

NEURAL CONTROL OF THE PITUITARY GLAND

Hypothalamic Control of the Anterior Pituitary

An Experimental-Morphological Study. By János Szentágothai, Béla Flerkó, Béla Mess and Béla Halász. Pp. 330. (Budapest: Akadémiai Kiadó, Publishing House of the Hungarian Academy of Sciences, 1962.) n.p.

"THE present volume is the result of some ten years team work carried out in the Department of Anatomy of the Pécs University Medical School." So runs the first sentence of the foreword of this monograph by a group of Hungarian scientists led by Prof. J. Szentágothai. The book presents an integrated account of investigations carried out on the neural control of endocrine function in the rat and does so in a most satisfying manner. It begins with a chapter on the anatomy of the hypothalamus in which the studies of Szentágothai on the interneuronal connexions within the hypothalamus are given due and welcome prominence, and the nerve supply to the primary capillary loops of the hypophysial portal vessels examined. Neurosecretion and the blood circulation of the hypophysis are also dealt with in this most lucid section. There follow an examination of the effects of destruction of the pituitary stalk in the rat and chapters on the control by the hypothalamus of the secretion of thyrotrophic hormone, adrenocorticotrophic hormone and the gonadotrophins. One chapter is devoted to the trophic dependence of the anterior pituitary gland on connexions with the hypothalamus and another to the localization of the different control mechanisms within that part of the nervous system. This latter includes much information derived from studies of the changes in the size of the nucleus of cells in the hypothalamus following experimental modification of endocrine function, and it is interesting to compare the localization achieved by this means with that obtained from lesion and stimulation experiments. The validity of this procedure, which has been much criticized, appears to be established.

A considerable amount of hitherto unpublished work is described, and of this the examination of the function of pieces of anterior lobe tissue introduced into the hypothalamus, though of a preliminary nature, is particularly illuminating. This has led to the definition of a distinct 'hypophyseotropic area' in the hypothalamus within which the grafted tissue retains a substantial degree of cytological differentiation and is able, unlike grafts made elsewhere, to support target organ activity. Considerable evidence is provided against the popular view that the classical hypothalamic neurosecretory system of the supra-optic and paraventricular nuclei and tracts govern the release of anterior lobe hormones.

The authors are particularly concerned to examine the broader significance of their findings and to relate them to the work of others. They also advance several new concepts which merit serious consideration. Thus, the possibility that the anterior pituitary hormones may themselves exert a direct feed-back action on the hypothalamus is discussed, as is the rather strange idea that afferent nervous paths from the peripheral endocrine organs to the hypothalamus may exist. On the other hand, the view that the habenular nuclei play a major part in the feed-back action of thyroid hormone on the brain has been substantially modified. Consideration of the anatomy of the hypothalamus together with experimental observations makes it seem unlikely that control of any one aspect of anterior pituitary function will ever be related to a particular structure within the hypothalamus and the view that this part of the brain functions as an integrated system has much to recommend it.

The book is very fully illustrated in colour and in half tone, is most attractive, and can be recommended without reservation. It is, of course, required reading for all 'neuro-endocrinologists'.

B. T. DONOVAN

RADIOSENSITIVITY

Fundamental Aspects of Radiosensitivity

Report of Symposium held June 5-7, 1961. (Brookhaven Symposia in Biology, No. 14.) Pp. vii+308. (Upton, New York: Brookhaven National Laboratory, 1961. Available from the Office of Technical Services, Department of Commerce, Washington, D.C.) 3 dollars.

IT is commonplace to describe ionizing radiation as a two-edged sword. On one side it is used extensively in radiodiagnosis and radiotherapy; on the other, it can be acutely lethal and notoriously efficient as a leukamogen, carcinogen and mutagen. An understanding of the multifarious actions of radiation is therefore of more than academic interest, for the sharpening of its therapeutic properties, and the blunting of its maiming edge are of personal concern to each and every one of us.

This book deals solely with the biological effects of radiation, and apart from one article on ultra-violet, the preoccupation is mainly with ionizing radiation. Bold speculation was encouraged by the symposium committee in the hope that basic mechanisms would be suggested. However, despite labyrinthine discussions of irradiated bacteriophages and bacteria; yeast, plant and mammalian cells; whole plants, plant embryos and whole mammals; and despite detailed consideration of gene mutation, chromosomal defects, phage inactivation, cytotoxicity, growth reduction, developmental abnormalities and recovery and repair phenomena, the committee sadly conclude "... radiobiologists continue to produce a great plethora of factors and figures to ponder but a great dearth of general principles to unify and guide the way". No more appropriate general comment on this book can be made. Physics, the most advanced of the natural sciences, has prospered through a fruitful cross-fertilization between theory and experiment. The Einsteins have complemented the Rutherfords. It is perhaps slightly premature to expect an Einstein of radiobiology to appear, although this book at least makes clear the emergence of a paramount principle in radiobiology—the central, though far from exclusive, role of deoxyribonucleic acid. With the rapid advance of molecular biology the era must be approaching when to-day's chaos will be largely resolved in a set of general principles. Volumes such as this will be indispensable to this important synthesis.

P. R. J. BURCH

MONOGRAPHS ON PHARMACOLOGY

Advances in Pharmacology

Vol. 1. Edited by Silvio Garattini and Parkhurst A. Shore. Pp. xi+474. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1962.) 93s.

THIS book is the first of a series each of which is to consist of a number of up-to-date monographs on important aspects of pharmacology. In this volume eight different topical subjects are discussed.

In the first article, J. H. Burn and M. J. Rand give a lucid account of the evidence which led them to classify sympathomimetic amines into those acting directly and those acting largely through releasing noradrenaline from storage sites. They follow with a stimulating discussion of their theory that adrenergic nerve fibres are in reality cholinergic fibres, the release of acetylcholine forming a necessary intermediate step in the process of noradrenaline release. A. H. Conney and J. J. Burns then provide an interesting description of chemical and physiological factors which affect the rate of destruction of drugs in the body.

The longest article in the volume is that by D. Steinberg, who gives a critical and balanced review of some of the