

and salt-water bodies are given. Three short chapters describe aquatic bacteria and fungi and their distribution in water and bottom sediments of rivers, lakes and the sea. Chapter 6 deals with the influence of light, temperature, hydrostatic pressure, turbidity, pH, redox potential, salinity, organic substances and dissolved gases. The importance of competition for nutrients and microbes as food for larger organisms and the association of microbes with aquatic plants and animals receive scant attention. Chapters 10 and 11 outline the role of bacteria in the cycling of elements and in the origin of mineral resources. Water-pollution problems are treated in Chapter 12. The economic significance of aquatic microbes is discussed in Chapter 13.

The original version was published in German in 1971. The present English translation represents some improvements. Nearly half of the 300 references are in German; 182 of the references were published since 1960. Nearly half of the 72 figures are graphs, the others being photographs or drawings of micro-organisms.

The quality of the book and its printing is good. There are relatively few word or typographical errors, e.g., in line 21 on p. 123 *amylase* should be *amylose*. Twice in line 37 on p. 127 *caprilic* should be *caprylic*. In line 7 on p. 90 *-oxydans* should be *-oxidans* in both words. In line 43 on p. 127 *immediate* should be *intermediate*. At the end of lines 22 and 23 on p. 133, the *t* and comma should be transposed. Several places in the book, including the index, the author uses the term *desulphurication* for a process commonly called *desulphurization*.

Although useful, the index is also scant. In order to make it more useful to me, I have already added about 50 headings which are treated in the book but not listed in the index, e.g., *Bdellovibrio*, Biomass, Fungi, Petroleum, Distribution, Solid substrates, Yeasts.

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*Metallogenetic and Geochemical Provinces*. W.E. Petrascheck (Editor). Springer Verlag, New York, N.Y.—Vienna, 183 pp., 48 figs., 17 tables, DM 37,— (ca. US \$ 15.10). (Österreichische Akademie der Wissenschaften Schriftenreihe der Erdwissenschaftlichen Kommission, 1. Metallogenetische und Geochemische Provinzen (Symposium Leoben, November 1972).)

In November 1972 a symposium on metallogenetic and geochemical provinces was organized in Leoben by Prof. W.E. Petrascheck; the proceedings of this symposium have now appeared. Of course plate tectonics plays a prominent role as is apparent in the contribution by Guild "Distribution of metallogenetic provinces in relation to major earth features", as well as in the papers by Szádeczky-Kardóss and Santos. More than half of the papers deal only marginally with the problems of metallogenetic provinces, but more with ore-forming processes in general. Wedepohl for example (basic geochemical data of Zn, Pb and Cu and hydrothermal ore genesis) assembles and discusses a lot

of recent and useful data on the geochemistry of these elements, but none of it relates directly to ore provinces. The same holds for Leutwein's "Geochemical and geochronological studies of barren and ore-bearing granites, particularly from the Vendée", in which the trace-element geochemistry of granites is related to their ore-bearing potential for elements such as Sn, Mo, W and U. Unfortunately his Fig.4 is incomplete as the metal contents are lacking. Although it may soon be possible to present such correlations in an even more convincing way, Leutwein presents the evidence in a lucid manner.

A paper which deals effectively with an ore province is that by Baumann and Leeder on the fluorite—barite province of Central (?) Europe. They place a strong emphasis on tectonics, sometimes even too strongly, as in their Fig.4 which purports to show, a.o. a strong correlation between the location of CO<sub>2</sub>-rich sources and crossings of major fault zones. Of the thirty CO<sub>2</sub>-sources shown on the map I could with some phantasy find only four which were on or near such crossings.

Ingerson investigates the problem of geochemical provinces in ocean basins, and arrives at the conclusion that these do not exist. This is another argument in favor of Petrascheck's (and this reviewer's) views, that most ore-forming elements are contained in the continental crust, apart from such obvious examples as Pt, Cr, and Ni in most of its deposits. An intermediate position is taken by many Cu-deposits, including the porphyry coppers. These seem to be related to subduction zones (see again Guild, as well as Karamata's contribution on the metallogenetic provinces of the Balkan peninsula and Asia Minor). That such relations find direct application in prospecting is shown rather dramatically by Guild's Fig.4, which shows a conspicuous gap in the zone of porphyry coppers between Colombia and NW Mexico; this gap has since been closed by several spectacular discoveries in Middle America.

Petrascheck concludes the symposium with a thoughtful synthesis on the origin of the ore metals.

The book is recommended to all those who want to combine their interest in economic geology with a somewhat wider outlook in order to place the ore deposits in their geologic context.

The quality of the contributions is uneven, but some are outstanding, and Prof. Petrascheck can be proud of his initiative.

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*Applied Geophysics — Introduction to Geophysical Prospecting.* Gerhard Dohr. Ferdinand Enke Verlag, Stuttgart, 1974, 272 pp., DM 16.80.

This book is the first of a series, under the general editorial direction of Prof. Heinz Beckmann, on the *Geology of Petroleum*. The book is a translation of the original German text. The translator is G.H. Kirby. In *Applied*