

Microbiology

David M. Karl

The Quarterly Review of Biology, Vol. 65, No. 1 (Mar., 1990), 83-84.

Stable URL:
http://links.jstor.org/sici?sici=0033-5770%28199003%2965%3A1%3C83%3AM%3E2.0.CO%3B2-4

The Quarterly Review of Biology is currently published by The University of Chicago Press.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at http://www.jstor.org/about/terms.html. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at http://www.jstor.org/journals/ucpress.html.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is an independent not-for-profit organization dedicated to creating and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact support@jstor.org.

http://www.jstor.org/
Wed Mar 16 16:24:06 2005

Historically, the foundations of experimental embryology can be traced back to the time between the first and second world wars. Hamburger (*The Heritage of Experimental Embryology*, Oxford Univ. Press, New York, 1988) does an admirable job of capturing this period, when a more holistic approach to embryology prevailed. During this period many of the present embryological concepts, such as induction, morphological field phenomena, determination, self-differentiation, and the "organizer" were developed and defined with concise embryological experiments using salamander embryos. Subsequent to the discovery of the structure of DNA by Watson and Crick during the fifties and the breaking of the genetic code during the sixties, embryology took a more reductionist and subcellular approach. The outlook shifted to a more programmatic emphasis on embryology, which was renamed "developmental biology." As emphasis in different hierarchial approaches shifted, there was also a change in favorite model organisms to study development. At the present time, favorite organisms to study development are *Drosophila* and *Xenopus*. These are popular because they are easily bred, embryos are accessible, they are relatively easy to manipulate and they develop quickly. Thus, quick answers to gene expression questions can be obtained. The axolotl, or Mexican salamander, *Ambystoma mexicanum*, has all of the above features, but it develops much more slowly.

John Armstrong and George Malacinski have edited a fine book that compiles a cross section of developmental studies under way using the axolotl. They divide this book into three main parts: (1) natural history of the axolotl, (2) developmental studies using the axolotl, and (3) general and specific bits of information needed to rear and experiment with axolotls. The greatest bulk of the book consists of sixteen reviews of the stages and organs of axolotl development presently under investigation. These articles were written to emphasize the range of developmental studies using the axolotl and to underscore the advantages of using the axolotl for such studies. The articles are arranged in developmental order starting with gametogenesis and ending with an article on metamorphosis (or, in the case of the axolotl, "induced" metamorphosis). In general, the papers are clear and concise, and as a result they are informative to both the generalist and specialist. All cited references are at the end of the book rather than the end of each chapter. There are few editorial errors (e.g., "asses" instead of "assess," and two plates have their legends reversed), but the overall quality of the writing and photographs is very good. This book could be used both as an advanced undergraduate reference for general development and as a laboratory source for axolotl maintenance.

With recent discoveries concerning homeobox genes in *Xenopus* and the correlation of the expression of these genes with segmentation events, the axolotl might become even more popular with regard to assessing the presumed function of these genes. A need for more slowly developing embryos will be required for experimental manipulation of developmental events to test tissue-causal relations that evoke homeobox gene expression. A return to the higher hierarchial levels of epigenetic interactions should also result in a switch in animal models back to more slowly developing embryos.

GERALD W. EAGLESON, *Biology, Loras College, Dubuque, Iowa*

OVARIAN FOLLICLES IN REPTILES AND BIRDS. *Zoophysiology, Volume 24.*

By Sardul S. Guraya. Springer-Verlag, Berlin and New York. $141.50. xiii + 285 p.; ill.; subject and species indexes. ISBN: 0-387-50416-8 (from New York). 1989.

Reproductive function in birds and reptiles has achieved global economic and ecologic importance, and this book will become an important tool for those involved in the reproductive cycles of these animals. Specifically intended for biologists, toxicologists, and breeders, the book covers oogenesis, folliculogenesis, ovulation, postovulatory follicular function, and follicular atresia; it also discusses the evolutionary significance of these events as they pertain to different species and the survival of these species. The author, an authority on ovarian function, makes use of morphological and biochemical data, carefully weaving it into a detailed but lucid descriptive summary. He takes care to highlight the functional similarities and differences between reptiles and birds or between species and, at the same time, he points out areas of needed future research. The book is extremely well organized, referenced and documented. The index guides the reader according to subject and species of interest. The text is richly illustrated, although some of the prints are slightly blurred. This book is highly recommended to those involved with the reproductive biology of reptiles and birds, but the cost ($141.50) may limit its purchase to libraries.

ROBERT E. JONES, *Uniformed Services University of the Health Sciences, Madigan Army Medical Center, Tacoma, Washington*



MICROBIOLOGY

MICROBIAL ECOSYSTEMS OF ANTARCTICA. *Studies in Polar Research.*

By Warwick F. Vincent. Cambridge University Press, Cambridge and New York. $75.00. xiii + 304 p.; ill.; index. ISBN: 0-521-32875-6. 1988.

