

# book reviews

## Lobotomy

*Psychophysiology of the Frontal Lobes.* Edited by K. H. Pribram and A. R. Luria. Pp. xii+332. (Academic: London, August, 1973.) \$19.95.

THE starting point of interest in the frontal lobes was the celebrated "Crowbar Case" reported by Harlow in 1848. One Phineas Gage, a quarry worker, had a large iron tamping rod blown by a stick of dynamite into his jaw and out through the top of his head, producing serious injury to both frontal lobes. As a result, Gage underwent a disastrous change of personality. From having been an efficient and capable foreman, he became fitful, irreverent and obstinate, and is said to have "indulged in profanity that would have embarrassed an 18th century British Sea Captain". Thus was born the "frontal lobe syndrome", the study of which in modern times owes much to the Russian neuropsychologist Alexander Luria, himself a coeditor of this volume.

Although a subject of fascination to psychiatrists and others, the frontal lobes have hitherto excited comparatively little interest among physiologists, largely because they are in the main electrically inexcitable and their excision does not occasion gross defects in sensation or movement. Indeed it was not until systematic behaviour experiments were begun in the thirties that any appreciable progress was made. These experiments claimed to reveal some fairly constant behaviour deficits in subhuman primates following bilateral frontal excisions and also—incidentally—led Moniz to inaugurate the era of psychosurgery. Dr Karl Pribram, likewise a coeditor, has been active over many years in charting the behavioural deficits produced in monkeys by circumscribed cerebral excisions. Their underlying physiology, however, has remained largely unexplored.

This volume represents an attempt, if a somewhat diffuse and ill-coordinated one, to fill this gap. Based upon a symposium on frontal lobe function held during the 18th International Congress of Psychology in Moscow some years ago, it brings together fourteen papers concerned with the neurophysiology of the frontal lobes and the effects of frontal lesions on the electrical activity of the human brain. Of the contributors, fourteen are American (mostly based on the West Coast), eight are Russian (all based on Mos-

cow) and one is English (based on Bristol). The history of the enterprise and its relation to other recent symposia on closely related topics is outlined in a brief preface.

Taken as a whole, this volume reveals a distinct difference in approach as between the Russian and American contributors, though there is, of course, a good deal of common ground. By and large, the Russian work is almost exclusively limited to experiments with human subjects, mainly evoked potential and EEG studies, whereas the Americans give far more attention to the data of animal experiments and to explanation of behavioural deficits in physiological terms. Although much of the work is pretty specialised, it does serve to give an overview of current physiological work on the frontal lobes, though alas there is nowhere any real sign of a breakthrough.

In his concluding chapter, Pribram discusses frontal lobe functions in terms of spatial and temporal organisation and, more interestingly, the inhibitory mechanisms that, when deranged, produce the distractibility so marked in the 'frontal' animal or patient. He also places stress on the frontal cortex as the "executive" of the brain in the overall control of behaviour. In this latter claim, at least, he and Luria see eye to eye.

O. L. ZANGWILL

## Breaking bones

*Mechanical Properties of Bone.* By F. Gaynor Evans. Pp. xiii+322. (Thomas: Springfield, Illinois, June 1973.) \$25.75.

THIS interesting and well illustrated compendium of data on the mechanical properties of bone is a necessary reference work for all biologists and engineers who are concerned with the mechanical properties of materials. For the biologist, and this includes the orthopaedic surgeon, neurosurgeon, orthodontist and others who must be particularly interested in the effects of force either applied to, or generated within the body, an understanding of the mechanical properties of bone, which forms some 18% of the body, is essential for the prevention and treatment of a variety of conditions afflicting the musculo-skeletal system. An assessment of the change in mechanical properties of biopsy specimens of bone in the course of disease and its treatment may before long become a diagnostic and prognostic procedure.

For the engineer an appreciation of

the design of the skeleton, the structure of bone and its mechanical properties is of considerable interest. In particular the materials scientists and structural engineers who are concerned with the design of passenger-carrying vehicles, which are increasingly involved in accidents, need the information concerning the mechanical properties of the living item contained within the vehicle. This book deals with, in the main, the mechanical properties of bone as a material. The thoughts of those who are responsible for the development of new materials may well be stimulated by the section dealing with the effects of the microscopic structure of bone when considered as a structural material.

For those who are interested in the mechanical properties of the whole bone this work should be read in conjunction with the author's other publication *Stress and Strain in Bones*.

JOHN T. SCALES

## Water crossing membranes

*Water Transport in Cells and Tissues.* By C. R. House. Pp. vi+562. (Monographs of the Physiological Society, No. 24 Arnold: London, January 17 1974) £10.50.

THIS book is a mine of information and the fact that more than 900 references are included in the bibliography is a measure of the thoroughness with which the relevant literature has been surveyed. Of the total of ten chapters, seven make unexceptionable reading and the accounts of transcapillary and transepithelial water transport are outstandingly clear and comprehensive. The permeability characteristics of cell membranes in general and of artificial membranes also receive detailed and informative consideration as do the physical and chemical properties of water, which are dealt with at the beginning of the book.

The account of fluid dynamics in the embryo is less impressive, although this seems to be due more to the shortage of precise information than to any fault of the author, who is led to the conclusion that "our ignorance of the processes that trigger, enhance and finally block the formation of extra-embryonic cavities is enormous". One may question the wisdom of devoting nearly 25 pages to the exposition of this topic, except perhaps as a challenge to future investigators, to whom the message could have been given rather more