

part of England, perhaps some of the authors of these communications may feel inclined to refer to the observations I have recorded; and I only regret that all my spare copies have long since been used up.

GEOLOGICAL SURVEY OFFICE, DUBLIN,
16th February, 1871.

EDWARD HULL.

GLACIATION OF THE LAKE-DISTRICT.

SIR,—Allow me to make a few more remarks on the question of the glaciation of these dales—I think they will be my last.

Let not Mr. Mackintosh suppose that Mr. Rutley and I have combined to make out a case of “The Queen *v.* Mackintosh.” I differ from them both. A friend of mine, accustomed to the aiguilles and horns of the Alps, remarked that our hills looked like great heaps of rubbish shot out of a cart; and “a distinguished personage” once said to me with characteristic vehemence—“The whole of Cumberland is one vast *roche moutonnée*.”

Is not this the result we should expect from a thick sheet of ice moving across the whole country, leaving its marks in boulders and glaciated rocks near the Tarns of Busco at a height of 2,300 feet, in scratches across the water-shed between Grasmere and Loughrigg Tarn, in boulders on Silver How, in scratches across the water-sheds of Kentmere and Long Sleddale, and finally, as Mr. Croll suggests, in the erratics of Stainmoor?

If, as the climate grew warmer, this sheet of ice shrank into glaciers of the Alpine type, should we not then have such scratchings and roundings as we find in the bottoms and along the sides of the dales?

These scratches in the valleys would then be more recent than those across the water-sheds.

I do not understand how the want of parallelism in some of the scratches is any bar to our supposing them to be the product of land-ice. When two ice-currents meet, the stronger will deflect the course of the weaker; and if its strength vary ever so little, according to the season, so also will the direction of the scratches.

Let not Mr. Mackintosh say:

“Proveniebant oratores novi, stulti adolescentuli.”

I speak only of what I have seen in the last three years in the valleys reaching from Little Langdale to Long Sleddale, and in the Green Slate area. The rest of his paper I leave to those who know the country he treats of.

GEOLOGICAL SURVEY, GRASMERE,
16th February, 1861.

GEO. HYDE WOLLASTON.

THE SUPPOSED THERMAL SPRINGS IN CAMBRIDGESHIRE.

SIR,—The explanation which the Rev. O. Fisher suggests as to the cause of the heated water in the fen wells, to which I called attention at Liverpool, is that which, when I first heard of the circumstance, occurred to my own mind.

I am quite disposed to accept it, if it can be made to square with the facts, as I confess I am unable satisfactorily to explain the

matter, but it did not seem to me at the time to do so, nor does it now, for the following reasons:—

Well No. 1 appears to have been sunk through 5 or 6 feet of peat, then $1\frac{1}{2}$ foot of clay; the water coming from a seam of sand beneath the clay; the heat of the water being 69° on March 14th last, while that of the air was 39° .

At the adjoining farmyard, half a mile distant, Well No. 2 is supplied from the surface water, and this showed on my visit no such abnormal temperature; but at the next farm, half a mile beyond, where Well No. 3 pierces the clay, I found again the water to be heated.

If the heat were caused by the decomposition of manure (or of the peat), one would suppose that the water nearest the surface would show the highest temperature—the contrary being the case.

At another farmyard, Well No. 4 shows water of only about 50° Far., but I was informed by the proprietor that a short time since an Abyssinian tube-well was put down temporarily, and at a few feet greater depth it brought up heated water.

Well No. 5, the water from which I found to be of $71\frac{1}{2}^{\circ}$ of temperature on March 14th, and $79\frac{3}{4}^{\circ}$ on June 2nd, that of the air being at the same time 39° and 70° respectively, is sunk through gravel, and the water from it is so pure that it is used for drinking purposes.

Beside this, I am informed that the phenomenon has been observed continuously for years, not only in winter, when the yards are full of stock, but in summer, when they are unoccupied.

Several samples of water have been analyzed by Mr. Francis Sutton, F.C.S., and he can find nothing whatever to support the hypothesis that the heat results from chemical decomposition.

I feel with Mr. Fisher the difficulties of any other than a chemical explanation, but I have called attention to the phenomenon because I think there is a *prima facie* case for further investigation.

HIGHAM GROVE, NORWICH,
February 15th, 1871.

F. W. HARMER.

MISCELLANEOUS.

STUDENT'S ELEMENTS OF GEOLOGY. By SIR CHARLES LYELL, Bart., F.R.S., 8vo. pp. 624. 1871. (London: John Murray.)

It may be of use to the readers of this work to learn that owing to a "shift in printing," which happened during the production of the copies first issued, certain passages in pages 452 to 454, are rendered difficult of comprehension. The bottom line of p. 452 should be at the top of p. 451; the bottom line of p. 453 at the top of p. 452; the top line of p. 454 at the top of p. 453. This error is corrected in the later copies, and those who possess the faulty volume can obtain the four pages properly corrected on application to Mr. Murray, 50, Albemarle-street. They can also procure at the same time a short list of errata, which have been lately printed, and in which the most important correction is the substitution of the word "magnesia" for that of "lime" in the last line but one of p. 485.