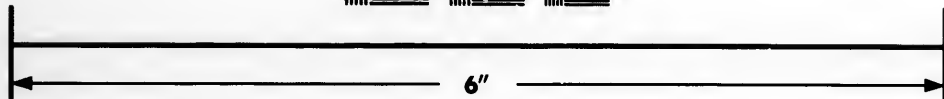
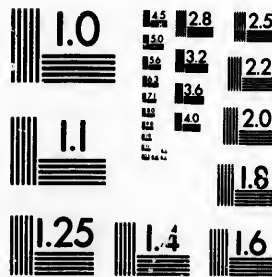
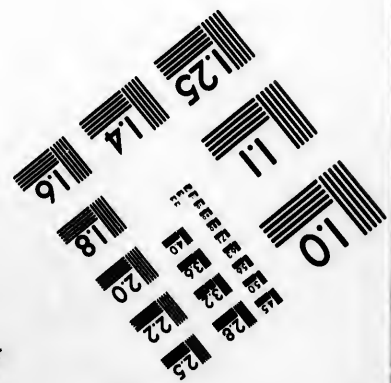


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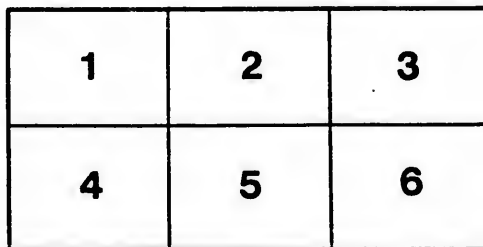
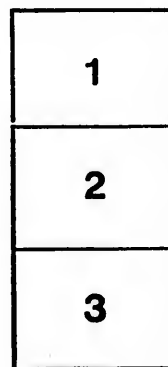
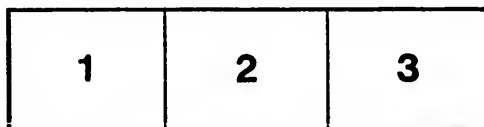
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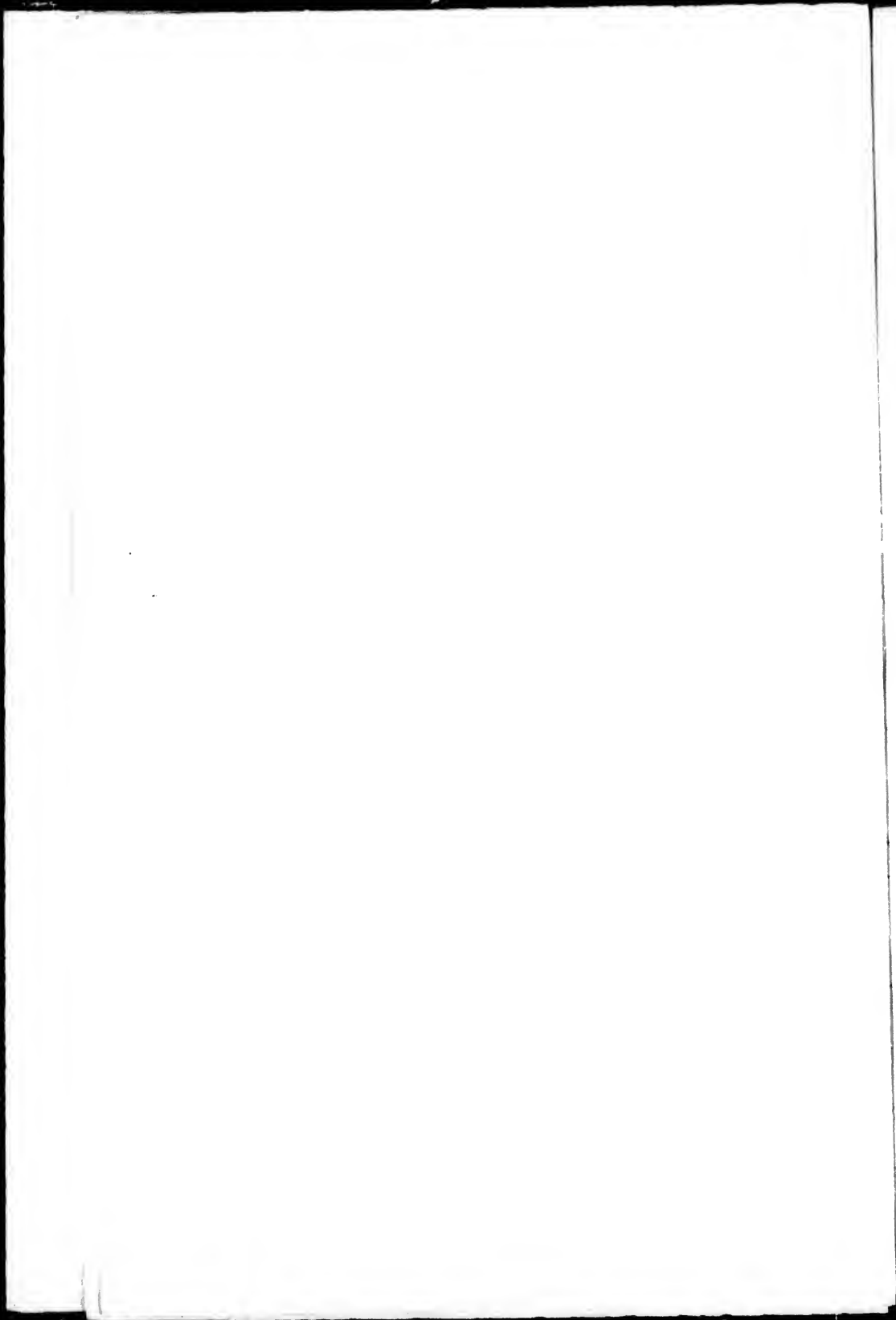
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REPORT

