

AND THEN THERE WERE NONE: AMERICA'S VANISHING WILDLIFE, by Nina Leen with commentary by Joseph A. Davis. 1973. Holt, Rinehart & Winston, New York. 128 p. \$8.95 (hardback).

This is a picture essay with a difference: no coffee-table, four-color, "gee whiz" volume; rather, a reasoned, compassionate look at endangered and extinct species in surprising black-and-white—a medium that calls for participation instead of mere spectatorship. Each picture is a study in understatement; each combines reality with subtlety, allowing the reader to understand and appreciate what the loss of a species can mean. The photographs of the horned owl, desert bighorn, spotted bat, kit fox, and Kodiak bear are brilliant; each links action with intrinsic beauty.

The text, too, is a study in understatement. Facts are concisely stated. Reasons for extinction are clearly defined from what seems an accurate base in biologic research and historical evidence. Emotionalism has been avoided in favor of simple but powerful information. The reader's conclusions—and feelings—can then be his own. My own conclusion is that the book can be highly recommended for all ages.

Faith Hickman

Biological Sciences Curriculum Study  
Boulder, Colo.

CHEMICAL VILLAINS: A BIOLOGY OF POLLUTION, by James W. Berry, David W. Osgood, and Philip A. St. John. 1974. C. V. Mosby Co., St. Louis. 196 p. \$5.75 (softback).

This book is intended to be a source book. With some limitations it should serve its purpose well. The authors state that the book is intended as a supplement to introductory courses in biology and ecology, as well as a source of information for presentations to general audiences outside the classroom. Although they state that it is about environmental contaminants and how they act in plants and animals, the book has a definite human emphasis.

The book has two sections: an introduction, designed to serve as a background, and a section discussing specific classes of environmental pollutants. The introductory section provides an overview of ecosystems and biogeochemical cycles, cell physiology, and functions of tissues and organs in animals. That formidable task is completed in 65 pages.

Chapters in the second section deal with metals, inorganic and simple organic compounds, industrial and municipal organics, pesticides, and miscellaneous pollutants. The last chapter includes a section on radioactivity. For most of the specific pollutants discussed, a topical outline is followed. The topics are as follows: description, natural oc-

currence, and uses; occurrence in the environment; mode of entry and accumulation in the body; symptoms of poisoning; mode of action; and perspective. The book also has a short appendix of units of measurement and a glossary of radiation, which defines only five terms.

The sections on energy reactions in the cell, the electron transport system, and protein synthesis are notably weak. The potential user should have at least a minimal background in cell physiology to compensate for the book's weaknesses. The chapter on metal pollutants is especially complete. Several references are listed at the end of each chapter, directing the user to further information. The book is well indexed, is attractively printed, and has excellent illustrations.

It should prove to be of wide use to teachers of high-school and undergraduate biology and ecology classes. Its primary usefulness is information for lectures, talks, and discussions.

Jim Perry II

Idaho State University  
Pocatello

## Education

STUDENTS! DO NOT PUSH YOUR TEACHER DOWN THE STAIRS ON FRIDAY, by Alan Jones. 1973. Penguin Books Inc., Baltimore. 182 p. \$1.25 (softback).

This book is a chronicle of the author's experiences teaching black students in the Du Sable Upper Grade Center, in a ghetto section of Chicago.

The purpose of the book is not clearly discernible. Humor may be an objective. However, to classify it as humorous one would have to appreciate statements such as "kicking black asses," descriptions of a black coach keeping order with a baseball bat, and students and teachers developing emphasis by reference to sexual intercourse.

If the purpose of the book is to provide enlightenment about the educational process in a ghetto school, one is left somewhat confused. Most of the book is devoted to describing a chaotic educational situation due to inadequate administrative procedures, lack of student preparation, a fear-laden environment, and lack of teaching equipment. However, the author, in sketchy references to his own teaching, indicates that by planning and structuring class work he was able to generate interest in learning and achievement among the black students in his room. The author might well have given more attention to expanding descriptions of his teaching and less consideration to the exploits of the black coach with the baseball bat.

