

with sectioned tissues, Sjöstrand accepts the Danielli model as a plausible structure for the cell membrane but maintains that many intracytoplasmic membranes, especially those of mitochondria and the endoplasmic reticulum, consist of globular lipoprotein particles. Reasonable arguments for and against this thesis can be advanced, but the problem most likely will not be solved by electron microscopy alone.

The otherwise well-produced book suffers from many typographic errors and a lack of language correction for the contributions by foreign authors.

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Creatures That Abound

Life on a Little-Known Planet. HOWARD ENSIGN EVANS. Illustrations by Arnold Clapman. Dutton, New York, 1968. 320 pp. \$7.95.

There is something about the study of hunting wasps and social insects that brings out the philosopher in a person. Most entomologists know what it is—the complex behavior and special perceptions of such insects almost defy human comprehension and inspire a profound sense of awe. Author-scientists like J. H. Fabre, W. M. Wheeler, and G. W. and E. G. Peckham, to name a few, became hooked on such mind-expanding studies and fortunately shared their awareness of nature in popular works. The latest of this line of writers is wasp-specialist Howard E. Evans, of the Harvard University Museum of Comparative Zoology, author of *Life on a Little-Known Planet*.

Biologists, especially the lonely biosystematists, confronted with the vast, little-explored taxonomic "territories" on earth quickly grasp the implications of this unusual title. Writing in a pleasant, conversational style, Evans soon makes it clear that he is more than a little wistful and concerned about the attention and support given to space biology, moon shots, and other far-flung ventures while man is faced with the grim, if not hopeless, prospect of biologically adjusting himself to his one and only and little-known planet.

A series of chapters reveal the intricate habits of familiar insects. Much of this constitutes a review and the first

popularization of recent technical research. The chapters not only are highly informative and entertaining to laymen and even scientists, but also suggest that there is glittering promise in studies yet to be undertaken.

One of the most thought-provoking chapters deals with the crowded "Cities of the soil: the world of springtails." While discussing the fascinating habits of these seldom-noticed, microscopic soil creatures, Evans calls attention to their tremendous populations, in one case calculated to be 50 individuals per cubic inch of pasture soil, or 248,375,000 per acre! Yet, in spite of all, only "a scattered handful of underpaid and underequipped researchers struggle to decrease vast areas of ignorance about creatures that abound in our lawns, gardens, and woodlands."

After this broad, multitudinous base of minute soil creatures, the world of cockroaches is explored. These are animals well worth knowing, for their ways of coping with earth environments are age-old and time-tested. In succession, dragonflies, crickets, fireflies, butterflies, flies, bedbugs and conenoses, grasshoppers, and wasps are treated in highly informative chapters.

The book is climaxed by the author's most important statements concerning man's relation to his environment. Of interest are his comments on the use of insecticides. Evans reminds us that the greatest losses and modifications are due to expanding and shifting populations with increasing material expectations, all of which increase the urban sprawl over useful farmlands and esthetic open spaces while fouling the land, waters, and air with pollutants. Not the least of the causes of "silent springs" where we most need bird songs (around our homes), and one which is perhaps overlooked in all the attention paid to insecticides, is the increasing number of cats.

Those who think that scientists—especially those "cloistered" in natural history museums, are out of touch with realities and the most pressing issues facing mankind, should read and re-read the final chapter, entitled "Is nature necessary?" If we cannot have a man with Evans' insight as the nation's Secretary of the Interior, let us hope that at least we will have one who has read and understood the message of *Life on a Little-Known Planet*.

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Radiation and Its Effects

Radiation Biology. ALISON P. CASARETT. Prepared under the auspices of the American Institute of Biological Sciences for the U.S. Atomic Energy Commission. Prentice-Hall, Englewood Cliffs, N.J., 1968. xiv + 368 pp., illus. \$9.25.

Apart from Bacq and Alexander's *Fundamentals of Radiobiology* and the popular paperback by Alexander, *Atomic Radiation and Life*, previous efforts to present a comprehensive treatment of the biological effects of ionizing radiations have been the joint enterprise of a number of specialists (for example, *Radiation Biology*, edited by Hollaender). All other volumes published in this field have been at least somewhat limited in scope. The reasons for this are not hard to find: courses in radiation biology are not often taught to undergraduate students; over a period of a few years, significant advances take place in a limited number of areas within the field; and the subject is so broad that few workers would venture to write authoritatively about all of it.

Casarett undertook the difficult assignment of writing a general text apparently because she felt that there was need for a volume from which to teach an elementary undergraduate course in radiation biology. In this task she has succeeded admirably. The treatment is indeed comprehensive; the book includes four chapters on the radiation physics and chemistry necessary for a presentation of radiation biology. The writing is clear and the book reads well. There are few errors, typographical or otherwise (though four of the figures are missing in the copy I read, and the scales on some of the graphs are incorrect). The topics are equitably treated; emphasis of those areas in which there has been rapid, fundamental recent progress has been avoided, as may be proper in an introductory text (although the scant treatment of cellular radiation biology, from study of which fundamental understanding of the biological effects of ionizing radiations is likely to come, might have been a mistake). The presentation is elementary, and no knowledge of physics, chemistry, or biology on the reader's part is assumed.

But this last characteristic, rather than adding to the book's usefulness, probably limits it. The very elementary level of presentation will restrict readership to the scientifically naive. For the nonscientist in this category, Alexan-

der's paperback offers a more exciting presentation of radiation biology. The undergraduate science student will have studied some biology, chemistry, and physics before taking a course in radiation biology, and deserves a more sophisticated treatment than is presented in this volume. The only justification for a freshman-level course in radiation biology, for which so elementary a text might be suitable, would be as a vehicle for teaching biology, and this book certainly cannot serve such a purpose; fundamental biological facts and concepts are discussed only sufficiently to allow the presentation of the biological effects of radiations to at least appear meaningful. It is regrettable that Casarett did not employ her considerable talents for organization and exposition to write an introductory text on radiation biology for the intermediate or advanced science student.

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