OF

THE PRESIDENT AND DIRECTORS

OF THE

LAKE HURON

SILVER AND COPPER MINING
COMPANY.

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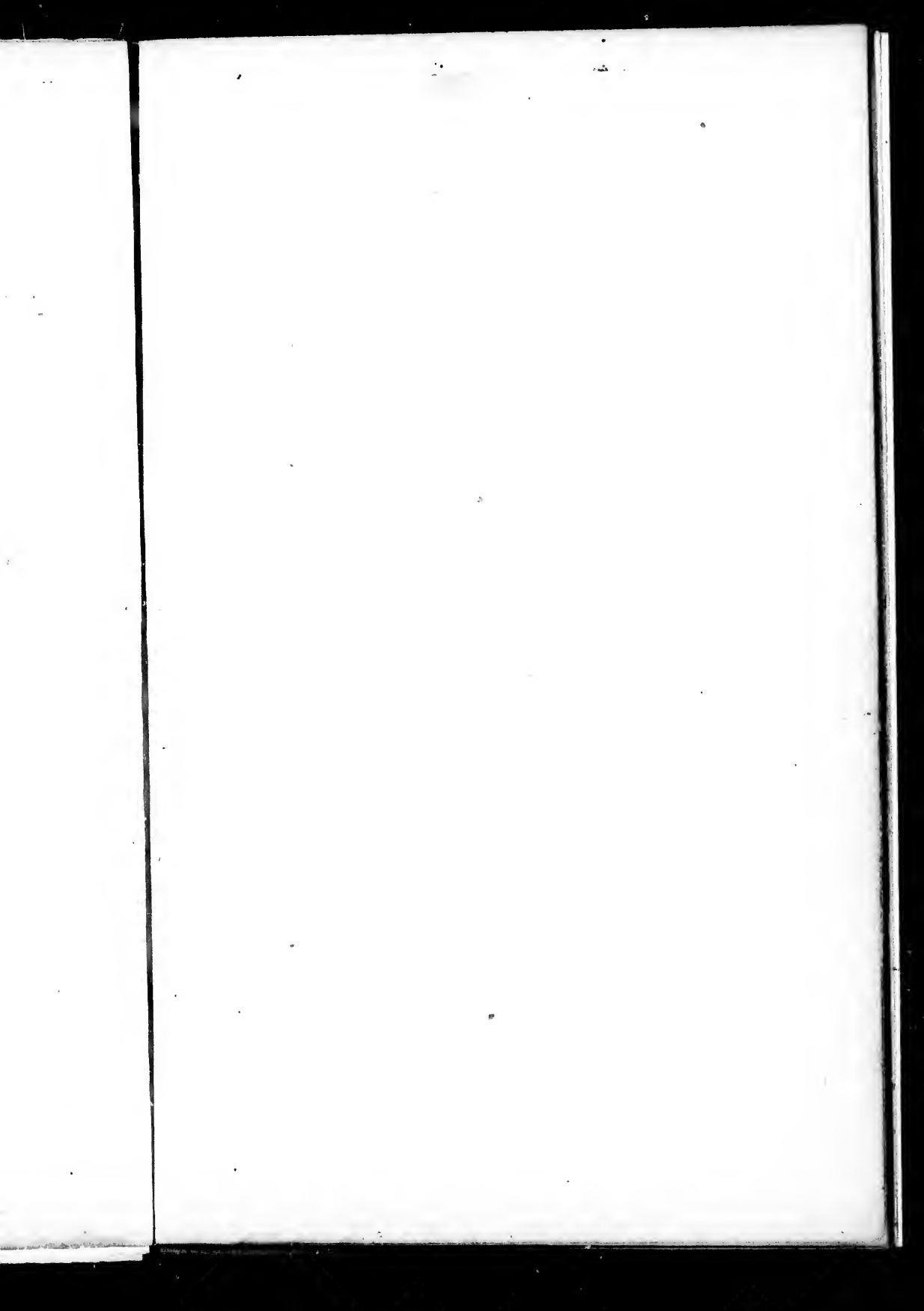
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REPORT
OF THE
PRESIDENT AND DIRECTORS
OF THE

