

olivine section as an example, there is room for slight improvement. It is a pity that, in discussing olivine distribution, mention has not been made of olivine settling in Bowen's crucible, lava flows, and the Palisades sill, of the evidence for the contrasted stability fields of olivines in tholeiitic-type (e.g. Palisades) and alkali-type (e.g. Shiant) basalt magmas, and of the significant disappearance and reappearance of olivine in the Skaergaard intrusion (in relation to the synthetic system $MgO-FeO-SiO_2$). The statement, on p. 26, that fayalite in granites is usually restricted to pegmatitic segregations, is unlikely to meet with general approval, and it is surprising that reference is not made to local British examples such as fayalite-bearing Skye granophyres and the Arran pitchstones. In such a large, neatly subdivided work as this, the authors have been faced with the difficult problem of where to place certain facts, and in certain cases paragenetic aspects appear in the chemistry section and vice versa; this could hardly be avoided. A more acute drawback lies in the placing of mineral groups that have close genetic relationships into separate volumes, such as the olivines and pyroxenes. The omission of the important system $Fe-Di-SiO_2$ from the olivine section is a case in point, and it is to be expected that part of the olivine story may be continued in volume 2.

The work involved in producing such a monumental work must have been somewhat exhausting, and the authors are to be congratulated on maintaining a high standard of writing throughout each volume, and for diligently assembling recent information up to the time of going to press. In such a rapidly developing subject it is apparent that the issue of further, revised editions will involve them in more than the average amount of fresh writing. Already, extensive new accounts of minerals such as chloritoid have appeared, and it is questionable whether any mineralogist would have the courage to close a chapter on the feldspars without some misgivings. For many years, however, these five volumes should serve their purpose well, as an indispensable aid to the research worker in petrology, and of the authors it can be truly said that they have lived up to the high expectations of those who have looked forward to the appearance of this book.

G. M. BROWN

COMPTON (R. R.). *Manual of Field Geology*. New York and London: John Wiley and Sons, Inc., 1962. x+378 pp., illus. Price 57s.

PROFESSOR COMPTON wrote this *Manual of Field Geology* primarily 'to assist undergraduate students in field training', but in the preface he also indicates that he has included specialized procedures and data

likely to be of value to advanced students and professional geologists. In the opinion of the reviewer the work is so lucid, and the numerous diagrams of such high instructional quality, that all concerned with field geology would enjoy reading it, and at the end most would have learned something and many a great deal from it. To any embarking on a study of field geology the manual is to be highly recommended as instructions relating to basic techniques are so clear that they can be mastered without additional guidance.

The extent of the coverage can be judged by the titles of the chapters: Ch. 1. Observing and collecting data and samples. Ch. 2. Using the compass, clinometer, and hand level. Ch. 3. The compass traverse. Ch. 4. Plotting geologic features on a base map. Ch. 5. Mapping geologic features on aerial photographs. Ch. 6. The alidade and plane table. Ch. 7. Control of geologic maps. Ch. 8. Geologic mapping with the alidade and plane table. Ch. 9. Making a geologic map from aerial photographs. Ch. 10. Detailed mapping and sampling. Ch. 11. Preparing geologic reports. Ch. 12. Field work with sedimentary rocks. Ch. 13. Field work with volcanic rocks. Ch. 14. Field work with igneous and igneous-appearing plutonic rocks. Ch. 15. Field work with metamorphic rocks.

Naturally, in a book designed to be carried in the pocket, it has been impossible to include detailed accounts of all the topics likely to be of interest to the field geologist, but Professor Compton has certainly dealt comprehensively with the fundamental ones, and whenever a topic has received but brief mention he has noted sources from which a full account might be obtained. The work contains a brief, but distinctly useful, account of underground mapping, but it is a matter for regret that not even a passing reference has been made to certain mapping aids of the greatest value to the economic geologist and, on occasion, of equal value to others. Of these omissions applied geochemistry and geophysics are, perhaps, the most important, but also of importance are Banka and other forms of drilling, designed to facilitate the mapping and evaluation of alluvial deposits. A note about boxwork structures is also surely worth including, as they can contribute much towards the correct interpretation of oxidized outcrops, as is a further one concerning the important role which fragmental petrological studies might play during the mapping of an igneous complex such as the plateau of Northern Nigeria.

Finally, the manual possesses an excellent index and nine appendices, which with one exception (the isogonic chart of the United States and

neighbouring areas) are of distinct value to the field geologist wherever he may be working.

K. F. G. HOSKING

WILSON (A. J. C.). *X-ray Optics*. Second edition. London (Methuen's Monographs on Physical Subjects), 1961. 141 pp. Price 21s.

The subtitle of this book was, and is, 'The Diffraction of X-rays by Finite and Imperfect Crystals'. On its first appearance in 1946 it was a classic in its field and a new edition is to be welcomed. The new edition has been revised throughout to incorporate work of the last fifteen years, without any great expansion and without changing the simplicity and clarity of the approach. A full modern bibliography is given with each chapter.

R. J. DAVIS

FISCHER (W.). *Gesteins- und Lagerstättenbildung im Wandel der wissenschaftlichen Anschauung*. Stuttgart (E. Schweizerbartsche Verlagsbuchhandlung), 1961. viii+592 pp., 12 plates, 12 figs., 24 tables. Price DM 84.

This book provides a clear and concise survey of the development of petrology and economic geology from the earliest beginnings in the sixteenth century up to the present day. Russian, German, and French sources are used to a large extent.

An introductory chapter deals with the first attempts of petrographic classification (Agricola, 1546; Werner, 1787), and its further development until about 1850. The neptunist-plutonist controversy receives a lucid and comprehensive treatment in the following section. The chapter on igneous rocks (51 pp.) begins with a survey of petrographic techniques. The various systems of petrographic classifications from Loewinson-Lessing to CIPW, Niggli, and Tröger are explained in simple terms. The same applies to the section on 'The origin of igneous rocks', which devotes special attention to problems of magmatic differentiation and to the history of the granite controversy.

The chapter on sedimentary rocks (135 pp.) incorporates sections on weathering, clastic sediments, sulphate- and chloride-rocks, carbonate rocks, phosphate rocks, and siliceous sediments. Nearly thirty pages are devoted to coal petrology; the most recent results obtained in this field are reported. A special section deals with the historic development of views on oil genesis.

The specific character of metamorphic rocks was not fully recognized until the introduction of the petrological microscope in the 1860's