

tions, there are yet bends in it that seem to correspond with some of the curves of that chain of mountains. From Monroe County in Kentucky, this axis takes a gently sinuous course, running under Cincinnati, on the Ohio, to the upper end of Lake Erie: thence it curves to the upper end of Lake Ontario, where my assistant, Mr. Murray, has observed its influence in deflecting the strike of the strata in the neighbourhood of Burlington Bay. It then enters the lake, under the waters of which it probably dies away towards the north shore.

From beneath the three great coal-fields which have been mentioned, the subjacent formations crop out in succession, surrounding their carboniferous nuclei with rudely concentric belts of greater or less breadth, according to the thickness or dip of the deposit, and taking a wider and a wider sweep as they descend in the order of superposition, while they conform at the same time in their superficial distribution to all the sinuosities and irregularities occasioned by geographical and geological undulations. The organic remains of these rocks proclaim them to be contemporaneous with the Silurian and Devonian epochs of Europe, including the old red sandstone; and the Pennsylvanian geologists compute that in their south-eastern development they attain the aggregate thickness of about 30,000 feet. But in the State of New York, where the quiet condition of the northern outcrop affords an admirable opportunity of determining with certainty all the relations of the deposits to one another, not more than one third of that amount can be made out. It would seem, therefore, if the many complicated folds existing on the south-east side have occasioned no error in the estimate, that the formations must thin down greatly towards the north.

The fossiliferous formations, wherever they have been found in actual contact with the rocks beneath, appear to rest upon masses of the primary order. But the geologists of New York consider they have evidence of the existence of a series of non-fossiliferous sedimentary strata, in a more or less highly crystalline condition, of an age between the two. As considerable difficulties, however, attend the question, it will be sufficient for the purposes of the present description to unite all the subjacent rocks, whether metamorphic or primary, and to class them under the latter denomination.

The lowest of the fossiliferous strata is a sandstone of variable quality, more purely silicious towards the bottom, and calciferous towards the top, which gives support to a thick and remarkably persistent deposit of limestone, strongly distinguished by its organic remains. This limestone thus becomes an admirable means of tracing out the perimeter of the great western area under consideration. From the north-west border of North Carolina, it sweeps in a broad belt across Virginia to the junction of the Shenandoah and Potomac. Thence traversing Maryland, it passes through Pennsylvania by Harrisburgh, on the Susquehanna, and Belvidere, on the Delaware, accompanied up to this point by the underlying sandstone. Diminished in its thickness, it thence crosses New Jersey, and reaching Poughkeepsie it passes up the valley of the Hudson and Champlain, keeping to the east of the river and the lake and attains the neighbourhood of Missisquoi Bay.—Entering Canada, it proceeds towards Quebec, and it reaches the vicinity of that fortress; but I am not yet aware of the precise spots at which it is visible in its course thither, further that I have been informed stratified limestone answering its condition is quarried and burned in the Seignior of St. Hyacinthe, east of the Yamaska River. As Quebec itself does not stand upon the formation, it probably

crosses the St. Lawrence higher up the stream; but it may be seen in the quarries of Beauport and farther down the river, and its limit in that direction is to be found near Cape Tourment, where the underlying primary rocks come to the water's edge. Turning at this point, and following the northern outcrop of the deposit up the valley of the St. Lawrence, it is found to run along the foot of a range of syenitic hills of a gneissoid order, which preserve a very even and direct south-westerly course, and down the flank of which the various tributaries of the great river are successively precipitated in rapids and cascades. On the Maskinongé the syenitic range is about twelve miles in a direct line from the St. Lawrence, on the Achigan about twenty, and it strikes the Rivière du Nord about a half a mile south of the village of St. Jerome.—Following this stream, the primary rocks, which are close upon its northern bank, gradually assume a course which less of southing in it, until they reach Lachute Mills, where their direction becomes nearly due east. Along this line from Cape Tourment, the basset edge of the limestone does not in all cases come quite up to the primary rock. There is occasionally a space left between the two for the sandstone beneath, and on the Rivière du Nord the calciferous part of this rock, capped by the limestone, is seen in several places in a well defined escarpment about half a mile from the syenitic range, dipping southward at an angle of six degrees, which is probably one or two more than the average inclination along the strike of the northern outcrop thus far traced.

Leaving the Rivière du Nord, at Lachute Mills the edge of the fossiliferous strata, still well defined by the rise of the primary rocks from below them, crosses the township of Chatham, pursuing a direct course to Grenville, on the Ottawa, where the calciferous deposit is seen at the upper end of the canal. A little above the village the primary range comes upon the river, which may correctly be considered the general division between the two until we attain the township of Hull. A bend in the Ottawa there, cutting deep into the limestone, leaves four to five miles breadth of it on its left bank, and the formation displayed in lofty precipices in the neighbourhood of Bytown, affords the magnificent scenery of the Chaudière Falls. From personal observation I cannot speak of its course further up the Ottawa, but I understand it reaches the island of Allumet, and thence turning southward, runs through the townships of Packenham, Ramsay, and Drummond,—crosses the Rideau Canal in Rideau Lake in Elmsley, where, with the subjacent sandstone, it is seen in section at the Upper Narrows resting on the primary rocks and dipping to the north of east at an angle of four degrees,—and sweeping round the adjoining corner of Bastard and Young, traverses Elisabethtown, and reaches the St. Lawrence in the neighbourhood of Brockville. The limestone deposit following the St. Lawrence down to St. Regis, has a wide spread of the sandstone coming from beneath it on the United States side of the river, the lower edge of which passes by Canton, Hopkin, and Malone, to Chateaugay, in a line north of east. Here it makes a sudden turn to the south-east, and the limestone sweeping round at its proportionate distance, comes upon the western shore of Lake Champlain at the mouth of the Chazy River, about five miles up which its base is seen. Running along the shore of the lake it reaches Peru, where the basset edges of both sedimentary deposits come close together. Following up the lake they attain Whitehall. They then bend round to the valley of the Mohawk, ascending which they arrive in the neighbourhood of Trenton, where a grand display of limestone in the Falls of that name gave origin to the New York designation of