SILVER AND COPPER COMPANY.

The Lake Huron Silver and Copper Company, associated in the early part of last year, was formally established by an Act of the Provincial Parliament, passed during its session in the same year. By this Act a very favourable charter has been granted to the Company, the importance of which is sufficiently obvious ; a copy of this charter is hereto appended.

At the request, and to meet the wishes of the New York portion of the proprietors, the services of Professor Forrest Shepherd were engaged last summer for the purpose of having a general examination and report made by him upon as much of the mineral tract belonging to the Company as the time which he could thus devote would enable him to make.

Mr. Richard Kernick, a practical Cornish miner, professing extensive experience in the various branches of mining and smelting, &c., who is well and favourably known among the American mining interests, was also engaged for the same purpose, but independent of Mr. Shepherd. The Directors beg to draw attention

to the several reports of these gentlemen hereunto affixed.

The Company was based upon extensive and highly promising mineral tracts, comprehending three locations, all of them situate on the shores of, or immediately contiguous to, Lake Huron, viz. :—1st. The Spanish River Location lies a few miles east of the river of that name ; it contains an area of 6,400 acres, and adjoins a location belonging to the Canada Mining Company, and upon which a party has been employed during the past season in sinking a shaft upon a highly promising vein. 2ndly. The Hincks Location also comprises an area of 6400 acres. The value and importance originally attached to this location is daily becoming greater, and is further established by the very many and favourable indications which the explorations made of it during the past summer by Messrs. Forrest Shepherd and Richard Kernick have developed, and which are fully set forth in the several reports of these gentlemen. Its peculiar position, adjoining to the Keating Location, and lying in the direction of these great veins, a portion of which constitute the justly celebrated and valuable "Bruce Mine," contributes also largely to support the expectations which have been formed of it.

At the time of the formation of the Lake Huron Silver and Copper Company, "the Bruce Mine" was considered and stated by its proprietors to be situate on the Keating Location, but subsequently it was found to be within the limits of the Cuthbertson Location.

The Directors have much gratification in being able to state, that by the practical examination of the Copper Bay Company's Agents, these veins have been traced up to the limits of that Company, and ; as will be seen by the reports of Messrs. Shepherd and Ker-

nick, the explorations and trials of these gentlemen have not only all but proved the further continuance of these veins across the Hincks Location, but have also established the existence on it of several other highly promising lodes or veins.

3rd. The location north of Echo Lake. This location, two and a half miles in length from west to east, by an average breadth of two miles from north to south, containing 3,200 acres, is situate towards the western end of Echo Lake.

