

the drift series. The existence, however, of Mr. Harmer's "Third Boulder-clay," as a distinct formation, seems to depend on the certainty of the coast beds being inferior to those of High Suffolk. The small patches of Boulder-clay in the Yare Valley are clearly more recent than the drifts that have been cut through to form the valley; but does it not seem less improbable that the coast beds may be identical with them, than that these isolated patches of a marine deposit should have been the solitary result of the submergence during which they were formed?

GEORGE MAW.

BENTHALL HALL, BROSELEY,
August 6th, 1867.

"THE LOB-WORM EPOCH."

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—Colonel Greenwood's remarks in the August number of the GEOLOGICAL MAGAZINE on the "Lob-Worm Epoch" tempt me to lay before your readers a few facts concerning the rocks of that period, as shown in this neighbourhood, and the results obtained by their examination during the last few years.

Mr. Salter and myself have for some time felt convinced that most, if not the whole, of the Cambrian rocks belonged to a fossiliferous period, and accordingly in our own report to the British Association in 1865, on the "Lower Lingula-flags" (Menevian group) and its fossils, it was stated that, "though the purple band series have not yet yielded any definite traces of these higher forms of fossils, we are scarcely warranted in looking upon that as a proof of their absence; neither is it likely that so rich, though limited, a fauna should come so suddenly into existence." Since then I have been fortunate enough to find fossils in these identical purple beds, which prove the facts at that time only conjectured.

In a paper by Mr. Salter and myself, read before the Geological Society on June 19th, an account is given of the finding of a *Lingulella* in the red rocks of the Lower Cambrian-rocks, hitherto deemed quite destitute of higher organisms than worms, and belonging to the very series mentioned by Mr. Baily. I have found also, subsequently to the reading of the paper referred to, a whole colony of species (trilobites, etc.) still lower down, showing, beyond a doubt, that much, if not the whole, of the so-called "worm epoch" represents a time when animals of much higher forms than worms were in existence, and flourished in the seas of the period. I therefore feel satisfied that if active explorations be carried on in North and South Wales, it will be proved that the series throughout is truly fossiliferous, but I am also sensible that some time will be required to decide the fact, since the working of the strata is, in many ways, difficult, and the deposit from its very nature, as a rule, unfavourable to the exhibition of organic remains.

Moreover we are sure to find, especially in so extensive a series, much that is but very slightly fossiliferous, or, indeed, almost barren, intervening between colonies of rich faunas. Such is really the case

with nearly all the groups already found, scarcely a vestige being seen in most of the beds which separate the several colonies, upon which usually we come quite abruptly. This I look upon also as one of the chief causes why a Lower Cambrian fauna has not ere now come to light.

I am, sir, yours truly,

ST. DAVID'S,
7th August, 1867.

HENRY HICKS.

PHOLAS-BORINGS IN DEVONSHIRE.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—As I have observed in your journal for July some remarks on Pholas-borings found 200 feet or more above the present high-water-mark, on the cliffs in the neighbourhood of Torquay, perhaps one or two words on these ancient rock-perforations may not be out of place by one who has more than once made them the object of his search and examination.

Some time ago, in the year 1864, I happened to be visiting Ilfracombe and its neighbourhood, and, amongst other coast scenery, I spent a day on Woollacombe sands, extending my ramble to the summit of the hills called Morte Point, not forgetting to search carefully far above the present sea level, its rocky wall and face, when practicable, for the marks or signs of some ancient stone-boring mollusk.

And here I ought to mention that Mr. Pengelly was the first person from whom I learnt the supposed origin of these peculiar marks or holes in rocks near the sea-coast. As I minutely looked over its pointed heights facing the sea, after some trouble I found a number of perforations from an inch to two inches in size, and about one inch or a little more in depth. I cannot speak exactly, as I write now from my recollection of what I then saw.

Some of the rock-cuttings were much worn by the action of the weather: some, no doubt, were naturally formed by frost and other causes; while some, in a more sheltered part of the hill, appeared nearly as perfect as when left by their excavators.

In my own mind the evidence is so conclusive that these small hollows are Pholas-borings, or the work of some Mollusk, and that the rock, now 200 feet or more above the sea-level, must have been once under water at every tide.

Some five or six years before this examination of the hills at Morte Point, I happened to be staying in Plymouth, and, having a little spare time on hand, I closely explored the rocks which fringe the sea-beach below the Hoe, and there I found a number of freshly-formed holes in the limestone rock, covered at every tide, about the size of the Pholas-borings, only they extended much deeper in the rock, while at the same time there appeared to be a kind of hard, shining coating on the inside of their holes, much like the inner part of an almond shell. The reason, perhaps, why these ancient stone-borings are seldom noticed, is the fact, I think, that the old sea-coast is partly washed away, for it is only (so far as my observa-