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Review Of "A Primer Of Human Genetics" By G. Gibson

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out for the clarity with which it describes the phylogenetic points of origin of various multicellularity-associated genes, as well as for the important caution that we may yet have underestimated the complexity with which so-called simple animals are organized (p. 290).

Along with the usual suspects—metazoans, slime molds, and volvocine algae—new models are presented from overlooked groups such as red and brown algae (Cock et al.; Cock and Collén) and filastereans and ichthyosporeans (Suga and Ruiz-Trillo). These yield some important correctives to the metazoan bias, including the identification of a third mode of multicellular development—cellularization of a syncytium—to go alongside incomplete separation and aggregation of cells (Suga and Ruiz-Trillo; p. 125); and the recognition of polyloidization as an important mechanism for generating transcriptional diversity (Lang and Rensing). It is interesting to see that the inclusion of additional lineages has led to a downward revision of earlier claims about genes that are unique to multicellular animals (Tweedt and Erwin; Suga and Ruiz-Trillo).

There are some truly pioneering perspectives, such as an article that details a neat study subjecting various adaptive hypotheses for multicellularity to empirical investigation (Solari et al.); another proposing a compelling hypothesis implicating optical physics in the evolution of multicellular polarity (Kessler et al.); and another an interesting proposal for viewing life cycle evolution as driven passively by variation in cellular birth and death rates, rather than by selection (Rossetti and Bagheri).

Altogether, the collection provides a comprehensive explanation for why there are no simple answers to when multicellularity first appeared, how many times it appeared, or why and how.

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FREE RADICALS IN BIOLOGY AND MEDICINE. *Fifth Edition.*

By Barry Halliwell and John M. C. Gutteridge. *Oxford and New York: Oxford University Press.* \$115.00 (paper). xxxviii + 905 p.; ill.; index. ISBN: 978-0-19-871748-5. 2015.



GENETICS

A PRIMER OF HUMAN GENETICS.

By Greg Gibson. *Sunderland (Massachusetts): Sinauer Associates.* \$64.95 (paper). xiv + 442 p.; ill.; index. ISBN: 978-1-60535-313-5. 2015.

Gibson, professor and director at the Center for Integrative Genomics, Georgia Institute of Technology in Atlanta, has constructed a fascinating journey through the rapidly evolving field of human genetics, although I do question the use of “primer” in the title and the overall level of writing. He assumes readers will need no more than an introductory biology course to fully understand the content of the 16 chapters, although this is a debatable assumption. I found the textual material to be often very complex and I suspect it will not be readily accessible to students who have had only an introductory biology course (for example, see the last paragraph on page 72). Furthermore, figures and their legends, which should stand on their own for the most part, often do not because terms or concepts are explained in the body of the text (and often not too clearly), not in the legend itself (for example, see Figures 3-8, 6-3, and 9-3). Furthermore, the figures are frequently too complex to be fully appreciated.

Gibson has organized the 16 chapters into three parts. The first part consists of five chapters focused upon the theme Foundations. There are five chapters in the second part united under the theme of Tools, and six chapters in Part III united under the theme of Diseases.

The first chapter in the Foundations section focuses on the conceptual foundations of human genetics, and it is representative of problems I had with other chapters in other sections. If readers or students expect to get any historical perspective on the roots of Mendelian or classical genetics, they should forget it. Mendelian principles are covered in a little more than four pages, and not very well at that. The opening section of this chapter strangely concerns itself with the concept of heritability, which in itself is a difficult and complex concept, especially for students without a proper grounding, and a concept that is deeply rooted in variance and Mendelian principles, which do not make their appearance, and a brief one it is, until the next section of the chapter. Mendel’s principles of segregation, independent assortment, and dominant/recessive are not really covered, nor is the process of meiosis that is at the core of Mendelism and the chromosome theory of inheritance. Gibson discusses “whole exome” and “whole

genome" sequencing without defining clearly for students what an "exome" is, or anything about sequencing strategies. These topics are not discussed until Part II.

