

more accessible, species key to identify the most commonly encountered, or most dangerous, species. Similarly, although important life-cycle diagrams are technically sound, they are crammed with information and abbreviations and require considerable effort by the reader to interpret them.

More questioning of accepted knowledge by the author with suggestions for new research directions would have been valuable. Some specialists might be disappointed also at not having all of their work incorporated. I, for example, looked in vain (and perhaps vainly) for my report on the presence in some argasid ticks of well-developed eyes that have a reflective tapetum of trachea instead of a lens.

On the other hand, the book contains few overt factual errors. One I was able to find states that tick oenocytoid hemocytes are similar to insect oenocytes—subdermal cells that secrete lipidic substances. The reader is also not distracted by spelling and typographic errors; information is generally well presented—although I had early misgivings on seeing “critique” converted to a verb in the Introduction.

A comprehensive work on the biology of ticks is long overdue; tick researchers have had to suffer a combination of the outdated textbooks of Arthur and Balashov together with useful, but unbalanced, books that have emanated from conferences. The shortcomings of *Biology of Ticks*, Volume 1, are relatively unimportant. The unique nature of the collected information, including many photographs and illustrations, makes this a valuable reference for advanced students and researchers. It is a high-quality, well-edited production and its price is a fair one.

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PHYSIOLOGICAL ADAPTATIONS IN VERTEBRATES: RESPIRATION, CIRCULATION, AND METABOLISM. *Based on a symposium held in Copenhagen, June 1989. Lung Biology in Health and Disease, Volume 56.*

Edited by Stephen C. Wood, Roy E. Weber, Alan R. Hargens, and Ronald W. Millard. Marcel Dekker, New York. \$150.00. xxiii + 419 p. + 1 pl.; ill.; author and subject indexes. ISBN: 0-8247-8558-4. 1992.

This is an eclectic mix of philosophical essays, review articles, and research reports originating from a symposium honoring the well-known comparative physiologist, Kjell Johansen. The chapter titles and authors provide excellent testimony to the richness and diversity of the intellectual legacy Johansen left upon his premature death in 1987. The four editors are all part of that legacy, and it is significant that they each make unique contributions to assembling this broad spectrum of papers. The aim of this volume, according to the Introduction

by Claude Lenfant, editor of the Lung Biology in Health and Disease series, is to inspire young scientists and future students with this interesting collection.

Of the twenty-one chapters, twelve deal with comparative cardiovascular physiology, which was Johansen's primary research area. These include historical essays (Schmidt-Nielsen), methodological critiques (Rigel and Millard), an ontogenetic alternative to phylogenetic comparisons (Burggren), and molecular (Weber) to whole-animal research reviews (Mangum, writing the only chapter on invertebrates, incidentally). The other nine chapters, on comparative gas exchange and metabolism, include some new ideas that have not been published before (e.g., Perry), other ideas that are already well covered in the literature (e.g., Piiper and Scheid), and finally, useful reviews of research in developing fields (e.g., Milsom).

The breadth of this book is also its limitation. The range of circulatory, metabolic, and respiratory topics covered is broader than vertebrate comparative physiologists can successfully attack with modern research programs. It is also difficult to specify the background necessary to make the book a useful teaching companion; some of the papers are highly specialized, while others are more general. Finally, even with a wide range of editorial expertise, some errors were inevitable. For example, in Perry's chapter dealing with material I routinely review, good ventilation-perfusion matching in monitor lizards is presented as a “paradoxical solution” because of the lack of such close matching in teju lizards (p. 153). Actually, the original references deal with the two different phenomena of *spatial* and *temporal* matching in tejus and monitors, respectively.

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ENVIRONMENTAL PHYSIOLOGY OF THE AMPHIBIANS.

Edited by Martin E. Feder and Warren W. Burggren. The University of Chicago Press, Chicago (Illinois). \$135.00 (hardcover); \$47.50 (paper). viii + 646 p.; ill.; systematic and subject indexes. ISBN: 0-226-23943-8 (hc); 0-226-23944-6 (pb). 1992.

