go far towards the resolution of an inveterate controversy. Numerous instructive illustrations and a detailed summary in English should be helpful to readers not conversant with the German language.

A. MEYER

MODELS OF THE NERVOUS SYSTEM By Sid Deutsch. (Pp. vii + 266; illustrated. 94s.) John Wiley: London. 1967. This book is primarily concerned with the pattern-recognizing functions of the nervous system. It is evident from the first few chapters that the book is intended for aspiring bioengineers trained in the physical sciences. For example, complex numbers are introduced in both the exponential and the polar form without any explanation of the concepts involved. One is therefore inclined to ask what impression of the nervous system the engineer will gain from reading this book. He will discover that the brain is made up of neurones which can be modelled by a system having pulse-width and pulse-height modulation as well as pulse-frequency modulation. This is 'justified on the ground that a meaningful response in a living organism is generally the algebraic summation of many individual responses'. Unfortunately this treatment gives the impression that the brain is to be seen as a digital rather than as an analogue machine.

From consideration of chains of neurones the author moves through neurone networks modelling pattern recognition in each of the sensory modalities. This part of the book is best summed up by a sentence from the preface, 'Wild conjecture is a shock front that always accompanies the advance of science'.

D. J. MCFARLAND

HYPOTHALAMUS UND THALAMUS. EXPERIMENTAL DOKUMENTE 2nd ed. By W. R. Hess. (Pp. viii + 78; 207 figures. DM 48.) Georg Thieme: Stuttgart. 1968.

This is not a monograph but an atlas illustrating experiments done in Hess's laboratory with his technique—not described here—of stimulating diencephalic structures and recording the resulting behaviour of the animals cinematographically. The book consists of pictures of cats in various postures and with various expressions, and pictures of the brain-stem indicating the position of the stimulating electrode, accompanied by a very brief text. The experiments were done over a period of 25 years and have all been published before, either in previous monographs and atlases or in scientific journals. There is no discussion and no review of the literature, but there is a bibliography of papers by the author and his collaborators.

NEUROLOGY IN ORTHOPAEDICS By Paul H. Sandifer. (Pp. xi + 63; 2 tables. 16s.) Butterworth: London. 1968.

Paul Sandifer's special knowledge has developed in relation to his work with both paediatricians and orthopaedic surgeons. This short guide to neuro-orthopaedic problems is concerned especially with diseases affecting children and should be very useful, particularly to young surgeons in orthopaedic departments.

W. RITCHIE RUSSELL

BLOOD FLOW THROUGH ORGANS AND TISSUES Edited by William H. Bain and A. Murray Harper. (Pp. xx + 515; illustrated. 84s.) E. & S. Livingstone: Edinburgh and London. 1968.

This volume reports the proceedings of an International Conference on Blood Flow through Tissues and Organs held in March 1967. Many important recent advances in knowledge are reported and over 20 of the papers are concerned with the central nervous system.

PROGRESS IN BRAIN RESEARCH Vol. 28. Anticholinergic Drugs. Edited by P. B. Bradley and M. Fink. (Pp. xvi + 184; illustrated. 85s.) Elsevier: London, Amsterdam, New York. 1968.

The papers in this volume represent the edited proceedings of a symposium entitled 'Anticholinergic Drugs and Brain Functions in Animals and Man', held during the fifth meeting of the Collegium Internationale Neuro-Psychopharmacologicum in Washington in 1966. This collection of papers is a unique and comprehensive account of the behavioural and physiological actions of anticholinergic drugs. Particular emphasis is placed, in this volume, on the paradoxical effects of such drugs in producing profound changes in EEG activity, without producing correspondingly dramatic changes in overt behaviour. This phenomenon of *dissociation* between EEG and behaviour, which is particularly evident after anticholinergic drugs, has proved to be of central importance in debates of the degree to which EEG records may be correlated or *associated* with behaviour. In addition, papers deal with the hallucinogenic activity of some anticholinergic agents, with cholinergic mechanisms in sleep and wakefulness, and with the effects of anticholinergic drugs on habituation and learning. The interactions between anticholinergic and other psychoactive drugs are also discussed.