Except for selected coastal areas which comprise the

seasonal breeding and rearing grounds for a variety of birds and marine mammals, and the northernmost reaches of the Palmer Peninsula where an occasional clump of moss or tuft of grass can be observed, Antarctica and its surrounding glacial ice shelves is a continent dominated by microorganisms, including algae, bacteria, protozoa and fungi. Antarctic habitats are extremely diverse and include: hypersaline lakes and soils, arid deserts, cryoconite holes and supraglacial pools, ice bubbles, sea-ice and volcanic fumeroles. The microbial assemblages are equally diverse and well adapted for growth in these specialized habitats. This latest title in the "Studies in Polar Research" series provides a vivid, comprehensive account of these complex and, sometimes, ephemeral microbial ecosystems and their inhabitants.

Following the preface and brief introduction, this monograph is organized around a presentation and discussion of eight selected macro-ecosystems: snow and ice, sea-ice, marginal-ice zone, open ocean, benthic marine zone, lakes and streams, soils, and rocks. The author provides a detailed physical-chemical description of each major habitat before proceeding with discussions of the microbial community structure, microbial processes and trophic structure that are unique to each ecosystem. The final two chapters, Microbial Strategies in Antarctica and Microbes and Humans in Antarctica, provide information of a more specialized and, in part, less relevant nature, compared to the primary focus of this book. Also included are two appendixes, one on Antarctic climates and the other on general environmental data, a five-page glossary of terms for the nonspecialist and an extensive, and largely up-to-date reference list.

In general, the materials presented in this book clearly reflect the title, with an emphasis on "ecosystems." The author clearly and authoritatively describes the habitats and their characteristic microbial communities. Emphasis is placed on the photoautotrophic assemblages, perhaps reflecting either the author's own bias and expertise or the dearth of quantitative information on the heterotrophic and phagotrophic microbial components. The book is well illustrated with photographs, photomicrographs and line drawings mostly reproduced from primary sources in the literature. In my opinion the most well-presented and informative sections are Chapter 3 (Sea-Ice Ecosystems) and Chapter 9 (Lithic Ecosystems: The Rock Environments). The discussions of microbial rates and processes (especially of the heterotrophic microbes), although not the central thesis of this monograph, are often weak by comparison to the excellent descriptions of the ecosystems themselves. A discussion of the effects of global warming and atmospheric ozone deficits might have been more informative, timely and useful than the selected presentations, in the final chapter, of medical microbiology and microbial introductions made by man.

In summary, I found *Microbial Ecosystems of Antarctica* to be a delightful, scholarly treatise on the habitats and inhabitants of my favorite continent. This book should serve as an excellent reference for all individuals interested in Antarctic biology and microbial ecology. As a marine microbiologist interested in polar processes, I expect to refer to my copy often. Because of the book's specialized topics, its readership may be very narrow. The careful research and intellectual synthesis that obviously went into the preparation of this treatise, however, deserve the scrutiny of a more general scientific community.

DAVID M. KARL, *Oceanography* and *Hawaii Institute of Geophysics, University of Hawaii, Honolulu, Hawaii*

THE BACTERIOPHAGES. *The Viruses, Volume 1, Volume 2. Edited by Richard Calendar; Series Editors: Heinz Fraenkel-Conrat and Robert R. Wagner. Plenum Press, New York.* (1) $105.00. xviii + 596 p.; ill.; index. ISBN: 0-306-42730-3. 1988. (2) $125.00. xviii + 760 p.; ill.; index. ISBN: 0-306-42853-9. 1988.

This encyclopedic work is effectively an updated version of Volumes 7 and 8 of *Comprehensive Virology* (1977) with the same series editors and many of the same authors contributing chapters. Volumes 7 and 8 of *Comprehensive Virology* were particularly useful as reference works for those who taught advanced undergraduate courses, with their relatively terse but informative chapters on lambda and such large virulent DNA bacteriophages as T4. How does this new version measure up? The editor, Richard Calendar has included two types of chapters, one based on particular bacteriophages such as Mu and P1, and the other centered on such molecular themes as DNA packaging and assembly. This arrangement is only partially successful. Chapters have been partitioned between the two volumes apparently at random and there seems to have been no effort to provide a logical progression from the general to the particular. For example, the series could have started with the chapter on Strategies of Bacteriophage DNA Replication (F. Keppel, O. Fayet and C. Georgopoulus, Chapt. 3, Vol. 2), followed by The Changes in RNA Polymerase (E. P. Geiduschek and G. A. Kassavetis, Chapt. 3, Vol. 1), and so on, so that the molecular themes were dealt with in the first volume and the organism-based chapters, in the second volume.

Despite their illogical organization, the two volumes do provide an extremely useful reference source for students and experimental workers, marred only by the fact that there is no synoptic view of lambda. It is necessary to read *Bacteriophage Lambda* (ed. by A. D. Hershey, Cold Spring Harbor Labo-