

that the Drift-beds are exposed in the railway-cutting at Fremington Station, and at Baggy Point, where he had found a great many flint weapons. He next discussed the origin of the Pebble-ridge of Northam Burrows, which is a line of pebbles extending far along the coast and serving as a natural breakwater; he suggested several theories to account for it, and stated his opinion that the source was the bed of the sea, not far off the granite of Lundy Island, and that it was not a work of the past only, for fresh material was still being added to the ridge. The writer concluded by pointing out the vast degradation that was taking place on the north-eastern side of the Burrows, where there is no barrier to protect the cliffs, and said that within the last few years many acres of land had been destroyed.

CORRESPONDENCE.

FROST AND SEA *V.* RAIN AND RIVERS.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—Some observers would have us believe “that Rain and Rivers have been the principal agents in forming the present features of the land,” while to me it would appear that they did the least part of the work, if we are to judge by what we see going on at the present day.

Rain, *by itself*, appears to be a *Preserver*, not a *Destroyer*, for if we go up on an uncultivated mountain, we find that rain has covered it with a mantle of Peat, and to that it can only add, unless other agencies come into force. This is well exemplified where a hill-side has been cultivated. Man, while he cultivated it, acted as the destroyer, and Rain only as a *carrier* to take away part of the soil that man had rooted up. If man ceases to cultivate that mountain side, Rain causes plants to grow, then to become *Reisk*, and eventually *Bog*, which latter, as long as only Rain acts on it, continues to increase in thickness. Rain must have some foreign help to commit destruction. Let the hot summer sun open cracks in that bog, or cattle form deep tracks, or man cut trenches in it, and what are the results? Rain continues the work that a foreign agent has begun; but even then it cannot do much work unless *Frost* comes to its aid, to expand the water that fills the cracks and small fissures, and breaks off large and small pieces, which falling into the hands of its *carrier*, Rain, are washed down off the mountain.

It is the same with rocks. Examine a mountain formed of hard compact rock, that rain has run over for ages, and you will find that the Glacial striæ are scarcely obliterated, because the sun and frost could not act on it. On the other hand, examine a mountain composed of jointed or cleaved rock, and what are the results? The summer sun opens the minute fissures, the winter frosts expand the moisture in them, and then, and *not till then*, rain has work to do in carrying away the *débris*.

Look at a river-cliff, formed of drift; what destruction does a flood do to it? A mere bagatelle, unless there has been a frost previously, and then tons of *débris* fall, to be carried away by the river.

The work done by Rain and Rivers is perceptible in centuries, while the work done by Frost in this country (not to go to its large work-shop in the North) is perceptible after every winter.

The Sea acts in a similar manner. Its years' work is clearly seen—aye, even the work of a single tide. We know that Rain has done very little work in this country since the Glacial period, as the rocks forming the bottom of all the large valleys and *Cooms*, and of most *Ailles* or ravines, are Ice-dressed, and yet we are to believe that Rain has cut out those valleys instead of ice! while ice is doing exactly similar work farther North at the present day.

The same way with the sea. If we examine the work done by the sea we find that it cuts away soft or homogeneous rocks, such as shales or limestones, while hard rocks, such as traps and grits, it leaves standing as *Carrigs*, *Carrigeens*, or *Illawns*; and if we go inland we find hummocks, *Carricks*, or crags and hillocks formed of bosses of trap or some other hard kind of rock protruding out from mountain sides or standing up in undulating plains; the surrounding country in every case being of a much softer rock; and yet we are to believe that the mountain slopes and the undulating plains were formed by Rain and Rivers, and not by marine denudation.

I do not mean to say that Rain and Rivers have not done some work, but what I do say is that they are only some of the minor workers—that they do a little work on their own account—but that their place in nature is that of “Carriers” to remove the *débris* which other agents (principally the Sun and Frost) have formed.

Yours truly,

G. HENRY KINAHAN.

OUGHTERARD, IRELAND, Dec. 2nd, 1865.

A BURNING COAL-SEAM.

A CORRESPONDENT, “R. N.,” states that “at Bradley, a small village near Bilston in Staffordshire, a Coal-bed has been burning for half a century,” and enquires if this be true, and “whether there are no other means, except ‘flooding the pit,’ to extinguish the fire and arrest the useless destruction of valuable fuel.”

On referring to A. K. Johnston’s Dictionary of Geography (London, 1853) we find a statement to the same effect. We shall be glad if any correspondent will inform us whether the seam be still burning, and what is the depth of the mine.

We recorded (GEOLOGICAL MAGAZINE, vol. ii. p. 336) an instance of an outcrop of Coal of Miocene Tertiary age on the Mackenzie River, noticed on fire, as long ago as 1785, by Sir Alexander Mackenzie, and again by Sir John Richardson, in 1849; but we did not think that such destruction was allowed to take place in England, and cannot suppose it to be irremediable.—EDIT.