This volume provides a long-awaited successor to the seminal volumes on amphibian physiology edited by John A. Moore (*Physiology of the Amphibia*, Academic Press, New York, 1964–1976). The goal of the editors was to supply a current overview of amphibian environmental physiology that might also serve to direct future research. Following an introductory perspective (largely devoted to exposing common misconceptions about amphibian physiology) by Martin Feder, the remaining 15 chapters in this excellent book are divided into four major sections: (1) Control Systems, (2) Exchange

of Gases, Osmolytes, Water, and Heat, (3) Energetics and Locomotion, and (4) Development and Reproduction. It is important to note that this book is not a review of amphibian biology and thus does not cover (nor does it aim to cover) many features of amphibian morphology or evolution (even when relevant to physiological interpretation). Most chapters concentrate on the specifics of amphibian physiology from an environmental perspective. Thus, topics such as amphibian immunology and regeneration are not considered in detail.

A number of the chapters are outstanding and provide a comprehensive overview with extensive tables. For example, the chapters on the biophysics of heat and mass transfer, exchange of respiratory gases, thermoregulation, and behavioral energetics all supply lucid summaries of important principles and their application to diverse amphibian taxa. Particularly noteworthy is the chapter on energetics at rest and during locomotion, which includes several very large tables summarizing the literature on both larval and adult amphibian oxygen consumption at rest and during nonsustainable exercise.

Several other chapters are less comprehensive. The material on the nervous system (Chapter 2) and endocrinology (Chapter 3), for example, is in many ways better treated in Chapter 16, which discusses developmental changes in physiological systems.

A particularly excellent feature of the book is the single bibliography containing more than 4500 references to the literature. This list is made considerably more useful by the notation (following each reference) of the chapters that cite that reference, making it much easier to follow a single topic across chapters.

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SNAKES OF THE UNITED STATES AND CANADA: KEEPING THEM HEALTHY IN CAPTIVITY. Volume I: Eastern Area.

By John Rossi. Krieger Publishing, Malabar (Florida). \$42.50. xiv + 209 p.; ill.; index of common names and subject index. ISBN: 0-89464-590-0. 1992.

This book deals with a phenomenon that has been practiced by a few for decades and has achieved widespread popularity in recent years—keeping snakes in captivity. This volume should be useful to anyone who wants to keep a species native to eastern North America.

Information in the section on general care and maintenance is critical for anyone attempting to keep a snake for a pet. Novices will benefit from

learning the basics, and even experienced herpetoculturists are likely to pick up a few tips.

Details are given on proper cage construction and cleaning, temperature, lighting, and humidity. Several pages are devoted to feeding techniques, a vital consideration for keeping any snake in captivity. Emphasis is given to causes, symptoms and treatments of health hazards that confront many captive specimens, including mites, internal parasites, and loss of appetite. Problems resulting from overheating, lack of a suitable hide box, and keeping more than one specimen in a cage during feeding are also stressed. Information charts and lists of rules provide quick reference to certain techniques and considerations. The occasional controversy and contradiction surrounding certain topics demonstrates the variability that continues to be uncovered as workers in this field increase their level of experience. Some seasoned snake hobbyists will probably disagree on certain points. The overall presentation, however, indicates a wealth of experience and dedication to the care of captive snakes.

Most of the remainder of the book consists of individual accounts on how each species, including the seven venomous ones, responds to captivity. The accounts are based on the experiences of the author and others. A rating chart gives a maintenance difficulty index, cage recommendations (size, substrate, temperature, and lighting), and a short discussion of special considerations for each species.

I recommend the book for hobbyists, researchers, and zoo or nature center curators who anticipate keeping native eastern species of snakes.

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VENOMOUS REPTILES OF NORTH AMERICA.

By Carl H. Ernst. Smithsonian Institution Press, Washington, D. C. \$35.00. ix + 236 p. + 16 pl.; ill.; index. ISBN: 1-56096-114-8. 1992.

The scope of the book is defined by Ernst's statement that "my interests, however, lie principally in natural history; I have excluded technical papers that do not have a direct bearing on the life of the reptile in the wild" (p. viii). This volume covers one helodermatid lizard species, three elapid snake species, and 17 viperid snake species. The book might be better titled "Venomous Reptiles of the United States and Canada," since North American species found only in Mexico and Central America are not included.

The book begins with a synopsis of characters commonly used in identification, a short discussion of venoms and envenomization, and a dichotomous key. The key is useful only if the specimen