Part 1 (44 pp.) contains two chapters of general information, mainly on immersion media, preparation of mounts, and staining procedures. Chapter 3 considers shape and optic orientation of minerals, followed by a brief Chapter 4 on elementary chemical aspects of isomorphism. Information on the *theory* of convergent light and the indicatrix is omitted and Chapter 5, which deals with immersion identification technique, illustrates very satisfactorily the relationship of the principal optic vibration directions (and hence R.I.) to various types of interference figure.

Part 2 contains the descriptions of minerals and is well illustrated with line drawings, photomicrographs, variation diagrams, and drawings of detrital grains. A coloured birefringence chart is also included in the book. The data on the various minerals is well presented, up to date, and there is generally more information on variations within mineral groups than in Kerr.

The problem facing the reviewer is whether this book represents (at its not inconsiderable price) any significant advance on existing texts. Perhaps the final criterion is the degree to which the reader is prepared to forgo the theoretical aspects of optical mineralogy for its practical application. T. W. BLOXAM

BRANCAZIO (P. J.) and CAMERON (A. G. W.), editors. *The origin and evolution of atmospheres and oceans.* New York (Wiley), 1964. xii+314 pp. Price: 94*s*.

This book contains the proceedings of a conference held at the Goddard Institute for Space Studies of the National Aeronautics and Space Administration in April, 1963. There are seventeen papers, some followed by discussions, which fall under the several general headings of: processes by which gases escape from the earth's interior to form terrestrial oceans and atmosphere; processes leading to alterations of the atmosphere such as chemical reaction with surface rocks, biological interactions and thermal escape; the gas content of meteorites and its significance in relation to the earth's history; and seven papers on the atmospheres of other planets. T. W. BLOXAM

CRAIG (G. Y.), editor. *The geology of Scotland.* Edinburgh (Oliver & Boyd), 1965. xv+556 pp. Price: 105*s*.

The book contains fifteen contributions by various authors on several major topics of Scottish geology: 1. The geological growth of Scotland (T. N. George); 2. Lewisian (J. Watson); 3. Torridonian and Moinian

(M. R. W. Johnson); 4. Dalradian (M. R. W. Johnson); 5. Lower Palaeozoic rocks—stratigraphy (E. K. Walton); 6. Lower Palaeozoic rocks—palaeogeography and structure (E. K. Walton); 7. Caledonian igneous activity (E. L. P. Mercy); 8. Old Red Sandstone (E. H. Francis); 9. Carboniferous (E. H. Francis); 10. Carboniferous-Permian igneous rocks (E. H. Francis); 11. Permian and Triassic (G. Y. Craig); 12. Jurassic, Cretaceous and Tertiary sediments (A. Hallam); 13. Tertiary igneous activity (F. H. Stewart); 14. Quarternary (J. B. Sissons); 15. Economic geology (P. McL. Duff).

It is a well-produced book and contains an abundance of photographic plates, including several air photographs, line drawings, and maps; all of excellent quality. A folded coloured geological map of Scotland on the scale 25 miles to one inch is included at the back of the book. It aims at providing a synthesis of the present state of knowledge of Scottish geology, including references to pertinent material published as recently as 1965.

Perhaps the only minor criticism concerns some of the sections on igneous activity, which tend to stress the petrography of the rocks but do not deal very fully with petrogenetic aspects. The present trend of opinion towards a mode of origin other than simple fractional crystallization for many of the Tertiary granites will be seen by some as at least a partial vindication of much abused earlier work on these rocks.

Geologists who have attempted to keep abreast of the extensive and frequently contradictory literature on Lewisian, Moine, Torridonian metamorphism, and the Dalradian, will find these sections particularly valuable, although specialists in these areas will have no difficulty in finding points of difference; the origin of F_2 folds in the Dalradian for instance. However, alternative views seem to be fairly stated (as they should be in any synthesis) and, comparing the price of the book with other geological texts, its cost is not unreasonable. T. W. Bloxam

Fitz Osborne (F.), editor. *Geochronology in Canada.* Royal Society of Canada Special Publication, No. 8. Toronto (University of Toronto Press), 1964. 156 pp. Price: 48*s*.

This volume consists of nine papers presented at a colloquium of the Geology Division of the Royal Society of Canada at the annual meeting in Quebec, June 1963. One group of papers deals with the validity and limitations of a variety of methods used for establishing the geological time-table, and with related problems of nomenclature. The titles of the papers are: The Geological Time-Scale (F. K. North); The Chronological