

summary of the most commonly useful statistical procedures. This is followed by a brief treatment of petrochemical calculations, including igneous and metamorphic norms and the interpretation of silicate mineral analyses. Statistical tables and tables for converting oxide weight percentages to gram-atoms $\times 10^4$ are appended.

Finally, A. Heydemann in Chapter 12 (pp. 376-412) provides 23 sets of tables of various kinds of use to the geochemist.

Each chapter has its own bibliography and the volume is completed by author and subject indices.

The first instalment of Volume II of this work, which will appear sporadically, begins the systematic compilation of geochemical data for most of the elements, arranged in order of increasing atomic number (see M.A., abstr. 70-90). A standard layout will make for reasonably homogeneous treatment, and it is this part of the work which will be most used and is most eagerly awaited by working geochemists. Few of the sections in this first instalment are complete and it is impossible yet to judge the effectiveness of the whole.

Of the elements dealt with so far, the sections on Be, C, O, As, Sn, Sb, Re, Pt metals, Bi, Th, and U are complete or virtually so; considerable gaps remain to be filled in the cases of B, V, Fe, and Ag. Each element will be treated systematically: crystal chemistry; natural isotopes; abundances; behaviour in magmatogenic processes, weathering and alteration of rocks; biogeochemistry; economic importance and so on. This second part of the work will eventually fill three or four loose-leaf binders, and when complete will certainly be a most valuable mine of information. The problem will be to keep it reasonably up to date.

The production of the whole work is of a high standard, clearly and attractively printed and set out. Perhaps not unexpectedly, certain chapters in Volume I carry clear evidence of having been translated from the German and are by no means free from minor errors and misprints. On the whole, however, the impression is of a carefully thought out and well-presented compendium. It is to be hoped that Volume II will be completed within a reasonable time, and that the work will receive from all interested in geochemistry the warm welcome it deserves, despite its very high price.

E. A. VINCENT

FRANTSESSON (E. V.). *The Petrology of the Kimberlites*. Trans. from the Russian by D. A. Brown. Canberra (Department of Geology, Australian National University), 1970. vi+194 pp., 69 figs. Price \$4.00.

After a five-and-a-half page introduction and a short geological description of the Siberian Platform kimberlitic and alkaline-ultrabasic volcanism a comprehensive account of the terminology and classification of kimberlitic rocks is given. This section deals with the complex problem of defining kimberlites when other alkaline-ultrabasic formations, plus carbonatites, are associated.

The petrography of kimberlite and eruptive breccias of porphyritic alkaline-ultrabasic rocks follows the classificatory schemes and in this section analyses of

inclusions occurring in kimberlite are presented for dunite, pyrope-lherzolite, pyropewebsterite, eclogites, and also for coexisting minerals from these rock types. Other inclusions, notably the mica-pyroxenites, glimmerites, together with phlogopite plus ilmenite, mica-apatite rocks, and picritic porphyries are also detailed. The chemical characteristics of kimberlites and eruptive breccias of porphyritic alkaline-ultrabasic rocks naturally follows the petrographic section.

Minerals occurring both in kimberlite and its numerous inclusions are discussed in a separate section and here details of their morphology, including intricately sculptured surface phenomena, optical properties, and chemical compositions are featured. Picroilmenites have been singled out for extensive study and apart from numerous chemical analyses thermoelectromotive force and magnetic susceptibility data are presented.

Recent phase equilibrium studies, in conjunction with petrographic observations, have been applied to kimberlite minerals endeavouring to ascertain *PT* conditions of formation. Consequently a number of subfacies are delineated, e.g. diamond, pyrope, perovskite subfacies, etc., and all are individually described.

The final two sections deal with the evolution of alkaline-ultrabasic magma during kimberlite formation and the position of kimberlites in the classification of igneous rocks.

Although the presentation closely simulates a typed text the numerous diagrams and photographs for this type of book are very clear. The translation is a very welcome contribution to kimberlite petrology by bringing information on Russian kimberlites to light, although the use of the term rhombic pyroxene and the lack of an index when a multitude of facts is presented are regrettable.

A. LIVINGSTONE

KENT (P. E.), SATTERTHWAIT (G. E.), and SPENCER (A. M.), editors. *Time and Place in Orogeny*. Geological Society of London, Spec. Publ. No. 3. viii + 311 pp., 106 figs., 7 pls., 1969. Price £7.50.

This volume is intended to form the introduction to a series dealing with the compilation and interpretation of factual data about the Tertiary and Mesozoic orogenic belts, as part of the 'Data for orogenic studies' project. Reviewers are notoriously hard men, carping where they neither sow nor reap, but this book can be received with enthusiastic praise despite its handicap of being a collection of papers originally presented at a symposium.

A detailed list of the fifteen papers has been listed in *Mineralogical Abstracts* (M.A. 70-2953) and need not be repeated.

Shackleton opens with some customary succinct and stimulating remarks. Falcon follows by describing the structural units of the Zagros Range, south-west Iran. He shows that even where a wealth of borehole information is available, prediction of the nature of deep structures is usually highly unreliable. As Rast points out, despite the immense volume of detailed work available on the geology of the British Isles, we still do not know what the structure of the Pre-Cambrian basement is. A fundamental