and serum pherograms in a number of inflammatory, neoplastic, and demyelinating disorders with brief accompanying case details. Changes in the CSF protein pattern found in meningitis of varying aetiology and radiculitis are attributed largely to selective alteration of blood-brain barrier permeability. Certain changes in post-albumin and transferrin bands are of interest and deserve further study. However, in general, the data do not provide any fresh information of diagnostic importance. The problem of CSF immunoglobulins in multiple sclerosis receives only scant mention. Brain proteins and CSF enzymes do not appear to have been considered in relation to the abnormal pherograms. The standard of production and illustration is high and there is a useful bibliography with full titles. The introductory sections on electrophoretic technique and the blood-brain barrier are lucid and would be of value to students.

J. F. HALLPIKE

CONTEMPORARY RESEARCH METHODS IN NEUROANATOMY Proceedings of an International Conference, held at the Laboratory of Perinatal Physiology, San Juan, Puerto Rico, in January 1969, under the auspices of the National Institute of Neurological Diseases and Stroke and the University of Puerto Rico. Edited by W. J. H. Nauta and S. O. E. Ebbesson. (Pp. 386; illus.; DM 98, \$27.00, £11.75.) Springer: Berlin. 1970.

This volume contains the 14 papers given at the conference and the ensuing discussions. It is of the high quality one would expect from these editors and the distinguished participants. The reviews of most of the current techniques used in studying the brain as a neuronal system are authoritative, and it is of particular value to have them together in one volume. Four papers are especially concerned with the study of degenerating axons. Different methods of staining are reviewed and light and electronmicroscope findings correlated. There is an excellent review of fluorescence microscopy. Other papers are concerned with the analysis of electronmicrographs of the cortex, autoradiographic methods, and retrograde neuronal changes. As most of the papers are concerned with modern techniques it is of especial interest to note the inclusion of four excellent papers on the Golgi method, one combining light and electronmicroscopy. This 100 year old method is enjoying a resurgence of popularity and, although it is probably not extensively used, the observations made by those specializing in it are constantly quoted and applied to the interpretation of the intimate organization of the nervous system.

Most neuroanatomical work is experimental and many of the methods are restricted to animal tissue. Two of the papers, however, are applicable to, and include observations on, human tissue. One is a re-

view of a variety of methods of counting neurones, the other an invaluable and comprehensive review of anterograde and retrograde transneuronal degeneration in the central and peripheral nervous system.

The volume is beautifully produced, and can be recommended to all interested in neuroanatomy and allied subjects.

MARION C. SMITH

ALFRED BENZON SYMPOSIUM III. ION HOMEOSTASIS OF THE BRAIN: THE REGULATION OF HYDROGEN AND POTASSIUM ION CONCENTRATIONS IN CEREBRAL INTRA- AND EXTRACELLULAR FLUIDS Edited by B. K. Siesjö and S. C. Sørensen. (Pp. 479; illus.; D.Kr. 130.) Munksgaard: Copenhagen. 1971.

This book is the record of the proceedings of the 3rd Alfred Benzon Symposium held in May 1970. The contributions cover a wide range, necessary because of the complex relationships of the four compartments of the brain—namely, the blood, cerebrospinal fluid, and extra- and intracellular fluids. The study of the cerebrospinal fluid occupies the dominant position, and with reason, since it is now generally accepted that it reflects, and influences, the composition of the extracellular fluid of the central nervous parenchyma, and thus permits the experimenter to assess, with some assurance, the probable character of the ionic environment of the central neurones and glia, at any rate in the steady state. Thus the study of the homeostatic mechanisms involved in maintaining the composition of the cerebrospinal fluid reasonably constant, in the face of large fluctuations in the blood, is of primary importance; and the volume, after an introductory article on the relations between blood, brain, and cerebrospinal fluid, continues with studies on the volume of the extracellular space, the rate of secretion of cerebrospinal fluid, the kinetics of the blood-brain barrier, brain and cerebrospinal fluid D.C. potentials, and neurone-glia relationships. More directly concerned with homeostasis are papers on the mechanism by which the cerebrospinal fluid K^+ is held at a very constant level when the blood- K^+ is varied, while the changes due to acidosis and alkalosis emphasize the intimate relation between K^+ and H^+ in the brain as in other tissues. So important did the acid-base relationships appear to the organizers of the symposium, that most of the remaining studies are devoted to some aspect of these—intracellular pH, H^+ , and HCO_3^- relations in cerebrospinal fluid, effects of acetazolamide, whole-body buffering capacity, effects of acid-base alterations on HCO_3^- , Cl^- , and lactate in brain, and control of glycolytic and oxidative metabolism. The volume concludes with three articles, thrown in for good measure, on epileptic seizures and comatose states, on the quantification of buffering *in vivo*, and on a hypo-