Book Reviews

Am. J. Hum. Genet. 67:264, 2000

Neurofibromatosis: Phenotype, Natural History, and Pathogenesis, 3d ed. Edited by J. M. Friedman, David H. Gutmann, Mia MacCollin, and Vincent M. Riccardi. Baltimore: Johns Hopkins Press, 1999. Pp. 380. $99.95 (hardcover only).

This is the third edition of a very reputable book that was first written by Vincent Riccardi and Jan Eichner in 1986, prior to the molecular explosion in human genetics. The first edition represented the most comprehensive review of neurofibromatosis (NF) literature at that time, with proposed categorization based on the variable expression seen in these disorders. The second edition (written by Riccardi in 1992) was also a seminal volume, in terms of medical literature review by organ system, insight about underlying mechanisms, and information about the newly cloned *NF1* gene. For the third edition, Dr. Riccardi is joined by three well-respected physician-scientists (Jan Friedman, David Gutmann, and Mia MacCollin) as editors. This edition is a welcome update, but it has diverged in format. Instead of one author writing multiple sections based mostly on organ systems, the medical information is somewhat reorganized into chapters written by contributing authors, all of whom are active, established investigators (and, in nearly all cases, physicians) in NF. This altered structure was likely necessary because of the vast increase in knowledge in the NF1 and NF2 fields. To include this new information, the pages devoted to clinical descriptions have been reduced, to focus on the most important and well-described medical aspects of NF; however, coverage of the relevant genetic and cell biology advances in both NF1 and NF2 has increased. Furthermore, in the second edition, all the references were listed together alphabetically at the back of the book, providing a single, large literature-search listing. In the third edition, the references are placed at the end of each chapter, which is traditional for multiauthored books but not quite as helpful for some uses. It is very difficult for any physician or investigator to be familiar with all the NF1 and NF2 literature, since there are literally hundreds of articles, across the spectrum of work, being published each year. Overall, the authors do a creditable job of referencing and summarizing the most current and medically relevant progress, given that, because of space issues, only a portion of the relevant NF literature can be discussed.

This volume provides excellent illustrations of clinical features and clinical and scientific data. Some of the chapters offer "future directions" (or similar reference to needs and directions of clinical and basic research). These paragraphs provide an insightful overview on what is known and what we need to know. lso included are recommendations from clinical task forces that have been created to specifically study areas such as pilocytic astrocytoma (optic-pathway glioma) in NF1. Recent clinical data from NF databases, which contain information from many patients, are provided to add to the current literature and to increase confidence in clinically relevant statistics, such as frequencies of features and severity. Thus, this book will likely be widely used by physicians in all specialties, as the most current guideline for clinical management of NF and as a source for finding further information. To summarize the current understanding of cognitive deficits in NF1, an understanding that is greatly expanded compared with the prior edition, the chapter by Kathryn North draws cognitive and molecular/pathogenetic/animal model data together. This will benefit researchers as well as professionals such as psychologists and educators. Investigators in the many areas of NF1 and NF2 research will also find this to be a useful reference, since it is the most up-to-date publication bringing together clinical data and basic science knowledge. There are a few other helpful touches, such as David Viskochil's glossary at the end of the *NF1*-gene chapter. Although this work is not primarily intended for a lay audience, some features were designed for the public (e.g., the Appendix lists resources [including Web sites] for patients). Given both the relatively high frequency of NF in the general population and the increasing recognition of and interest in these disorders, this book will effectively serve both professionals and patients.

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0002-9297/2000/6701-0039$02.00

Am. J. Hum. Genet. 67:264–266, 2000

Genes, Peoples, and Languages. By Luigi Luca Cavalli-Sforza. New York: Farrar, Straus & Giroux, 2000. Pp. 224. $24.00 (hardcover).

The human past has traditionally been reconstructed on the basis of written records and archaeological evidence. It was

only in the past 20 years or so that we came to appreciate that our genes can also tell us much about our history. People move; populations expand or shrink, sometimes give rise to new groups, sometimes mix with other populations, sometimes become extinct. The levels and patterns of genetic diversity in contemporary humans have largely been shaped by these processes, and by studying the latter we can understand something about the former. The first major effort in this direction was made by Menozzi, Piazza, and Cavalli-Sforza and was described in their study of European allele frequencies (Menozzi et al. 1978).

In the years since then, what is now called "anthropological genetics" (Crawford 2000) has developed quickly. New groups have entered the field, an abundant body of data has been generated, competing models have been proposed, and old conclusions have been questioned (and some new ones as well). Population geneticists have introduced evolutionary thinking into the study of pathologies, leading to the development of a new area of research—evolutionary medicine. Also, methods developed in anthropological genetics have been borrowed by, and have significantly contributed to, other disciplines—molecular ecology among them. During all this time, Luca Cavalli-Sforza has played a central role in the field, both as an investigator and as a cultural organizer. His book *Genes, Peoples, and Languages* is a synthesis of a lifetime of work and achievements.

