Appendix (G.) 29th January.

to determine the quantity of copper contained in them. A considerable collection of specimens was also forwarded to illustrate the rocks and minerals of the country, several of the packages containing which only arrived in the beginning of the month.

The foregoing narrative will display to Your Excellency the extent to which our investigations were carried on the North Shore of Lake Huron in the short period devoted to it, and although, since my final return to Montreal, sufficient time has not elapsed for a perfect arrangement of the facts ascertained, and, perhaps, the number of these facts is scarcely sufficient to fully elucidate the geological structure of the area thus partially examined, yet as a desire may naturally be felt on the part of the Government to be put in possession, with as little delay as possible, of some account of a district in which private enterprise has recently expended a considerable amount of capital on what may hereafter become an important branch of trade, I have the honor to place before Your Excellency such a Report as circumstances permit, reserving for a future occasion what is to be said on the general progress of the Survey in other parts.

The North Shore of Lake Huron, on which twenty-two mining locations have been claimed of the Government, in so far as it has come under my observation, presents an undulating country, rising into hills which sometimes attain the height of 400 and 700 feet above the lake. These occasionally exhibit rugged escarpments and naked rocky surfaces; but in general, their summits are rather rounded, and their flanks, with the valleys separating one range from another, are most frequently well clothed with hard and soft wood, often of large growth, and of such species as are valuable in commerce; in many places giving promise of a good arable soil. Many of the slopes are gentle, and many of the valleys wide.

Five principal rivers, besides several of inferior note, flow through the country, and it appears to abound in lakes. The principal streams are the Thessalon, the Mississagui, the Serpent, the Spanish River and the White Fish, of which the mouths are from fifteen to thirty miles apart. The Mississagui and the Spanish Rivers are the largest two, the reported length of the former being 120 and of the latter 200 miles; the other three are probably not much over fifty to sixty miles each. In the distances measured, the Thessalon and the Mississagui flow from the north-west to the south-east, the Spanish River from the north of east to the south of west, and this is navigable for craft drawing not over five feet, for thirty-five miles from its mouth.

The series of rocks occupying this country from the connecting link between Lakes Huron and Superior to the vicinity of Shebawenahning, a distance of 120 miles, with a breadth in some places of ten, and in others exceeding twenty miles, it appears to me, must be taken as belonging to one formation; on the west it seems to repose on the granite which was represented in my Report on Lake Superior as running to the east of Gros Cap, north of Sault Ste. Marie; on the east the same supporting granite was observed by Mr. Murray north of LaCloche, between three and four miles in a straight line up the Rivière au Sable, a south flowing tributary of the Spanish River; and again, about an equal distance up another and parallel tributary joining that stream eight miles farther from its mouth, in both cases about ten miles from the coast. The series is to be divided into rocks of a sedimentary, and rocks of an igneous origin.

The sedimentary portion consists of sandstones, conglomerates, slates and limestones. The sandstones are sometimes grey, but more generally white, they are almost purely silicious, and principally fine grained, but the granular texture is often lost, and great masses assuming a vitreous lustre present the character of a perfect quartz rock, which is met with of both the colours mentioned; and when white, it sometimes exhibits precisely the aspect of the milky or greasy quartz of mineralogists. The quartz rock, in addition to white and gray, is not unfrequently of a reddish colour, and sometimes a decided red, seemingly derived from minute and thickly disseminated spots, or a diffused tinge of an orange red, probably due to the presence of iron; but the spots are sometimes of a larger size, and so arranged as to give the stone a speckled appearance. In the granular varieties considerable masses of the rock sometimes present a white with a faint tinge of sea-green, which seems to arise from a small quantity of finely disseminated epidote. The rock often becomes coarse grained, assuming the character of a conglomerate, the pebbles of which vary from the size of duck shot to that of grape and canister. These pebbles are almost entirely either of opaque white vitreous quartz or various coloured jaspers; some few are of lydian stone, and some of hornstone and other varieties. The pebbles are often disposed in thin layers at the top or bottom, or in the midst of finer grained beds; but they are sometimes arranged in thicker bands, which swell into mountain masses, and blood-red jaspers often disseminated in these to a preponderating degree on a nearly pure white ground, giving a brilliant, unique and beautiful rock, appear to characterize some ranges of considerable importance. When considerable masses of a fine-grained or vitrified quality are met with, it is often difficult if not impossible to determine the bedding; and the rock in such cases, having usually a jointed structure, with planes of division in several directions, some of which are frequently nearly horizontal or moderately inclined, it would not be safe to assume any of them as indicating the dip, until bands distinguished by differences of colour, or changes in the texture from fine to coarse grained, or the occurrence of a line or surface of pebbles, may give the means of deciding. The bedding, however, is often well defined by such indications as these, and it not unfrequently happens that surfaces present ripple-mark, and strata display elementary layers oblique to the general plane. The sandstones sometimes, but rarely, exhibit a slaty or flaggy structure, and they appear then to hold a small quantity of mica.

In addition to those already mentioned, conglomerates of a distinctly different character belong to the formation. They are composed chiefly of syenitic pebbles, held in an argillo-arenaceous cement of a gray, and more frequently of a greenish colour, from the presence of chlorite. The pebbles, which are of reddish and gray colours, vary greatly in size, being sometimes no larger than swan shot, and at others boulders rather than pebbles, measuring upwards of a foot in diameter. The quantities too in which they are aggregated vary much; they sometimes constitute nearly the whole mass of the rock, leaving but few interstices for a matrix, and sometimes, on the contrary, they are so sparingly disseminated through considerable masses of the matrix as to leave spaces of several feet between neighbouring pebbles, which are still in such cases often several inches in diameter; with the syenitic pebbles, are occasionally associated some of different coloured jaspers. The matrix appears often to pass on the one hand into the gray quartz rock by an increased proportion of the arenaceous particles, and on the other into a thin-bedded greenish fine-grained slate, which is sometimes very chloritic. A third form the matrix sometimes assumes is one in which it is scarcely distin-