Laurence C. Boylan

Emporia Kansas State College

## Evolution

THE ORIGINS OF LIFE ON THE EARTH, by Stanley L. Miller and Leslie E. Orgel. 1974. Prentice-Hall, Inc., Englewood Cliffs, N.J. 239 p. \$5.95 softback, \$10.95 hardback.

The vast majority of modern biologists feel satisfied that the diversity of living organisms on earth has resulted from processes of evolution. Far less consensus exists concerning the question of how life came to be on the earth in the first place. An upsurge of scientific inquiry into this problem followed publication of the pioneering writings of Oparin, Haldane, Urey, and others two to four decades ago. Among the most active experimentalists in this fascinating area are the authors of *The Origins of Life on the Earth*. Thus, it is not surprising to find here an impressive assembly of data and hypotheses, including ideas about the formation of the solar system; the composition of the atmosphere and the energy sources of the prebiotic world; and processes that could give rise to life—prebiotic formation of organic molecules, their assembly into macromolecules and multimolecular systems, and the evolutionary changes leading to living organisms. The book ends with a discussion of the possibility that life exists elsewhere in the universe, and a listing of outstanding problems.

Understanding of this area requires a broad sweep of data, and the authors marshal evidence from such diverse fields as astronomy, geophysics, paleontology, biochemistry, molecular biology, thermodynamics, and space exploration. A wide range of data is given in the form of tables and graphs, leaving the reader some opportunity for independent conclusions. This is welcome, for the origin of life is a highly controversial field. Throughout, the authors are conscientious in identifying their own opinions or prejudices, as well as in citing conflicting ideas and evidence.

Because the origin of life on our planet is of intense interest to students, teachers, and research workers alike, the book should have a wide readership. It will be difficult reading for people who have only a modest background in the physical sciences. The authors themselves recommend the book to college science students, and they suggest that readers whose background is not sufficient for some of the more technical chapters merely scan these and go on to the more general chapters. This advice seems sound. It is impressive to see this compilation of relevant data and to view the vast dimensions of areas of uncertainty and controversy, which, by default, they reveal in sharp detail.

There should be more monographs of this sort, written with the skill and dedication to reveal the real complex-

ities of the specific biologic area, yet with the recognition of its interest and importance to a wide range of people—nonspecialists as well as specialists. This book can be recommended as a fascinating introduction to current problems and progress in the investigation of the origin of life on earth.

Ingrith D. Olsen  
University of Washington  
Seattle

VERTEBRATE HISTORY: PROBLEMS IN EVOLUTION, by Barbara J. Stahl. 1974. McGraw-Hill Book Co., New York. 605 p. \$15.95 (hardback).

It has been great fun reading Stahl's *Vertebrate History* while working, on leave from Bowdoin College, in the Museum of Comparative Zoology at Harvard, whence cometh much of the inspiration and authority behind this discussion of progression in vertebrate groups. Using a somewhat journalistic style in reviewing an impressively broad area, the author demonstrates that she is thoroughly at home in vertebrate paleontology, is knowledgeable in research, and that in the history of fishes she has a special interest. She has had the advice of a number of outstanding authorities in the writing of this most informative book.

Not content with a single most-favored phyletic line proposed by a single authority or by a consensus of paleontologists, Stahl presents a variety of points of view on most problems and freely criticizes diverse conclusions, thus conveying some of the excitement of research on fossil vertebrates. The book differs from others on vertebrate paleontology in that its originality lies in its synthesizing of literature and current speculation on vertebrate progression, rather than in assimilation of present information to form a new theory or to establish new vertebrate groups.

*Vertebrate History* is a book for students with backgrounds in zoology and geology who are interested in pursuing paleontology professionally and for students who are interested in evolution and in paleontology. (McGraw-Hill includes this text in its "Series in Population Biology.") It is not a book that will provide entertaining reading for the casual reader, for Stahl's familiarity with vertebrate history leads her to freely use scientific names—the proper names of science. A useful addition to the book would be a glossary of scientific names and terms. A surprising feature is the small number of phyletic diagrams or evolutionary flow-charts, summarizing discussion. Such diagrams a beginning student, especially, finds useful.