Some scientists like to operate only in a well-defined field; some enjoy crossing boundaries between disciplines. Luca Cavalli-Sforza belongs to the latter category; if somebody doubts it, just check the titles of the six chapters of his book. The first one, "Genes and History," is about human diversity and the social and cultural implications of its study. The broad cultural framework thus identified encompasses biology and linguistics, statistics and demography, and a number of other areas that the reader will discover with increasing curiosity. The author does not hesitate to address controversial issues, including the meaning and the genetic bases of racial classification, and does so in a highly understandable manner. The second chapter, "A Walk in the Woods," lays the methodological foundations for the models and results that will later be introduced. Very seldom did I find such a comprehensible, sometimes even pleasant, description of statistical techniques, mainly those leading to estimation of evolutionary trees (hence the chapter's title). Even the unsophisticated reader, in this way, is given the necessary information to critically approach the third chapter, "Of Adam and Eve," which deals with human origins and with the evidence for a spread out of Africa. The section on mtDNA and the so-called African Eve is particularly instructive. Although there is no justification for it, an alarming number of recent studies have estimated the time depth of mitochondrial genealogies and then used that number (i.e., the age of a molecule) as an estimate of a population's age. Luca Cavalli-Sforza points out concisely but cogently why that leads to erroneous, and often absurd, conclusions. Those of us who act as referees should really try to keep those concepts in mind.

In the fourth chapter, "Technological Revolutions and Gene Geography," the author moves to the main subject of his research, inferring evolutionary and demographic processes from patterns of genetic diversity. In the article by Menozzi et al. (1978) and in the subsequent book by Ammerman and Cavalli-Sforza (1984), the observation that allele frequencies tend to be distributed in clines in Europe was not new; what was new was the use of archaeological data to interpret genetic variation. On the basis of nonbiological evidence, the hypothesis that the continent-wide allele-frequency clines could be due to admixture between a northwestern and a southeastern population was discarded, in favor of the hypothesis of a population expansion from the Levant into western and northern Europe. That was the first of a series of cross-disciplinary studies that Luca Cavalli-Sforza, along with a few other scientists (Robert Sokal among them) pioneered (Sokal 1988; also see Sajantila et al. 1995; Poloni et al. 1997), which are described in that chapter and in the following one, "Languages and Genes." This title is already eloquent; the reader will discover that there are many stimulating correspondences between genetic and linguistic diversity, which cast light both on the demographic shifts that shaped our genome and on the effects that these shifts may have had on the distribution of modern languages.

This is a rather controversial area, and I doubt that many linguists will easily accept all the conclusions in this part of the book. Without trying to establish here who is right and who is wrong, I think that any effort to bridge the gap between the people working in these related but methodologically so distant fields should be encouraged. The hypotheses and the results of genetic analyses may not always prove correct or even useful to address questions in historical linguistics. However, it is only by trial and error that people interested in genes and in words, as well as in bones and in artifacts, can approach a common view of the human past. Finally, the sixth chapter, "Cultural Transmission and Evolution," starts with a definition of culture, goes through several examples of cultural transmission, discusses a possible role of cultural factors in constraining biological evolution, and ends with some paragraphs on the evolutionary future of humankind.

This book derives from six lectures that the author gave at the College de France. This college has no students; anybody who is interested can follow the classes. The teachers are thus facing a culturally heterogeneous audience and must define and explain all technical terms that they use. *Genes, Peoples, and Languages* reflects the successful effort that has been made to deliver to such a broad public an often complex message, without any excess simplification. The text has lost nothing of its brilliance in the double translation, from French to Italian and from Italian to English, and has retained a very distinctive colloquial style. Even professional geneticists will find useful information there. But the main asset of this book is the author's ability to put many different elements into a context in which they shed light on one another. The resulting mosaic of data, models, and hypotheses is a fascinating introduction to human evolution, which many readers, even those with a limited scientific background, are likely to enjoy.

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References

Ammerman AJ, Cavalli-Sforza LL (1984) The Neolithic transition and the genetics of populations in Europe. Princeton University Press, Princeton, NJ

Crawford MH (2000) Anthropological genetics in the 21st century: introduction. Hum Biol 72:3–13

Menozzi P, Piazza A, Cavalli-Sforza LL (1978) Synthetic maps of human gene frequencies in Europeans. Science 201:786–792

Poloni ES, Semino O, Passarino G, Santachiara-Benerecetti AS, Dupanloup I, Langaney A, Excoffier L (1997) Human genetic affinities for Y-chromosome P49a,f/*Taq*I haplotypes show strong correspondence with linguistics. Am J Hum Genet 61:1015–1035

Sajantila A, Lahermo P, Anttinen T, Lukka M, Sistonen P, Savontaus ML, Aula P, et al (1995) Genes and languages in Europe: an analysis of mitochondrial lineages. Genome Res 5:42–52

Sokal RR (1988) Genetic, geographic, and linguistic distances in Europe. Proc Natl Acad Sci USA 85:1722-1726

0002-9297/2000/6701-0040$02.00