



**Biology of the Reptilia. Volume 2, Morphology B.**

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the red muscle. Of more consequence, however, is the loss of utility of the book due to the time requirements for its final wrap-up and publication. It was estimated from the relative proportion of bibliographic listings for 1968 to those of 1966 and 1967 that the time loss was two years.

The first half of the book is a detailed but readable account of the comparative biochemistry of fishes. It includes discussions on the chemical contents of tissues, and metamorphic changes during development and growth; differences as within and between marine and fresh-water species; and, differences related to various ecological factors including salinity, bottom characteristics, available oxygen, depth, light, diet, and temperature. The section ends with a chapter on the effects of starvation. It's a subject that at first sight seems only of slight significance, but as the author states: "Unlike most terrestrial animals, the majority of fish experience severe depletion for a part of every year of their lives. They are therefore unusually well adapted to mobilizing their body constituents as fuel for survival . . ." (p. 222). Most chapters are brief but thoughtful reviews which will be helpful to comparative physiologists and professional fish biologists alike. As an example, Chapter 4, "The Influences of the Environment," has excellent discussions on the ecology of visual pigments, adaptations peculiar to circumpolar fishes (hemoglobin absent or in low concentration, frost resistance, body fluid osmotic pressures), and regulations for migrations between the sea and fresh-water.

Indexes in the second half list enzymes and other chemical agents in fish cross-referenced to text pages where mentioned, to bibliographic entries, and to tissues where found (except enzymes). This listing is followed by an alphabetical index of fish names with geographic locations and bibliographic referencing that is keyed to specific enzymes and chemical substances. The final index is a second alphabetical index, this time of English common names and Latin equivalents. The bibliographic listing can only be described as superb.

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**ANATOMY OF THE CHORDATES.** *Fourth Edition.*

By Charles K. Weichert. McGraw-Hill, New York. \$13.50. viii + 814 p.; ill.; index. 1970.

**BIOLOGY OF THE REPTILIA.** *Volume 2, Morphology B.*

Edited by Carl Gans and Thomas S. Parsons. Academic Press, London and New York. \$16.50. xiv + 374 p.; ill.; author and subject indexes. 1970.

The second volume of this exhaustive series maintains and surpasses the high standards established in the first. The series is designed for specialists, with an emphasis on in-depth studies of many aspects of reptilian biology. Major papers on reptilian sense organs comprise nearly all of the present volume. These will be of interest to a wide range of specialists, as well as to biologists interested in general aspects of comparative anatomy.

Underwood treats the reptilian eye in a long, well-organized paper. Descriptions of the orbit and adnexae, the eyeball, and the retina are presented for each major reptilian group. These thorough and well-illustrated sections focus on one or on a few species. Comparative sections follow each major descriptive account. Much original information is integrated with data from the literature. The discussion is characterized by Underwood's familiar attempts to be provocative. Certain parts are confusing, mainly because of their brevity and the use of Underwood's relatively unfamiliar, and as yet poorly documented, taxonomy of snakes. Nevertheless, his treatment of the retina and his comments on lizard and snake evolution are imaginative and stimulating. He extends and elaborates the early views of Walls concerning the origin of ophidian eyes, providing new documentation of several kinds of retinal cell "transformations." This important chapter, while somewhat assertive in style, eases the task of future researchers. It should serve as a stimulus for more studies of such fascinating groups as the nocturnal and limbless lizards and the snakes.

The reptilian nose and Jacobson's organ are subject of a detailed consideration by Parsons. General features of nasal structure are briefly discussed, and more technical accounts of adult morphology in the separate orders follow. These clearly written and well-illustrated sections are based primarily on the literature, but include many original observations. Brief, but adequate, considerations of histology and embryology of the nasal region and comparative morphology of nasal glands are presented. Parsons has previously published accounts of the evolution of the reptilian nose, and his discussion here is very short.

Baird presents a valuable account of the anatomy of the reptilian ear. A detailed description of the general aural anatomy of a "typical" lizard provides a foundation for the comparative section. All parts of the ear are considered, and the treatment is comprehensive, from the gross to the ultrastructural level. Many original observations and interpretations are included. He wisely rejects the standard, confusing otological nomenclature, and uses the more precise system introduced by Streeter.

