

extensive field studies it is not possible to say whether or not the apparent fruitlessness of Mr. Davies' statistical analysis is borne out by research in the field, but he does remark that he can find little support from field mapping of erosion surfaces in County Down and County Clare.

E. H. THORNTON.

UNIVERSITY OF DUBLIN,
TRINITY COLLEGE,
DUBLIN.

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REFERENCES

- DAVIES, G. L., 1958. Irish Erosion Surfaces—a Statistical Analysis. *Adv. Sci.*, 56, 385.
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PETROGRAPHY OF THE MESOZOIC SUCCESSION OF SOUTH WALES

SIR,—In his account of the petrography of the Mesozoic succession of South Wales, Dr. C. B. Crampton (*Geol. Mag.*, 1960, xcvi, 227) concludes that "derivation of material . . . was very local . . . Thus the mineral assemblage at any particular point in the littoral zone was determined largely by the nature of the outcropping rocks of the coastal mainland. This is particularly evident within the Rhaetic sandstones". The statement is based, in part, on evidence advanced to suggest that garnet appears only in the sandstones near contemporaneous shore-line outcrops of Old Red Sandstone and is contrary to some of my own findings (*Proc. Geol. Assoc.*, 1959, lxx, 158–178) which may not have been published in time for Dr. Crampton's prior consideration.

Among these findings is the recognition of two sandstones separated by black shales. The Lower Sandstone everywhere (even as far west as Pyle, several miles from any possible outcrop of Old Red Sandstone) contains garnet in such abundance as to be almost diagnostic whereas in the Upper Sandstone that mineral is scarce or even absent. The distribution of garnet thus varies with horizon rather than with shore-line outcrop as claimed by Dr. Crampton; indeed his garnet-free Sample 4 (Table I) must be presumed to belong to the Upper Sandstone since I have collected garnetiferous Lower Sandstone in the Cwrt Colman Railway Cutting, only 600 yards to the east of the quoted map reference. Although I have not examined by microscope any samples from Dr. Crampton's other three named localities it seems that the two without garnet (No. 5 and the one from St. Mary Hill) also belong to the Upper Sandstone since the Lower is overlapped thereabouts; the garnetiferous Specimen 3, on the other hand, is part of the How Mill-Herbert's outcrop which I have tentatively correlated with the Lower Sandstone (*op. cit.*, 168).

Nevertheless, there may be local concentrations of minerals as evinced by the titaniferous suite in Sample 4 and in my own record of a "flood" of apatite in the Upper Sandstone at Bridgend, but if the distribution of garnet is any guide, such concentrations could only be proved to be local by wide-spread sampling of specific horizons within the sandstone concerned. This is rarely possible because of the difficulty of identifying specific horizons. At almost every horizon within the Rhaetic sandstones, moreover, quantitative examination is complicated by the presence of yellow or colourless fossil phosphate which forms part (often a very large part) of the heavy fraction in bromoform separations and which occurs either as sub-angular to sub-rounded grains simulating detrital minerals or as recognizable fragments of fish tooth, scale or bone.

Finally, the Rhaetic sandstones have often been described as estuarine, and apart from the caution expressed by Strahan (1904, *The Country around Bridgend, Mem. Geol. Surv.*, 36) no evidence has yet been produced to the contrary or to support Dr. Crampton's claim of "little detritus being carried from inland regions by large rivers".

E. H. FRANCIS.

33 PALMERSTON PLACE,
EDINBURGH, 12.

SIR,—We write to deplore the misleading practice of describing as petrography mere accounts of the heavy mineral content of sedimentary rocks. For instance, Mr. C. B. Crampton's recent paper ("Petrography of the Mesozoic Succession of South Wales", *Geol. Mag.*, 1960, xcvii, 215–228) deals with the number-frequency of heavy minerals, but gives no petrographical details of the rocks in which they were found. The description of sedimentary rocks as *rocks* is surely a well-established branch of petrography and deserves better than to be confused with a tabulation of mineral species.

R. WALLS.
G. V. WOOD.

EXPLORATION DIVISION,
BP RESEARCH CENTRE,
CHERTSEY ROAD,
SUNBURY-ON-THAMES,
MIDDLESEX.

15th July, 1960.

REVIEWS

MINERALOGY—CONCEPTS, DESCRIPTIONS, DETERMINATIONS. By L. G. BERRY and BRIAN MASON. pp. xi + 612, numerous text-figs. and photographs. San Francisco: W. H. Freeman and Co. (London, W. H. Freeman and Co., Ltd.), 1959. Price 56s.

Part 1 (Concepts) contains 275 pages distributed in the following chapters: Introduction, 11; Crystallography (i.e. Crystal Geometry and Symmetry), 138; Chemistry of Minerals, 34; Physics of Minerals (i.e. Notes on Simple Physical Properties), 25; Genesis of Minerals, 41; Determinative Mineralogy, 20; Systematics of Mineralogy, 5. The subject of the optical properties of crystals is specifically excluded.

Part 2 (Descriptions) contains 287 pages in which some minerals are described in a simple chemical classification, with structural sub-divisions for the silicates. The data given are: formula, crystal system, and class; axial elements; cell dimensions; common forms and angles; followed by the usual tests on hand specimens, with notes on diagnostic features, chemistry, occurrence and uses. For the silicates the general structural relations are given, and there are notes on the simpler structures of other minerals.

Part 3 (Determinative Tables) contains 29 pages in which minerals are listed by observations on hand specimens, along with simple physical and chemical tests. The determination of minerals by their optical properties is regarded as outside the scope of the book.

In a text-book there are three factors: first the subjects chosen (and those omitted), second the manner in which the topics are discussed, and third the general balance of the book. The omission of the optical properties of the transparent minerals is surprising in a text-book of this quality, but the presentation of the material is excellent. In chapter 2 the approach is through the lattice concept, while the stereogram and the international symbols of crystal classes are used. This chapter demonstrates that, properly done, the modern treatment simplifies the whole teaching of the symmetry and geometry of crystals. Likewise, in the chemical chapters the modern approach is very