buted anything of his own to the literature of quantum mechanics. Bohr, they write, took Rutherford's atomic model more seriously than most people, "including Rutherford himself". Even in the few months he spent at Manchester, Bohr was using implicitly the notions of atomic number and of isotopes which afterwards were published by Soddy, Fajans and van den Broek. But why, then, did Bohr not publish them? Rutherford, devoted experimentalist that he was, wanted data bearing more directly on the argument before he would be convinced. Rutherford was not alone in taking such a remote point of view, and this volume quotes a letter to Bohr in which even Sommerfeld admits to being "for the present sceptical about atom models in general". In the event, of course, Bohr's mastery in the field was established by his calculation of the spectral lines of hydrogen, even if it took the best part of a decade to defend himself against Rutherford's view that the first atomic calculations were a "mixture of Planck's ideas with the old mechanics".

The steps by which Bohr filled out this story, and went on to erect his epistemological foundation for quantum mechanics, are patiently dissected in a separate contribution by Professor Leon Rosenfeld. Bohr's son, Professor Aage Bohr, provides an authoritative account of what Bohr did during the war to help the development of nuclear weapons. One thing which emerges is that Heisenberg and Von Weizsacker, on their visit to Copenhagen in the autumn of 1941, did not suggest that German scientists might come to a mutual agreement with scientists elsewhere not to develop nuclear weapons but, rather, they left Bohr with the impression that the German effort in this direction would be considerable. Running through the whole volume is the theme of Bohr's relationship with Einstein and of his continuing disappointment at being unable to convince Einstein of the rightness of his way of looking at things.

Biological Science

NERVOUS DISEASE GENETICS

The Genetics of Neurological Disorders

By R. T. C. Pratt. (Oxford Monographs on Medical Genetics.) Pp. vii+310. (London: Oxford University Press, 1967.) 80*s*. net.

SINCE technical advances made the human chromosomes identifiable a little more than ten years ago the study of their aberrations has gradually become one of the main interests for students of human genetics. Consequently there has been a tendency to forget the overriding significance of variations in the genes. Dr. Pratt's monograph on the genetics of neurological disorders is a welcome corrective to excessive cytogenetical enthusiasm. Information is given about more than 300 diseases, in effect, and there are nearly 3,000 references. To deal usefully with a task so prodigious would be expected to involve the ponderous and unprepossessing treatment which almost invariably characterizes an efficient text-book. The intention, as indicated in the preface, was to omit clinical descriptions except when rarity or dishomogeneity of disease type made this necessary. Although the references are very numerous, a great deal of selection must have been exercised and this has been done with good judgment. The reader will be astonished on every page at the engaging and pertinent brevity both of the clinical notes and the relevant genetical information supported by key references. Let us take an example, almost at random, from page 109, "Epilepsy Induced by Reading".

"Of the reflex epilepsies seizures induced by reading are amongst the most curious. This group is heterogeneous, some patients having a focal lesion. Others show no focal abnormality, and attacks are specifically precipitated by reading, with movements of the jaw often proceeding to grand mal (530). Two similarly affected sisters have been reported (1496A) amongst a total of about twenty cases."

The treatment of important conditions, like the ataxias and the lipidoses, is, of course, more extensive though the pattern is the same, and in this way information can be absorbed by the reader so easily that he is hardly aware of what is happening. One of the reasons for this is the inclusion of many conditions in the catalogue which, though they may be commonplace to neurologists, are likely to be new to the genetically minded student. Of special interest is the chapter on higher level disorders in which dyslexia, cerebral dominance and number form imagery are discussed.

A characteristic feature of the treatment throughout is the absence of speculation. Many writers might have attempted to give their own explanations when nothing is known, but Dr. Pratt resists these temptations. I, for example, would not have been able to mention the peculiar inheritance of Leber's disease without theorizing on the subject of gametic selection, nor to have refrained from a pronouncement on biological philosophy in discussing the genetics of insensitivity to pain. The genetical information which is given is always reliable and this is what the clinician needs.

Perhaps there is something to be desired in the arrangement of the order of the diseases within the chapters, but there is a compensatory pleasure in not knowing exactly what is coming next. Furthermore, in a book devoted to the genetics of neurological diseases, the inclusion of chapters on disorders of muscle and on inborn metabolic errors might seem, at first sight, out of place. Their presence is defended in the preface on the ground that diseases in these categories are encountered in neurological practice and they certainly add value to the book. Malformations of the nervous system are examined in the first chapter and here the reader might have wished for a little more information. There is no mention, for example, of the nervous system malformations which are liable to occur in twins, but it may have been in accordance with the editorial policy for the series of books on clinical genetics, of which this is one volume, not to encourage the extension of this section. The author has succeeded in presenting his collection of varied and complex material as an artistic whole. He has produced an admirable work and he has been well supported by the publishers with clear printing and a supplementary analysis of the bibliography: there is also a good index.

L. S. PENROSE

IN AND OUT OF CELLS

Problems of Cell Permeability

By A. S. Troshin. Revised and Supplemented Edition. Translated by M. G. Hell. Translation edited by W. F. Widdas. (International Series of Monographs, Vol. 26.) Pp. xiv+549. (Oxford, London and New York: Pergamon Press, Ltd., 1966.) 120*s*. net.

IN this work Dr. Troshin follows Nasonov's approach to the interpretation of permeability problems. According to the introduction, the term "permeability" would better be replaced by the words "sorptional activity". Much of the material presented concerns ratios between internal