The comparative section is concise and well organized. The treatment is by taxonomic group, and is especially detailed for the lizards. Problem areas are clearly identified, and this stimulating account should do much to encourage and facilitate future research.

Barrett discusses the morphology and physiology of the facial pits of crotaline snakes (the pit vipers) and the labial pits of certain boiid snakes. These specialized organs are among the most sensitive thermal receptors known, and they function in the detection of warm-blood prey. This chapter is a summary of information from the literature, but there are a few original observations. Pit organs are of potentially great significance for the analysis of fundamental questions in neurophysiology, and these problems are outlined by Barrett. Brief appendixes by other authors list the distribution of labial pits in boiid snakes and examine some ultrastructural details.

The last chapter, by the editors, is a brief guide to the literature on reptilian classification, prepared for readers who are not taxonomists.

Excellence characterizes the contributions to this volume, especially the three major papers. The high level of competence of the authors is revealed by the breadth and depth of their treatments. These are stimulating, even dynamic presentations which provide information and analysis, and indicate directions of future research.

The quality of the first two volumes of this important series leads me to await future volumes with eager anticipation.

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#### HAWKS, OWLS AND WILDLIFE.

By John J. Craighead and Frank C. Craighead; drawings by Jean Craighead George. *Dover Publications, New York*. \$3.75 (paper). xx + 443 p.; ill.; index. [Unabridged republication of work originally published by Stackpole Company and Wildlife Management Institute in 1956]. 1969.

#### BASIC ANATOMY. *A Laboratory Manual. The Human Skeleton. The Cat.*

By B. L. Allen. W. H. Freeman, San Francisco. \$4.95 (paper). xvi + 152 p.; ill.; index. 1970.

#### PRIMATES: COMPARATIVE ANATOMY AND TAXONOMY. VIII: *Cynopithecinae. Genera Papio, Mandrillus and Theropithecus. A Monograph.*

By W. C. Osman Hill. John Wiley & Sons (Inter-science Division), New York. \$49.95. xx + 680 p. + 36 p. pl. + 12 p. maps; ill.; index. 1970.

The eighth volume of this series appears before the seventh and covers the biology of baboons. In the format of previous volumes, the author treats the nomenclature, history, anatomy, physiology, behavior, pathology, and taxonomy of recent baboons, including the drill, mandrill and gelada. He maps the geographic distribution of the 8 species he recognizes and shows that *Papio anubis*, *P. cynocephalus*, and *P. ursinus* (as he defines them) have contiguous allopatric ranges. He also treats 19 species of fossil baboons, which he allocates to 7 genera.

Unfortunately, most of the criticism leveled at previous volumes are valid for this one. For example, the first three of the four taxonomic names in the subtitle are invalid as used by Hill, an unfavorable start for a treatise on taxonomy. Typological attitudes seem basic to Hill's taxonomic discussions. He describes geographic variation without adequate consideration of variation within demes. He lacks a quantitative approach. Although he includes lists of individual measurements, many taken from the literature, he seldom computes averages and apparently never cites standard deviations, standard errors, or tests of significance. The maps show "general ranges" of baboons — only two include dots indicating actual records and curiously not all dots are included in the "general range." Reference to the text does not adequately clarify the situation. Hill's treatment of anatomy is also typological. Many detailed descriptions are obviously based on single specimens. Many of the anatomical diagrams are puzzling and difficult to interpret.

A precise detailed study of the geographic variation of baboons is greatly needed. More trustworthy taxonomic conclusions could be based on such a study. Unfortunately, this long expensive volume does not add very much to the body of knowledge on baboons already in the literature. Neither does it add significantly to our access to that literature. Happily the baboon bibliographies of the Southwest Foundation have already done that job better than this volume does.

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#### ANIMAL PHYSIOLOGY. *Third Edition. Foundations of Modern Biology Series.*

By Knut Schmidt-Nielsen. Prentice-Hall, Englewood Cliffs, New Jersey. \$6.95 (cloth); \$2.95 (paper). xii + 145 p.; ill.; index. 1970.

#### COMPARATIVE PHYSIOLOGY OF THERMOREGULATION. *Volume I: Invertebrates and Nonmammalian Vertebrates.*

Edited by G. Causey Whitton. Academic Press,