Although the publication of symposium proceedings in this way may not always prove successful, this volume does appear to be a valuable contribution to this now very extensive series of specialized volumes on current topics in brain research. One may perhaps be disappointed to see so little attention paid to pharmacological effects of drugs at a neuronal level, with the exception of Dr. Bradley's own excellent contribution, and virtually nothing is included on neurochemical effects of these drugs. However, the volume, on the whole, is recommended to all interested in psychopharmacology, and in the correlation between electrophysiological records and behaviour.

L. L. IVERSEN

NEURO-PSYCHOPHARMACOLOGY Edited by H. Brill, J. O. Cole, P. Deniker, H. Hippus, and P. B. Bradley. (Pp. xxiv + 1278, illustrated. £21.15s.) Excerpta Medica Foundation: Amsterdam. 1966.

The Proceedings of the Fifth International Congress of the Collegium Internationale Neuro-Psychopharmacologicum, held in Washington, D.C. in 1966, are contained within the 1,250 pages of this volume. In all, nearly 250 communications or abstracts of communi-

cations—some of them consisting of only one paragraph—given in the course of 14 symposia and nine sessions of individual papers, are included, some in English, some in French, and some in German. The symposia dealt with such topics as research methodology, actions of sedative-hypnotic, tranquillizer, and narcoleptic drugs, drug effects on memory and learning, drug abuse and dependence, mechanisms of action of psychotropic drugs, anticholinergic drugs, and side-effects of drug toxicity.

After perusing these many papers one is left with the impression that, while much ground was certainly covered at this international gathering, a critical assessment of the present position of some of the topics discussed would be of greater value than the mere presentation of these short communications. Although it may have some value as a record of what was said this is a book to be consulted, but not to be read.

NEUROSCIENCES RESEARCH SYMPOSIUM SUMMARIES, Vol. 2.

An Anthology of Work Session Reports from the Neurosciences Research Program Bulletin. Edited by F. O. Schmitt, T. Melnechuk, G. C. Quarton, and G. Adelman. (Pp. xiii + 642; illustrated. 112s.) M.I.T. Press: Cambridge, Massachusetts, London. 1967. This volume contains the proceedings of six symposia selected from those which have appeared in the Neurosciences Research Program Bulletin. They were held between 1965 and 1967 and dealt with sleep, conditioning and learning, learning in simple organisms, brain and nerve proteins, the neural properties of biogenic amines, and cerebellar circuitry. Each chapter is said to provide a critical survey of 'the state-of-the art' in the subject under discussion, whatever that may mean. That aside, this is a very useful volume.

Unlike many reports of symposia, which contain a series of disjointed and often irrelevant remarks extending even to interjections such as 'I can't hear', each chapter of the present work has been edited so as to provide a coherent account of the subject as it unfolded during the session. Attention was paid to the classification of concepts rather than to the presentation of detailed experimental results. Thus, the present status of a subject and the lines of future research emerge clearly.

The needs of the non-expert reader have been very much borne in mind. For instance, in the chapter on biogenic amines the structural formulae of some 50 substances are given in an appendix as well as the distribution of some substances in the nervous system. Each chapter is also provided with an edited bibliography.

It is difficult to select one symposium from another for special mention, but perhaps the work on biogenic amines in relation to extrapyramidal disorders will be of special interest to the clinician. The products of small stereotactic lesions with subsequent estimation of amine content at the site of the lesion and in the projection areas, and the correlation with the clinical picture manifest by the animal offers a refined approach to the study of this complex system.

Symposia edited and presented in this way will undoubtedly be of more lasting value than the majority of current productions which are often nothing more than souvenirs for those who attended.

