

The authors of these books are in some respects victims of the field of research in which they work. Recent developments have occurred so rapidly that the accounts are already somewhat dated. There is, for example, no extensive discussion of inductively coupled plasmas as excitation sources. However, the authors and editor cannot be blamed for this and the book will provide a valuable reference work for some years to come.

J. N. WALSH

Rochow (J. G.) and Rochow (E. G.). *An Introduction to Microscopy by Means of Light, Electrons, X-rays or Ultrasound*. New York and London (Plenum Press), 1978. xvi + 367 pp., 221 figs., 2 pls. (1 in colour). Price \$35.00.

Rochow and Rochow set out to encompass the whole field of microscopy in one volume and consider both optical microscopy and instrumental methods. Two particular themes run through this book. The first theme acknowledges the objective results of microscopy and concentrates on the subjective aspects of interpretation, whilst the second theme elevates resolution of detail to the status of an attribute of a microscope more significant than magnification. The claim on the jacket of this book is that it is 'the first book to deal with *all* aspects of microscopy in one volume', although it deals with fewer topics than are covered in for instance 'The Encyclopedia of Microscopy' (G. L. Clark, ed., 1961).

An opening chapter gallops through a history of microscopy from magnifying glasses in AD 60 to instrumental methods in thirteen pages like the proverbial American tourist on a 'Cooks' tour. Nevertheless I found this chapter very readable and the pages on corrections for aberrations particularly useful. Any doubts that resolution is less important than magnification are dispelled here. Definitions, attributes contributing to visibility, and principles is the title of the next chapter which provides necessary definitions and optical theory and an introduction to the first theme of the book on the subjective nature of the interpretative process.

Two chapters deal efficiently with the principles of the optical microscope in transmitted and reflected light. Continuously throughout these chapters the particular problems of biological microscopy are examined and the reader may feel that this field and the techniques rather than their application are the authors' main interest. This view is encompassed by the following abstract which contains the authors total contributions under the heading Field of View: 'Field of view

is important in biological microscopy because natural material is so complex and variable. Biologists know this, and they know how to cope statistically with the variables. Their experience with computers and the design of experiments makes them potentially good microscopists, who need only to understand more about the construction and use of their instruments.'

Three chapters follow on microscopy with polarized light and microscopical properties of fibres and crystals. Whilst there is general coverage of these subjects it is insufficient in depth for, e.g. the mineralogical or microscopic aspects of the first year of a degree course in geology. Passing reference is made to the universal stage but the absence of a description and discussion of its application is particularly unfortunate as is the overwhelming concern of the chapter on crystal properties with organic crystals and microscopic morphology. There is no adequate treatment here of mineralogical examination of thin sections despite a well-produced Michel-Lévy Chart.

A useful chapter on micro-photography is followed by two very informative chapters discussing methods of enhancing contrast by phase modulation, contrast modulation, dispersion staining, and interferometry.

The chapters on Transmission Electron Microscopy, Scanning Electron Microscopy, the Field-Emission Microscope, X-ray Microscopy, and Acoustic Microscopy are written in a gauche style which leaves me with the impression that the authors have no great practical experience of these subjects. There are many errors and situations where the choice of words is inappropriate almost as though these chapters had been rewritten from other texts without a sufficient degree of understanding. To give just a few examples we learn that electron microscopes use '... an electron beam whose rays . . . one at a time, strike the specimen', and it is necessary to clean the electron column not to prevent astigmatism, but to prevent the apertures being 'plugged by contaminant' or 'to keep the apertures open'. As an example of the atomic number effect contributing to a back-scattered electron image we are presented with a photomicrograph of a pure gold surface with interesting topography but no variation in atomic number. The chapter on X-ray Microscopy though, comes near to providing a satisfactory description of how this technique is applied and interpreted.

This book makes some valid comments on microscopy especially in regard to resolution, subjective interpretation, and useful magnification. It provides an introduction without depth and is not an authoritative text. The book displays too many errors and omissions—where for instance is the

chapter on computerized image analysis? I cannot think of any group of readers to whom I could recommend this book.

