Biology of the Reptilia. Volume 3, Part C: Morphology.

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By Richard J. Hallock, Robert F. Elwell, and Donald H. Fry, Jr. Department of Fish and Game, Sacramento. 92 p.; ill.; no index. 1970.

FISH PHYSIOLOGY. *Volume IV. The Nervous System, Circulation, and Respiration.*

Edited by W. S. Hoar and D. J. Randall. Academic Press, New York. $27.50. xviii + 532 p., ill.; author and subject indexes. 1970.

This volume, like the first three of the six planned for the series, varies considerably in the style and coverage of subjects treated by its eleven contributors. Clearly, developments in some areas have proceeded much more rapidly than in others over the intervening years since completion of the parent work (M. E. Brown, *The Physiology of Fish*) in 1957. [See *Q. R. B.*, 45: 417 (1970) for review of Volume 1 of the current series, and *Q. R. B.*, 32: 300 (1957) and *Q. R. B.*, 33: 170 (1958) for reviews of Volumes 1 and 2 of *The Physiology of Fish*.] In the present volume, there is, for example, a whole "new look" to the areas of respiratory and circulatory physiology of fish. Well arranged and detailed chapters by D. J. Randall (The Circulatory System), G. Shelton (The Regulation of Breathing), and K. Johansen (Air Breathing in Fish), attest to this. In fact, about three-fourths of the research papers cited in these chapters were not yet written and available to Brown's authors in 1957. The triplet of chapters by C. Albers (Acid-Base Balance), A. Riggs (Properties of Fish Hemoglobins), and Randall (Gas Exchange in Fish), also leads into subjects that have changed greatly in recent years. The review by Riggs is of especial interest to zoologists in general because so much of the adaptive evolution of hemoglobin structure and function seems to have been "invented" in fish prior to vertebrate emmigrations to land.

Unfortunately, the specialized orientation, brevity, and curious repetition of material found elsewhere in the series faults the first chapter by J. J. Bernstein (The Anatomy and Physiology of the Central Nervous System). A much larger share of the volume should have been reserved for this important subject. The related chapters by J. C. Fenwick (The Pineal Organ) and G. Campbell (The Autonomic Nervous System), although short, are complete and carefully handled reviews. Fenwick's chapter on the pineal would be much more useful with photographs or drawings of the anatomy and cellular detail, but then, the entire series suffers from being under-illustrated.

Summary chapters are also provided by M. S. Gordon (Hydrostatic Pressure) and J. E. Cushing (Immunology of Fish). Both are useful despite the rather exotic subject matter of the former, and informational limitations of the latter because of the very recent application of immunological techniques to studies with fish. The remaining chapter by J. B. Steen (The Swim Bladder as a Hydrostatic Organ) is also short, but very much to the point. It is one of the most carefully organized and illustrated chapters in the book and maintains the usual high standards of his publications.

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BIOLOGY OF THE REPTILIA. *Volume 3, Part C: Morphology.*

Edited by Carl Gans and Thomas S. Parsons. Academic Press, London and New York. $21.00. xiv + 385 p.; ill.; author and subject indexes. 1970.

The third volume of this ambitious series resembles the earlier volumes in the general quality of the authoritative, thorough chapters, and in the excellence of editing and production. The major difference is that the articles, dealing with blood and endocrines, are more numerous and more specialized than in previous volumes. Also, the price has increased appreciably.

A chapter on blood chemistry by Dessauer may be a bit out of place in a volume on morphology, but it is detailed, lucid and well organized. The treatment is thoroughly comparative, with an emphasis on physiological, ecological, systematic, and evolutionary considerations. This is a most useful summary of the widely scattered literature by a major contributor to the field.

The remaining chapters are more strictly morphological and they suffer somewhat from narrowness of approach. M-C. Saint Girons summarizes knowledge of blood cell morphology from a comparative viewpoint, and Duguy treats blood cell number and its variation. Work on these topics is fragmentary, but at least these useful summaries help identify problem areas. Gross, light-microscopic, ultrastructural and developmental anatomy of the thymus are considered by Bockman, who presents some original information. H. Saint Girons presents a long chapter, including many original observations and illustrations, on the comparative morphology of the pituitary. His identification of functional cell types on the basis of morphology is not convincing. A chapter on the thyroid, by Lynn, includes both physiological and morphological summaries. Clark summarizes the rather small amount of information available on the parathyroid, and Gabe presents a detailed survey of comparative morphology, cytology, and histochemistry of the adrenals. A final chapter by Miller and Lagios is an attempt at a comparative morphological treatment of the reptilian pancreas, with an emphasis on islet tissue.

