Ch. 3 (Electron probe microanalysis, 32 pages) outlines the general principles and practice of the analytical method, including such problems as line-shift of characteristic X-rays of light elements, X-ray generation, analysing crystals for long-wavelength X-rays, sample preparation, techniques of measurement, and selection of standards. Ch. 4 (5 pages) briefly discusses correction procedures.

The remaining chapters describe applications of the microprobe in refractories research. Ch. 5 (16 pages) illustrates the use of the microprobe for the determination of phase diagrams, using the systems MgO–CaO–SiO_2, CaO–Fe-oxide, and CaO–SrO as examples. Ch. 6 (39 pages) describes the use of the microprobe in the examination of unused and used basic refractories. Dolomite (i.e. CaO+MgO) and magnesite (i.e. MgO) refractories are given 25 pages, while chromite, chrome-magnesite, and other refractories (carbon, zircon, and silicon carbide) are dealt with more briefly.

The book is neither a manual for the use of the microprobe nor a comprehensive account of the findings obtained from its use in the refractories field. Rather it is a review covering all methods of examination, and particularly by use of the microprobe, of a specialized but important type of refractory material. About 180 references are cited; these are not comprehensive but are mainly included as being important examples of the use of particular techniques for the examination of materials or for the importance of the results obtained. Although the form of treatment gives a first impression of superficiality, the wide coverage and careful selection of examples and references provide an introductory account of the subject which fulfils the stated aims of the Applied Mineralogy Series—'to inform the engineer and technically interested scientist on mineralogical methods and knowledge relevant to technological problems'.

B. C. M. BUTLER

JAMES (BILL). *Collecting Australian gemstones.* (Fourth edition.) Sydney and Melbourne (Murray) and Folkestone, England (Bailey Bros. and Swinfen), 1972. 192 pp., 32 figs., 48 pls. (8 in colour), 12 sketch-maps. Price £5·00.

This is primarily a book for the rockhound and intending amateur lapidary. Written in a journalistic and enthusiastic style, it includes practical information on mineral hunting and lapidary work, good lists of Australian mineral localities, and a not inconsiderable proportion of somewhat irrelevant detail on Australian personalities in the lapidary field, which will be of little interest to most non-Australian readers.

The first chapter contains a collection of interesting and odd facts on gemstones in history, the second gives some account of the equipment needed for gem hunting, and the third chapter a very brief account of natural gem concentration concluding with a useful list of Australian gem localities.

The fourth and fifth chapters give details of mining laws and prospecting in the various Australian states and further information on equipment, modes of gemstone occurrence, and the code of conduct expected. Chapters six and seven are devoted to elementary mineralogy and gold panning and goldfields respectively. Chapter eight lists gemmology and lapidary classes in the various states.

The five chapters (9–13) on tumbling, equipping a workroom, cutting cabochons, faceting, and carving are very good as an introductory guide and include advice on avoiding the many pitfalls that might beset a novice. In view of the importance of opal in Australia and the difficulties experienced in successful cutting it is surprising that more details are not included. The use of a faceting head is described in some detail but an illustration of the device is lacking. Chapters fourteen and fifteen give details of miscellaneous Australian minerals and a glossary of geological and mining terms, misnomers, and physical constants.

The book concludes with a series of twelve sketch-maps of world-famous Australian mineral and gem localities.

Illustrations take the form of colour plates, which are generally good, numerous black and white plates, which sometimes lack contrast, and many line drawings.

The first reading is interesting, but the serious student might well find the many personal details rather tiring on subsequent study. E. A. JOBBINS