J. F. W. BOWLES

Rode (O. D.), Ivanov (A. V.), Nazarov (M. A.), Cimbálníková (A.), Jurek (K.), and Hejl (V.). *Atlas of Photomicrographs of the Surface Structures of Lunar Regolith Particles*. Dordrecht, Boston, and London (D. Reidel), 1979. 76 pp., 82 pls. Price \$39.00 Dfl. 80.00.

This atlas contains 164 SEM photomicrographs of regolith particles from the Luna 16 and 20 missions. The text is in Russian (35 pages) and English (30 pages), followed by 3 pages of references, to 1975, with one Russian reference dated 1979. Each plate has an explanatory caption. No chemical data are given though the photographs are classified by subject into rocks, glasses, olivines, and plagioclases. The range in magnification used is from $40\,000\times$ to $48\times$ with the majority at about $1000\times$. The photographs are of reasonable quality and show a variety of surface features. Their appeal, and that of the book, is likely to be limited to those with a particular interest in grain morphology on a fine scale.

A. L. GRAHAM

Arcyana [Cheminée (J.-L.), Hekinian (R.), Le Pichon (X.), Choukroune (P.), Francheteau (J.), Bellaiche (G.), and Needham (D.)] *FAMOUS: Photographic Atlas of the Mid-Atlantic Ridge; rift and transform faults at 3000 meters depth*. Paris (Gauthier-Villars/CNEXO), 1979. 128 pp., 425 photos, 3 folding maps. Price 150 FF.

FAMOUS (French American Mid-Ocean Undersea Survey) was a scientific expedition of great achievement. By the early nineteen-seventies it was generally accepted that the mid-ocean ridge systems of the world played a crucial role in geodynamics, as the sites of the spreading axes where lithospheric plates were formed and separated. Nevertheless, this concept was vague in detail. It relied entirely upon bathymetric maps and several lines of geophysical evidence, because no part of the typical ridge axis is exposed subaerially. FAMOUS took the first step in resolving this problem during 1973 and 1974, by making a very detailed survey of the section of the Rift Valley of the Mid-Atlantic Ridge between $36^{\circ} 30'$ and $37^{\circ} 00'$ N, at a water depth of between 2500 and 3000 m. In addition to geophysical studies (a phase which included UK participation), the area was criss-crossed by three miniature submarines packed with volcano-

logists and petrologists. This atlas includes a selection of 430 photographs from the thousands taken. It is restricted to the data obtained by the French crews of the vessels *Archimède* and *Cyana*.

The atlas appears to have three distinct objectives: (1) to provide a complete record of the field geology of the area, as an essential background for anyone reading the numerous detailed published studies; (2) to contribute towards our knowledge of volcanology and tectonics; (3) to give a general account of the achievements of FAMOUS, suitable for a wide scientific readership (including the sponsors of the work). There are duplicate texts throughout in French and English. These are printed side-by-side, which is a great advantage because the minor abbreviation of the English text and occasional slight hiccups in the translation may be corrected at once by reference to the French original.

The introductory chapter of the volume is an excellent general account of the geology of the area. A series of detailed bathymetric maps and photos of a scale-model enable the reader to obtain a vivid over-all impression of the topography. This includes a segment of the Mid-Atlantic Ridge rift valley, a transform-fault fracture zone, and the complex area where they join. The plates are grouped to illustrate these three distinctive areas, including the hydrothermal deposits in the fracture zone. Each page of photographs is accompanied by a table of technical data and a locality map, so that every view can be related precisely to the area as a whole. With few exceptions the photographs are sharp and have printed clearly. Each group is accompanied by a descriptive geological text and a note on any interesting life forms.

The photographs which are probably the most successful from a geological point of view are those showing the diverse forms of basalt extruded on to the ocean floor. These offer immense possibilities for improving our understanding of ancient pillow lavas and their related deposits. The terminology erected by the authors for these extraordinary eruptive forms is robustly Gallic. Thus phalli are pictured inflated and collapsed—with and without warts. Both are carefully distinguished from coliform lavas, which the English text transliterates from the French as 'tripe-like'. (A visitor to France might be well advised to remember this before ordering a dish of tripe and onions!)

Some of the photographs of structural features in both the rift valley and the fracture zone are spectacular and easy to understand. Nevertheless, many of these pictures suffer from the same problem as besets innumerable published photographs of field features; namely that the interpretation which appeared so obvious to the photographer is far less