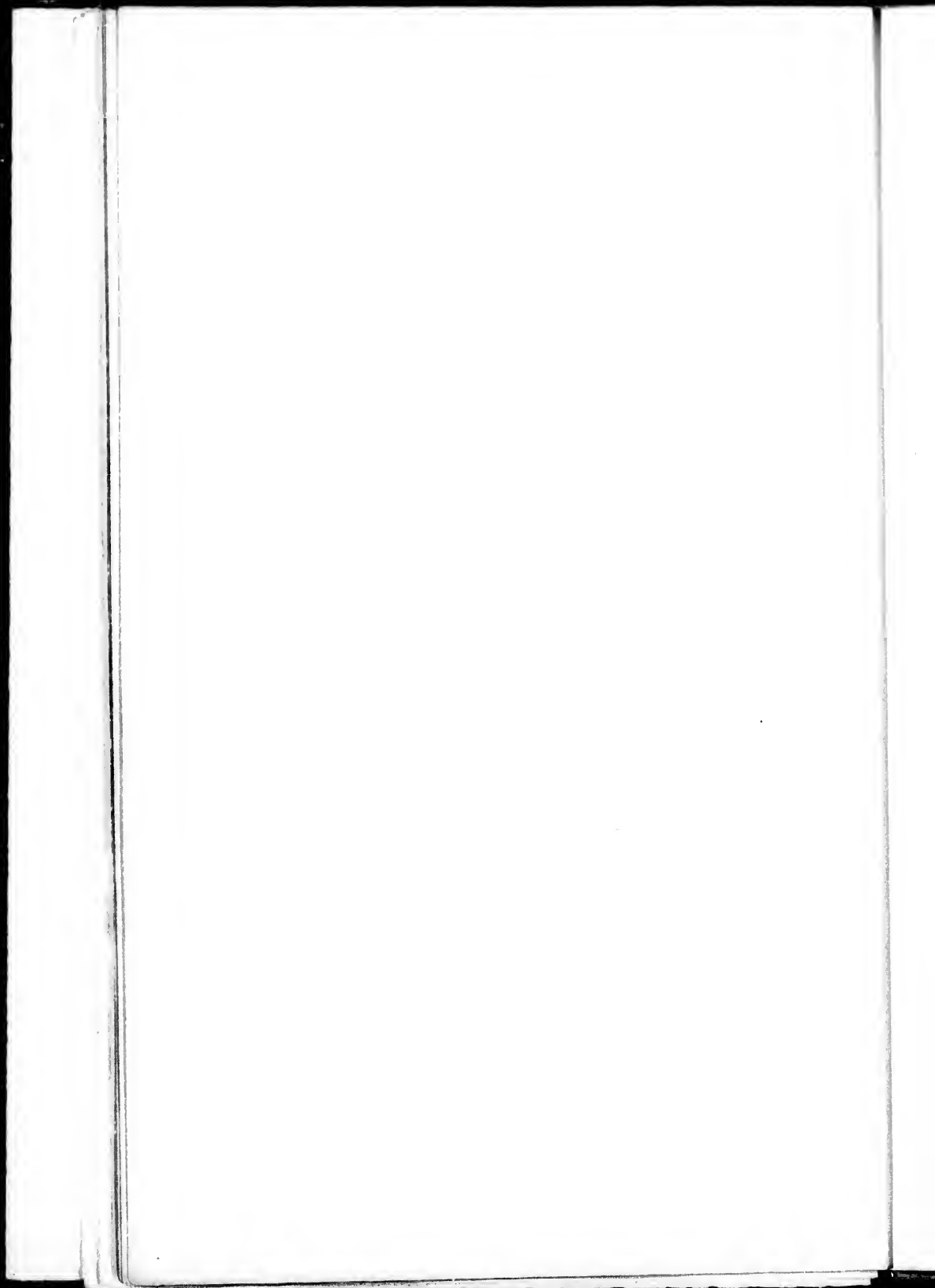
The geological structure and general mineralogical character of this location, taken in connection with the indications and existence of copper upon it, which the explorations of Messrs. Shepherd and Kernick have justly established, together with the other circumstances set forth in the reports of these gentlemen, lead the Directors to hope that this will ultimately prove to be a valuable location.

As a general meeting of the Stockholders will be shortly held, for the purpose of examining into the affairs of the Company, and as the Directors will then have an opportunity of submitting in detail all matters connected therewith, it is unnecessary on the present occasion to enter further upon these details.

(Signed)

A. SIMPSON,
PRESIDENT.

WM. HINCKS,
SECRETARY.



REPORT OF RICHARD KERNICK

ON THE

HINCKS LOCATION.

TO THE TRUSTEES OF THE LAKE HURON SILVER AND
COPPER MINING COMPANY.

GENTLEMEN,—

In submitting to you my Report of the results of my examinations of the Hincks location, and the location on the north side of Ecao Lake, I have to beg your indulgence for its imperfections, as it is prepared amidst many inconveniences, in the midst of the woods, and without the means of my having access to any scientific work for reference or information. The difficulties were many which I have had to contend with in my examinations, arising from the extent of ground to be explored, without properly defined boundary lines, in an entirely new country, the dense forests of which render it almost impossible to see farther than you can put your foot upon, and these greatly increased by the tortures and fever caused by the countless multitudes of black flies with which the woods have swarmed this season in an unusual degree. It has been my constant endeavour throughout these examinations to observe the most careful scrutiny, and to spare no effort that was consistent with a faithful attainment of the great object which I was instructed to accomplish. And I trust that when the extent of territory to be explored, and the necessarily minute character of the exploration are borne in mind, it will be admitted that my endeavours have not been wanting. It is not necessary for me to enter into a minute description of the geological formations of this district, as that important subject is placed by the Colonial Government of Canada in the hands of a gentleman distinguished for his abilities in the science of geology, and whose opportunities of examining the entire district along Lakes Huron and Superior, will furnish him with facts more reliable than any I could derive from the examination of

detached districts, and those comparatively small. I will proceed, therefore, simply to describe the results of my examination.

