
Like most of the books in the well-known 'Progress in Brain Research' Series published by Elsevier, this volume represents the proceedings of a symposium, ostensibly held to bring together a multidisciplinary gathering of investigators to focus discussion on a problem of common interest. The Conference attempts to correlate various biochemical parameters to behaviour and focuses on two main types of experimentation in basic research: biochemical analysis and the effects of pharmacologic manipulation. The emphasis placed on cholinergic mechanisms at the Conference might lead one to conclude that acetylcholine is the most significant transmitter involved with behaviour. This seems unlikely and one might wish that more had been provided concerning other transmitter substances. Since the issue of the blood-brain barrier was raised by one author, it seems unfortunate that some attempt was not made to consider this problem in somewhat greater depth. Further, some attention to hormones and the influence which they have on a wide variety of biochemical mechanisms might have been introduced and related to behaviour.

Finally, I find the title misleading, in that the various papers did not provide for an understanding of biochemical and pharmacological mechanisms underlying behaviour. What can be said is that some evidence is provided for certain biochemical changes occurring in relation to pharmacologic manipulation which could be correlated with behaviour and other experimental conditions. Undoubtedly, such data as that provided in this volume will some day contribute to our understanding of these biochemical mechanisms and directly relate them successfully to behaviour.

DONALD H. FORD, New York, N. Y.


The 'Progress in Brain Research' series has a fine addition in these proceedings of an International Symposium held in Pisa in July, 1971. The volume is well organized with an introductory chapter containing review articles by J. WERSÄLL, O. LOWENSTEIN, A. BRODAL, W. R. MEHLER and D. E. HILLMAN. These reviews which are, for the most part, lucidly written and extensively illustrated, provide a summary of the current state of knowledge of the anatomy and physiology of the vestibulär receptors and the anatomy of the vestibulär nuclear complex in several species. In particular, the article by J. WERSXLL is handsomely illustrated with several new and recently published electron micrographs of the vestibulär receptors.
The remaining chapters deal with specific problems of structure and function of the vestibular system and its relationship to other brain systems. There are chapters on the connections between the vestibular nuclei and spinal cord, cerebellum and reticular formation. A comprehensive survey of the field introduces each of these chapters and is followed by a series of experimental reports of a more restricted scope.

In general, the writing is excellent, the illustrations are pertinent and helpful, and the choice of references is quite adequate.

M. H. HALPERN, New York, N. Y.


This volume represents the proceedings of one of the regular summer school programs organized by the Netherlands Central Institute for Brain Research. Comparable to previous summer school programs, a group of highly qualified researchers have been called upon by the Organizers to review their particular fields of interest in some depth and with considerable success. Naturally, a considerable interest focused on CNS-endocrine control mechanisms, which despite a large literature are still far from understood. However, the participants at the Conference have provided a basic overall understanding of the problem as to where we are now in relation to past studies for both the anterior and posterior hypothalamic systems. The various effects of internal and external environmental factors (seasonal, diurnal, various stresses, olfactory signals, protein synthesis, hormones, spinal cord afferents, etc.) are also considered in relation to their interrelated roles in influencing hypothalamic-pituitary function. Thus, the twenty-two major papers presented provide a broad, well-written survey of many of the current views accepted as representing a reasonable understanding of the mechanisms (as we view them today) normally involved in CNS-endocrine interactions at the level of the experimental animal. The major emphasis is on control and how various inputs may influence control. Relatively little is said about the effect of hormones from the target endocrine glands on hypothalamic differentiation, myelination, protein synthesis, etc. This book can be recommended to anyone interested in neuroendocrinology and should be very useful to younger members of the scientific community with a burgeoning interest in this field since it will provide a broadly based introduction to many different areas of investigation, coupled with a voluminous bibliography.

DONALD H. FORD, New York, N. Y.


The ancient Chinese believed that there are four essentials to the good education: the special, the universal, the comparative and the historical. These likewise apply to the study of behavior, and HOWARD MOLTZ has presented us with a book which adds significantly to the still meager literature available, mining the individual's developmental history as a proper approach to behavior. The introductory chapter by J. ROSENBLATT and the late D. LEHRMAN surveys some of the major classes of behavioral problems being investigated at the present time, i.e., sensorimotor development, emotion and motivation, specific and individual recognition and mother-young synchrony, with the intent of discussing different approaches to behavioral development. While specifically not advocating a particular theory of development, the authors express some 'orienting attitudes', emphasizing diversity among species, temporal processes in behavior and interaction between the changing biological and psychological processes of the organism and its social and nonsocial environments.

