
Denny-Brown's Croonian Lectures at the Royal College of Physicians in 1960, which were published in an abridged form in the Lancet later in the same year, have now been expanded into a short monograph. This author is unique in that he is equally skilled in the fields of clinical and experimental neurology and neuropathology. His book in consequence is a most remarkable record of research, profoundly original in its development of classical Jacksonian and Sherringtonian ideas, profoundly interesting in its results.

It approaches normal and abnormal posture and movement as a bona fide physiological study, that is, as one which can be usefully sustained without, in the first instance, a too close preoccupation with possible anatomical pathways. Movement is change of posture, and posture and movement use a common neuromuscular apparatus. Postural reactions are determined by proprioceptive, labyrinthine, and visual stimuli and by coarse body contacts. In Magnus' conception these were harmonious reflexes, additively reinforcing one another. Denny-Brown's view is rather that the reflexes are compounded of conflicting elements which in health are resolved to give normal attitudes. Superimposed on these primary postural reactions are the exploratory probings of the environment by mouth, limbs, and gaze. The basic exploratory movements, as seen in the infant, form an antagonistic pair: exploratory grasping and avoiding, both guided by visual stimuli and by contacts with the distal parts of the limbs. On these basic movements the full range of skilled movements of the adult are supposed to be built up, as responses to adequate stimuli ever more subtly refined and differentiated.

The abnormal postures and the involuntary movements that have been long familiar in disease of the basal ganglia can now be viewed as the result of a progressive disintegration of these functions. If, as yet, they cannot be fitted perfectly into a unified conceptual scheme, the attempt is more useful than any further proliferation of merely descriptive classification. These conditions begin with involuntary movements and small abnormalities of posture, and tend to progress towards a terminal dystonia in generalized flexion. As the reflex apparatus is disconnected progressively from higher control, it needs coarser peripheral stimulation and reacts from abnormally wide receptive fields; the responses long outlast the stimuli, and can only be cut short by powerful antagonistic reflexes. The conflicts inherent in the reflexes are not resolved as they are in health. At every stage of disintegration, the abnormal postures and movements can be influenced in meaningful ways by labyrinthine, cutaneous, visual, or proprioceptive stimulation. Even the terminal dystonia-in-flexion depends on cutaneous stimulation, and the limbs extend if the patient is lifted off the bed.

To take examples of the application of these principles, athetosis is seen as a partial or complete oscillation between two extremes of movement: pronation of wrist with overextension of fingers, resembling the infantile avoiding of a stimulus, and supination with flexion of wrist, thumb and fingers, resembling the exploration of the environment guided by sight and touch. The limb may become fixed in either position, and can then only be unlocked by an appropriate stimulus: the flexed attitude may be switched to the extended one by the approach of the observer (visual avoiding), or by stroking the fingers: the extended attitude can be unlocked by strongly stroking the palm. The prevailing posture is the result of the most recent reflex effect. Again, voluntary direction of the gaze may be weak in a certain direction, but a coarse visual stimulus from that quarter may attract an abnormally prolonged deviation of head and eyes, resembling a 'spontaneous' oculogyric crisis.

The muscles engaged in the maintenance of abnormal attitudes at first offer a soft plastic resistance to passive movement. Electromyographic analysis shows that such muscles are stretched, the motor units first recruited cease to discharge as fresh motor units are brought in. It is as if the motor units are inhibited by individual, asynchronous lengthening reactions. Thus the resistance to passive stretch remains about the same throughout the full range of movement. In tremor, the unitary recruitments and lengthenings become synchronized and alternating, with reciprocal bursts of discharge in related muscles. In the terminal dystonic state, these inhibitory reactions are lost, and the muscles offer a mounting resistance to stretch, springing back to their initial length when released. These electromyographic abnormalities are seen as the result of conflict between cutaneous, proprioceptive, labyrinthine, and visual control: as visual and tactile control of hands and feet fails, labyrinthine reactions and finally contact reactions from the trunk come to dominate the picture.

The anatomical substrates of these disturbances have been studied in human pathological material and by making electrolytic lesions in monkeys. Parts of the thalamus and the whole of the basal ganglia form an input-output system which survives excision of the cortex, but there is fresh evidence of the great quantity of cortico-striatal and corticopallidal fibres, whose existence was so long denied. The basal ganglia are peculiarly vulnerable to attack, possibly because of local peculiarities in the blood-brain barrier. Following recovery from acute anoxic damage there is a remarkable tendency to delayed relapse, with fresh vascular lesions. In clinicopathological work it is rare to find lesions confined to the basal ganglia, and any symptom may be found in any case; but it is possible broadly to distinguish striatal syndromes, in which involuntary movements go with flexed
Book reviews

The pathology is well described, but the delineation of symptoms due to root and cord compression lacks clarity, and the arrangement of the material has involved needless repetition. The sections on treatment and prognosis fail to present a clear picture either of the natural history of the disease or the indications for different methods of treatment. The bibliography is inadequate.

There is a brief but useful account of disease of the corpus striatum and the surgical treatment of Parkinsonism. A variety of other subjects are satisfactorily covered. The neurologist will find little in this book that is new to him, but it is a valuable source of reference to recent papers.


This paper-back volume contains 18 chapters on subjects ranging from the electrical activity of the cerebral cortex to the molecular biology of neurofilaments, all written by workers intensely active in current research. The result is a most stimulating series of essays on neurophysiological subjects which have been written with liveliness, authority, and lack of verbiage which mark this as a most valuable and rather unusual contribution to physiological literature and an enjoyable volume to read.

The earlier chapters deal with various neurophysiological aspects of the central nervous system, and there is a general trend to the periphery as one progresses through the book, so that one finds, for example, a chapter on 'The rôle of acetylcholine in nervous activity', and 'Where does the energy of nervous excitation come from?' occurring rather late in the volume. One chapter on the excitability of the peripheral motor system seems to have escaped the editor's usual correctness for the experiments described and illustrated are on 'Chat spinal curarisé par flaxedil!'

Nevertheless, the editor is to be congratulated on producing an interesting book. How sad it is that one like this does not exist in English!

SOCIAL REPORT ON A FOLLOW-UP STUDY OF PATIENTS SUFFERING FROM MULTIPLE SCLEROSIS By E. Gruber. (Pp. 71; 25 tables. 2s. 6d.) Belfast: Graham & Heslip. 1962.

This report is concerned with the 444 survivors of 698 cases of multiple sclerosis which were traced in Northern Ireland in 1948 to 1951, the work being carried out ten years later. It emphasizes the basic inadequacy of the facilities available to these patients and attempts to outline some measures to alleviate the situation. This is a valuable and original contribution which should be read by all those concerned with the care of patients suffering from this disease.


The authors of this practical manual of techniques used in neurochemistry have based their description on their own highly successful teaching and research experience. They provide details of the preparation and technique