

BOOK REVIEWS

Marshall, D. J. *Cathodoluminescence of Geological Materials*. London and Boston, (Unwin Hyman Ltd.). xiv + 146 pp., 12 colour plates. Price £60.00.

Cathodoluminescence is a most useful, but possibly under-utilized petrological or mineralogical technique. D. J. Marshall has written a highly readable book, which should bring the subject out of the shadows. There can be no doubt that this book is a most valuable addition to the mineralogical literature. The author sets out by introducing the phenomena of luminescence, then discusses the history and instrumentation associated with cathodoluminescence, and finally provides detailed chapters on the cathodoluminescence properties of a variety of important mineral groups. In addition there is a chapter by A. N. Mariano on further geological applications of cathodoluminescence, and a fine set of colour plates illustrating many important features described in the text.

The introductory chapter is pitched at exactly the right level for the average mineralogist or petrologist, and provides a clear description of the physics behind the various types of luminescence, without getting bogged down in detailed theory. Electron energy levels, the effect of imperfections, and the importance of activators and quenchers are discussed qualitatively, but the author provides sufficient references to enable the motivated reader to obtain a more quantitative and rigorous understanding should it be required.

The brief history of cathodoluminescence is most interesting, and stresses, amongst other things, the impact that a 1965 paper, by J. V. Smith, had on the subject, because of its use of colour plates. The understandable difficulty that authors have in attempting to get colour plates printed in journals may well account for the relatively limited impact that cathodoluminescence has had in the wider mineralogical world. The author of this book, and the publisher, are to be congratulated for the excellent and essential colour plates presented in the text. There is, however, a price to pay for these plates, but it would be a shame if the relatively high cost of this volume were to limit its sales.

The chapter on instrumentation for cathodoluminescence studies is most authoritative and detailed. It includes a discussion of available

instruments, safety, sample preparation, spectral analysis, and the problems of the photographic recording or cathodoluminescence. There then follows a chapter in which a highly condensed, but fully referenced, review of mineral cathodoluminescence is presented. The properties of elements, sulphides, oxides, halides, carbonates, sulphates, phosphates, and silicates are outlined. Subsequent chapters delve more deeply into the properties of feldspars, quartz and carbonates. These three chapters are very thorough, and bring the reader rapidly to the frontiers of the subject. This is emphasized by the final section of these chapters, which outlines areas of potentially fruitful future research.

The chapter by A. N. Mariano concentrates on cathodoluminescence in minerals from igneous and metamorphic rocks, and reveals the importance of rare-earth elements in determining the luminescence behaviour of minerals like apatite. A final chapter discusses briefly the role of cathodoluminescence in the study of gem materials, and of lunar and meteoritic samples.

This book is well written throughout, clearly illustrated and has an extensive reference list. It should be essential reading for all those working in the field, and for all mineralogists and petrologists concerned with petrography, mineral growth and textural evolution.

G. D. PRICE

Kodera, M., and Kolektív, A. *Topografická Mineralógia Slovenska I: A-Kl.* (in Slovak). Bratislava (Veda Vydavateľstvo Slovenskej Akadémie Vied), 1986. 577 pp. Price Kčs. 105.00.

This encyclopaedic work on the topographic mineralogy of Slovakia aims to provide comprehensive information on the mineral and raw material wealth of the country. This first of two volumes starts with a complete bibliography of some 3200 numbered items up to 1982 from over 130 domestic and also foreign periodicals. This is followed by an alphabetical listing of the main localities, chosen to cover the territories of the main towns and villages. The genetic principle is then used to classify particular types of mineralization found in these localities. The names used for territorial units are the current ones, but cross references to the older names often used in the