Book Reviews

The Physiology of the Pituitary Glands of Fishes. Grace E. Pickford and James W. Atz. New York Zoological Society, New York, 1957. xxiii + 613 pp. $6.

The Physiology of the Pituitary Gland of Fishes is a book that students of fish endocrinology have been hoping for. Heretofore, the literature of this field has been scattered through a wide variety of journals and languages. Now, for the first time, all significant contributions to the knowledge of the functioning of the pituitary gland of fishes, including its morphology and relationships to the target organs of the endocrine system, have been brought together in a comprehensive and orderly manner.

The book consists of three main divisions: text, tables, and bibliography. The introduction and six of the seven chapters of the text are written by Grace E. Pickford; the last and longest section, by James W. Atz. In the introductory chapter, an attempt is made to bring order out of the chaos of the terminology used in describing the several parts of the fish pituitary, which differs considerably from the mammalian gland. While the proposed terminology may not be generally acceptable or final, it does indicate clearly the different regions of the fish pituitary and should be helpful to workers in this field. To provide a general background for discussion of the physiology of the fish pituitary, a succinct and well-balanced account of the hormones and cell types of the mammal pituitary is presented.

Each of the succeeding sections, which deal with the different pituitary hormones and their effects, begins with a statement of what is known concerning the particular hormone in mammals, birds, and amphibians. Then the several classes, orders, and suborders of fishes are taken up. The value of separating groups and species of fishes is brought out, particularly in the classification of their chromatophore reactions. It is doubtful whether any zoological literature is more confusing and contradictory than that dealing with fishes' color responses to pituitary hormones and other influences. By means of careful analyses of procedures and the grouping of types of response in different fishes (given in detail in the accompanying tables), Pickford has managed to derive a reasonable working classification in a field which is still far from being completely explored. This is the best discussion that has been written on the subject and constitutes a real contribution.

Limitations of space preclude comments on the excellent presentation of the hormones of the neurohypophysis, growth hormone, corticotropin, and the adrenal. Treatment of the thyroid and thyrotropin is comprehensive and brings out many similarities to, and some differences from, the mammalian thyroid functioning. In part VII, the relation of the pituitary to reproduction in fishes, Atz has with great success assembled, analyzed, and classified the abundant and diversified literature on this subject. This chapter is of especial value in that a number of Russian and Brazilian contributions, previously inaccessible to the general reader, are here made available. Since most of the work on hormonal stimulation of spawning in fishes has been done in these two countries, knowledge of their progress in the field is obviously important.

One of the outstanding merits of the book is the section of some 200 pages of tables. The tabulated data, presented clearly and in sufficient detail by the authors, adds greatly to the value of the text. In addition, there are 25 summarizing text tables. The bibliography is inclusive and brings the literature up to the middle of 1956. The index is unusually complete. This is a remarkably scholarly and valuable piece of work, which adds new significance to the study of fish endocrines as a fertile field in the domain of general vertebrate endocrinology.

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Advances in Protein Chemistry. vol. XI. M. L. Anson, K. Bailey, and J. T. Edsall, Eds. Academic Press, New York, 1956. 591 pp. Illus. + cumulative index, vols. VI–X. $12.

The 11th volume in this valuable series maintains the consistently high standards of the earlier volumes with a series of six articles which range over a good part of present-day protein chemistry. The articles and their authors are as follows: "Protein structure in relation to function and biosynthesis," by C. B. Anfinsen and R. R. Redfield; "Hormones of the anterior pituitary gland: part 1, Growth and adrenocorticotropic hormones," by C. H. Li; "Column chromatography of peptides and proteins," by S. Moore and W. H. Stein; "Countercurrent distribution in protein chemistry," by P. von Tavel and R. Signer; "Complex formation between metallic cations and proteins, peptides, and amino acids," by F. N. R. Gurd and P. E. Wilcox; and "Measurement and interpretation of diffusion coefficients of proteins," by L. J. Gosting.

The types of reviews included in the present volume tend to reflect the spectacular progress of recent years in the study of protein structure and in the attempts to understand the functional properties of these complex molecules in terms of their structure. The articles by Anfinsen and Redfield and by Li deal largely with this problem. Likewise, the discussion of column chromatography and countercurrent distribution reflects the important advances in methodology which have made possible such rapid progress. These methods have been invaluable, both for isolation of pure proteins and for their partial hydrolysis products, the peptides. Both types of methods have come to be among the most generally used in protein chemistry in a relatively short time.

The specific interactions of proteins are obviously of great importance for understanding the behavior and function of these large molecules. The present review by Gurd and Wilcox summarizes current theory of interaction of metallic cations with proteins and discusses the presently available information.

Hand-in-hand with progress in understanding the chemical structure of proteins has been the development and use of physical methods which have permitted studies of these large molecules. Gosting provides a comprehensive discussion of the theory and application of diffusion measurements. Technical progress in this field has been spectacular, owing largely to the development of interferometric optical systems for measuring refractive index gradients. This has provided a tenfold increase in the accuracy by which diffusion constants can be estimated. As a result, such measurements are now among the most precise available for studying the physical properties of proteins.

It is of interest to all who must keep abreast of rapidly developing fields to contrast the two types of review volumes which are published periodically—those which summarize information in certain fields annually and those which review certain topics occasionally. *Advances in*