

CORRESPONDENCE

ERRATIC BOULDERS WITHIN THE FREMINGTON CLAY OF NORTH DEVON

SIR,—Erratics associated with the Fremington Clay of North Devon have been described by Maw (1864), Dewey (1910), Taylor (1956, 1958), Vachell (1963), and others. The object of this letter is to put on record what I have learnt locally concerning the stratigraphical position at which some of these erratics were excavated. I wish to express my gratitude for this information, and for all their help, to Mr. A. Hobbs, Mr. W. Prust and the late Mr. C. Green, and also to the late Mr. C. W. Taylor.

The Fremington Clay (Maw, 1864) occupies part of a valley west of Barnstaple and opening into the Taw estuary at Fremington Pill; it is generally considered to be of glacial origin, although Balchin (1952) suggested that it was an alluvial infilling of reworked Keuper Marl. Zeuner (1959) believed that it was the bottom-moraine of an ice-sheet which approached Barnstaple Bay from the Irish Sea, so that its existence is the only evidence at present known of an ice-sheet having actually penetrated inland on the south shore of the Bristol Channel. Near Fremington, the Culm Measures are overlain by a bed of gravel above which is clay with stones, and then comes the smooth brown potting clay of variable thickness, up to 21 feet being found in the present pits at Bickington. Above the smooth clay are about 2 feet or more of clay known as "horseflesh", with small stones and grit and decayed wood; and finally at the surface there is a layer of gravel ranging from a few feet up to 16 feet or more in thickness, from which erratics have also been recorded.

At Combrew Farm (SS(21)524323) near Fremington, the boulder described by Dewey (1910) as a vesicular granophyre and catalogued by Taylor (1956) as erratic No. 6, appears to be the same boulder which Maw (1864) recorded as having been found in isolation in the middle of the clay-bed at Combrew. At Chilcotts Farm (523323), the erratic No. 7 of Taylor (1956), on the gatepost to the right as one faces the house, is evidently the hypersthene-andesite discussed by Dewey (1910), although he described it as having been placed on the garden-wall of Combrew Farm house. Mr. A. Hobbs, of Chilcotts Farm, has told me that this boulder was found by his grandfather about the year 1870, in the clay near by, some 22 feet below the surface of the ground.

I am indebted to Messrs. C. H. Brannam, Ltd., of Barnstaple, for permission to study their pits (SS(21)531318) in Tews Lane at Bickington near Fremington. The late Mr. C. Green, who had worked there since 1920, showed me in 1948 a quartz-dolerite boulder (No. 9 of Taylor, 1956), which he had found many years before in the very middle of the brown clay. In 1957, the present foreman, Mr. W. Prust, showed me a smooth rounded boulder, some 19 inches long, which he had excavated 10 feet below the upper surface of the clay, and in 1957 he found another boulder 16 feet below the upper surface of the clay. Neither of these boulders has hitherto been recorded, nor have they (so far as I know) been identified. In 1962, Mr. Prust excavated another quartz-dolerite erratic, No. 13 of Taylor (Vachell, 1963), about 10 feet from the top of the clay. Since 1956, Mr. Prust has also collected over fifty miscellaneous small pebbles, the majority of which were found at or near the base or the top of the clay; a number, however, were embedded in the clay itself at depths ranging from approximately 5 feet to 11 feet above the base of the clay. Two pebbles found in 1955 about 2 or 3 feet above the base of the clay were described by Taylor (1956) who identified one as an olivine-dolerite.

There is thus first-hand evidence that erratics are actually included in the heart of the Fremington Clay itself. This supports the theory of its glacial origin.

REFERENCES

- BALCHIN, W. G. V., 1952. The Erosion Surfaces of Exmoor and Adjacent Areas. *Geogr. J.*, **118**, 453-476.
- DEWEY, H., 1910. Notes on some Igneous Rocks from North Devon. *Proc. Geol. Ass., Lond.*, **21**, 429-434.
- MAW, G., 1864. On a Supposed Deposit of Boulder-Clay in North Devon. *Quart. J. geol. Soc. Lond.*, **20**, 445-451.
- TAYLOR, C. W., 1956. Erratics of the Saunton and Fremington Areas. *Rep. Devon. Ass. Adv. Sci.*, **88**, 52-64.
- 1958. Some Supplementary Notes on Saunton Erratics. *Ibid.*, **90**, 187-191.
- VACHELL, E. T., 1963. 5th Report on Geology. *Rep. Devon. Ass. Adv. Sci.*, **95**, 100-7.
- ZEUNER, F. E., 1959. *The Pleistocene Period*. London.

MURIEL A. ARBER.

18 SHERLOCK CLOSE,
CAMBRIDGE.
8th March, 1964.

NEW LIGHT ON THE DAWROS PERIDOTITE

SIR.—Dr. Leake in a recent paper (*Geol. Mag.*, **101**, 63-75) presents some new ideas on the peridotite intrusion at Dawros in Connemara (Ingold, 1937; Rothstein, 1957).

Evidence is given by Dr. Leake for a transition from the non-feldspathic ultramafic rocks to the gabbro found associated with the intrusion; and new points are raised on the possible folded character of the main body of the peridotite.

In 1957 I drew attention to what I considered to be the intrusive character of the junction between the peridotites and the gabbro. In my thesis (1954), also referred to by Dr. Leake, some details of this boundary were given, including its abrupt nature and the absence of plagioclase in the immediately adjacent peridotites. Also described in the thesis was the presence of plagioclase in the gabbro. If evidence for a transition between these two groups of rocks has been found then this adds to the interest of the Dawros intrusion. However, I am not convinced that the peridotite layer in the gabbro as shown by Leake (1964, Plate II, fig. 2) is a true layer of primary igneous accumulation. It may be a raft from the layered ultramafic caught up in the gabbro. Until this point is decided the significance of the mineral assemblages in it must remain indeterminate. Likewise, how does the petrography of this "layer" compare with that of the rare rocks, within the peridotite itself, newly recorded by Leake (1964, p. 65) as containing feldspar? The statement concerning the mineral assemblages present requires further petrographic details.

The detailed study I undertook of the phase petrology of the non-feldspathic ultramafic rocks of the Dawros intrusion was developed by means of a comparison with that of the feldspathic peridotites of the Belhelvie intrusion in Aberdeenshire (Stewart, 1947), and by taking into account a variety of published experimental and theoretical data (given in full in the bibliography of Rothstein, 1962a). This study brought to notice a number of interesting points (Rothstein, 1961a, 1961b, 1962a, 1963). Some of these include the relations between spinel and plagioclase. A variety of possibilities were shown to exist including some of those now put forward by Leake (1964, p. 73, *et seq.*), for example, the role of Cr₂O₃. It is not possible, however, to choose between these different possibilities on the basis of the amount of new evidence published so far. More curious in my opinion, from the point of view of the phase petrology of the Dawros intrusion, is the status of the hypersthene-bearing pyroxenites with their highly aluminous pyroxenes