

The Solar Corona

Proceedings of International Astronomical Union Symposium No. 16, held at Cloudercroft, New Mexico, U.S.A., 28-30 August, 1961. Edited by John W. Evans. Pp. xi+344. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1963.) 100s.

THE thirty papers presented at the Cloudercroft symposium, and contained in this volume, provide a comprehensive review of the considerable amount of research on the solar corona which is at present being undertaken. Contributions have been grouped in three sections—"Local Physics of the Corona", "Coronal Phenomena", and "Larger Aspects of the Corona"—each of which is introduced by one or two review articles.

The first section, with the introductory paper by C. W. Allen, discusses such topics as the discrepancy in the coronal temperatures obtained by different methods, the ionization and excitation equilibria and coronal line emission, and possible heating mechanisms. Mention should be made of a paper on "Solar X-Ray Emission" by H. Friedman which gives a survey of some impressive results in this wave-length region, obtained from rocket and satellite work. The second section has two reviews, the fast and the slow phenomena being discussed by J. P. Wild and by M. Waldmeier respectively. The flare-associated phenomena and the relationship of the corona to prominences receive much attention. There are also two or three interesting papers on observational techniques which might have been better grouped under a separate heading.

The section on the "Larger Aspects of the Corona" deals with questions of general structure, and with the origin and nature of corpuscular streams. This is probably the aspect of the subject which is most speculative at present, but which is most likely to benefit in the next few years from rocket observations in interplanetary space. The review for this section was written by S. Chapman, while E. R. Mustel made a substantial contribution on the corpuscular streams and their relationship to regions of solar activity. The volume also contains short reports of nine informal discussions, which are useful in pin-pointing those problems most in need of attention. A further section contains five communicated papers which could not be presented at the symposium for want of time.

During recent years, the study of the solar corona appears to have entered a new phase, with new observational techniques providing a wealth of information from the X-ray region to the radio wave-lengths. These *Proceedings* provide ample evidence of the rapid increase which is occurring in our understanding of the corona as a consequence. D. J. FAULKNER

An Economic Geography of Oil

By Dr. Peter R. Odell. (Bell's Advanced Economic Geographies.) Pp. xii+219. (London: G. Bell and Sons, Ltd., 1963.) 22s. 6d. net.

AVAILABLE literature of the petroleum industry contains more than average references to essential economics. They are chiefly statistical, as they would necessarily be, and as such find a relatively limited appeal in the broader sense of the technology. The trouble with these books and essays is that they tend to date in a matter of a few years after publication because, in the oil world particularly, economic circumstances change so rapidly that the mathematics of supply, demand, refining, transport and distribution throughout the world can never be reduced to static formulae. This book, however, is in a rather different category in that the stress is on basic geographical analysis of the activities of the world oil industry, not so much on purely present-day statistical data and hypothetical trends in the future. Coming from the pen of a lecturer in geography at the London School of

Economics and Political Science, it would be anticipated that the discipline of geographical science applied to the primary commercial factors in the industry would break new and profitable ground. Although the book is designated as an introductory investigation, partly owing to limitations on space, also because of what the author modestly describes as "... my own inability to grasp and to bring out all the relevant factors which contribute to the geographical distribution of the production, refining and consumption of oil", there is little doubt that a more ambitious treatise on the subject would, at this juncture, probably have defeated its object.

The book is divided into four parts—(1) the pattern of world oil supply; (2) the pattern of world oil demand; (3) refining, transport and distribution; (4) conclusion—concerned with the oil industry and economic development. Part 1 embraces consideration of the industry's resources, the world pattern of production and the determining factors thereof. Part 2 discusses the pattern of oil consumption and the factors influencing this demand. Part 3 describes the pattern of refining and the determinants of refinery location, also transport and distribution. Part 4 is in itself quite a masterly exposition of the relationship of the industry to the countries within which its activities are at present located. Here the author quotes R. C. Estall and R. O. Buchanan: "Oil does not in general attract major industries to its source of origin... major industrial concentrations are not a normal feature of oilfields as they have been of coalfields". The author accepts this point as valid both in the past and to-day, and he advances good reasons why this should be so.

The book is well written, and not overwhelmed with masses of statistics although well supported with outline maps, tables and diagrams. As an attempt to bring an extremely complex and ramified subject into assimilable proportions, it deserves praise. H. B. MILNER

Spirit and Man

An Essay on Being and Value. By Prof. Nathan Rotenstreich. Pp. 257. (The Hague: Martinus Nijhoff, 1963.) 20.75 guilders.

SPIRIT and Man is essentially a study in ethics. The outlook is contemporary, but with a well-balanced historical background. Novelty is scarcely to be expected, but the author makes several interesting observations. Examples are: the limitations of calculating machines, the risk of obliterating creativeness and responsibility if systems of Government are too 'paternal', and the dilemma of true freedom in terms of detachment from man's immediate environment. Evidently, some of these questions are of importance to scientists, especially problems relating to team-work in research, and the delicate balance between policies dictated from outside, and the desire of the individual (sometimes) to follow his own inclinations.

The book is divided into three main parts: (1) dimensions, (2) features and (3) significance. In addition, there is an adequate index.

Naturally, the reader will expect a decidedly axiological slant, and in this he will not be disappointed. In fact, the writer sums up by declaring his purpose to be to establish man's worthiness as anchored in the fact that he is a subject, and that the value of his being so is not arbitrary, either anthropocentrically or otherwise.

The text, however, is marred by an excessive number of printer's errors (singulars for plurals, misplaced punctuation, careless spelling, and so forth). The proof-reading must have been much below the standard usually achieved by the publishers. In addition, the writer has the tiresome habit of using the phrase "to be sure" far too often, sometimes even twice on the same page. Nevertheless, it is a useful book in itself, and worth careful study.

F. I. G. RAWLINS