Chapter 3 examines human evolution, which implies that fundamental principles of neo-Darwinian evolution will be clearly discussed. They are mentioned but not described in any depth, nor are the forces that drive evolution and disrupt Hardy-Weinberg equilibrium, such as natural selection or genetic drift. And there is not much discussion of Darwin at all, a puzzling omission. There is an excellent and thoughtful two- or three-page discussion of adaptation, which includes selection issues, but the fundamental groundwork is missing.

In many ways, Gibson has written a thought-provoking and informative book that is current and raises some fascinating issues in human genetics. For example, his chapter on the genetics of aging is excellent and brings to the forefront a lucid and critical discussion of key approaches to the genetic analysis of aging. Some of the major problems I have are the volume's lack of any historical perspective or context, the overly complex figures and text, and the overall general topic structure of the text. There are other medical genetic and human genetics volumes that would serve students better.

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PERSONALIZED EPIGENETICS.

Edited by Trygve O. Tollefsbol. Academic Press. Amsterdam (The Netherlands) and Boston (Massachusetts): Elsevier. \$85.95. xvii + 591 p.; ill.; index. ISBN: 978-0-12-420135-4. 2015.

EPIGENETIC CANCER THERAPY. *Translational Epigenetics Series.*

Edited by Steven G. Gray. Academic Press. Amsterdam (The Netherlands) and Boston (Massachusetts): Elsevier. \$150.00. xxvi + 721 p.; ill.; index. ISBN: 978-0-12-800206-3. 2015.

CODE BIOLOGY: A NEW SCIENCE OF LIFE.

By Marcello Barbieri. Cham (Switzerland) and New York: Springer. \$159.00. xxi + 224 p.; ill.; author and subject indexes. ISBN: 978-3-319-14534-1 (hc); 978-3-319-14535-8 (eb). 2015.



MICROBIOLOGY

PARASITOLOGY: A CONCEPTUAL APPROACH.

By Eric S. Loker and Bruce V. Hofkin. New York: Garland Science (Taylor & Francis Group). \$120.00 (paper). xv + 560 p.; ill.; index. ISBN: 978-0-8153-4473-5. 2015.

Parasitology deals with parasites and the effects of parasitism. This is a tremendously broad field that includes a range of multicellular and unicellular parasites of vertebrates, invertebrates, and plants.

In the 10 chapters of this work, the authors discuss various parasites, especially those affecting humans and domestic animals. The chapters include: Introduction to Parasitism; An Overview of Parasite Diversity; The Parasite's Way of Life; Host Defense and Parasite Evasion; Parasite Versus Host: Pathology and Disease; The Ecology of Parasitism; Evolutionary Biology of Parasitism; Parasites and Conservation Biology; The Challenge of Parasite Control; and The Future of Parasitology. At the end of the book are discussions on the biology and life cycles of representative parasitic protozoa, platyhelminthes, nematodes, and arthropods, mostly in relation to human populations around the world. A short glossary is a helpful addition.

The authors' conceptual approach is refreshing and results in an interesting textbook for an introductory class dealing with the ramifications of parasites and parasitism. Although not meant to be a reference volume, it could serve as one except that the index is not specific enough. Some items included in the text are not found in the index and there are few subheadings in the index. If you want to find the life cycle of malaria in both the vector and host, you have to search 73 pages (the pages listed in the index under malaria and *Plasmodium*) before discovering the page (p. 449) depicting the various stages of a malarial parasite in the vector and host. As with malaria, since many other parasites are discussed multiple times in the above-named chapters, more subheadings in the index, especially underlining the major ones, would be helpful. Also, although references are provided after specific topics throughout the text, it would have been helpful to also have them grouped together in a separate section in the back of the book.

As a parasitologist interested in nematode parasites of invertebrates, I was a bit disappointed that some of the large, common nematode parasites of insects and arachnids, such as members of the family Mermithidae, were not included. I certainly understand that not all parasites can be covered in a single work and this volume certainly does include