

techniques and materials. As before, the chapter on the universal stage (40 pp.) concentrates on the three-axis stage, but details of a method for orthoscopic adjustment with the Federov stage [Min. Mag. 32–245] are included. The book includes appendices with notes on point counters, data for representative ore minerals in reflected light, tables of sine, sine², and sine⁴, and colour plates showing typical interference colours and optic axial figures. For a work so copiously illustrated the price, although representing a five-fold increase on the previous edition, is still extremely reasonable and this book should be available in all libraries and research laboratories.

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STRAKHOV (N. M.). *Principles of Lithogenesis*, volume 2. New York (Consultants Bureau) and Edinburgh (Oliver and Boyd), 1969. xii+609 pp., 222 figs. Translated from the Russian by J. Paul Fitzsimmons and edited by S. I. Tomkeieff and J. E. Hemingway. Price £10. 10s.

Strakhov's three-volume work on the formation of sedimentary rocks is not merely large—volume 2 alone contains over 600 pages—but is written on the grand scale: sentences are rarely interrupted by references, whilst the cover by a single author for the whole subject gives the book a coherence that has become rare in general works. The style is confidently authoritarian, and even if the reader is told on whose work a paragraph is based, only occasionally is a date given, and this does not mean that one will always find the reference in the bibliography. Occasionally one wonders how much is fact and how much is imaginative generalization.

Strakhov is an exponent of the theory that sedimentary facies are controlled by climate and tectonics: the main divisions over the Earth correspond to climatic belts, but within any one climatic belt the variations in the tectonic setting are more important than local variations of climate. Volume 2 covers the formation of sediments in humid climates with much valuable discussion of the geochemistry, more than usual on the stratigraphical distribution, and relatively less emphasis than is currently fashionable in English text-books on the tectonic controls. Volume 3 will be on sediments formed in arid climatic belts, including seas in such regions.

The coverage of western literature is good up to 1962 when the original Russian edition was published, but for many western readers the chief value of this book will be the provision of summaries in English of recent Russian work. This is particularly valuable for subjects such as the work of Botvinkina on the formation of coals, Betekhtin on the Chiaturi manganese ores, Kazakov on phosphate formation, Petelin and Bezrukov on the sediments of the Okhotsk Sea, Bruevich on the Caspian Sea, Strakhov and Knyazeva on authigenic minerals in Lake Baikal and the Black Sea, and a whole range of geologists including Strakhov himself on the sediments of the Black Sea.

In spite of its smooth style, this is a difficult book to read. Much of the translation would seem to be too literal so that the vocabulary includes many words unfamiliar to readers of English, e.g. swale, hydrologic, benthotic (instead of benthic or benthonic), deluvium, proluvium, clarke, oligomict, pelitomorphie. This reviewer does

not read Russian and so cannot estimate the amount of mis-translation (only one actual mistake has been noted) but the three distinguished geologists who have done the translating would have served Strakhov better if they had felt able to translate more freely. The title of the book itself should have been 'The formation of sedimentary rocks in humid climates'. As it was this reviewer failed to grasp that 'humid' was only being used in a climatic sense until he was more than half-way through the book. Volume numbers are not given in the references. There is no index and the chapter titles and subtitles are of limited value for finding even major subject divisions. This is hardly a book that could be recommended for undergraduate reading, but equally every professional sedimentologist ought to have it on his shelf.

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LOUGHNAN (F. C.). *Chemical Weathering of the Silicate Minerals*. Amsterdam and New York (Elsevier Publ. Co.), 1969. 154 pp., 62 figs. Price £5.

According to the author this volume is designed as a textbook for graduate students of sedimentary petrology, clay mineralogy, pedology, and soil engineering. It deals with the mechanisms and products of chemical weathering of silicate minerals in six chapters: Chapter I. 'Introduction' (3 pp.). Chapter II. 'Structures and Properties of some of the Primary and Secondary Minerals involved in Weathering Reactions' (23 pp.). Chapter III. 'The Chemistry of Weathering' (39 pp.). Chapter IV. 'Environmental Factors Influencing Chemical Weathering' (8 pp.). Chapter V. 'Chemical Weathering of Various Rock Types' (39 pp.). Chapter VI. 'Chemical Weathering and Soil Formalin' (22 pp.). There is also a glossary and separate author and subject indexes.

The author has two main theses—that chemical weathering reactions are subject to the same laws governing equilibrium as are other chemical reactions, and that the equilibrium of the unweathered rock is disturbed primarily by solution and removal of constituents by meteoric waters. Few would contest the first but the general application of the second discounts the important effects of organisms and organic matter.

The book adopts one over-simplified approach to a complex subject. This may be thought necessary in a book designed for students but the author does not always distinguish established facts from what is hypothesis and speculation. In some aspects the book is somewhat dated. No mention is made of topotactic alteration as a possible weathering mechanism and the approach to soils and soil formation is more than twenty years out-of-date. There are also some errors and misprints. For example the definitions of 'unit cell', 'basal spacing', 'activity', 'cation', 'anion', and 'solubility product' in the glossary are not really correct, and an error has been introduced in adapting the illustration of the structure of kaolinite from the first edition of *X-ray Identification and Crystal Structures of Clay Minerals*.

The book cannot therefore be commended as a textbook but specialists in the subject may find it useful particularly for the collection of weathering case-histories presented in Chapter V.

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