The Hincks location is situated on the borders of Lake Huron, bounded on the east side by the Keating's or Copper Bay location, running north five miles from the Lake shore. Commencing at the N. E. corner appear strata of limestone, conglomerate, and quartz rock, running in a northwesterly direction, and lying on the Trap range, which is the true metalliferous stratum of the country, and in which the veins from the Cuthbertson location must necessarily run, and of the value of which there cannot be a shadow of a doubt. In the examination of these ranges of hills, particular attention should be paid; and for a thorough examination, it would require more time than I could possibly devote to it; but, with the partial exploration made, the discoveries are:—

1st.—At a point, say two and a half miles, from the shore, and half a mile from the east line, in the side of a hill, and about three hundred feet from its base, a vein of quartz is exposed to view about 3 feet wide, and carrying some little portion of yellow copper pyrites. A little west of this point is a very promising side vein, bearing copper, about 1 foot wide, falling in with it; and taking into consideration that the rock is the true metalliferous stratum of the district—that copper is interspersed in the rock surrounding the vein—that this side vein bears very rich spots of pyritous copper—that the quartz of which the vein is composed principally is the true gangue of the copper—bearing veins of this district;—all these facts would induce me to believe that it is well worthy of some trial in mining, and might probably be of great importance; by sinking on it a few feet would prove if it would improve in descending, and if so, it would establish the fact of the copper having a downward tendency, and consequently the probability of its being a lasting workable vein.

2nd.—North from this before named point, say $\frac{3}{4}$ ths of a mile, in a dyke of trap, are three veins of quartz within the space of about 40 feet, each of those veins ranging from 1 to 2 feet wide, and of a truly metalliferous character; but at this point showing no copper; yet I should think the Company would do well to open them for the purpose of testing them.

3rd.—Nearly due east from No. 2 point, and nearly the east line of the location in a small stream is another vein of quartz, a little more aluminous than either of the other veins

before named, but yet no appearance of copper could be detected.

All these veins should be cautiously and carefully tested by mining; but no considerable outlay should be made without improvement was perceptible in the veins as you descended; and if such improvement should take place, it would clearly define your line of future operations. I recommend this because many a true and valuable vein which, at the surface, was composed of the proper metalliferous gangue as these appear to have been, have, in descending, become immensely valuable.

4th.—Near the east line of the location, and say $3\frac{1}{2}$ miles from the Lake, appears a junction of quartzose rock and the trap formation. At this point a number of veins, varying from 2 feet wide to 6 inches, cover a space of at least 20 feet; and along the whole of this surface the pyritous copper appears in rich abundance, and amply justifying any recommendation I might give for future mining operations, promising abundant success. Break it at whatever point, and I found it would yield similar specimens to those which accompany. At the foot of the rock lie masses of veinstone of considerable sizes, rich in copper.

While I would be extremely cautious in my recommendations, it would not become me to conceal the impression which rested on my mind previous to my examination of this property, and which opinion is now fully confirmed, that Keating's vein on the Bruce Mines should cross this location near this point, and that this is a continuation of the same vein. If so, what the value of this vein is cannot be fully imagined; and there is no longer uncertainty or speculation in the mining of it, but a return of profit that will be yielded and increased in proportion as any given number of miners may be properly employed. If it is not Keating's vein, yet still such are the indications on the surface—such the value of the stuff broken out of the vein—such the probabilities of its being very productive at the junction of the strata, that any intelligent miner seeing it, would pronounce that here was a field for mining investment, and a certainty of return sufficient to satisfy any reasonable expectations or wishes.

5th.—Going west from this point, I again found large masses of vein stone bearing copper, and in all probability in the direction of the last named discovery. The vein is about 3 feet wide, intersected by another about 1 foot wide. In addition to the yellow copper is the carbonate of copper, and showing every indication of being exceedingly valuable: this probably is a continuance of the large vein.