THE UNCERTAIN NERVOUS SYSTEM By B. D. Burns. (Pp. viii + 194; 83 figures, 3 tables. 65s.) Edward Arnold: London. 1968.

There can be no doubt about the contribution of classical neurophysiology to our understanding of the nervous system, yet, paradoxically, there can equally be no doubt about the impediment it has placed to further understanding. The suprathreshold stimulus and the gross ablation have obscured the significance of the constant background activity within the complex nerve net we call the nervous system.

A number of factors have combined to change the situation. The discovery of spontaneous subthreshold activity at motor nerve endings by Fatt and Katz in 1962, the application of statistical methods, the development of the principles of stochastic analysis, and the use of on-line computers have each played their part. Study of the compound action potential has given way to analysis of such phenomena as the mean frequency of response of a neurone to stimulation, the histogram of the distribution of the frequency of this response, the time intervals between responses, and the number of responses occurring during different time intervals (autocorrelation). This has revealed that our previous concepts of set-pathways in the nervous system are inadequate to explain its activity and has shown that activity in any part influences the activity in every other part, the end-result being determined in accordance with stochastic principles.

NEUROPSYCHOLOGICAL SYMPTOMS AND SYNDROMES IN LESIONS OF THE OCCIPITAL LOBE AND THE ADJACENT AREAS By Ilse Gloning, Karl Gloning, and Hans Hoff. (Pp. 98; 2 figures, 22 tables.) Gauthier-Villars: Paris. 1968; and PERFORMANCES IN APHASIA By A. Kreindler and A. Fradis. (Pp. 261; 19 figures, 40 tables. 44F.) Gauthier-Villars; Paris. 1968.

There are few concise reviews of clinical findings in neuropsychology and, therefore, the present series of monographs, edited by Dr. Henri Hecaen, could be of considerable value, especially for those who have no direct access to classical German literature.

The short monograph by Gloning, Gloning, and Hoff tabulates the main clinical findings in 241 patients, with unilateral cerebral lesions, verified at necropsy or operation. It provides clinical evidence for those syndromes, usually associated with left hemisphere lesions (alexia, agraphia, R/L disorientation, finger agnosia, colour agnosia, and pure word blindness), and tabulates the significant relationship between right hemisphere lesions and unilateral spatial inattention, metamorphosis and spatial agnosia. The authors do not state the criteria used in diagnosis and the translation is poor. Nevertheless, the value of their careful observation of a large unselected group, with known lesions, can hardly be questioned.

The monograph of Kreindler and Fradis is particularly welcome in that it introduces the English-speaking reader to a wide sample of current experimental work on aphasia being carried out at the Institute of Neurology of the Roumanian Academy. The authors have broken away from the aphasia test battery approach, and have been exploring the possible physiological and linguistic

components of speech disorders. They also present some neatly designed experiments on memory disturbance in aphasia and summarize much of the relevant work in the field of speech disturbance. This is at the same time a most useful reference book and also a source of creative speculation for both clinical and research workers.

FREDA NEWCOME

SENSORINEURAL HEARING PROCESSES AND DISORDERS

Proceedings of the 16th Henry Ford Hospital International Symposium held in Detroit, Michigan, March 25, 26, and 27, 1965. Edited by A. B. Graham. (Pp. xvi + 543; illustrated. \$19.00) J. & A. Churchill Ltd: London. 1967.

The subject matter of this symposium covers virtually every aspect of the discipline of audiology as currently practised. Sixty-one specialists contributed 37 papers nicely organized under five general headings. So diverse and rich is the material, that the talents of Hallowell Davis, Raymond Carhart, and Harold Schucknecht were well-used for the three formal summaries which appear at the end. Would-be editors of proceedings such as these stand to learn much from the splendid job performed by A. Bruce Graham of the Henry Ford Hospital.

