

advocates "the development of the capacity for intelligent *nonmanipulation*." He says, "We need more people to say: 'I'm sorry, but I can't work on that, I'm busy thinking and living as simply and nondestructively as I can.' Such an attitude," Kozlovsky continues, "combined with a general enlightenment of *what is* destructive, is the only thing that can get us out of this mess."

This retreat from aspects of social responsibility is the crux of Kozlovsky ethic. Escape, he says, to your own self and family in a serene and non-threatened environment and live a full animal and human existence. "All you have to do is learn to say to hell with it!" Marijuana may help you. "Dope . . . lets you see the simple 'is-ness' of things and of yourself."

Despite the inconsistencies (don't ingest preservatives, but trip on dope), oversimplifications ("we must stop being ignorant, superstitious, and greedy"), and distortions ("a good biology course should teach you why it feels so good to climb into bed with someone of the opposite sex"), Kozlovsky manages to achieve some concise and lyrical prose, bursting with urgency and anger. He trusts "we can and will, as a people, tell the present destructive culture to *stick it*." With a great deal left unsaid, Kozlovsky delivers his outrageous injunction decorated with some fine epigrams selected from his outspoken predecessors—Whitman and Thoreau.

A to-hell-with attitude has both its uses and abuses. Kozlovsky's rather poorly printed book is daring, his casuistry understandable, if arguable, and his indignation honest. But he has written neither a biology nor a philosophy book. Instead, he has put together some arguments for a radical life style that will probably exorcise the familiar ecological devils for the fortunate few who can get their kicks from self-imposed poverty. The hard truth Kozlovsky doesn't see is that this nation's people, to say nothing of the world's, cannot return to the tribe.

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### Education and Professional Concerns

**CONSTRUCTIVE CLASSROOM BEHAVIOR: A TEACHER'S GUIDE TO MODELING AND ROLE-PLAYING TECHNIQUES**, by Irwin G. Sarason and Barbara R. Sarason. 1974. Behavioral Publications, New York. 56 p. \$2.95 (softback).

This publication is a companion to *Reinforcing Productive Classroom Behavior*. The book is aimed at getting the teacher to help his students through the effective use of role-playing and

modeling. Examples of ways the teacher may help his students and solve problems of school and vocational adjustment are included. The style is clear and to the point, and there is a thorough glossary and an annotated bibliography. Most important, the book takes into account the real situations a teacher may face in a busy day and suggests solutions.

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**CAREERS IN ENVIRONMENTAL PROTECTION**, by Reed Millard and editors of Science Book Associates. 1974. Julian Messner, New York. 188 p. \$5.79 (hardback).

Sound career counseling is at best difficult; in periods of rapid change it may seem impossible. Particularly when job markets decline, coordinated nationwide efforts to counsel can and do create dislocations in the supply-demand tug-of-war. Predictions of relative demand in the various careers are especially likely to cause long-term problems. Fortunately, this book avoids that pitfall.

Over half of the book describes some of our environmental problems along with some of the attempts to solve them. The author, apparently trying to be evenhanded, relates both exploitationist and conservationist views. He went too far in such cases as devoting nearly three pages to the virtues of clearcutting by the lumber industry and in extolling the advantages of both restored and unrestored strip-mined lands. He also states (p. 96) that the "use of [offshore] oil rigs . . . for fish habitats is the kind of achievement that results from the environmental scientist's search for knowledge."

Descriptions of the careers, however, are done well, indicating the need for training and the relationships of educational level to job hierarchy. There is a separate section for careers not requiring college degrees. Curiously, limnology is not mentioned, and marine biology is referred to only obliquely. Otherwise, a wide range of careers is listed.

In common with most career books, there is an ample list of addresses to which one can presumably write for "further information." Actually, few of the addresses will lead to any more detail than one finds in the book and some are worthless in this respect. Federal agencies concerned with environmental protection, regional offices of the Environmental Protection Agency, and regional offices of the U.S. Civil Service Commission, are also identified.

Shortcomings of this book are largely an indication of the state of the art of

career counseling. I have seen much worse, but I wish I could claim to have seen much better.

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### Evolution

**THE LIFE GAME: EVOLUTION AND THE NEW BIOLOGY**, by Nigel Calder. 1974. Viking Press, New York. 141 p. \$12.50.

From such diverse fields as molecular biology, anthropology, geology, game theory, computer technology, and zoological field research the author of this work has woven a story worth reading. Here is a volume so beautifully illustrated as to be a collector's item, so sprinkled with delightful pearls of information that scanning it should be forbidden.

Calder reports on a journey undertaken for BBC television and coproducing organizations from seven other countries. Creationists may take offense to the opening paragraph, wherein they are referred to as Bible thumpers, but a moment's reflection should bring to mind the authority under which they have placed themselves. Perhaps some readers will be newly advised of the suggestion by Cavalli-Sforza that Europeans acquired a white skin as an adaptation for vitamin D production, when rickets seemed to threaten survival. A section called "Doing without Fossils" introduces protein chemistry as the living link between the drifting continents from fragmented Pangaea, while also referring to the roughly constant rate of change in working molecules. The latter topic relates the 17 chemical differences of present day animal cytochrome c to the length of existence of those various animals.

The reminder is stated that not even the Stalinist geneticists could muster any hard evidence to support Lamarckism, which holds that experience directly modifies heredity. The serious argument now is between the selectionists and mutationists. The former hold that variations are normal and healthy while the latter think that genetic variations are aberrant and usually disadvantageous. Ernst Mayr has represented the preponderance of selectionists (or New Darwinists) in stating that although their theory is not controversial, its application sometimes is. A new proponent of mutationism has arisen in Motoo Kimura, who suggests that most mutations are nearly neutral in their effect; otherwise the high rate of change in working molecules would be lethal. To Kimura, most evolutionary changes are escapees from the control of natural selection. He and his colleague Tomoko Ohta continue their "heresy" by presenting

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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