

mathematical arguments which seem to negate the requirement of large numbers for a proper application of the Hardy-Weinberg equation.

Eigen and Winkler have devised a hypercycle game with the A,U,G,C components of DNA to illustrate the helping hand given to chance in making the leap to life from the chaos of the primordial soup. Some very nicely rendered electron micrographs illustrate the theory of primitive microbe conglomeration to form more modern cells. The Britten-Davidson theory of gene regulation is reviewed to show the probable relationships between master gene, control genes, and producer genes.

Next appear illustrations that well depict the domination of Pangaea by the dinosaurs. The record of life would seem to indicate that continental coalescence had led to radical change in life forms, whereas continental break-ups have been accompanied by greater diversity in life. This would support Adriaan Kortlandt's explanation of the appearance of early man in East Africa as due to isolation caused by the Western Rift Valley. The variance in wind-up and delivery of an object thrown by a chimpanzee is related to his habitat. Special attention is then given to man's great superiority in the throwing action as though "taking his canines in his hands." Richard Leakey is inferred to use skull number 1470 from Lake Rudolf, to cast doubt on the very idea of trying to formulate any clear-cut theories of human evolution. Bjorn Kurten presents a table of mammalian half-life to illustrate the rapid evolution of the primates. John Napier is quoted as saying "Were it not for the coming of man, macaques and baboons might well have been the dominant form of animal life in all the temperate regions of the Old World."

Surely all of the "radical possibilities for self-directed human evolution" are reviewed in the closing pages. An adequate index and an intriguing dust cover finally make a volume that more people than just biologists will enjoy

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Rc. well

General Biology

LIFE ON THE PLANET EARTH, by Harold J. Morowitz and Lucille S. Morowitz. 1974. W. W. Norton & Co., New York. 394 p. \$8.95.

According to the "Note to the Instructor," the book is planned for a one-term course in biology for nonspecialists. The authors have succeeded in reducing terminology to a minimum. The narrative style is excellent and the book is very readable.

However, it is marred with errors. Ostrich eggs are not really one-celled; bird

eggs have had some cell divisions before the eggs are laid. Most specialists will look at their own areas for accuracy, and botanists, especially plant morphologists, will be disappointed. There are international codes of nomenclature in botany and microbiology as well as geology. Meiosis does not result in gametes in plants. Pollen is not sperm. Fig. 11-5 is a diagram of a root cross section, not of a stem. Maple syrup is obtained from sap rising in xylem in the spring, not from phloem. And there are many more.

It is unfortunate that so many errors occurred. Sharply reducing vocabulary in biology courses for nonprofessionals would help biology become as central to human consciousness as the environmental, nutritional, and population challenges demand. The vocabulary in this textbook is reduced to the extent that a glossary of 235 words is sufficient, and this is a substantial advantage. Perhaps in a subsequent edition, the authors will improve this textbook's potential by eliminating a substantial number of the misstatements.

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Genetics

A PROGRAMMED APPROACH TO HUMAN GENETICS, by Allen Vegetsky and Cynthia A. White. 1974. John Wiley & Sons, Inc., New York. 163 p. \$3.95 softback.

Designed to be used as a supplementary text in undergraduate general genetics courses, this textbook covers classical, or Mendelian, genetics and makes no effort to supplement material in the molecular or cellular aspects of genetics. It limits the problems and examples to the field of human genetics, a field most interesting to beginners in genetics and one for which it is most difficult to find simplified material.

The text takes the student, step by step, from the physical bases of heredity (that is, chromosomes, mitosis, meiosis, and basic terminology) through the more complex problems such as those dealing with linkage, chromosome mapping, and multiple allelism. More emphasis is placed on making, reading, and interpreting human pedigree charts than is usually found in genetics textbooks. Each chapter concludes with a review problem or two and well-explained expected answers; a final examination with answers at the end of the book allows the student to check his own understanding of the material.

The student with a good background in genetics may find the programmed approach annoyingly simple, but for the general student it should help clear up common difficulties such as those with the rationale and mechanics of de-

termining various genetic ratios. An index to the material in the text would be helpful, but the authors do include a good literature list of both general and human genetics titles.

The programmed approach and stress on the genetics of man, using the Mendelian principles, should make this book very useful as a supplementary textbook for undergraduate college students. It could also be used on the upper secondary school level.

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Microbiology

FUNDAMENTALS OF MICROBIOLOGY, by Martin Frobisher, Ronald D. Hinsdill, Koby T. Crabtree, and Clyde Goodheart. 9th ed., 1974. W. B. Saunders, Co., Philadelphia. 867 p. \$16.50.

The authors have produced a remarkable book which deals in a masterly manner with the multifaceted topics of microbiology. Subject matter is treated so proficiently that the neophyte and professional find the book inspirational as well as informational. Following each chapter is a list of supplementary readings. A glossary is included.

The origin and development of microbiology as an offshoot of biology is dis-

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