

BOOK REVIEWS

Cybernetics. By Norbert Wiener. 1948. John Wiley and Sons Inc., New York. (Chapman and Hall, London.) Pp. 194. Price 18s.

This book deals with the problems of automatic control of processes both in the biological and mechanical fields. The name "cybernetics" has been coined from the Greek κυβερνήτης—a guide or helmsman. Simple examples of the subject matter are the devices for thermostatic control of temperature in a room which as soon as the temperature rises above the chosen level automatically reduce the heating source and *vice versa*; or the automatic steering mechanism of certain ships which, when the ship deviates to one side or the other from its set course, automatically adjusts the tiller to correct this. In these and other examples, information about the process to be controlled is fed back to the source driving that process and as a result of this "feed back" adjustments at the source are made. In the biological sphere, voluntary muscular activity is cited as an example of a similar mechanism. During the course of a given action proprioceptive impulses are continuously passed back to the "head ganglion of the proprioceptive system" and smooth execution of the required movement ensues. When the head ganglion is faulty in cerebellar disease, jerky irregular movement occurs just as when the central steering mechanism is faulty the ship's course may be a series of jerky over-corrections known as "hunting."

In this book Professor Wiener elaborates the similarities between various self-controlling biological processes, and the mechanical and electrical devices also designed to achieve automatic control. Much of the detailed argument will be caviare to the general of non-mathematical readers; but the book is quite fascinating in its discussion of methods of analysing the mechanism of much biological and especially central nervous activity.

Neurologists will find of special interest the chapter on computing machines and the nervous system. The similarities between the possible neuronal basis of thought and memory, and these machines, with their rapid solution of complex mathematical problems and their retention for a period of time of previously acquired information as stored condenser charges, are clearly presented. The similarities are great, but on second thoughts perhaps, the differences are greater. Can one envisage these machines as possessing during their electrical activity some such epiphenomena as are revealed to introspection during the mental activity of the human individual, or suppose them to have those qualities of affect which pervade, grossly or subtly, all mental life? To this reviewer at any rate such conceptions present insuperable difficulties. Nor should it be thought that the author of the book, who is trained both

as mathematician and philosopher, argues for any crude homology. He merely points to possible similarities of mechanism and rushes no philosophical fences. Cybernetics has vast possibilities in analysing the "how" of biological action. It may be doubted whether it will have anything to say of the "why". Nevertheless, the presence of such men as Lorente de No and Warren McCulloch in the cybernetic field indicates that all those, whether physicians or neurophysiologists, who are interested in the mechanics of the integrative action of the nervous system at all its levels, may find something for profitable reflection in the book.

Functional Localization in the Frontal Lobes and Cerebellum, with Particular Reference to the Operation of Frontal Lobotomy. By John F. Fulton. 1948. Oxford University Press. Pp. 140. Price 15s.

Professor Fulton has been actively associated with advances in neurophysiology for over 20 years, but besides this he has also earned a special place as an *entrepreneur* for clinicians and workers in other medical sciences of the results of neurophysiological research in general. These recently published lectures, although they contain some current work from his own laboratory, should be regarded chiefly as an exercise of this second function. A critical appraisal of the rapidly growing corpus of neurophysiological knowledge presented with some of its clinical implications, is a difficult and not unimportant task. On the whole this book fulfils it well, even though workers immersed in one or other of the special fields mentioned may find some points tendentious.

In the first chapter on the precentral motor cortex the author discusses the functions of Brodmann's areas 4 and 6, pointing out that appropriate stimulation of area 4, in monkeys at any rate, can at times produce movements of isolated muscles and not always a co-ordinated pattern of movement involving agonists and antagonists. This latter type of response seems much more the function of areas 6 and 8. The experimental evidence on this seems convincing, though how important it is in the functioning of the human cortex has still to be shown. The results of ablation of area 4 in apes and monkeys are described, and the "flaccid" paresis produced, which also follows pyramidal tract section in the medulla, suggests that the clinical concept of pyramidal spasticity must be reconsidered. This is probably justified, though the evidence Fulton quotes is not quite so non-controversial as he makes it appear. Mention is also made of the suppressor areas, described by Hines and Dusser de Barenne, two of which occur in the frontal lobes. Here again, their importance in man has still to be fully determined. And the very tentative findings of Ritchie Russell in man on the relation of site

of epileptogenic cortical wounds to these suppressor areas which Fulton quotes have still to be confirmed.

In discussing the prefrontal region and the orbital and medial aspects of the frontal lobe, evidence is assembled suggesting that there are important autonomic centres in these areas. To elicit many of these responses it appears to be necessary to use electrical stimuli of a strength and duration optimal for that particular response. Indeed this is so generally important that it is suggested that much previous work on cortical stimulation requires repeating with more careful control of the type of electrical stimulus used. At present it seems as if the same point may at times give rise to differing but constant responses with changes in the parameters of stimulus.

