

All seem to have come from a less distance than those of Lancashire. Mr. Hull gives the percentage (as determined by Professor Ramsay) of rock fragments found in the Upper Boulder-clay at Gorton, in Lancashire, as follows (*vide Geol. of Country around Oldham: Memoirs of Geological Survey*):

	per cent.		per cent.
Silurian Grits ... ..	37	Granite ... ..	6
Felspar Porphyry ... ..	31	Porphyritic Conglomerate	4
Felstone ... ..	2	Carboniferous Limestone	3
Carboniferous Grits ... ..	14	Ironstone ... ..	2

In this case the Silurian Grits, which are most abundant in the Upper Boulder-clay of Lancashire, may be taken to represent their having been conveyed from a distance (the Silurians of Cumberland and north of Lancashire) equivalent to the distance of the source of the Oolitic pebbles found in the Upper Boulder-clay of Norfolk (the Oolite of Yorkshire). The greater percentage of igneous boulders found in the Lancashire Drift beds may arise from the fact of their being nearer to their parent rock than those of the corresponding beds in Norfolk. The small percentage of boulders of local rock (sandstone) in Lancashire, as compared with the much greater percentage of flint boulders in Norfolk, may arise from the different nature of the two parent beds whence both were derived. It would be much easier for marine or glacial agency to disintegrate the Chalk and liberate the enclosed flint nodules, than it would be to break up a sandstone bed and to roll the fragments into boulders. But these exceptions seem to me to carry out the analogy between the northern and eastern deposits instead of detracting from their relation.

Mr. Binney very justly remarks<sup>1</sup> on the varying nature of the beds which compose the various members of the Drift or Quaternary formation. The same feature is, more or less, common in Norfolk, although it is not so decidedly shown as in Lancashire, owing to the absence of high hills, along whose base, in the North, the various drift beds usually split up into almost unrecognisable portions. At Sprowston in Norfolk, in the Upper Boulder-clay, there are thin seams of sand intercalated, in which Mr. T. G. Bayfield and myself found numerous fragments of marine shells, among others of *Cyprina Islandica* and *Astarte borealis*. But both in Lancashire and in Norfolk these local deposits do not affect the general features of resemblance so broadly manifested in both districts.

I remain, etc.,

JOHN E. TAYLOR.

NORWICH, May 8th, 1867.

BALA AND HIRNANT LIMESTONES AT MYNYD FRON FRYNS IN  
GLYN CEIRIOG.

To the Editor of the GEOLOGICAL MAGAZINE.

DEAR SIR,—I am glad to find Mr. Salter calling attention in this month's Magazine to one of the most interesting spots in North Wales—especially so to students of the Lower Silurian group.

<sup>1</sup> See *GEOL. MAG.* Vol. IV., May, 1867, p. 231.

As some of the features of this district (which Mr. Salter properly suggests, are deserving the attention of Geologists), have already had some attention paid them by myself, you will, perhaps, allow me to say that, in 1859,<sup>1</sup> I described the various beds of which this hill is made up, noticing some of their peculiarities and rarer fossils. In 1863, in a paper of mine on "The Bala Limestone of North Wales and its associated beds,"<sup>2</sup> I classed the Upper Limestone of the hill as "Hirnant Limestone," as Mr. Salter now proposes.

In a section which accompanied that paper, I represented the overlying schists "Pale shales very fossiliferous," as I called them (the No. 5 of Mr. Salter's letter) as conformable to the underlying beds. In a letter which I afterwards received from Professor Sedgwick, that gentleman—the value of whose labours in North Wales I estimate very highly—said, "the order of superposition is quite clear, yet there is, I believe, a *break* in the order of *succession*;" and he adds I should be grateful to you for more information respecting the group of "pale shales very fossiliferous." These remarks led me to review the matter, and the result was that I found the "pale shales of the Pentre hill and round about, to be unconformable to the Bala group below, as Mr. Salter now wagers that, upon examination, they will be found to be; and if your readers will refer to the GEOLOGICAL MAGAZINE for 1865, page 344, they will find, in a section of the beds referred to, that I have named the uppermost band of limestone, "Hirnant Limestone;" and that I have represented these pale shales of the Pentre as unconformable to those below.

Mr. Salter truly says, that working this district is like working a museum; and I may mention, in addition to the fossils he enumerates, a beautiful one once examined and named by himself *Ischadites tessellatus*, which I quite expected to see in the excellent plates of fossils that adorn Professor Ramsay's admirable memoir on North Wales.

Plenty yet remains to be done there, and I promise any geologists who may be willing to hammer for a day or two about Mynyd Fron Frys, a charming time of it. If gentlemen, who would like a joint meeting for the purpose of more fully exploring the spot, will communicate with me, I shall be glad to make the necessary local arrangements, and to join them on the occasion.

I am, Sir, yours very truly,  
D. C. DAVIES.

CONEY-GREEN HOUSE, OSWESTRY,  
May 3rd, 1867.

#### FISH IN DEVONIAN ROCKS.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—Can you favour me with space for a few friendly remarks on the P.S. of Mr. Salter's letter in your May number.

The fish defence spines in my collection are two in number,—one from Looe Island, and one from Looe; not both "from the

<sup>1</sup> Vide Proceedings of the Oswestry Field-club, pages 32-35. <sup>2</sup> *Ibid.*, page 71. See also for section, Proceedings of the Liverpool Geological Society, 1863-4; for list of fossils, *ibid.*, 1864-5.