

BOOK REVIEWS

Cook's tour

Anderson, J. G. C. *Field Geology in the British Isles*. Pergamon, Oxford, 324 pp. Price: hardcover US\$35.00, £19.50; flexicover US\$16.00, £8.95.

This book's sub-title 'A Guide to Regional Excursions' more accurately describes its contents. After four pages of introduction and four pages of general information, there are 278 pages describing 194 geological itineraries in the British Isles. The itineraries are divided between six chapters, each based on a terrane, namely: Precambrian, Caledonian with metamorphism, Caledonian without metamorphism, Hercynian, Alpine and Tertiary Volcanoes. Each terrane is subdivided into convenient geographical/geological units, for example, the Welsh Block, the Lake District, the Southern Uplands, the Southern Uplands in Ireland, SE Ireland in the Caledonian non-metamorphic chapter. Each of these units has its own geological sketch map of variable quality, a brief introduction to the geology and is further broken down into Centres upon which a number of excursions are based. Detailed geological maps are provided for only some 25 of the 83 excursion centres; most of the excursion routes are shown on maps which are blank other than for occasional railways and selected names and topographical features.

Each excursion is discussed under the headings, "Access", "Maps", "Walking distances" and then follows a description of a day's itinerary in an average of 300 words. The final chapter (24 pages) describes the geology of some rail, road and ferry routes.

The aim of the book is to describe "as many facets as possible of British Geology" and clearly the author felt he should also give as wide a geographical coverage as possible. Thus itineraries range from Shetland to the Isle of Wight, from Connemara to East Anglia, though the Isle of Man and the Channel Islands are not represented. This, I feel, is the author's first mistake; it is impossible to usefully describe 194 itineraries in the given space. The itineraries, for the most part, are a hectic Cook's tour: thus at Start Point (p. 169) we are taken to just two groups of exposures described in six lines; on Anglesey (p. 111) we are told to "examine exposures of Carboniferous Limestone" and continue to Traeth Lligwy where "there are exposures of red sandstone". These exposures contain some fascinating palaeo-ecological and sedimentological features apart from their structural interest. Further on we are told to look out for the Wylfa Nuclear Power Station but not to look at the mélange on which it stands, surely one of the most dramatic rocks in Britain. In Connemara (p. 102) the one excursion in the Dalradian takes us to just two marble quarries and the boulder bed. On the Berwickshire coast (p. 138) our attention is not directed at all to the dramatic folds in the Silurian below, as we walk along the cliff top. Partly as a consequence of this lack of detail, the descriptions rarely develop any geological theme. In 100 well-chosen itineraries, the author could have usefully described some actual exposures which would have brought out the essential sedimentological, igneous, and structural features of a particular terrane. For instance, instead of briefly mentioning Dalradian rocks in some 15 different itineraries, three excursions from northwest to southeast across the SE Gramscians, with the sediments, volcanics and structures put into the context of one cross-section would have real teaching value. As it is, we have confusing references to folds with F and D numbers, to the Illay (?) Nappe and other major folds which are placed in no context at all. Even an excursion across the demonstrably downward-facing folds at Loch Lomond makes no reference to their structural significance.

Unfortunately, the author claims that "all important outcrops, contacts, structures and igneous intrusions are localised". Throughout the book I could not find one single reference to the National or Irish Grids, either in the text or on the maps. In very rare instances are road numbers used. Thus in Anglesey (p. 111) we are told to "drive or walk (from Holyhead) W. by S. to South Stack"; in Connemara (p. 102) we are told to walk N. (from a quarry) to the W. slopes of Lissoughter to find the boulder bed. For these and hundreds of other localities six (or preferably eight) figure grid references are essential; they would remove a lot of descriptive text and direct the reader to the precise locality.

The book is often out of date or mistaken in its information and references. The Newborough pillow lavas (p. 111) are described not only as part of the New Harbour Series but also as Precambrian; there is no mention of the context of Anglesey in North Wales geology, let alone the recent re-interpretation of the Mona Complex. Pebbles at Collieston (p. 74) are elongated in C and fold axial-surfaces are consistently referred to as axes. Thus at Dobb's Linn (p. 141) the anticline has "a N. 5°E axis which oscillates about the vertical so that strata are inverted in opposite directions in different places". Arkosic, low-grade metamorphic rocks are described as "granulites". The Silurian of the Berwickshire coast is ascribed to the Southern Belt of the Southern Uplands.

The reference lists could have been used to supplement the detail lacking in the text. But the many published papers and excellent excursion guides which do give precise details of localities are not mentioned. The only references to the Southern Uplands are to a 1932 paper on the Loch Doon granite and a totally incorrect one to the Regional Geology series of H.M.S.O.

I have looked at this book primarily from the point of view of the structural geologist. Moreover, I only felt justified in criticising excursions to areas that I know well myself. It is possible that the other sections (to the less deformed Hercynian and Alpine terranes) are more dynamic, accurate and better referenced. There is certainly a need for detailed excursion guides to many areas of the British Isles; even more useful would be a source-book to all the widely scattered guides and papers that do exist. This book, I regret, fills neither of these needs.

Jack Treagus

Global processes

Miyarshiro, A., Aki, K. & Şengör, A. M. C. 1982. *Orogeny*. John Wiley, New York, 242 pp. Price: softcover £8.40.

This book was originally published in Japanese in 1979 but now has been revised and translated into English. There are only five chapters in the book and each has been written solely by one of the authors. They do admit in the introduction that there were considerable differences of opinion on the problems covered by the book and that they have left some important problems untouched. They suggest that the subject matter is too wide and diversified for a small group of authors to cover comprehensively and this admission, of course, makes my job as reviewer doubly difficult. In the first chapter Şengör, a tectonic geologist, reviews the classic theories of orogenesis from pre-Christian times up to 1945. I have to admit that I found this chapter the most illuminating in the whole book. British geologists, by nature, are notoriously bad at foreign languages. Most of the early tectonic literature, with the exception of a few American workers, seems to have been mainly written by German-speaking authors and hence their views are probably not well known by most British geologists. Şengör succinctly covers the development of orogenic theories, the early arguments between mobilists and fixists and the brave attempts of authors like Argand to incorporate the movement of continents into orogenesis. Some surprising facts appear in the first chapter: Steno in 1669 was already trying to restore deformed rocks to their undeformed state; Sir John Herschel, an astronomer, incorporated isostasy into a model of a sedimentary basin 33 years before it formally re-appeared in the literature. At the end of this chapter the British reader is left wondering why Scotland and England, the home of Hutton and Smith, did not play a more important role in the development of tectonic ideas. Probably the Alps were such an important spur to the German speakers who were then drawn along the strike of that mountain belt towards Asia which influenced Suess so much. One is also left with a reminder of the elegance of Argand's Alpine sections which look so modern with a sole thrust beneath the external massifs and an imbricate thrust stack drawn within the massifs.