

Naiadites. It has a *Stigmaria* under-clay. The point on which the town of Sydney stands is composed of the red sandstones, marls and thin bedded limestones of the upper part of this formation.

6. THE MILLSTONE GRIT.

The rocks overlying the Carboniferous Limestone series, intermediate between these and the productive Coal Measures, and thus occupying a position analogous to that of the Millstone Grit of the English coal fields, are well exposed in the natural sections afforded by Sydney Harbour, the Great Bras d'Or and other parts of the coast. They consist, on Sydney Harbour, of a great series of sandstone beds, generally very coarse and almost conglomerate in character, and deeply stained with peroxide of iron; but sometimes of a bluish-gray colour, finely grained, evenly bedded and flaggy, with occasional patches (but apparently no continuous beds) of argillaceous shale and coal. Some of the sandstone beds, contain great quantities of obscure and fragmentary vegetable fossils, such as *Sigillaria*, *Stigmaria*, *Lepidodendron*, *Cordaite* and *Calamites*. The shales also contain plant remains. In one bed or thin patch of carbonaceous shale were observed teeth, scales, spines and coprolites of fishes. The Millstone Grit formation is here distinguished from those underlying and overlying it by the absence of calcareous strata; false bedding is prevalent, and it is difficult to arrive at any just or accurate estimate of its total thickness.

In the eastern section of the field, however, where the same formation is very extensively developed, it is much thicker; and while still preserving the same character and the same relations to the overlying and underlying rocks, includes thicker and more regular beds of argillaceous shale, with seams of coal, one of which at least is of workable dimensions and quality. In this respect the remarkably perfect section afforded by the cliffs at the western side of Mira Bay* is more closely allied than in the western district to the typical series of rocks of this division in the Joggins section, as described by Sir William Logan, from which, however, it differs in the general absence of calcareous beds. There can be no doubt that the materials of which the Millstone Grit rocks are composed have been derived chiefly from the disintegration of the underlying rocks, which may have been either the Lower Carboniferous sandstones, shales and conglomerates, or the older crystalline rocks from which these have in their turn been derived. This fact is very strikingly manifested on the shores of the Great Bras d'Or, where some beds of the Millstone Grit are found to be largely

* Report of Progress, Geol. Surv. Can., 1874-1875, p. 176.