

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.

DAVID BALSILLIE.

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'.

They are certainly not more technical, and I should have thought even less technical, than the phrases 'facetted pebbles' and 'tabular outliers' which he prefers. They don't mean the same thing, it is true; but supposing they did, the objection to them seems to me that they are German and not English. In so far, I agree with your reviewer rather than with Mr. Grabham. One should distinguish very carefully between the using of foreign words out of laziness or because one is ignorant of one's own language, and the use of a correct technical term. A technical term, to be worthy of the name, should be clearly defined, and should be capable of use in all languages with equal convenience. For this reason it is generally preferable to form technical terms out of Greek or Latin words.

The word 'Dreikante' is not a good technical term. It does not mean a wind-worn pebble, but a tripyramidal or triquetral pebble, and the wind-worn pebbles that have this shape are in a minority. In the second place, being German and not English, it presents peculiar difficulties. Mr. Grabham himself writes of 'a dreikanter', when he means a Dreikante (though it is not clear that he would exclude Einkanter, Zweikanter, Vierkanter, u.s.w.), while the last gentleman who wrote on them in your pages persistently spoke of 'Dreikañte' when he meant 'Dreikanter'. German is an excellent language—for Germans; but when I am writing for Englishmen, I prefer to write in English, rather than to risk errors in a foreign tongue.

F. A. BATHER.

May 2, 1911.

THE LAND-ICE QUESTION.

SIR,—Though I ought to leave Mr. Deeley to reply for himself, is not the difficulty raised by the Rev. O. Fisher in the Magazine for May, p. 238, removed when we regard the so-called ground-moraine of Boulder-clay as consisting originally of intraglacial material, moved forward at various levels within and with the body of the ice? This is the view forced upon one by the examination of Arctic glaciers, as Garwood and Gregory and others have pointed out. Even in India, as T. D. La Touche shows, some glaciers consist largely of stones. A composite mass of this kind may do a large amount of damage to its floor. The conception of the formation of Boulder-clay as an independent entity under ice is probably not commonly held at the present time by glacialists.

GRENVILLE A. J. COLE.

GEOLOGICAL SURVEY OF IRELAND, DUBLIN.

May 10, 1911.

OBITUARY.

ÉDOUARD FRANÇOIS DUPONT.

BORN JANUARY 31, 1841.

DIED MARCH 31, 1911.

We regret to record the death at Cannes, at the age of 70, of É. Dupont, the Honorary Director of the Royal Museum of Natural History at Brussels. The results of his early geological studies on the Carboniferous Limestone of Belgium and on the fossil Cephalopods date from 1859, and he subsequently published observations on the Devonian.