Taking into consideration the appearances of the veins, and the direction of the true metalliferous deposits of the district, I cannot hesitate in recommending this as the line for future mining operations in preference to any other on this property that has yet come under my notice.

With respect to the mode of egress and ingress to and from the Lake, the north-west side of the location is bounded by a large Lake about 4 miles long and $\frac{3}{4}$ of a mile wide, which empties itself into Portlock harbour, thus affording great facilities for the transporting necessary supplies and the mineral by water carriage, with a short distance by road on a very level and firm piece of land.

The streams of water are few, and but small, yet sufficiently large for washing and separating the ores that may be raised by mining.

Some parts of the land are covered by large pine and birch trees, and are well adapted for farming purposes, thus giving the opportunity to the Company of raising those vegetables, &c., which might be necessary for supplying the laborers, instead of bringing these things from a distance, and incurring all the disadvantages connected with their transportation.

The method proposed for working the veins numbered 4 and 5 should be commenced by sinking a shaft on the vein No. 4, and at the same time opening for a short distance from north to south, so as to ascertain the proper direction of the metalliferous deposit; this opening to be merely on the surface of the rock,—the shaft to be continued down for about 15 fathoms, or as far as the free circulation of air will permit,—then drifting on the course of the vein, and by sinking a second shaft, say about 40 to 50 fathoms distant from the first, and drifting towards it, so as to meet and make a communication with the first shaft. By this means a free circulation of air will be produced that will enable you to resume the sinking your shafts and extend your drifts on either side, while it will also leave the back of the vein fairly tested and opened on, so that you may commence stopeing or breaking out the vein at a much less expense, and giving all the necessary information for your future operations.

The number of men required will be 6 miners and 2 assistants for mining, and the necessary number of workmen that may be required for making roads and raising the necessary buildings.

The method of preparing the ores for the market should be by careful selection of the richer portions, and then by crushing the poorer portions and washing the ores previous to smelting.

The machinery necessary would be a stamping mill, with a pair of crushing rollers attached, worked by a steam engine, which might also be employed for raising the water and stuff (or ores) out of the same. In addition, it would be a matter for serious consideration whether it would not be most profitable to erect a smelting furnace, or give all due encouragement to spirited individuals well acquainted with the business of smelting to erect such furnaces for the purpose of smelting on such terms as would be mutually advantageous.

The expense of erecting the stamping mill and crusher for two sets would not exceed six hundred dollars, exclusive of the moving power or engine.

The probable per centage of the vein in mass, as it now appears, would be about say six per cent of copper; but selections of the vein might be made, yielding from fifteen to twenty per cent, and by dressing, it might be made to yield that per centage, which would be sufficiently rich previous to smelting.

The varieties of the ore found on this property are the pyritous copper, (yellow copper ore,) the purple or variegated copper ore, the green carbonate of copper, and the bisilicate of copper.

If the vein continue of the same size and appearance as at present, the ores raised from the mine would yield a profit during the sinking of the shafts, and during the necessary drifts; and if it yields a profit during this period, the profits from stooping the ground would be increased at least one hundred and fifty per cent. It would scarcely appear probable to persons unacquainted with the proper process of mining, the increase of profit for raising the ore from the vein by stooping after the shafts are sunk, and the drifts are made; but these workings prove the relative value of the veins at different points, and render it only necessary that such portions of the vein should be broken as will yield a profit to the Company; and no rubbish need be sent to the surface, but stowed away in the cavities below, while the facilities for breaking the vein are very great and advantageous.

You will not form your judgment of the per centage of the vein from the specimens that accompany, as they were all taken out by a small hand-pick or exploring hammer from the surface of the vein; and more in quantity might also have been sent, but where everything has to be taken into the woods, including bedding, provisions, cooking utensils, camp and all the necessary apparatus, it is an arduous undertaking

to pack much in the shape of copper ores through the woods. There cannot be a shadow of doubt, but that immediately on commencing to mine, copper ores may be raised equal to any that have yet been sent from Lake Huron.

I have the honor to be,
Gentlemen,

Your very obedient servant,

(Signed)

RICHARD KERNICK.

HINCKS LOCATION, LAKE HURON, }
13th August, 1847. }

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REPORT OF RICHARD KERNICK

UPON THE LOCATION

NORTH OF ECHO LAKE.

RNICK.

TO THE TRUSTEES OF THE LAKE HURON SILVER AND
COPPER MINING COMPANY.

