

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.

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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.

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### 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.

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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

can continue with relationships which are naturally repugnant to them" (p. 201). Furthermore, the chapters on the emotional and psychologic aspects of sexuality would have benefited from having a woman coauthor: the discussion of women's feelings and perceptions seems less perceptive than that of men's.

Nonetheless, as a whole the book is factually accurate, substantive, and refreshingly nonjudgmental. It is well illustrated and provides an excellent resource for teenagers seeking accurate answers to some of their very important personal questions.

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**THE JOYS AND SORROWS OF PARENTHOOD**, by the Committee on Public Education of the Group for the Advancement of Psychiatry. 1973. Charles Scribner's Sons, New York. 159 p. \$5.95 (hardback).

This little book may be read profitably by all parents and prospective parents. Inasmuch as teachers—especially elementary-school and secondary-school teachers—have a surrogate parental function in their role as teachers, the book will also be useful to them. My own perspectives in reading the book were those of a parent, a teacher, and a biologist.

Not being familiar with professional organizations of psychiatrists, I was interested in the credentials of the authors. From the book's dust cover I learned that the Group for Advancement of Psychiatry (GAP) is an organization of more than 300 of America's most distinguished psychiatrists. Committees within the group explore timely topics relating to psychiatry. One such GAP committee wrote *The Joys and Sorrows of Parenthood*.

The authors accurately claim that the book is *not* a how-to-do-it book on childrearing. It is designed, however, to help parents allay the anxieties and guilt feelings they have acquired in rearing their children. As with most other parents who become caught up in the popular image of parenthood (which emphasizes its joys), I have experienced some of its disappointments and sorrows. Seeing my own parental problems, my failures and inadequacies, and noting those of my friends and colleagues, I can readily identify with a book that "centers on what it is to be a parent, on expectations for one's self instead of for the children, on the goals of an individual apart from the children." Chapter titles further reveal the nature of the book: *Parenthood*, *a Period of Personal Development*; *Expectation and Disappointment in Parenthood*; *The Psychology of Values*; *Discipline—Self and Imposed*; *Varieties*

*of Parenthood Experiences*; *The Middle Years of Parenthood*; *Grandparenthood*; and *Parents Are People Too*.

As a biology teacher I found that some of the chapters relate well to current concerns in science education. The chapter on the psychology of values emphasizes parental values, transmission of values, and the roles of religion, parents, family, and society in helping children to develop values. The biology teacher concerned with relating his science to the value systems of his students will profit from reading this chapter. Most teachers, both in-service and preservice, will also profit from the chapter on discipline, which includes discussions of permissiveness vs. license, self-discipline vs. imposed discipline, and punishment vs. the real object of discipline.

As might be expected from a Committee on Public Education, the book has been written for the lay public. It is not filled with footnotes and the technical jargon of professional psychiatrists; it is not a scholarly research publication. It could be read with understanding by most high-school upperclassmen (and their parents). Although not a book that will find its way into the library as a biology book, it has a very definite place in the high-school and college library as a reference for courses in family living and sex education.

The book concludes with a 57-item bibliography. More than two-thirds of these references were published in the 1960s; the two most recent were published in 1970.

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**THE BEHAVIOURAL PHYSIOLOGY OF ANIMALS AND MAN: THE COLLECTED PAPERS OF ERICH VON HOLST, VOL. 1.** Translated by Robert Martin. 1973. University of Miami Press, Coral Gables. 355 p. \$18.00 (hardback).

Erich von Holst, scientifically active from 1932 to 1962, was one of the founders of behavioral physiology. A generally recognized pioneer, he was the first director of the Max Planck Institute for Behavioral Physiology, in Bavaria. His work, published first in German, has a place among classic sources for studies in neurophysiology, psychology, ethology, and other disciplines in psychobiology and neurobiology. Most of the 14 essays in this collection are research reports, and several of these are still extensively used and cited in the world's scientific literature. They are on the nature of order in the central nervous system; brain mechanisms in the coordination of body movements; the reference principle; mechanisms of convergence and accommodation in visual function; functions of human visual per-

ception; brain localizations and behavioral organization of drives; and tactile illusions. Although well-written and ably translated, these are too detailed and difficult for direct use in the classroom. However, a diligent instructor could gain from these essays some excellent ideas for classroom demonstrations on the scientific method and on how we can learn about our senses, nervous system, and behavior patterns.

The last five essays, on the other hand, are more broadly and philosophically oriented. Some could serve as assigned readings and as the starting points for discussions in high-school or elementary college biology classes. Their topics are the nature of animal life (9 p.); human environment and technology (16 p.); problems of modern research on instinct (14 p.); and freedom (5 p.). The instructor will have to supplement the short list of references at the end of the book, with others that are in English, more current, and more appropriate for class or student use. Many such are available from journals (such as *Scientific American* and *Animal Behavior*), monographs, and textbooks.

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### Laboratory Manuals

**A MANUAL OF BASIC VIROLOGICAL TECHNIQUES**, by Grace C. Rovozzo and Carroll N. Burke. 1973. Prentice-Hall, Inc., Englewood Cliffs, N.J. 287 p. \$6.95.

The book succeeds very well in achieving the goal stated by the authors in the preface: "to acquaint the user with procedures which are fundamental to the study of viruses." Chapters are devoted to egg and tissue cultures, propagation of viruses, virologic techniques, biochemical characterizations, and bacteriophages. Consistently, throughout, the explanations are exceptionally clear, the illustrations beneficial and not redundant. The equipment called for is well within the reach of most biology laboratories, and the procedures are arranged in a straight-line, step arrangement, which makes them very easy to follow. Of particular benefit is a long chapter entitled "Preparation of Materials, Equipment and Supplies." Cleaning procedures, sterilization, disinfecting, infiltration, and preparation of media are all covered simply and clearly in that chapter. I recommend the chapter to anyone working in microbiology: student assistants, students, preparators, stockroom people, teachers, and professional consultants.

Any biology teacher who plans to have class exercises in microbiology or viruses or who encourages students to do special projects in these areas should have this book. Although no special