In referring to the applications of this newer knowledge of frontal lobe function to clinical work, and especially to the various operative procedures now being explored in the treatment of mental diseases, Fulton pleads for a scientific approach and for the replacement of blunderbuss leucotomy by some more limited and anatomically controlled procedure. Most clinicians will be sympathetic to this plea, but the author appears to be unfamiliar with the very great difficulties to any accurate observations that are often presented by the kind of clinical material which has to be used here.

In his final chapter on the cerebellum the writer reviews the modern experimental evidence for the functions of this organ, and for somatotopical localization of function. This field is one whose primary geography is still being decided, but it would seem that the flocculonodular, the anterior, and the phylogenetically younger posterior lobes each have functions which may be separable experimentally and perhaps also clinically as our knowledge increases. The book has limitations inevitable to a review of work in progress, but it is stimulating reading, and deserves a place beside the "Physiology of the Nervous System" on the shelves of clinical neurologists.

Études Psychiatriques: Historique—Méthodologie—Psychopathologie Générale. By Henri Ey. 1948. Desclée de Brouwer et Cie, Paris. Pp. 263. Price 200 fr.

The eight separate essays which comprise this book, though in some ways disconnected, have a single theme. This is essentially a familiar one. Mental disorders are not to be wholly understood as aggregates of symptoms each of which is mechanistically determined, and without an inner psychological meaning, nor along psychogenic lines as simple variations of behaviour under the impact of psychological or social causes, but as a partial dissolution of mental activity brought about by organic processes, and so analogous to the dream which is liberated by sleep. This theme is handled historically, and the discussion of the development of French psychiatry is abundantly documented, able, and interesting. Throughout this historical development the three types of theories reappear, represented by new exponents in successive periods. The mechanistic approach of Clérambault, and the psychogenic formulation of Freud are discussed in considerable detail, before the author puts his own "organic-dynamic" point of view. To the English reviewer the book seems to suffer from the

defects of its class, that of the philosophical and theoretical treatise without a close connexion with biology, medicine, physiology, or neurology. That is to say, the theories which are debated are appraised more for their clarity, symmetry, or subtlety than for their relevance to experimental or even clinical medicine. At no point is an attempt made to summarize the evidence which might have a bearing on the theoretical interpretations which are advanced.

BOOKS RECEIVED

(Review in a later issue is not precluded by notice here of books recently received.)

A Criança Portuguesa (Morfologia, Psicologia, Médico-Pedagogia) Boletim do Instituto António Aurélio da Costa Ferreira. 1949. Lisbon: Inst. António Aurélio da Costa. Vol. 8. 1948-49. Pp. 254. No price given.

Das Chronische Cystische Hydrom der Dura in Seinen Beziehungen zum sog. Chronischen Traumatischen Subduralen Hämatom und zur Pachymeningitis Hämorrhagica Interna im Lichte der Relationspathologie. By Alfred Bannwarth. 1949. Stuttgart: Georg Thieme Verlag. Pp. vii + 57. Price DM9.50.

Vom Wesen der Neurose und von ihren Erscheinungsformen. By Ernst Speer. 1949. Stuttgart: Georg Thieme Verlag. Pp. 106. Price DM7.80.

Taschenbuch der praktischen Medizin. Edited by Johannes Kottmaier. 1949. Stuttgart: Georg Thieme Verlag. Pp. xxx + 788. Price DM24.00.

Die Therapie der Übertragbaren Kinderlähmung. By Kurt Hofmeier. 1949. Pp. 112. Price DM7.50.

Il sistema nervoso studiato con una nuova tecnica. By Lea Rossi del Bo. 1949. Milan: Officina d'Arte Grafica, A. Lucini & Co. Pp. 82. No price given.

Hypnotherapy of War Neuroses. By John G. Watkins, Ph.D. New York: Ronald Press Co. Pp. 384. Price \$5.00.

Clinical Electroencephalography. By Robert Cohn. 1949. New York and London: McGraw-Hill Publishing Co. Ltd. Pp. 639. Price \$14.00 or 119s.

Mr Carlyle—My Patient. By J. L. Halliday. 1949. London: Wm. Heinemann. Pp. 227. Price 15s.

Teoria Y Practica del Psicodiagnostico de Rorschach. By Frederico Pascual Del Roncal. Published by The University Society Mexicana, S.A. No price given.

Introduction à la Pathologie du Système Nerveux. By F. J. Collet. 1950. Paris: G. Doin et Cie. Pp. 368. Price FF. 1300.00.

The Sexual Perversions and Abnormalities. By Clifford Allen. 1950. Oxford University Press. London: Geoffrey Cumberlege. Pp. 346. Price 25s.

Centenario Do-Hospital Miguel-Bombarda (1848-1948). 1949. Lisbon: Antigo Hospital de Rilhafoles. Pp. 315. No price given.

Injuries of the Brain and Spinal Cord. Edited by Samuel Brock. Third edit. London: Baillière, Tindall & Cox. Pp. xii + 783. Price 76s. 6d.