

GEOLOGY

A Descriptive Petrography of the Igneous Rocks
Vol. I: Introduction, Textures, Classifications and Glossary. By Prof. Albert Johannsen. Second edition. Pp. xxiv+318. (Chicago: University of Chicago Press; London: Cambridge University Press, 1939.) 27s. net.

THE publication of Prof. Johannsen's four-volume "Petrography" was completed by the appearance of the last volume in 1938. Notices of the work have appeared in *NATURE*, 129, 636 (1932); 132, 691 (1933); and 142, 495 (1938). The first volume, dealing mainly with the textures and classification of the igneous rocks, now appears in a second edition.

In his preface to this new edition, Johannsen quotes a statement made by Tom Barth in connexion with certain proposed modifications of rock classifications: "One should always be careful not to spoil a good idea by undue improvements". Apparently adopting this advice, Johannsen has made very few alterations in his revision. Apart from a few minor improvements of the text and additions to the biographies of prominent petrographers, he has been content to make only the following changes. The summary of Hodge's quantitative system of rock classification has been replaced by short accounts of Lacroix's (1933) and Tröger's (1935) systems. A few pages are added dealing with Niggli's (1931) modification of Johannsen's classification and with Andreatta's (1937) modification of Niggli's modification; these few pages are headed with a figure of what appears to be a monkey-wrench—a pleasant gibe which most readers will appreciate. A new appendix, giving the definitions of some 750 rocks described in the other three volumes of the work, has been added, but the other appendixes and tables remain exactly as in the 1931 edition. Teuscher's (1933) method of describing granularity is summarized, and Fersmann's (1928) views on the origin of graphic texture are briefly mentioned. With the exceptions noted, no reference to new work appearing since 1931 is made.

Das Relief der Erde

Versuch einer regionalen Morphologie der Erdoberfläche. Von Prof. Dr. Fritz Machatschek. Band I. Pp. xi+545+10 plates. (Berlin: Gebrüder Borntraeger, 1938.) 36 gold marks.

NOTWITHSTANDING the title of his great work, "Das Antlitz der Erde", Suess really provided the classic account of the skeleton of the earth's crust. Machatschek proposes to describe the true face of the earth, and to discuss the geological factors that have controlled its development. The whole work will exhibit the relations between the single physiological units of the earth's surface and the geological-tectonic raw material from which they have been derived. It will be a study in morphotectonics.

This first volume here noticed begins with a few pages of introductory matter, dealing mainly with the classification of the major divisions of the earth's

surface. Then follows a treatment of the continental block of Europe and Asia, that is, the part of these continents lying north and west of the Alpidic fold-zones. The units of the British Isles, Middle Europe, Fennoskandia, Russia, Siberia, Central and East Asia are dealt with in turn. As an example of Machatschek's method, we may take his account of Fennoskandia; brief summaries of the Pre-Cambrian and Caledonian history are followed by a detailed description of the glacial and post-glacial happenings, and this by a discussion of the topography special to the dozen separate districts into which he divides the region. The second part of the volume deals with the Alpidic fold-belt in Europe and North Africa, and treats of the Mediterranean countries.

There are 141 text-figures, many being morphological maps, and ten excellent morphotectonic plates which cover most of the greater regions of Eurasia. The bibliography is selected. The book is good meat for geologists and for those geographers blessed with some geological knowledge.

MATHEMATICAL AND PHYSICAL SCIENCES

The Cyclotron

By Dr. W. B. Mann. (Methuen's Monographs on Physical Subjects.) Pp. xi+92. (London: Methuen and Co., Ltd., 1940.) 3s. net.

THE cyclotron is essentially an instrument acting as a source of very high velocity nuclear particles—protons, deuterons, neutrons and alpha-particles—which have been used successfully by physicists in the further study of the constitution of matter by atomic bombardment. Although the fundamental principles of the method were known more than ten years ago, it is during the past few years that the problems involved in the design and construction of practical apparatus have been solved by the work of E. O. Lawrence at the University of California, Berkeley. The author of this little monograph, Dr. Mann, spent a period of two years in Prof. Lawrence's laboratory, and so has been able to describe the principles and some of the possibilities of the cyclotron, as the result of first-hand experience.

After an introductory chapter, a description is given of the phenomenon of magnetic resonance acceleration, upon which the operation of the cyclotron depends. Details of the design of the cyclotron vacuum chamber and the associated magnet are then given, followed by somewhat less satisfactory chapters on the radio-frequency supply, and the adjustments and electric and magnetic focusing arrangements involved. The final chapter, entitled "Applications of the Cyclotron", would appear to be unnecessarily detailed, and much of the material discussed is not concerned with the cyclotron as such but rather with atomic physics and chemistry. This account could have been made more interesting to the general scientific reader, for whom this series of monographs is intended, by confining the description to a few examples, treated more generally. A good bibliography is included at the end of the book.