A major paper on the ontogeny of emotional behavior by D. CANDLAND deals with several current strategies of research, including studies on prenatal and infantile experiences' effects of motivation on learning, the open field test and individual versus social situations. The author also constructs an ontogenetic model of emotional behavior which in the newborn is seen to be both diffuse and species-specific. With experience
there is a general increase in activity, which, in turn, facilitates still wider experiences, thus allowing for the establishment of a broad range of learned responses which provide for the large number of ‘subtle, but discrete’ emotional responses seen in adults.

There are two chapters on communication: one on vocal learning in birds by P. MARLER and P. MUNDGE and the other on the ontogeny of language by J. CHURCH. The former includes discussions on vocalization as an isolating mechanism, sensory mechanisms in song learning and a novel section on ‘individual improvisation’. The chapter on language is quite a bit more than a review of the ontogeny of speech: after surveying modern schools of linguistics CHURCH develops an insightful and delightful essay on the meaning of language to the infant and adult in their relations with the animate and the social spheres of their worlds. Finally, CHURCH asks for an approach to language that emphasizes the semantic aspect of ‘speech rather than the grammatical, syntactical, phonological and lexical devices used to communicate meaning.

Play and exploratory behavior are discussed by W. WEKLER. There are extensive lists of ‘overt’ and ‘covert’ behaviors which suggest the difficulties familiar to investigators of behavior in choosing appropriate labels for an animal’s acts. R. WHALEN’S article on the ontogeny of sexual behavior briefly mentions the effects of breeding (‘genetic’) and extra-organismic (‘environmental’) manipulations on sexual behavior and then discusses more fully hormonal influences on the development of sexual behavior and male-female differences. The editor, H. MOLTZ, has a chapter on the ontogeny of maternal behavior, including an interesting analysis of male maternal behavior. Most of the literature, and consequently most of MOLTZ’S paper is on the rat, although the rabbit, golden hamster and mouse are also discussed. L. ROSENBLUM’S chapter is devoted exclusively to pre- and post-parturient maternal behavior and subsequent mother-young interactions in macaques.

There are also chapters on the development of Visual perceptual Systems, problem-solving behavior in young postnatal mammals and imprinting by M. HERSHENSON, B. MEYERS and P. BATESONS, respectively.

It is comforting to note the sophistication of the authors - each has avoided the usual traps in discussing critical periods, instincts, interspecific extrapolations, unitary drives, and the like. Where blinding controversy and dogmatism have abounded, conciliatory tones and synthetic approaches now are present. The only criticism I have is the typical almost total absence of work on fish, amphibians and reptiles.

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Book Reviews

(The comparative, remember?) Other than that, this volume is highly recommended, both because of the need it fills and because of the Superlative job done in filling that need. Except for the introductory chapter, a relatively uniform format is followed. Each author quickly introduces the reader to the historical controversies and theoretical problems of the field, much as one gently teaches a neate, then guides the reader through the thicket of current research, much as one allows a child to selectively encounter the realities of life and, finally, suggests the correct theoretical paths to good future research, much as one sends an adolescent off into the adult world, down the right path, but on his own. LAWRENCE KUNSTADT, New York, N.Y.


Although ‘written specifically for the practicing veterinary clinician’, this book should become a highly valued addition to the personal libraries of all scientists working with reptiles in the laboratory. The three chapters on husbandry, medicine and surgery, pathology, are each followed by an extensive bibliography which, while not intended to represent a complete survey of the literature on the subject at hand, does provide an excellent guide to more detailed reports of topics mentioned in the text.

The volume is handsomely illustrated with 247 high quality color photographs of specimens illustrating for example, sex differences, disease states and operative techniques. Unfortunately, there are some cases where the critical feature being illustrated is out of focus or otherwise unclear.

Several tables are included which will be particularly useful for the nonveterinarian researcher using reptiles. These tables include lists of parenteral antibiotics, miscellaneous drugs, topical ointments, sprays and solutions and parasiticides used in captive reptiles. The generic name, source, route of administration, frequency of administration, dosage and precautions in use of the drugs are included in the tables.
The text itself is somewhat sketchy and not always well organized. The chapter on husbandry is perfunctory and anyone wishing to rear captive animals would have to go to a more complete source. On the other hand, the chapter on medicine is quite excellent, replete with photographs of various common disease states and discussions of causes and treatments for these states.

A short glossary at the end of the volume would be more helpful to the non-veterinarian if it included more of the technical terms found in the text.

T. Taken as a whole

one must concur with Nathan W. Cohen who states in the forward to this work that it 'will become a most valuable addition to the working knowledge of all those concerned with ... reptiles'. Mimi Halpern

New York

N.Y.