The most refreshing thing about this volume is the brevity (and in most instances the clarity) with which each topic is handled. Many of the contributors had gone on record with similar material before the date of this conference; no matter, there is here the novelty of concise presentation to be enjoyed. In like manner, the open discussion which follow upon every few papers of closely related content are kept short and usually to important points. Any member of the medical or related professions could find occasion to refer to this book and such reference would certainly prove worthwhile. Unless such occasions were to arise frequently, however, the cost of the volume and its status as a speciality item make it difficult to recommend for general personal acquisition. It is good, nonetheless, to know of its existence.

JAMES H. DEWSON

INTERDISCIPLINARY TOPICS IN GERONTOLOGY Vol. I.

Psychological Functioning in the Normal Aging and Senile Aged. Edited by Sheila S. Chown and K. F. Riegel. (Pp. x + 153; illustrated. 63s.) S. Karger: Basel, London and New York. 1968.

This volume contains papers and discussions from a colloquium held in Austria in June 1966. Investigations into learning functions at various ages are reported, using psychological tests such as verbal paired-associates, dichotic listening, memory for designs, perceptual mazes, and digit-substitution. The results are of interest, but of greater interest is the use of a variety of tests that were introduced for the investigation of learning in normal subjects, and which are now being extended to patients with intellectual changes from old age or from cerebral lesions. The increasing refinement of learning tests as exemplified in this volume should lead to considerable advances in our understanding of memory impairment in patients with cerebral disease.

THE CAUSES OF BLINDNESS IN CHILDHOOD By G. R. Fraser and A. I. Friedmann. (Pp. xvii + 245. \$12.00.) Johns Hopkins: Baltimore. 1967.

This volume records the results of an investigation carried out in 1963 of 776 children registered as blind or partially sighted in England and Wales. This amounts to almost one-quarter of the total number of blind children on the Register, and the size of the group, together with the extensive social, medical, and family information obtained, in addition to the ophthalmological examination itself, makes this investigation a unique and most valuable landmark in the study of the aetiology of childhood blindness. The various clinical subdivisions—for example, choroido-retinal degenerations, optic atrophy, retinoblastoma—are considered in separate chapters, and the parts played in each by genetic and environmental causes operating in pre-, peri-, and post-natal life, are separately assessed. The full data are clearly set out in a number of appendices. A careful analysis of the data is also presented; it is remarkable how far an accurate classification can now be reached, even with the current paucity of knowledge about the underlying biochemical lesions in most genetically-determined disorders affecting the eye. The conclusions of this survey are too numerous to list in a review; one finding, indicative of the great heterogeneity in causes of blindness, is that there are more than 50 independent single-gene abnormalities involved.

This book, with its clear and accurate record of the children studied, and its valuable consideration of the scattered literature on the subject, will be essential for many years for all those, including the neurologist, who are concerned with work on the problem of childhood blindness. It can be warmly recommended.

ELEMENTS OF MEDICAL GENETICS By A. E. H. Emery. (Pp. ix + 247; 44 figures, 11 tables. 35s.) E. & S. Livingstone: Edinburgh and London. 1968.

This book is designed as an introduction to human genetics for students of medicine and biological sciences. A historical introduction is followed by sections on the chemical basis of inheritance, chromosomes, developmental genetics, single-gene disorders, genetic factors in common disorders, pharmacogenetics, population genetics, radiation, and genetic counselling. The information is accurate and attractively presented. Professor Emery has provided an admirable introduction to human genetics. Most important of all, it holds the reader's interest, and should do much to attract the attention of the student to genetics in a formative stage of his training.

EARLY EXPERIENCE AND BEHAVIOR Edited by G. Newton and S. Levine. (Pp. xii + 785; 30 figures, 25 tables. \$28.50.) Thomas: Springfield, Illinois. 1968.

In their preface to this book the editors define its purpose as '... a discussion of research carried out to determine the relationships between specific independent and dependent variables in the general area now widely known as *early experience*, a term spotlighting the role of nurture in shaping the infant's future response characteristics'. The 18 chapters—all but two by