

## Life Nature Series: Two Subjects, Two Viewpoints

**The Insects.** Peter Farb and the editors of *Life*. Time, Inc., New York, 1963. 192 pp. Illus. \$3.95.

This is one of a series of books being published under the title "*Life* Nature Library." All follow the same pattern in size, design, and illustration; they all add up to 192 pages and show the results of extremely careful editorial attention. Freedom of expression, however, is reserved for the writer of the text of each book.

The text of *The Insects*, consisting of eight chapters totaling 72 pages, was written with great skill by Peter Farb. His pages are not interrupted by illustrations, but drawings pertinent to the text are placed in the wide margins. Each chapter of text is followed by 8 to 16 pages of "picture essays" illustrative of its subject. For the many who will not take time to read Farb's text, the illustrations and their captions should provide a short-cut to understanding. But the important part of the book is by Farb. Addressing intelligent people whose education did not include entomology, Farb takes as his theme the evolutionary success of insects in "invading . . . every possible niche and exploiting nearly every possible source of food." He points out the survival value of flight, adaptability, external skeleton, small size, metamorphosis, and a specialized system of reproduction. The salient features of insect anatomy and physiology are described, the hormone control of metamorphosis, the structures built by insects (particularly by termites), protection against parasites and predators, the social insects (honey bees and ants), and aquatic insects. Farb is not at all concerned with economic entomology, but he does point out that "turning the complexities of the insects' life cycle against itself may be man's best hope of eventual control over insect pests." And he adds this comment, "the most efficient insecticides are other insects." Insects have what it takes "to endure even in today's man-infested world," and we need not worry that the song of the cicada and the cricket will be heard no more.

A bibliography and an index complete this book, which I find is an excellent brief introduction to entomology.

FRANK L. CAMPBELL

*Division of Biology and Agriculture,  
National Academy of Sciences,  
National Research Council*

**The Fishes.** F. D. Ommanney and the editors of *Life*. Time, Inc., New York, 1963. 192 pp. Illus. \$3.95.

This volume is a popular and profusely illustrated account of the biology, evolution, and commercial importance of fishes. The presentation is typical of *Life* magazine, with photographs and text chosen to entertain as well as to inform. Following a general account of the habits, habitats, and structural adaptations of fishes, there are chapters devoted to their fossil history and evolution; a section on the sharks, skates, and rays; others on reproduction and parental care; and still others on food, feeding, survival, and migrations. The final section is a short (15 pages) but good introduction to fishery biology and fisheries. Supplementing the photographs, many of which are excellent, are "picture essays," sketches accompanied by explanatory synopses which generally supplement rather than illustrate the text. Those who wish a superficial account of the biology of fishes may find this book enjoyable.

The errors are few, and these are chiefly the result of oversimplification without qualification. I find particularly offensive the composite figure of the fresh water environment (pages 20 and 21), garishly colored, the scene overpopulated with a diverse array of leaping and swimming fishes, and depicting, among other incongruities, a marine or at best estuarine flounder (which is not a winter flounder, as the legend would have us believe) cheek-by-jowl with turtle, lily pad, and brown trout. Elsewhere in the volume, statements such as those that attribute regular self-fertilization to certain hermaphroditic species, or a sensory function to the elongate caudal and pelvic rays of *Benthosaurus*, lack basis in fact. But the complete absence of documentation makes verification impossible, an omission which also makes the volume a dead end rather than a means of access to the literature of ichthyology and related subjects. The one-page bibliography is inadequate. Even access to source material through acknowledgment is lacking. We find, for example, a "picture essay" depicting the parasitic relationship between male and female angler fish, an insert credited to the artist alone, no mention being made of the work from which figure and caption were taken.

The volume does serve to demonstrate the diversity of fishes and of their adaptations, as well as their importance and interest as populations of food animals. That material which is included is well organized and clearly presented. It will be informative to the lay reader and perhaps useful to the high school biology student. But since it lacks both depth and documentation, it can serve no higher scientific or educational purpose.

GILES W. MEAD

*Museum of Comparative Zoology,  
Harvard University*

## Panorama of Science

**Knowledge and Wonder.** The natural world as man knows it. Victor F. Weisskopf. Doubleday, Garden City, N.Y., 1962. 222 pp. Illus. \$4.95; PSSC Science Study Series edition: Doubleday, Garden City, N.Y., 1963. 282 pp. Illus. Paper, \$1.45.

British scientists, it would seem, more so than others, have pioneered in a kind of science writing that was erudite and lucid, constituted an excellent summary of one phase or another of the world of modern science, but was marked with a personal philosophy or was permeated with moral or social speculations. The names of Jeans, Eddington, Russell, Hogben, Haldane, Huxley, Bernal, Levy, Dingle, Ritchie, and others come readily to mind. While the first two tended toward cosmic theology, many of the latter made up for it with different concentrations of pietistics. In America, a different trend seems to have emerged of late, of which this book may be regarded as a fine example. A segment of science is summarized, brilliantly and clearly expounded in brief paragraphs, another one is added to it, until within the span of two or three hundred pages, the reader is presented with a panorama of the most recent findings in physics, biology, geology, astronomy, and cosmology. No message is appended, no philosophy is injected. It is science for science's sake, compact, accurate, lucid, and impressive.

