

These facts and comparative thicknesses are the basis of an argument as to the local distribution of land and water in Carboniferous times; and it is shown that the peculiar change in type which Carboniferous rocks undergo in passing from north to south is due entirely to physiographical conditions, and not to any theoretical assumption of contemporaneous faulting. It is shown, moreover, that the Craven Faults *per se* have had nothing to do with this change of type. The correlation of the limestone knolls of Craven with the Pendleside Limestone is demonstrated to be no longer tenable.

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### CORRESPONDENCE.

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#### MR. A. R. HUNT ON THE AGE OF THE EARTH AND THE SODIUM OF THE SEA.

SIR,—In the volume of this Magazine for 1900 I reviewed Professor Joly's theory, that the age of the earth can be calculated by comparing the amount of sodium now in the sea with the time rate at which rivers are at present conveying sodium down. Among other matters I suggested that the salinity of rivers might be partly due to sodium derived from *sedimentary* rocks, which had formerly come from the sea. This would of course lengthen the computed age of the earth.

Mr. Hunt now suggests that "sea-water reached the heated rocks," and he appears to consider that much of the sodium, which the Dartmoor granites (at any rate) contain, was derived from the sea.

This is turning Professor Joly's theory round about. Professor Joly derives the salts of the sea from the igneous rocks. Mr. Hunt derives the salts of the igneous rocks from the sea.

My object in this letter is to direct attention to the difficulty of explaining the undoubted abundance of water, which is extravasated by volcanoes, to absorption from the ocean or from any other external source. I have gone into my objections to this view (whatever they may be worth) in my "Physics of the Earth's Crust" (2nd ed., p. 144), where I have, in a note, given an account of Daubrée's experiment, to which Mr. Hunt refers.

Since, alas! my two friends have passed away, it may be permissible to say, that I was on a visit to my dear friend Professor Prestwich shortly after he had published his paper on "The Agency of Water in Volcanic Eruptions," and Professor John Morris was my fellow-guest. We two were talking about Prestwich's theory that the volcanic water was derived *ab extra*, and that water could enter into combination with molten rock. Morris said, "Water would not be so foolish!" This was not a very scientific reason, but it was putting his own idea pretty strongly. He also told me that he had tried to dissuade Prestwich from publishing his views of volcanic energy, but without success.

My own opinion is that water has been a constituent of the liquid

interior of the earth from the very first, and that it simply makes its escape at a tremendous pressure whenever a way is opened for it through the solid crust.

O. FISHER.

HARLTON.

March 5, 1901.

#### NAMES FOR BRITISH ICE-SHEETS.

SIR,—May I suggest to Mr. Lamplugh that to propose names for British Ice-sheets before proving that they have existed is rather like counting chickens before they are hatched. At present we know neither the ancient extent of land-ice in our Island, nor in all cases what are indisputable traces of it. Where faith is strong this, no doubt, seems a detail, but to sceptics it appears important.

If, however, we admit that there was an East British Ice-sheet, “maintained and augmented principally by the snowfall upon its own surface,” how are we to explain the presence of Scandinavian rocks at Cromer and other places on our East Coast? Of that ice-sheet the Dogger Bank would be centre and highest part. This tract is crossed (a little north of its centre) by a line drawn from Flamborough Head to the Naze of Norway. Over an area measuring about 70 miles from east to west, and 12 miles in the opposite direction, it rises above the ten-fathom contour-line (the minimum depth being 7 fathoms). The twenty-fathom line is very near to the other one at the south-west end, but then recedes from it so as to enclose a long bank which stretches in a north-easterly direction, almost half-way across the North Sea, and the thirty-fathom line on the northern side extends from the Yorkshire coast to Jutland. North and north-west of this limit are soundings down to 49 fathoms, and those over 40 fathoms are rather common. In the great channel off the south-west of Norway they are often over 200 fathoms (for particulars see this Magazine, 1899, p. 282). Thus the ice of the Dogger-fjeld (would not that have been a better name?) must have descended from its central plateau down slopes about 250 feet in vertical height on the north and north-west, and about half that amount down those from the south-west to the south-east. This mass of ice flowing outwards towards nearly all points of the compass, and buttressed on the western side by the Caledonian ice, which it would try to ‘shoulder’ in that direction, would surely defend our shores from the inroads of the Scandinavian ice-sheet, however nimbly it might climb the steep slope of the above-mentioned channel. Is it, then, a mistake to identify Scandinavian rocks in East Anglia; for if the Dogger-fjeld existed they could not have travelled on floating ice?

T. G. BONNEY.

#### CONCRETIONS OF CALCITE IN MAGNESIAN LIMESTONE.

SIR,—The well-known globular concretions from the Magnesian Limestone of Durham occur in many collections under the name of ‘dolomite’ or ‘magnesian limestone.’ Professor Garwood, however, effectually showed (GEOLOGICAL MAGAZINE, 1891, p. 436) that these concretions are due to the crystallization of calcite in a ground of