at Heidelberg, P. Routhier and J. Lombard in Paris, and A. Bernard at Nancy, classical metallogeny has been rejuvenated to the point where a term is required to designate this new discipline: *the Gîtologie*. The word is not capable of satisfactory translation into English, and it may be doubted whether the anglicized version gitology will prove acceptable; though gitologist might survive to describe the members of the group whose rigid belief it is that most if not all stratiform deposits of non-ferrous metals originated contemporaneously with the sedimentary rocks series which enclose them. In the main, the English-speaking world, and most of the Russian, finds that most such deposits are clearly not original sediments but were emplaced by fluids diffusing through permeability channels such as the intergranular pore spaces in sandstones, or dissolved palaeoaquifers in limestone, often aided by metasomatism.

Logically, the book gives a good account of sedimentological evolution; covering basin analysis, lithofacies, palaeogeography, transport, ancient climates, biological aspects of the environment. The development of the environment of ore deposition is then considered; diagenesis receives 61 pages of discussion, metamorphism and granitization are mentioned, and various types of sedimentary successions are described. Next, events external to the sedimentary environment are dealt with: tectonism, the cover-rock/basement conception, and here magmatism (including the formation of volcanosedimentary series) receives just eight pages of treatment out of 472 so far. The vast gulf that exists between the thinking of the gitologists and that of the Canadian ore geologists could hardly be better illustrated.

There follows a discussion of methodology—beloved of French authors—and classification. The facts having been interpreted, it is now time to apply them to the search for minerals. Here the conception of the metallotect, which might be defined as the sum of the conditions required to form an ore deposit, is introduced. The organization of a mineral exploration is described.

This is a strangely unbalanced book. The accepted syngenetic stratiform deposits, the 'minette' and chamosite–siderite iron ores, and the evaporites receive no attention, and manganese deposits get little enough. The work is directed towards the copper, lead, and zinc deposits in sediments. No doubt a few such deposits were formed on the sea-bed, where hydrothermal fluids escaped into the sea; indeed it seems reasonably certain that this is happening now in the Discovery and Atlantis II deeps in the Red Sea. But these are special cases, not the rule, and to argue that copper, lead, and zinc ore formation is part of the normal sedimentary cycle leaves me quite unconvinced.

K. C. DUNHAM

BRAITSCH (O.). *Salt deposits: their origin and composition.* Minerals, rocks, and inorganic materials: Monograph series of theoretical and experimental studies, 4. Transl. from the German by P. J. Burck and A. E. M. Nairn. Berlin, Heidelberg, and New York (Springer-Verlag), 1971. xiv+297 pp., 47 figs. Price DM 72.00.

The original German text for this important book by Professor Otto Braitsch was published in 1962. It is regrettable that it has taken nine years for this translation to

be produced. It is indicative of the comprehensive nature of the work in the geochemical and mineralogical aspects of the evaporite field that it is still worth publishing now. The team of translators and consultants have done their work well.

The English title of the book is unfortunate as it gives the impression of a broad treatment of the subject, whereas there is little discussion of petrology, stratigraphy, or palaeogeography. The mineralogy and geochemistry are however very fully explored.

In place of chapters the book is divided into seven sections. Section A contains an introduction, a brief history of the evolution of sea-water, and a very comprehensive list of the major and accessory minerals found in salt deposits.

Section B examines very fully the stability relationships and the application of Gibbs Phase Rule to seven important mineral assemblages.

The third section deals with the physicochemical conditions of precipitation and metamorphism of salt deposits. When dealing with salt genesis it is clear that the author was ahead of his time and aware that the conditions of salt formation are highly varied. He says 'This does not reduce the value of models, rather the comparison of different models with natural salt series is the only way of approaching the actual composition of the solutions and the conditions under which they existed.'

Section D compares the theoretical models of section C with the major and minor mineralogical and chemical components of natural evaporite deposits. One can but regret that Braitsch died (1966) before the results of the last decade of work on Recent evaporites became available.

The clay minerals found associated with evaporites and the geochemistry of iron and boron in salt deposits are discussed in section E.

Sections F and G give us the conclusions of the author together with his suggestions for future work and the philosophy by which to pursue that work.

This is an important book for all those interested in the chemistry and mineralogy of evaporite deposits. P. R. BUSH

PHILLIPS (W. R.). *Mineral Optics: principles and techniques.* San Francisco (W. H. Freeman & Co.), 1971. ix+249 pp., 113 figs., 14 colour pls. Price U.S. $12.50 (£5·30).

Students beginning a University course in geology frequently experience difficulty in grasping the principles of optical mineralogy and in the reviewer's opinion most of them do not really understand this subject until they have to: namely when they try to teach others. This may be the reason why there are so many textbooks on this topic and this is the latest one available.

The production on high quality paper with coloured illustrations, clearly drawn diagrams, and large margins to the pages make a very good impression. The coloured Michel-Lévy chart reproduced from one made by Carl Zeiss is excellent but the coloured diagrams of interference figures drawn with crayons showing the methods of determining optic sign are somewhat unnecessary since the student can produce equally good diagrams of his own with coloured crayons or he can even colour the