

assumes that his reader is intelligent, that he wants to understand the subject, including the most difficult parts, and that he is prepared to make a considerable mental effort. None of the usual devices of 'popular' books is employed. The author tells a plain tale in simple language. This method cannot convey the elegance of the mathematics but, by using it, the author forces his reader to attend to the substance. He depends upon that alone to sustain the interest. My first impression was that too much detail had been included and too few illustrations, so that many readers would find the book difficult. I feared that rather few non-scientists would be sufficiently interested to complete the book. As an experimental scientist, I felt the need of some evidence and asked three friends to begin the book, not to proceed further than they felt inclined, and to inform me where they stopped. All three complained that the book was difficult, that there were not enough diagrams, that the argument was very involved in places, *but* each of them had finished the book. The number is too small for statistical conclusions, but perhaps the potential readers are more numerous than I thought. There may be quite a lot of people who prefer to climb a steep intellectual mountain—with the help of a qualified guide—rather than to look at photographs of the wonderful view from the top. In any event, it is well that one distinguished physicist should try the 'direct method' of teaching his subject to the layman.

Prof. Peierls says he wrote partly to clarify his own ideas. Nearly every professional physicist who reads this book will find that there is some point at which his own mind is less clear than he believed and that the author has both revealed and resolved the difficulty.

R. W. DITCHBURN

FOSSIL PLANTS OF THE CARBONIFEROUS ROCKS OF GREAT BRITAIN

Memoirs of the Geological Survey of Great Britain Palaeontology. Vol. 4, Part 1: Fossil Plants of the Carboniferous Rocks of Great Britain. (Second Section.) By Dr. Robert Crookall. Pp. iv+84+24 plates. (London: H.M. Stationery Office, 1955.) £3.

THE first step in the publication of "Fossil Plants of the Carboniferous Rocks of Great Britain" was taken by Robert Kidston in Vol. 2 of the Memoirs of the Geological Survey, published in six parts between 1923 and 1925. They represented part of Dr. Kidston's researches on Carboniferous plants carried out during his long and active lifetime. Unfortunately, his death in 1924 put an end to this project and the description of British Carboniferous plants, which was largely based on his and the Geological Survey collections, was left incomplete. The parts which he completed dealt exclusively with the compression type of fossil plant and did not include petrifications. The compression type of fossil is the common type encountered in sedimentary rocks and is of greater importance to the geologist than the petrifications, which are mainly of botanical interest. The six parts included descriptions of most of the fern-like plants (ferns and pteridosperms). They are excellently illustrated memoirs and compare very favourably with any publication of a similar kind which appeared at that time. Similar illustrated

memoirs had previously been published by French palaeobotanists—Renault, Zeiller, Bertrand and others—in the "Études des Gîtes Minéraux", published under the auspices of the Ministry of Public Works; and Lesquereau, White and others described the coal measure floras of North America for the United States Geological Survey.

After a regrettably long interval, publication of the work started by Kidston has now been resumed, and it is very gratifying that the Geological Survey of Great Britain intends to continue this important work. In the interval, other countries, notably France, the Netherlands and Belgium, have produced magnificent monographs of plants of their coal-bearing formations and have to a certain extent anticipated part of the work Kidston had planned to do. Dr. Robert Crookall, author of this new part, while making use of some of Kidston's manuscripts and the magnificent Kidston Collection and other collections of the Geological Survey, has produced a volume which compares very favourably indeed with the earlier ones. He has brought our knowledge of the plants that he describes up to date and has added several new species to the British Carboniferous flora. In a clear and well-written introduction he explains the changes that have taken place in the scheme of classification of Carboniferous rocks since Kidston's time; these changes are largely due to the discussions and decisions taken at the congresses on Carboniferous stratigraphy held at Heerlen in the Netherlands in 1927, 1935 and 1952.

Dr. Crookall then describes the genera *Alethopteris* and *Lonchopteris*, two closely related genera of fern-like fronds which are almost certainly the foliage of pteridosperms. This is followed by the genus *Desmopteris*, a fern-like plant of uncertain affinities. He then describes the genera *Caulopteris* and *Megaphyton*, which are parts of stems that exhibit the scars left by the abscission of large fronds. *Caulopteris* and *Megaphyton* were evidently the stems of plants, some of which were almost certainly tree ferns, while some may have belonged to pteridosperms which had the habit of tree-ferns. Dr. Crookall describes several new species, one of *Caulopteris* and four of *Megaphyton*.

The descriptions are clear, and a comprehensive synonymy is given for each species. The photographic illustrations are excellent. This work is a worthy continuation of that started by Kidston, and it is to be hoped that other parts of this important series of publications on British Carboniferous plants will appear before long.

J. WALTON

THE METAPHYSICAL STRAIN IN KANT

Kant's Metaphysics and Theory of Science

By Prof. Gottfried Martin. (Translated from the German by P. G. Lucas.) Pp. viii+218. (Manchester: Manchester University Press, 1955.) 21s. net.

IT was Hume who urged us to burn all metaphysical books, and Kant is often regarded as supporting him in this. What Kant is prized for is his elaboration of the principle that concepts gain significance only in so far as they serve to link actual or possible sense experiences, and, from this point of view, statements about what is not so conditioned have no sense. Kant, it is true, made many references to noumena, but these can be rejected as inconsistent with his