

and there in the valley bottoms. The chief centre of activity probably lay west of the centre of the island.

Petrographical details of the andesites and anamesites, descriptions of groundmass and included minerals of each, and chemical analyses are given. As regards the age of the constituents, the Author arranges them in the following order, commencing with the oldest:—magnetite, olivine, augite, mica, felspar, nepheline.

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### CORRESPONDENCE.

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#### THE ST. BEES SANDSTONE.

SIR,—In the short notice in the last number of the *GEOLOGICAL MAGAZINE*, of Mr. Goodchild's paper on the above, read before the British Association at Edinburgh, I read that he considers the St. Bees Sandstone equivalent to the Bunter. I entirely disagree with him in this view. It is well known to those who are conversant with the Bunter Sandstone formation that it consists of the Upper Soft Red and Mottled Sandstone. The Pebble and Conglomerate beds and the Lower Soft Red and Mottled Sandstone, only the two lower divisions occurring in the North of England. These are well marked divisions, with beds totally unlike the St. Bees Sandstone.

I believe it to be much more probable that the St. Bees Sandstone is a large development of the Red Marls, Sandstones, and Gypsum beds that lie between the Upper and Lower Magnesian Limestone in Nottinghamshire and Yorkshire, and known as the "Permian Middle Marls and Sandstones." There is a break between these Sandstones and Marls and the Lower Magnesian Limestone quite as large as between the St. Bees Sandstone and the Magnesian Limestone and Penrith Sandstone. But breaks between two formations are often only local, caused by thinning away of beds, and there is really no great unconformity between the Bunter Sandstone and the Magnesian Limestone series (now called Permian) of Yorkshire, and I should not be surprised that in some locality it was found that the one passed up into the other. I will not quarrel with Mr. Goodchild for calling these lower formations "Lower New Red Sandstone" (the old term) though I do not like it, for in Yorkshire these beds are chiefly limestone, but I must protest against the St. Bees Sandstone being called Bunter, a formation, I consider, on a higher horizon.

W. TALBOT AVELINE.

OATLANDS, WRINGTON, SOMERSET,  
*December 5th, 1892.*

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#### ON THE SUPPOSED CONFLICT BETWEEN GEOLOGY AND PHYSICS.

SIR,—The late Dr. James Croll, while contending that there was ample proof from geology that conditions suitable for life on the Earth must have existed "far more than twice 20 millions of years ago"<sup>1</sup> (the narrow time limit of 20 million years only being supported by some physicists):—nevertheless Dr. Croll could not solve the following difficulty.

<sup>1</sup> Dr. Croll's paper in the *Quarterly Journal of Science*, July, 1877, p. 317.