

William shells are more plentiful, but not in great abundance, while at Cape Croker and Cape Montresor various species of shells occur in great numbers, in addition to ennerinites, corals and fucoïds. In the hard beds at the top of the formation, in Owen's Sound, we met with numerous fossils; they were principally small shells and corals, and the forms having been replaced by silica, while the imbedding matrix is calcareous, they were weathered out in relief on the exposed surfaces, being precisely in the condition in which similar remains were found in the upper beds of the same series last season, at Cabot's Head and in the Grand Manitoulin Island. The species of *Pterinea* (*P. carinata*) which appears to be peculiarly characteristic of this series of rocks, is found more or less abundantly in different parts throughout the whole vertical thickness, and in great numbers at Point William, Cape Croker and Cape Montresor.

Concretionary nodules of calcareous quality, usually assuming spheroidal or sub-spheroidal shapes, are thickly scattered through the shales in some parts of the formation, and were observed in particular among the rocks in the neighbourhood of Cape Boucher.

The materials of economic importance observed associated with the Loraine shales, were stones fit for building, for tiles and flagging, with limestone and clay. For building, the hard beds at the top of the series, are of tolerably good quality, when the layers are not too thin, which however they frequently are, and some of the calcareo-arenaceous bands might be used for a rough description of tiles and flagging; but the material is of an inferior quality for either purpose. There are very few beds fit for burning into lime; an occasional one, however, is met with among the blue and drab shales. When not too calcareous, the clays derived from the disintegration of the shales constitute material of good quality for brick making. Gypsum is reported to have been found in the formation near Cape Commodore, but the only specimens of it met with by me occurred in small isolated masses of no economical importance, being such as are known to exist in the formation elsewhere.

#### IV. V. MEDINA SANDSTONE AND NIAGARA LIMESTONE.

A bold precipitous escarpment marking the outcrop of the Niagara limestones, was traced along the coast during the season of 1847, from Cabot's Head to Colpoys Bay. Southward from the bight of this bay, the escarpment leaves the coast, but maintaining some degree of parallelism with it, sweeps round towards the heights over Cape Commodore, whence it runs nearly due south, keeping two or three miles distant from the west shore of Owen's Sound, until reaching the line between the Townships of Derby and Sydenham, about three miles south of the village of the latter name at the head of Owen's Sound, where it strikes to the south-eastward and crosses the Owen's Sound road. The subjacent formation was not exposed at any part that we visited south of Colpoys Bay, being concealed by detritus and forest trees, but the soil at the base of the Niagara escarpment was frequently observed to be of a red color and marly quality, leaving little doubt that it was derived from the immediately proximity of the marls of the Medina group.

The upper part of the Niagara limestones, which constitutes the south shores of the Manitoulin Islands, strikes from Horse or Fitzwilliam Island across to the Isle of Coves, then to Cape Hurd, whence it holds the coast and adjacent islands to Chief's Point and the Rivière au Sable (north;) from this, striking into the interior, it is no more seen on the lake. Rocks belonging either to the summit of this or to the base of the succeeding superior formation were seen at Galt, on the Grand

River, and beds belonging to the Niagara Group, were observed occasionally coming to the surface, on the road between Galt and Dundas, but the country north of Galt, and between it and the mouth of the Rivière au Sable (north,) has not yet been examined, and I am unacquainted with the details of the geographical boundary of the summit of the formation in the interval, which is nearly a hundred miles.

Numerous fossils were observed in the Niagara limestones, but the variety was not great except among the corals, which were of many different species. The most characteristic shell was a *Pentamerus*, which extended through the whole formation, but was most abundant near the top; *Euomphalus* and other spiral genera were met with; a large bivalve of a new genus occurred in great numbers at Galt, associated with *Pentamerus*.\* Among the thin-bedded limestones at the base of the formation (corresponding probably with the Clinton group portion of it,) some surfaces were thickly covered with organic remains, an *Atrypa* and a small turbinated shell chiefly prevailing. Trilobites, orthoceratites, corals and fucoïds also, though in less abundance, were observed in this portion, but principally in one place near Cape Chin, on the south side of Dyer's Bay.

The Niagara group is fruitful in excellent materials for building and lime burning. At Galt white limestone occurs of a beautiful and enduring quality for architectural purposes, for which it is extensively quarried from beds nearly horizontal, varying from one to three feet thick, and blocks may be obtained of almost any required size without much difficulty; the stone burns also to an excellent lime. At Owen's Sound, about two miles S. by E. from the village, there are unworked strata of white or pale grey limestone; the upper beds are from two to four feet thick, the lower ones occasionally over twelve feet, being all very massive; the upper beds could be quarried to an almost boundless extent, and would yield an excellent building material; the lower beds are likewise fit for building purposes, but being the base of an abrupt escarpment could not be extensively quarried; large loose masses, however, skirt the escarpment, and these might be made available for a great length of time. All the beds would stand the weather well; many of them have occasionally been burnt by the settlers, and are said to make an excellent quality of lime. Materials of much the same sort would be found all the way to Cabot's Head. On the Rivière au Sable (north,) about a mile and a half or two miles from its mouth, there are some pale greenish-blue limestone beds, one of them darker than the rest, which would all be fit for building purposes; the stone appears to resist the disintegrating influences of the weather well, but it turns under them to a blackish color. The beds are from eight to eighteen inches, and even two feet thick; they are divided by parallel joints into rhomboidal forms, and would afford blocks of any required size. At Chiefs' Point there is a limestone which presents a white or pale gray color on fracture; it has a rough pitted exterior surface, and weathers to a dark brown approaching to black; the beds are massive, ranging from two to four feet in thickness; parallel joints intersect them, and they could easily be quarried, and afford a very substantial building stone: most of the beds are supposed to be fit for burning into lime.

\* Since Mr. Murray's examination of the rocks at Galt, Mr. Hall, of New York, has visited the spot, and in addition to the new bivalve, above mentioned, to which he proposes to give the name of *Megalanus Canadensis*, he has met with other shells, two of which he recognises as belonging to the Onondaga Salt Group, or Gypsiferous Limestone, and he is disposed to class the Galt rocks with that formation.—W. E. L.