

and now my friend consents to have them figured and described by our best authorities. So I must invite geologists, if not Mr. Pengelly himself, to find for us what shells, corals, etc., occur *with* these actual specimens. They do indeed *appear* to lie in the lowest beds; but there is the possibility; I have above hinted at, of the Upper beds overlapping unconformably round the south coast, where hitherto we have not known them. Near Teignmouth, indeed, we have the Upper Devonian beds; and my note-book tells me there is a fault (one out of many in this district) between the Meadsfoot sandstones with Lower Devonian shells, and the pile of grey rocks which hold this fish-scale; and unconformity and faults will do *anything* but mix the fossils in the bed itself, especially in S. Devon.

But Looe Island with the fish, is not Looe with its Lower Devonian shells; and Meadsfoot fish-bed has not *yet* been proved to be the same beds as those which hold the trilobites and shells. Here is work for the local geologist; and as asking about the fish has produced so much, I hope asking about the geology will do more. We want now to know what are the exact relations of the beds which hold these fish: for fish they are—the only ones (the N. Devon one was a mistake) known in British Devonian rocks.—J. W. S.

BALA AND HIRNANT LIMESTONE.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—There is a point of much interest to be worked out in North Wales: viz., the exact relation and age of the upper or Hirnant limestone of Bala.

Some of the fossils in this remarkable band are known. It is the only example (so far as I know), in rocks below the Wenlock limestone, of a pisolitic structure; very marked in the neighbourhood of Bala. But beyond Bala, etc., it is not at present known.

I beg to suggest an excellent piece of work for one of the Clubs this year (unless Mr. Davies, of Oswestry, means to do it single handed). It is to work out *thoroughly* the geology of one mountain, close to Llangollen, and therefore easily accessible. If they would examine Mynydd-Fron-Frys, which is not a lofty one, and has good roads all round, it will be much better service than making what is called a section or a traverse. There are two beds of limestone there:—the Bala limestone, and an upper one, probably, the "Hirnant" limestone; and from this locality some of the very rarest of our Bala fossils have been obtained.

There is a huge *Loxonema* there, six or seven inches long; a fine *Lituites*, viz., *L. anguiformis*,—the only specimen known in Britain, yet, is that in the Woodwardian Museum. Then, again, there is a species, probably new, of *Bumastus* to be found; and such a crowd of Corals, *Bryozoa*, and other choice things, that it is like working in a museum; I had but two hours for it all.

Now what we want to know is the exact contents of each of these bands of limestone; for one is probably very different from the other. And if the above rare fossils are from quarries in the upper

bed, no wonder we do not know them elsewhere in the great Bala (or Caradoc) series. Besides that, in all probability, the north end of the hill is made up of the Llandovery rocks. I will gage almost anything I have (and that is not much), that the Llandovery conglomerates and shales occupy the hill of Pentre, and the slopes above Tal-y-Garth. Beyond this I will not suggest, for the neighbouring ground looks terribly faulted; and no one knows what is the actual base of the Upper Silurian series in the valley,—seeing that the pale “Tarannon” shales are not traced there, nor are the Denbighshire grits: indeed the latter never were there at all.

I know no place within *easy* reach, (for that is something in the matter,) where a Club-meeting might do more good; but then they must make up their minds to *walk the hill across from north to south, and in several directions*; and not disperse their energies over a long section, or go in search of the picturesque. The geology is very simple in the hill itself; but outside of it, faults and unconformable junctions obscure everything.

1. Slates under the lower limestone.
2. Lower limestone (Bala).
3. Slates between the limestones (Upper Bala).
4. Hirnant limestone?
5. Soft slates—which may be Llandovery?
6. Llandovery conglomerates?

Will anybody set to work on it?

J. W. SALTER.

GENERAL GLACIATION OF IRELAND.

(WITH A MAP.)

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—A number of copies of the accompanying map having been cast adrift by the unforeseen discontinuation of the Dublin Quarterly Journal of Science, for which they had been prepared, you have charitably consented to afford them harbour in the GEOLOGICAL MAGAZINE. At your desire I give an explanation of the map, and a concise account of the paper which it illustrates (noticed by yourself in your April number, and to be contained in the forthcoming part of the Journal of the Royal Geological Society of Ireland). The facts have been derived from a variety of sources, including my own observation.

The black strokes give the direction of the parallel ridging, which is so well developed over much of the low ground in this country. The ridges usually consist of Boulder-clay with well scratched and blunted (not rolled) stones; but sometimes the parallel shaping seems to be partially wrought in the rock. The Boulder-clay ridges are totally distinct from Eskers (or Kames); their average length is about three quarters of a mile; they sometimes exceed one hundred feet in height. The red strokes represent parallel rock-scourings. When the scorings show clearly, of themselves, which way the grinding agent went along the line of its motion, the strokes representing them are made into arrows. Cross striations, later than the