The volume has less general appeal than previous ones in this series because of the restricted range of topics. Further, the separation of structure and function is disconcerting and reduces the utility of the articles. Coverage thus appears to be spotty, and one wonders why certain papers are not cited. Yet, a valuable service is provided in that the surveys are thorough and gaps in current knowledge are usually either made explicit or are obvious from the treatment. In that major problem areas are identified, the volume will be of considerable value in providing direction for future researchers.

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STUDIES ON AMPHISBAENIANS (AMPHISBAENIA, REPTILIA). *4. A Review of the Amphisbaenid Genus* Leposternon. *Bulletin of the American Museum of Natural History. Volume 144: Article 6.*

By Carl Gans. American Museum of Natural History, New York. $3.25 (paper). ii + pp. 381-464; ill.; no index. 1971.

BUOYANCY, LOCOMOTION, MORPHOLOGY OF THE PELVIC GIRDLE AND HINDLIMB, AND SYSTEMATICS OF CRYPTODIRAN TURTLES.

By George R. Zug. Museum of Zoology, University of Michigan, Ann Arbor. $4.00 (paper). 98 p.; ill.; no index. 1971.

TYPE-SPECIMENS OF BIRDS IN THE BRITISH MUSEUM (NATURAL HISTORY). *Volume 2: Passerines.*

By Rachel L. M. Warren and C. J. O. Harrison. The British Museum (Natural History), London. £13.00. (paper) vi + 628 p.; no index. 1971.

THE FUNCTIONAL MORPHOLOGY OF THE HIND LIMB OF THE DOMESTIC PIGEON, *Columbia livia. Bulletin of the American Museum of Natural History. Volume 144: Article 3.*

By Joel Cracraft. American Museum of Natural History, New York. $3.65 (paper). ii + p. 173–268; ill.; no index. 1971.

BIOLOGY OF BATS. *Volume 1.*

Edited by William A. Wimsatt. Academic Press, New York. $25.00. xii + 406 p.; ill.; author and subject indexes. 1970.

BIOLOGY OF BATS. *Volume II.*

Edited by William A. Wimsatt. Academic Press, New York. $26.00. xvi + 477 p.; ill.; author and subject indexes. 1970.

The appearance of this two-volume work marks a milestone in chiroptology. Each contributor is a recognized authority in his field, and presents a concise summary of the present state of knowledge in his specialty, and follows it with an exhaustive bibliography. As a consequence, this publication may now be used as a starting reference for most future work on these intriguing animals. Systematics, with its own vast literature, has been omitted from the contents of this work, but most other aspects of bat study have been included.

Most early studies on bats had to do either with their identification or with behavior. However, recently many extensive and sophisticated studies have been undertaken. There is a full and thoughtful essay on the fossil history of bats by Jepsen, based largely on his study of the Eocene bat, *Icaronycteris*. Vaughn's studies on functional comparative anatomy, Baker's work on karyotypes, Lyman's work on thermoregulation and metabolism, Rosenbaum's work on the urinary system, and Quay, Henson, and Suthers' on work microanatomy, alongside more conventional reports by Orr on development, Griffin on movements, and Wayne Davis on ecology, make up the substance of the rest of the two volumes. Each of these authors is a specialist in his own right, and summarizes well the state of knowledge in his field. Readers and potential researchers will particularly appreciate the lengthy list of bibliographic sources at the close of each chapter.

Perhaps the section that will serve the widest reader group is the closing chapter by Constantine on bats in relation to the health, welfare, and economy of man. This section alone consists of 100 pages, exclusive of bibliography, and covers not only the subject of bats in relation to disease (of which rabies is only one of many), but also their relationship to agriculture, insect control, and medical research, and the problems of control measures.

These volumes will not introduce bats to the non-scientist as do numerous other recent publications in chiroptology. This is not their function. They will suggest new areas of research to be done in the future by outlining the present state of knowledge. One sees the same species reappearing throughout both volumes, and when one realizes that bats are, next to rodents, the most proliferated order of mammals, it becomes obvious that there are still many, many species about which nothing at all is known.

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OLD WORLD MONKEYS. *Evolution, Systematics, and Behavior.*

Edited by J. R. Napier and P. H. Napier. Academic Press, New York. $19.50. xvi + 660 p.; ill.; animal and author indexes. 1970.