

minerals found in unconsolidated and semi-consolidated sediments recovered from marine, particularly, but by no means exclusively, bathyal deposits. It is especially relevant for samples prepared by the smear-slide method as samples undergo their initial examination upon the recovery of cored material from the ocean floor, and it reflects the experience of workers involved in the Deep Sea Drilling Project and its successor, the Ocean Drilling Programme. The smear-slide method is quick and, with practice, offers a quantitative tool sufficient to name the sediment type. The appearance of the material on the slide differs from that when conventional methods of preparation are used and the book is very much related to the smear method. Provided certain rules are followed and the investigator is reasonably competent a 'permanent' name can be ascribed to the sample. The author describes the method and the system of nomenclature to be used: then, with many illustrations, the appearance, properties and usual occurrence of the mineral species are described. Over 40 minerals and mineraloids are described—only ikaite ($\text{CaCO}_3 \cdot 6\text{H}_2\text{O}$) is missing. [M.A. 86M/2239.] There is a section on extra-terrestrial material in marine sediments, an appendix illustrating the main microfossil groups, useful identification flow charts, a glossary of descriptive terms and an excellent list of references concerned with deep-sea minerals.

This book can be recommended as a welcome addition to texts on mineral identification and particularly so for those in the field of recent marine sediments.

A. J. SMITH

Alloway, J. D. (Ed.). *Heavy Metals in Soils*. Glasgow (Blackie), 1990. xiv + 339 pp. Price £59.00.

The term 'heavy metals' has been adopted as a group name for the metals and metalloids which are associated with pollution and toxicity but includes elements such as Co, Cu, Mn, Se and Zn, which are essential for living organisms at low concentrations. Studies of heavy metals in ecosystems around the world have identified many areas near industrial complexes, major road systems, metalliferous mines and waste disposal sites which contain anomalously high concentrations of these elements. With the current pressure on land for development the characterisation of such contaminated land and the introduction of clean up technologies has assumed major importance. The soil is at the interface between the atmosphere and the rocks which form the earth's crust,

and as such it is most vulnerable to heavy metal pollution.

This book seeks to bring together the information available on heavy metals in soils to provide a data base for research scientists and environmental technologists involved in heavy metal pollution, its characterisation and remediation. The book is divided into two parts. Section 1 contains chapters providing an introduction to the relevant soil processes affecting the chemical behaviour of heavy metals in soils, the sources from which the metals originate and a review of the methods used for their analysis. Section 2 constitutes the main part of the book and contains chapters dealing with 17 individual elements in detail.

Like any book of this type which attempts to cover a wide field with numerous contributors, the individual chapters vary in their usefulness to the student and research scientist. The chapter on methods of analysis for example is too brief to be of much use and could profitably have been omitted. However, the chapters in Section 2 provide an excellent source of reference on individual elements and contain a host of up-to-date references. One irritating feature is that the titles of referenced papers are not included, reducing the number of pages but also reducing the value of the listings. However, overall Brian Alloway has edited a useful volume which can be recommended to all workers interested in the subject of heavy metal pollution and particularly those involved in the increasingly important subject of contaminated land.

J. D. MATHER

Mottana, A. *Fondamenti di Mineralogia Geologica*. Bologna (Zanichelli), 1988. xii + 553 pp. Price L 52,000.

This text, dealing with the principles of geological mineralogy, opens, after a brief introductory chapter, with considerations on the distribution of elements in the Earth's crust, before turning to the structure of atoms and the principles of structural crystallography, where symmetry elements, the Bravais lattice, point groups, and space groups and their nomenclature are introduced. Defects in crystals, coordination numbers, Pauling's rules and possible systematic classifications of crystal structures are discussed in detail. These sections, the following chapter on the various silicate structure types, and indeed the whole book, benefit greatly from the provision of numerous two-colour figures, e.g. with atoms and bonds shown in orange-brown, light brown, black, grey, or white, making the details of crystal