In this kind of venture, Weisskopf's volume occupies an honored position. The reader will feel like a traveler given a plane ride over the Grand Canyon, or over some such panorama of a vast natural wonder. Weisskopf reviews in depth, though with amazing succinctness and lucidity, the basic concepts of

force, the nature of electricity, light, the atom, quanta, the nucleus, wave mechanics, complementarity, the chemical bond, mesons, and fields; next, he works up to the molecules of living systems, proteins, nucleic acids, DNA, RNA, and the origin of life and terminates with evolution and the emergence of man. A vast expanse of man's recent achievements is briefly scanned here, but the concepts are so clearly stated and so logically tied together that even the reader who is fully enlightened in these fields will enjoy the perspective and integration which the author achieves. Besides, one not familiar with these topics will probably derive little benefit from them. The book can only add, one may venture to say, insight and pleasure for students of science who need an inspiring overview of the terrain covered thus far on the shining frontiers of science, more or less in our own life span. The clarity with which well-known modern concepts are laid bare and related, with each other and with their historical antecedents, and the span of horizon covered, render the book worthwhile to any student of science, regardless of his specialization.

Its appearance as a paperback in the PSSC Science Series renders it possible for every student of science to add the book to his library; this he should quickly do, for it is a grand vision that he will gain, even if many of the facets are already known to him.

MARK GRAUBARD

*Natural Science, Interdisciplinary Studies, University of Minnesota*

## Sigma Xi-RESA Lectures

**Science in Progress**, vol. 12. Wallace R. Brode, Ed. Yale University Press, New Haven, Conn., 1962. xii + 331 pp. Illus. \$7.50.

For a quarter of a century it has been the privilege of scientists and of those interested in science to have available, at two-year intervals, excellent summary accounts of the progress of science. The Sigma Xi National Lectures, and more recently the Sigma Xi-RESA National Lectures, have appeared in the successive volumes of *Science in Progress*. Volume 12 in the series is edited by Wallace Brode and contains the lectures presented in 1959 and 1960. It maintains the high standards achieved by the previous volumes.

George C. Kennedy discusses the

origin of continents, mountains, and oceans, and he concludes that older theories must be discarded in favor of the view of phase transition. A chemical contrast at the Mohorovicic discontinuity is considered unnecessary.

William J. Luyten outlines stellar evolution and presents evidence that white dwarfs are nearing the end of the line to obscurity and oblivion. The end of the road is the black dwarf, small and degenerate and no longer giving off light. It may well be that our own sun will some day follow this path.

John Verhoogen describes temperatures within the earth; he outlines earth's thermal history and supports Ringwood's theory of formation of the metallic core by chemical reduction of the original meteoritic matter.

Paul Delahay builds his lecture around the cultural aspects of science and discusses such areas as intellectual curiosity versus utilitarian ends, the ways of scientific research, and the evaluation of scientific achievement.

Harold G. Cassidy diagnoses the problem of ineffective communication between scientists and humanists and gives concrete examples. Cassidy then proceeds to offer a prescription for treating the underlying causes. Members of university communities may well take his prescription to heart.

R. F. Dawson discusses the technical problems of the biosynthesis of alkaloids, especially nicotine, from the universal metabolites nicotinic acid and ornithine, and points out their potential importance in elucidating unresolved areas of general biochemistry.

J. Herbert Taylor presents an excellent account of chromosome reproduction and discusses the possibilities of breaking the genetic code. The code has, of course, been broken since the lecture was delivered, but the lecture itself furnishes a fine groundwork for understanding the subsequent developments.

Emil Witschi reviews the extensive researches, including his own important contributions, on sex reversal in man and other animals.

Robert C. Elderfield presents an interesting account of the alkaloids of certain Australian trees and of their effects on blood pressure.

Ralph H. Wetmore provides a new approach to morphogenesis in plants; Wetmore recognizes that embryonic development does not proceed by a single rigid pattern, but that alternative orderly patterns may occur side by side within the same genetic milieu.

Harry F. Harlow reviews in considerable detail the development of learning in the rhesus monkey and concludes that the monkey possesses capacities far in excess of those of any animal below the level of primates.

The volume concludes with a discussion by Barnett F. Dodge of the problem of applied versus basic research. Dodge uses as his vehicle of discussion the production of fresh water from saline waters.

The volume as a whole is a most worthy addition to a set of excellent summaries of progress in scientific research.

LAURENCE H. SNYDER

*University of Hawaii*

## On Writing About Science

**The Genetic Code**. Isaac Asimov. Orion Press, New York, 1962. xiv + 173 pp. Illus. \$3.95; New American Library, New York, 1963. 187 pp. Paper, 60¢.

**The Human Body**. Its structure and operation. Isaac Asimov. Houghton Mifflin, Boston, 1963. xii + 340 pp. Illus. \$5.95.

Isaac Asimov is the Lenny Bernstein of scientists who write. Bernstein conducts, composes, amuses, and teaches. Asimov writes, both fact and fiction, and he has written for scientists, students, adults, and children, in nearly 50 books to date. And only heaven knows how he does it.

But however he does it, he does it beautifully. Both of these new books are popular science of a high caliber for intelligent nonscientists. For one important thing, Asimov writes a good sentence—a simple sentence. This goes a long way toward keeping the eye and mind of any good reader.

For another, both books are extremely well constructed and organized. They go from a start to a finish, without needless side trips or see-sawing. Many a noble effort fails mainly for lack of organization, which is hard work.

To the critic, *The Genetic Code* is the more interesting of these books, for the job of telling the citizen about molecular biology is one of the hardest that has faced science reporters. To the average person, the cell is even a greater mystery than the atom. With his simplicity and discipline, Asimov is at his best in expounding this subject's