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slates than in the syenitic conglomerates. In the quartz rock the white quartz veins often appeared nearly destitute of ore, presenting but a few straggling specks of the yellow sulphuret, at great intervals from one another; and when a vein charged with ore in the greenstone could be traced to the quartz rock, it seemed gradually to lose what richness it might have had, as it approached the latter, finally presenting when it reached it, little else than veinstone, its breadth remaining undiminished. When by dislocation or the presence of a dyke, quartz rock was brought opposite to greenstone, a cupriferous vein would occasionally be found, between them, and what might be considered an encouraging quantity of ore was sometimes met with in it. But if a rule is to be derived from what the rocks appeared to shew, it will probably be where the lodes cut the greenstone and have that rock in both walls, or greenstone in one and slate in the other, that their contents will become economically available. How the productiveness of the metalliferous veins may be affected when they may meet with any considerable body of the intrusive granite, it is not yet in my power to state. None of them were observed cutting the granite nuclei, though they were the granitic dykes emanating from them; but these dykes were usually too narrow to produce any perceptible difference in the quantity of the copper ore.

It would perhaps be premature to say much respecting the general geological form of the area under description, though something may be gathered from the attitude noticed in the strata on the coast and up the rivers, and particularly from the position and attitude of observed masses of the limestone band. The dips of the formation over extensive tracts appear to be more moderate than might be anticipated from the presence of so much igneous rock. The forces originating the greenstone dykes do not seem in general to have exerted any very great influence on the slope of the strata, and it is mainly on approaching the underlying or intrusive granite that a precipitous inclination is perceived. But there is no doubt, whether the result of intrusive forces, or other causes, that there are indications of the existence of several undulations of some importance. A trough connected with one of these appears to occupy longitudinally a tract extending from Root River, near Sault Ste. Marie, to within a short distance of the mouth of the Thessalon; the evidences of it are found in the distribution of the limestone, and the dip of the strata between the Thessalon and the coast. Ascending the river in a general course N. 40 W. the limestone band is met with about nine miles up. It shews a dip towards the coast, and it follows the river and two of its lakes for a distance of ten miles, with a strike of N. 55 W. pointing in the direction of Echo Lake about seven miles further on. The band crosses Echo Lake, which has a breadth of one mile, and curving a little more to the westward it is again seen, as I am informed, about eleven miles still further on, removed about a mile from the shore of Little Lake George near Root River. In the whole of this distance, about thirty miles, the south-westerly inclination of the band ranges between 15° and 20°. On the other side of the synclinal axis the rock emerges from Lake Huron under three quarters of a mile westward of the French Islands, and it is traceable along the coast westwardly for about a mile and a half, when it again returns to the water. In this part, the distance between the two opposite outcrops is about seven miles: but as the limestone is not again met with striking into the land farther west, and a space measuring fourteen miles across from a point, midway between Echo Lake and the Lakes of the Thessalon, to the head of St. Joseph Island, is occupied by other rocks of the formation, it

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is probable the trough widens westwardly until lost beneath higher unconformable strata in that direction, on the west side of River St. Mary. The calcareous band was not met with coming out on the coast between the Thessalon and the Mississagui, but it was found about a mile from the left bank of the Little White River, a west-south-west flowing tributary of the latter, three miles up in a straight line from their junction, which occurs twenty miles in a north-west straight line from the lake. The dip was about east, or a little south of it, with a slope of 10°, and supposing the band to sweep round from this point to its lowest position on the Thessalon, it would cross the Mississagui somewhere below the Little White River; but in such case though we must have passed over its intersection with the main stream, it was not observed. Its dip in the valley of the Little White River appears to intimate the probability of another undulation. In a third locality, the outcrop of the band was seen on the north side of a trough in the vicinity of La Cloche, where it was traced for five miles on the north limb of La Cloche Lake, between two and three miles from the coast. It there plunges southwardly under a great mass of quartz rock and intermediate syenitic conglomerate, which again rise into the mountains ranging along Lake Huron, but the south outcrop of the limestone is lost in the water. There appear, however, to be traces of it in a small island off the coast. The axis of this synclinal seems to run in the middle of the south limb of La Cloche Lake, a mile and a quarter from the coast, and the south rise appears to result from an intrusion of granite, which is seen in several of the islands along the coast in front of La Cloche; but what relation this synclinal may have to others, has not yet been ascertained, the coast between the Spanish and the Mississagui Rivers being still unexamined; and although a patch of intrusive granite extending fourteen miles along the coast west of the Mississagui, to the Grande Batture, throws the strata into an anticlinal form at the mouth of the river, which the granite crosses at the lower falls, I am not able to state whether it runs to a junction with the intrusive mass at La Cloche. Probably the Mississagui granite starts from a wedge point eastward of the river; for although narrow on the river, it appears to widen westwardly, as what may be taken for the north side of it was met with on the right bank of the lower of the two lakes surveyed on the Grande Batture Portage, where it would thus have a breadth of about three miles. These transverse miles, however, were not examined, and the granite on the tributary lake may be an independent mass.

In respect to the geological age of the formation, the evidence afforded by the facts collected last year by Mr. Murray on the Grand Manatoulin, La Cloche, Snake, Thessalon, Sulphur, and other Islands, points ranging along a line of ninety miles out in front of the coast, is clear, satisfactory, and indisputably conclusive. On these islands, the Potsdam sandstone, the Trenton limestone, the Utica slates, and the Loraine shales, successive formations of the lowest fossiliferous group of North America, were each in one place or the other found, in exposures divested of all vegetation, resting in unconformable repose, in a nearly horizontal position, upon the tilted beds, and undulating surface of the quartz rock, and its accompanying strata, filling up valleys, overtopping mountains, and concealing every vestige of dykes and copper veins; and it would appear that some of these mountains have required the accumulation of the whole thickness of the lowest three, and part of the fourth fossiliferous deposit, equal to about 700 feet, to bury their summit, which were then about the same height over that part of the Huron base of the first known recipient, of organic remains, as the present neighbouring moun-