congratulations for a job well done!

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Facioscapulohumeral Muscular Dystrophy: Clinical Medicine and Molecular Cell Biology. Edited by Meena Upadhyaya and David N. Cooper. New York: BIOS Scientific Publishers, 2004. Pp. 250. $149 hardcover.

Facioscapulohumeral muscular dystrophy (FSHD) is a fascinating disorder from both clinical and molecular standpoints. The molecular basis of FSHD is still being debated and refined, 15 years after it was localized by linkage to chromosome 4q and 13 years after the causative genetic rearrangement was identified. This book presents a comprehensive compendium of the state of knowledge about all aspects of FSHD as of approximately 2003, with chapters written by clinicians and investigators who have been intimately involved in contributing to this knowledge base.

For those interested in clinical aspects of FSHD, there are three chapters that discuss the typical and unusual clinical features of the disease and one devoted to the retinal changes seen in some patients. Genetic counseling for FSHD, which is often complex, is discussed in detail by two different clinicians in separate chapters, and a third chapter (on genotype-phenotype correlation) covers many of the same issues. These chapters address interpretation of genetic test results, clinical anticipation (which is suggested in some families but is not uniformly agreed on), and the effect of sex on disease severity. An additional chapter covers genetic mosaicism in FSHD. Clinicians who are interpreting reports of DNA testing for FSHD will also find the chapter entitled "Molecular Diagnosis of FSHD" extremely helpful. Finally, there is a brief chapter reviewing clinical management.

Most of the remainder of the book is devoted to the unfolding story of the molecular basis of this disorder, beginning with linkage analysis and identification of the subtelomeric deletion that is the basis of the clinical diagnostic test. Subsequent chapters present proposed mechanisms of disease, identification of candidate genes, and genomic analysis of the deletion. The evidence for a genetic derepression model of pathogenesis is detailed, along with gene expression profiling that suggests an alternative model.

This book is an ideal resource for someone who wishes to have an in-depth understanding of FSHD. This includes genetic counselors or clinicians who deal with many FSHD families, as well as researchers who are considering entering this field. The book conveys the current state of understanding, as well as the remaining questions to be answered and conflicts to be resolved.

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