GENTLEMEN,—

The location on the north side of Echo Lake, of which your property there consists, lies at the westward end of the lake, and is approached by a river from Lake George, distant about 3 miles. At the entrance of Echo Lake, a visitor to the Company in furthering the mining operations on the property. The hills rise from its waters to a very great height, and thus in the working of the veins that may be found, preclude the necessity of water charges for years to come. The altitude of these hills has been stated at not less than 700 feet from the level of the water; and when the great expense necessarily attendant on the drainage of water from a mine is taken into account, the value of this property becomes proportionably greater by its exemption from such expense. Thus, then, you have water transportation for your supplies and mineral, and drainage for your water.

I visited this location, for the first time, for the purpose of taking a cursory survey of the property previous to a systematic exploration, in company with the Hon. H. H. Killaly. It was then thought best to work upon a vein which was very distinctly defined on the face of a hill and at a point about 400 feet above the level of the water, and where the vein was about 5 to 6 feet wide. On each side of the vein the gangue was composed of a very fine quartz, affording every indication of its being a true metalliferous vein. Along its face was seen the bisilicete of copper, and the blue and green carbonates of copper; on breaking it, the yellow copper pyrites was found to be universally diffused, and some very fine peacock colored and gray ore. Although this vein would not be pronounced to be *very rich*,

yet it had a very promising character, and the copper evidently tended downwards, as some very rich specimens were taken from the lowest point near the debris.

At my next visit, J. R. Livingston, Esq, discovered in the same hill, a little west of the above named vein, another vein about 3 feet wide, of fine quartz, and among the debris large quantities of vein-stone was observed, in which copper was abundantly diffused.

This vein is clearly defined—the walls are very distinct—the quartz highly metalliferous—the copper of a beautiful bright yellow color, in many instances showing the richly variegated copper ore associated with it; and then its verging in its course towards the before-mentioned vein, proves that if no other point were discovered on this property to warrant mining operations, these are amply sufficient.

The best method of operating successfully on these veins would be to trace them to the lowest possible depth, and commence a drift into the hill; thus opening along on their course, and leaving a high *back* of ground to slope in the most valuable parts of the vein. No shafts would be needed for a long distance, as by two drifts, one above the other, at stated distances, say 60 to 70 feet, by communicating these drifts one with the other, you will ventilate your mines for several years.

Having narrowly explored the adjoining location on the south side of the lake, and finding there a great number of veins of the most prominent character, and rich in copper, crossing the mountains, and evidently directing their course towards this location, and as the mountains of this locality are a continuance of the trap range, and are truly metalliferous, I cannot conceive but that this will prove very valuable.

I cannot close these remarks without adding that the operations which have been carried on under the direction of the Hon. H. H. Killaly, on the adjoining property, south, and which are every day proving the increased value of that property as a mineral district, must have a beneficial result on this property, as it will be a key as it were to guide you in your further researches, and must greatly facilitate your further exploration and point out the most desirable spots to be most careful and scrutinizing in the examination of; so that nothing may be overlooked.

Mining speculations have been viewed by many individuals with feelings of distrust, and those persons have avoided them as they would the sure road to ruin; others there are who enter into them with the idea of making a fortune almost instantly, and in their visionary fancies almost clutch the tempting gold. Each of these characters greatly err.

Mining, if properly conducted in a mining district, cautiously and judiciously, will yield fair returns for capital invested, and in many instances immense profits. To those persons who, in old mining districts, have invested capital for the purpose of mining, it is well known that the average return of any given number of these mines, so far from deterring them from embarking capital in these undertakings, only holds out strong inducements to investment. And if in those districts they are safe undertakings, why should they not be so here? They have the advantage of older experience and cheaper labour—you of shallower mines, scarcely any expense of machinery, cheap timber, and much richer veins, the veins yielding a higher per centage of copper.

The expense of heavy machinery in the older districts, from the great depth of the mines, and the immense quantity of water and stuff they have to draw out, can be fully imagined but by those who are now or have been engaged in those works. Much depends on the proper method of working the veins. Subject to bad or extravagant management, many mines which, under a different state of things, would have yielded a fair if not a very large interest upon the capital invested, have too often been profitless and losing concerns, and have been needlessly suspended or prematurely closed in consequence of general expensive management; but where due caution is used in the selection of the vein, and a just consideration is given to the proper mining and practical economy, it is certain that so far from being dangerous and speculative concerns, they are highly productive and immensely profitable: and if they are at all productive, the profits will be yearly increased, and will enable those using due caution and activity confidently to calculate upon a return of original capital without any interruption of the most effective and full operation.

