the whole of Nigeria within the Pan-African domain as shown by Clifford, and by Black and Girod (p. 186) is certainly open to further interpretation.

The point is that the Pan-African episode was based on isotopic age determinations largely without its relation to structure being known. Geochronology has provided data over the last decade from which a highly interesting and significant pattern has emerged—but only on a vast mega-tectonic scale. What we would like to see now is Dr. Clifford applying his encyclopaedic knowledge of African geology to the actual locations of the Pan-African mobile (i.e. metamorphic and structural) belts where these can be identified. It will then be possible to ask, taking as an example from this volume Bloomfield's admirable account of 'Orogenic and post-orogenic plutonism in Malawi', 'Which orogeny?' with reasonable expectation that the reply will not only be 'Pan-African'.

The volume is meticulously edited and well up to date. One may ask whether so many folding plates were required and did they not contribute to an unnecessarily high cost. Clear and adequate illustration is, however, one of the work's strong points.

J. V. HEPWORTH

READ (H. H.) [1889–1970]. *Rutley's Elements of Mineralogy*. London (Murby: Allen & Unwin), xii+560 pp., 151 figs., 1970. Price £3·50.

The last thorough revision of this well-known text was in 1936: in this 26th edition the main changes are the integration of the section on the atomic structure of silicates into the part dealing with mineral descriptions and the insertion of an elementary introduction to stereographic projection and its use in the description of crystal symmetry. As before, the classification used is a combined economic and chemical one, so that with the exception of the rock-forming silicates the grouping is not a structural one: thus rhodonite is dealt with between dialogite (rhodochrosite) and alabandite rather than adjacent to wollastonite. There is a distinct tendency to continue with the old mining names, e.g. nickel vitriol, though the modern nomenclature is normally also given: piemontite is rendered as piedmontite. This work remains a good text for applied geologists and will also find a place in introductory mineralogy courses. At a price of just over ½p per page it is remarkably good value.

R. A. H.