Science

Method and Meaning. Edited by Samuel Rapport and Helen Wright. (The New York University Library of Science.) Pp. xii+258. (New York: New York University Press, 1963.) 4.95 dollars.

THIS book, *Science: Method and Meaning*, presents a selection of excerpts from the writings of scientists, dealing first with science and the scientist and, in the second part, with science and its place in the modern world. Those in the first part are chosen to illustrate the nature of scientific activity, the stages of observation, hypothesis and experiment, and the process of discovery. They include a classic statement by T. H. Huxley on the method of scientific investigation and Warren Weaver's discussion of the imperfections or limitations of science. Dr. J. B. Conant's account of the overthrow of the phlogiston theory is also included, as well as passages from the writings of Claud Bernard from J. Livingston Lowe's *The Road to Xanadu*, from W. I. B. Beveridge's *The Art of Scientific Investigation* and from J. R. Baker's *The Scientific Life*. The excerpts in the second part are taken from A. N. Whitehead's *Science in the Modern World* and from the writings of Harlow Shapley, E. W. Sinnott, J. Bronowski, G. T. Seaborg and W. K. Heisenberg.

While the selections have obviously been made with some care, and are fully representative of the varied aspects of scientific activity and its impact on the world, the basis of selection is not clear and the general effect is rather that of patchwork. The book lacks the unity of Sir Richard Gregory's *Discovery*, Prof. W. I. B. Beveridge's *The Art of Scientific Investigation*, or J. R. Baker's *The Scientific Life*, for example, to mention only three which cover essentially the same ground and probably achieve the same objective more effectively. The scope of the book is perhaps slightly wider, however, and it could well serve as an introduction to a somewhat more extensive field of reading. Here it is unfortunate that the references to sources are lacking in precision: readers unfamiliar with the books quoted may have difficulty in locating the originals and there is a slip in the title of Whitehead's book. There is, however, much of merit in the book, but as a whole it does not measure up to the opportunity which the editors have seen but scarcely grasped.

R. BRIGHTMAN

Fundamentals of Palæontology

Reference work for Palæontologists and Geologists of the U.S.S.R. Vol. 15: Gymnosperms and Angiosperms. Edited by A. L. Takhtajan, V. A. Vachrameev and G. P. Radczenko. Pp. 742+80 plates. (U.S.S.R.: Academy of Sciences, Moscow, 1963.) n.p.

THIS impressive book is the final volume of the *Osnovii* series (which covers the whole field of palæontology), and is the second of the two volumes devoted to fossil plants. The earlier palæobotanical volume (*Nature*, 201, 652; 1964) dealt with the lower groups, while the present work covers the seed plants. The general style of treatment, the format and type of illustration are very much the same as in the earlier volume, and most of Harris's comments are equally applicable here. Like the earlier work, there are a considerable number of contributors in addition to the three editors.

To a reader outside the U.S.S.R., the extensive treatment given to the Angiosperms is perhaps the most noteworthy feature of the volume; almost exactly half the work is devoted to them. This is an unusually large fraction compared with other palæobotanical texts, and reflects the interest and considerable contribution made in this field of palæobotany by Prof. Takhtajan. Seward, in his four-volume work on fossil plants (now in many respects out of date, but still probably the nearest equivalent in English to the palæobotanical volumes of the *Osnovii*), significantly never included the Angiosperms, although he dealt with all other groups.

The introductory section of that half of the volume dealing with Angiosperms is particularly useful to the palæobotanist in treating those aspects of the living members of the group which are important to him, but which can only be found rather widely scattered in purely botanical literature; these are, particularly, wood anatomy, leaf form, pollen morphology and fruit structure. The consideration given in the whole volume to fossil pollen is especially salutary, as many Western palæobotanists working on pre-Quaternary material are apt to regard palynology as a branch of stratigraphy rather than an integral part of the general study of fossil plants. The acceptance of the identity of living Gymnosperm genera in the Mesozoic on the basis of their pollen alone (for example, Russian Jurassic *Podocarpus*) may seem an over-optimistic reliance on the systemic value of pollen characters. But the attempt at integrating data from dispersed spores and macrofossils is at least refreshing.

W. G. CHALONER

Nuclear Physics

Edited by V. F. Weisskopf. (Italian Physical Society, Proceedings of the International School of Physics "Enrico Fermi", Course 23, Varenna on Lake Como, August 7–August 26, 1961.) Pp. v+186. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1963.) 60*s*.

THE *Proceedings* of the Varenna Schools used to be published as supplements to *Il Nuovo Cimento*. They now appear in hard covers from the Academic Press, but the style, down to the last details of typography and the familiar group photograph, remains unchanged. Only the density of misprints seems to have increased; it is here regrettably high.

Three courses take up most of the book; Villars on the Hartree–Fock approximation in nuclear physics, Levinson on nuclear physics (deformed orbitals in shell-model theory) and Brown on collective motion and many-body techniques. The other two courses, de-Shalit on nuclear moments and Ericson on the compound nucleus and random phase approximation ('fluctuations'), are rather shorter.

Much of this is good teaching, with at least some of the hand-waving that (in moderation) is an essential part of good teaching coming through. The resulting informality makes for refreshing reading and provides a good introduction to many of the subjects covered as well as useful insights to those more familiar with them.

Of perhaps more doubtful value is the inclusion of four seminars on special topics. These are doubtless intended to be concrete examples of research related to the topics of the courses, but their teaching value in this role is limited and I feel these contributions would sit less awkwardly as research papers in the journal literature. If their exclusion had made possible a modest reduction in the price, so much the better for everybody.

J. M. SOPRE

Analysis of Petroleum for Trace Elements

By O. I. Milner. (International Series of Monographs on Analytical Chemistry, Vol. 14.) Pp. viii + 128. (Oxford, London, New York and Paris: Pergamon Press, 1963.) 35*s*.

THIS is a very useful monograph. It is very well referenced, and, for each of the elements which have most frequently to be determined, the author gives a recommended method of analysis the suitability of which has been confirmed by his personal experience. The title refers only to the analysis of petroleum, but the determination of trace elements in catalysts is also covered.