

1 inch to  $1\frac{1}{2}$  inch. Each vertebra has a long flattened spine upwards of  $3\frac{1}{2}$  inches in length. The snout apparently was 7 inches in length; the teeth not seemingly all of the same length, and at irregular distances between each other.

The 'cup-shaped vertebræ,' no doubt, indicate the deeper conical cavity of the terminal articular surface of the centrum, which distinguishes that part of the skeleton of the fish from the vertebræ of amphicœlian *Crocodylia*, of which, by the way, we have hitherto had no evidence in formations more recent than those of secondary geological age.

Like the *Pachyrhizodus*, the present Miocene Fish is most probably a Cycloid with sauroid dentition. The almost circular section of the teeth differentiate it from the large extinct 'Sphyrænoid Cycloids,' *Sphyrænodus*, *Hypsodon*, *Saurodon*, *Saurocephalus*, &c. It differs, by so much of the dental character as opportunity has been given me of comparing, both specifically and generically, from *Pachyrhizodus basalis*; and I propose to indicate this fine addition to Miocene Tertiary Fishes by the name of *Stereodus*\* *Melitensis*. It is much to be desired that the rest of the skeleton of this extinct Fish should be figured.

## II. A FEW MORE WORDS ON THE LAURENTIAN ROCKS, AND THE PROOFS OF THEIR EXISTENCE IN BRITAIN.

By Sir RODERICK I. MURCHISON, K.C.B., F.R.S., &c.

IN my observations on the Laurentian Rocks of Britain which appeared in the last number of the GEOLOGICAL MAGAZINE, there is one statement which calls for modification, and another which I revoke. The striking discordance of direction or strike between the true Laurentian rocks of the North-Western Highlands and Islands, and the superficial strata of Cambrian and Lower Silurian age as described by me, is undoubtedly correct; but in another paragraph it is inadvertently said that the Silurian rocks of Britain trend *everywhere* from N.E. to SW. For 'everywhere' the word 'usually' should have been employed, as there are tracts wherein these rocks unquestionably range from W. to E.

The essential point, however, to which I now call the attention of geologists is, that on reviewing my own notes upon and sections of the Connemara Mountains of Ireland (made in 1851), I am quite satisfied that the green serpentinous marble of that district, in which a Foraminifer supposed to be the *Eozoon Canadense* is found, is unquestionably of Lower Silurian age, and is not, as was surmised it might prove to be, a true Laurentian rock.

My friend Professor Harkness, who has examined this tract more recently than myself, has written to me expressing his conviction

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\* From *στερεός*, *solidus*; *ῥόδός*, *dens*.

that the Bins or Pins of Connemara are, as I had laid it down in 'Siluria,' simply prolongations of the quartzose and micaceous altered Lower Silurian rocks of the Highlands of Scotland.\*

The crystalline green limestone of Connemara is, in fact, encased in quartz-rocks; and, according to my own observation, it has a strike from W. by N. to E. by S., or nearly E. and W. But, far from being discordant to the direction of the overlying Middle Silurian strata with their characteristic fossils, you perceive, as you pass from the quartz-rocks with limestone through mica-schists to the fossiliferous beds, which are slightly transgressive to those beneath them, the whole ascending series has a general strike from E. to W., and a decided dip to the north. This is clearly seen as you travel from Clifden to the magnificent marine bay of the Killerries.

As to the presence of an *Eozoon* in the Lower Silurian rock, I find by a letter from Mr. W. A. Sanford, that he entertains doubts as to the identity of the Canadian and Irish forms. 'Further experiments (he adds), which are not yet concluded, lead me to believe that while the Canadian form is an immense Nummuline, the Irish one is analogous to a Rotaline, very like a gigantic *Polytrema*. In both we have the confluent cells; and, to a certain extent, the structure of both is in one part in layers, and in another acervuline. In the Irish fossil there is but little if any trace of the beautiful canal-system so striking in the *Eozoon Canadense*, the shell-structure being entirely tubular.'

It will doubtless be satisfactory to palæontologists if, as Mr. Sanford suggests, the Foraminifer of the Lower Silurian of Ireland should be found to be dissimilar to that of the Laurentian rock of Canada. But I beg to say, that, if the two be found to be identical, the green marble of Galway will still remain a true Lower Silurian rock, as proved by stratification and the range of similar strata from the NW. of Ireland into the Highlands of Scotland.

The persistence of so low an animal as a Foraminifer through vastly long periods is a fact well known to geologists. Thus we know that a *Globigerina* which lived in the Cretaceous age is still alive! Nay, even in the Lower Silurian green sand of Russia we see silicated remains of Foraminifera indistinguishable from recent forms.

Viewed, therefore, by itself only, the mere presence of *Eozoon Canadense* cannot be taken as a proof that the rock in which it occurs is of Laurentian age. Geologists require the further evidence of the infraposition of such rock to Cambrian and Silurian strata. On this principle, the Canadian rocks were called Laurentian by Logan long before an *Eozoon* was found in them. So also the basement-rocks or Fundamental Gneiss of the North-Western Highlands will remain of true Laurentian age, albeit no *Eozoon* may ever be found in them.

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\* See 'Siluria,' last edition, p. 190 (not p. 100, as stated in the last number of the GEOLOGICAL MAGAZINE).