

a hard bottom ; whereas the sea-pens, compound, feather-like Zoophytes, whose every fibre contains its rows of living creatures, affect soft muddy bottoms, in which they may be found sticking by their quill-like points, like arrows in the soft sward around a target. I have seen them brought up by scores on the lines of the fisherman, out of a muddy ravine in the Moray Firth that sinks abruptly from beside the edge of a hard submarine bank, to the depth of thirty fathoms ; and have often admired their graceful, quill-like forms, and their delicate hues, that range from pink to crimson, and from crimson to purple. And, judging from the character of those grey carbonaceous deposits in which the Graptolites of our Silurian rocks most abound, it is probable that they also were mud-loving animals, and more resembled in their habitats, if not in their structure, the sea-pens than the Sertularia. It is a curious circumstance that, in the group at least, the Graptolites of Scotland are more obviously allied to the Graptolites of the vast Silurian deposits of Canada and the United States, than to those of the Silurians of England. With this curious zoophyte we take farewell in Scotland of life and organization, and the record of the palæontologist closes. The remains of no plant or of no animal have been detected in this country underlying the rocks in which the oldest Graptolites occur.

Beneath the SILURIAN deposits of Scotland there rest, to an enormous thickness, what, with the elder geologists, I shall persist in terming the *primary deposits*, consisting, in the descending order, of clay-slates, mica-schists, quartz-rocks, primary limestones, and the two varieties of gneiss,—the granitic and the schistose.¹ In retaining the old name, I must, however, be regarded as merely holding that

¹ Hugh Miller evidently MORE THAN SUSPECTED the history of the geology of the north and north-west of Scotland, as developed by Mr. Peach and Sir Roderick Murchison in 1858.—W. S. S.