

lateral extension of the Permian. Associated with the breccias are other proofs of thrusting: (1) thrust or shear-planes; (2) disturbed and displaced masses of Lower Limestone; (3) intruded breccias; (4) slickensided and grooved, horizontal and vertical surfaces; (5) cleavage; (6) folding, both on a local and on a general scale; (7) buckling, thickening, and squeezing-out of beds; (8) phacoidal and other structures; and (9) fissuring. The main thrust at Marsden appears to have acted from a few degrees south of east to a few degrees north of west; there are, however, distinct evidences of movement from other directions in different parts of the district. Experiments made on the compressive strength of the rocks affected by the thrust at Marsden indicate that the thrusting reached a maximum of about 300 tons per square foot. Observations made by Mr. S. R. Haselhurst, M.Sc., in the Cullercoats area seem to prove that the thrusting occurred later than the post-Permian movement of the Ninety Fathom Dyke—some faulting in the area is, however, later than the thrusting—and it appears evident that the shattering of the strata was produced prior to the Pre-Glacial era of denudation. It may have been connected with the Miocene movements that produced such marked changes in the physiography of Britain.

CORRESPONDENCE.

THE LIMESTONE FRAGMENTS IN THE AGGLOMERATE OF THE "ROCK AND SPINDLE" VOLCANIC VENT, ST. ANDREWS, FIFE.

SIR,—Since the publication of my note under the above-named title (see *GEOL. MAG.*, May, p. 201) I have to record the further observation of a very remarkable fact. During a recent visit to the "Rock and Spindle" my friend Mr. R. M. Craig, M.A., B.Sc., of the Geological Department, St. Andrews University, and myself found that certain large masses of rock which stand almost vertically in the seaward extension of the agglomerate, and which we had long been accustomed to regard as consisting merely of hardened sandstone—they weather curiously like some of the siliceous sandstones along the shore—were in reality portions of a seam of limestone which must have measured at least 12 feet in thickness. These contain very large crinoid stems, isolated cup corals, polyzoa, etc., and look exactly as if they belonged to some of the beds at the base of the Carboniferous Limestones as exposed on the coast at Pittenweem. Certainly they can scarcely have come from the Calciferous Sandstones, and would accordingly appear to afford the strongest confirmation of the above opinion based almost solely on the palæontology of the fragments at the upper part of the beach.

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DREIKANTER.

SIR,—The reviewer to whom Mr. Grabham objects (*GEOL. MAG.*, May, 1911, p. 239) seems in his review (*GEOL. MAG.*, Feb., p. 85) to describe the words 'dreikanter', 'zeugen', etc., as 'technical terms'.