

it is, important work by such authors as Krauskopf and Iler is little more than mentioned, and then in an appendix. The most obvious weakness in presentation is the list of 160 references, which are not arranged alphabetically, chronologically, in order of use in the book, or, indeed, in any order at all.

All this is a pity because Mr. Shepherd has been working on flint since 1932, and he has assembled here a refreshing range of up-to-date information on the origin of flint, its weathering, and its uses by man. The section on origin is particularly comprehensive although he has limited himself to Chalk flints and does not discuss chert formation in general, but even amongst Chalk flints he recognizes that they have probably formed by several different processes. In this discussion he makes little reference to the fact that flints commonly follow the bedding, no mention of the absence of flints from penecontemporaneous conglomerates, both of which must be specially significant for any consideration of their formation.

The chapter on derived flints brings out the distinction between cortication (loss of water from the outer part of the flint leaving a white crust) and patination (refilling empty pores of the cortex with silica derived from soil water). These two quite opposite processes are still frequently confused.

About a third of the book is taken up with the uses of flint. The manufacture of flint implements is described in detail, and every known use of flint discussed in a most readable style.

Obvious errors in the book are few, although there are a number of minor ones in the chapter on the Chalk, of which the most serious is the repetition of the myth that the iron sulphide in the Chalk is marcasite, not pyrite: marcasite does occur, but is comparatively rare compared with pyrite. The total thickness of the Chalk is repeatedly overestimated. The absence of 'extensive deposits of terrigenous materials' happens to be a feature of north-west Europe, and is not universal.

This is a book that should be in every library of geology or archaeology, and any individual willing to pay the high price is certain to learn a surprising range of facts.

J. M. HANCOCK

FRONDEL (C.). *The minerals of Franklin and Sterling Hill. A check list.* New York and London (Wiley-Interscience), 1972. vi + 94 pp., 33 figs., 1 sketch-map. Price £4.60.

For over two hundred years the zinc mines at these famous neighbouring New Jersey sites have yielded a remarkable range of minerals often of outstanding quality. Altogether 230 minerals or mineral varieties have been identified from Franklin and Sterling Hill including 44 not previously known. Most museum, teaching, and private collections throughout the world have showpieces from these localities. In this book an account is given of the geology and geochemistry of the desposits and there is a brief discussion of the various origins ascribed to the orebodies. The Franklin orebody was estimated to have produced a total of 22 to 25 million tons of ore averaging

about 19.6 % Zn, 8.7 % Mn, and 17 % Fe. The history of the mines and notes on famous mineral collections from the area are also given. We are told that the Boston owners of the mine imposed temperance so that in 1880 'the bar of the Franklin hotel, instead of a display of bottles, exhibited various collections of ores'. More than half the book, however, is given over to the alphabetical checklist of minerals from these localities, in which each mineral is characterized by its composition, occurrence, abundance, and mineralogical history.

Charles Palache, in *The Minerals of Franklin and Sterling Hill* published in 1935 as a Professional Paper of the U.S. Geological Survey, critically reviewed all the minerals then reported from these localities; his study invalidated a number of minerals and added a number of proven new occurrences. The present list invalidates some additional mineral names and adds 'about 66' valid minerals that have been recognized from these localities since 1935. With some exceptions text references earlier than 1935 are not included as they can be found in the above work, but some 160 references are given for publications on these localities since that date. The black-and-white photographs on paper ill-suited for their reproduction hardly begin to do justice to the magnificence of many of the specimens, though the franklinite octahedron about 2 inches on edge and a group of dodecahedral andradite crystals, the largest almost 5 inches in size, can hardly fail to arouse enthusiasm. But at 4½p per page this slim book is very expensive and one continues to cherish Professional Paper 180.

R. A. HOWE

JONES (M. J.), Editor. *Geochemical Exploration 1972*. London (Inst. Mining and Metallurgy, 44 Portland Place), 1973. xiv + 458 pp., 336 figs. Price £12.00.

This volume contains the thirty-seven papers presented at the Fourth International Geochemical Exploration Symposium, organized by the Institution of Mining and Metallurgy on behalf of the Association of Exploration Geochemists, and held in London in 1972. The topics covered include virtually all aspects of geochemical prospecting; the authors and titles are listed in full in *Mineralogical Abstracts* (M.A. 73-2308). Although expensive, this book will be required by all geological libraries and will be essential reading for applied geochemists.

R. A. H.