Functions. The book is well illustrated with examples of the determination of structures involving these techniques; quite a few have been worked out in Buerger's own laboratory, but as mentioned earlier all these examples depend for their solution either on the presence of heavy atoms or some known geometrical configuration of the components of the unit cell. There is a very useful list of references at the end of each chapter to published work in X-ray crystal structure determinations using these methods.

The book is singularly free of major errors. Nevertheless it has two main shortcomings. The first is that it is too bulky for a treatment of one particular aspect of crystal structure determination and the author could well have presented the same arguments in half the number of pages, thereby reducing the price of the book and so bringing it into the hands of more beginners, for whom he must have intended it. The second criticism is the author's failure to warn the beginner both of the limitation and of the difficulties of the interpretation of Patterson vector maps. A minor criticism is the insufficient mention of the increasing and important use of 'sharpened' Patterson Functions in the structure determination of complex compounds, as for instance vitamin B_{12}.

C. H. CARLISLE

BURRI (Conrad). *Petrochemische Berechnungsmethoden auf Äquivalenter Grundlage* (*Methoden von Paul Niggli*). Basel and Stuttgart (Birkhäuser Verlag), 1959, 334 pp., 66 text-figs. Price (bound) 38 Swiss fr.

The late Professor Paul Niggli introduced several methods for handling chemical analyses of rocks both to use them as a basis for classification and to calculate their actual or potential mineral composition. These methods are scattered through Niggli's many publications. The author here has collected them together and, by means of fully worked out examples, he explains the methods and illustrates their uses. No one is better qualified to do this than the author, who worked very closely with Niggli for many years at Zürich where he is Professor of Petrography.

An introduction reviews the various methods of graphical and diagrammatic presentation including triangular and tetrahedral diagrams. The first main chapter, 100 pages, deals with 'Niggli values' and their calculation from and to wt. %, cation %, and mol. (equivalent) %. The calculation of silica saturation (the 'quartz number'), norms and normative feldspars, and other values (*k*, *mg*, &c.) are explained. A projection of the *al-fm-c-alk* tetrahedra is used to depict eruptive fields,

and the system of 'magma-types' is explained and a full list of these is given.

The next chapter, 150 pages, deals with the 'Equivalent Norm' and the calculation of the 'Basis' components and the sequence in which they are to be calculated to arrive at the standard catanorm. The same three rock analyses as were used to illustrate the use of Niggli values are again used throughout this chapter.

The equivalent norm is perhaps the most useful of Professor Niggli's introductions to arithmetical petrography. The author here shows how variants of the standard catanorm can be readily calculated. This is particularly useful in the study of the metamorphic rocks by the calculation of the epinorm and mesonorms. Graphical methods of displaying the chemical and potential mineral compositions of analysed rocks using the Q-L-M and the Mg–Fe–Ca triangular diagrams are well illustrated by examples.

In a short, final chapter the author describes the calculation of wt. % of oxides to cation % as advocated and used by Barth and Eskola, and Barth's proposal for a standard 'cell' of 160 oxygens is discussed. The clearly printed tables at the end of the book enable both molecular and atom proportions for the principal rock-forming oxides to be read off rapidly, and another list gives the conventional formulae of the compounds used in the 'Basis' and 'Equivalent norm' calculations and of the equations which have been devised for their conversions.

W. C. S.

BROWN (G. M.) and NOCKOLDS (S. R.), managing editors. *Journal of Petrology*. Oxford University Press, 1960, vol. 1, no. 1.

This is a new journal, and the aim of the editors is to provide a place for the publication of original researches in the whole range of subjects which fall within a liberal definition of petrology. The subjects will include the physics and chemistry of rocks, their mineralogy and textures, and certain aspects of petrology involving the dating of rocks by natural radioactivity. Quantitative studies of rock-forming minerals, experimental physical chemistry relevant to petrology, and isotope geology will also be included, though regional studies will not be covered unless they lead to results fundamental to petrology as a science.

The journal is printed on a 10 by 7 in. page with a type area of 8 by 5 in. and is expected at first to run to 400-page volumes consisting of three numbers per year, published in February, June, and October.