Technically, the book leaves something to be desired. The line diagrams, from impeccable sources, are excellent

and abundant, but of the several photographs a number are poorly reproduced, and in one case the labels are difficult to find (5.2). At least two photographs are printed backward (1.3), and one of these is disfigured by printing errors.

The book provides a new introduction to vertebrate paleontology—an introduction well conceived—and a useful guide to vertebrate history that belongs in college and university libraries of science.

James M. Moulton  
Bowdoin College  
Brunswick, Maine

### Human Behavior

GAZELLE-BOY, by Jean-Claude Armen. 1974. Universe Books, New York. 127 p. \$5.95.

Originally *L'Enfant Sauvage du Grand Désert* (1971), this is an account of an observation of a wild child. The author, a Basque poet and painter, claims to be the only man who has observed a wild child in its natural environment. While traveling by camel through the desert Armen was taken by a nomad to see a child (whom the nomads considered a genie) "galloping in gigantic bounds among a long cavalcade of white gazelles." Armen followed the herd and quietly observed it from a distance for several days. Eventually the gazelles became quite accustomed to him, and Armen was able to walk freely among them and even to share their shelter at night.

The child—a boy—behaved toward the man much as did the gazelles, largely ignoring him but occasionally sniffing or licking him. He exhibited strong imprinting by gazelles: herbivorous, he seldom used his hands for eating; as the gazelles communicated by tossing their heads and twitching their ears, the boy tossed his long hair and twitched his scalp muscles. The muscles of his legs were well developed, and he had exceptionally thick ankles. In the many migrations and wild running that Armen observed, the boy apparently had no difficulty keeping up with the gazelles. However, Armen noted that the child's eyes—in contrast to the placid, unchanging eyes of the gazelles—were expressive of many emotions: fear, delight, curiosity. Armen supposes that this mode of expression was learned from the child's mother before he was lost. He conjectures that the child fell off a camel in a caravan (traveling at night) when he was about 7 months old. He notes that nomad children learn to walk very early; and, when gazelles came upon the baby, it managed to keep up with the herd, aided by some female gazelle—possibly the one to whom the child showed especial affection during Armen's ob-

servation—that had recently lost her fawn.

Eventually, lack of food and water forced Armen to return to civilization; but he went back to the Sahara several months later and again found the herd and the boy, who still appeared to be healthy and well adapted to life with the gazelles.

The author is a meticulous observer. The book has many diagrams and maps of the herd's migrations, hierarchic structure, and modes of communication. Throughout, Armen touches on an amazingly wide scope of relevant information, and his discussion of wild children in general is particularly interesting. More than this: the story is a work of art—another reviewer called it a romance—with powerful imagery and beautifully evocative line drawings (by the author).

The lack of documentation in the book makes it impossible for me to vouch for the authenticity of the author's narrative, and while I would not accuse it of being antiscientific, Armen's treatment is highly mystical. But even if you are not interested in pondering the philosophic questions that the boy—a "happy being lacking self-knowledge"—brings to mind, there is much to be learned and enjoyed in the book.

Candace Bradford  
Alexandria, Va.

THE NATURE OF HUMAN SEXUALITY, by A. M. Winchester. 1973. Charles E. Merrill Publishing Co., Columbus, Ohio. 489 p. \$9.95 (hardback).

For every teacher concerned about his students' tumultuous transition into adulthood, this book is a must. The author has done a laudable job of bringing together the many aspects of the literature of human sexuality into one readable, informative book. The subject matter ranges from the biologic bases for separation of sexes and the historic bases for our sexual mores, through the anatomy and physiology of puberty and adulthood, to the role of sexuality in human pair-bond formation. Such usual topics as human embryology take on added interest when descriptions of fetal developmental stages include references to the sensations of kicking and movement that the mother may be experiencing.

Half of the book is devoted to topics ancillary to individual sexuality. Birth control, infertility, birth defects, venereal disease, and genetic engineering are all discussed in sufficient detail to discourage mistaken, and often emotionally costly, inferences.

There are occasional statements that smack more of personal opinion than of objective scientific analysis; for example, "The most promiscuous of all women, the prostitutes, often turn to drugs to dull their sensibilities so they