In conclusion, gentlemen, I beg leave to congratulate you on the judicious selection of your property, and wish you every prosperity in your spirited undertakings.

All of which is respectfully submitted.

I have the honor to be,

Gentlemen,

Your very obedient servant,

(Signed)

RICHARD KERNICK

HINCKS LOCATION, LAKE HURON, }
13th August, 1847. }

REPORT OF FORREST SHEPHERD

ON THE

HINCKS LOCATION.

TO THE TRUSTEES OF THE LAKE HURON SILVER AND
COPPER MINING COMPANY.

GENTLEMEN,—

Having been employed to visit and make an economic geological examination of your property known as the Hincks Location, situated near the entrance of Portlock Harbor, on the North Shore of Lake Huron, I beg leave to lay before you the following as the result of my examination.

REPORT.

The Hincks Location, as established by the Government Surveyor, is adjoining the Copper Bay Location, and only two miles westward of the location embracing the Bruce Mines already celebrated as the most remarkable discovery of copper ore hitherto made in North America.

The rock at the Bruce Mines is hornblende or sienitic trap. The same rock is found to occupy a large part of the Hincks Location. The veins at the Bruce Mines are of quartz, and vary in dimensions from two feet up to fifteen feet, and in some places reach even thirty feet in thickness. The general direction of the Bruce veins is nearly north-west and south-east; and if they extend inland, of which there is *very strong probability* from the indications which I met with, they will in that direction run *entirely through the Hincks Location*, a little northward of its centre, as may be seen by the accompanying map.

On or near the western border of the Hincks Location the sienitic rock of the Bruce Mines makes its appearance with copper bearing veins which, as I remarked above, renders the probability very strong, that the Bruce veins extend entirely through the Hincks tract, although covered with a deep diluvium, the location thus affording excellent soil for farming purposes in addition to its mineral wealth.

But whether these veins cross the location as supposed or not, is not a matter of immediate importance, for I have discovered others on this location which yield fine copper ore on the first blow of the hammer and pick, and which in my opinion are *sufficient* for the successful operations of any company for many years to come.

I shall first speak of the situation and extent of the location, its natural advantages, &c., and subsequently of its capabilities for mining purposes.

This location is most favorably situated on the northern shore of the broad and deep channel, which extends some eight or ten miles up from the open waters of Lake Huron and separates the main land from the large Island of St. Joseph. (See Map.)

It has a front of two miles upon the water by five miles inland, giving an area of six thousand four hundred acres. St. Joseph's Channel is here from three to four miles wide, with a depth of water varying from twenty to sixty feet. On the south east part of the location is an excellent harbour admirably protected by several small islands, while Portlock Harbor, one of the best in the world, lies near and parallel with the western boundry of the location for at least two miles and a half. Here vessels of the largest class may find easy ingress and egress, as well as the safest anchorage, and perfect security against all storms. On the northern part of the location are situated two lakes, which by means of rivers flowing from them into Portlock Harbor, render the northern section of the location easily accessible by boats and canoes. Near the outlet of these lakes, one or two mill seats may probably be obtained.

There are several other streams of minor importance upon the tract. The surface of the tract is moderately hilly and undulating, consisting of a succession of cones and ridges rising from the lake level to the height of three hundred feet or more. Nearly the whole tract is either fit for tillage or pasture. The lower grounds with little labor may be made to yield large harvests of hay for the winter, while near the central portions of the tract will be found from one to two thousand acres of fine arable land well adapted to the growing of grains and different kinds of esculent roots. There is on the location an abundance of timber consisting chiefly of white or red pine, cedar, elm, white birch, poplar, spruce, tamarack, fir, maple, ash, oak, and ironwood, &c. Good fishing grounds exist on the shores of the location.

The climate is remarkably healthy and the winters are considered much milder there than at Montreal.

The prevailing rock on the location, as I have before men-

tioned, is an apparently stratified syenite enclosing large veins of quartz in which are found both the yellow pyritons and the vitreous or gray sulphuret of copper. The syenite is in some places overlaid with a dense chloritic slate or killas, which some persons might consider green stone. Above this is seen a very compact sand stone similar to the Potsdam sand stone, and immediately over it is a porphyritic or brecciated rock often containing large fragments of granite, &c. ; while yet higher in the series, and especially near the south-east corner of the location, is a finely stratified, or sedimentary lime stone. This same lime stone is seen on the adjoining Copper Bay and Bruce Mine locations, especially in the vicinity of the great copper veins. The above rocks have been greatly changed by igneous action and thrown into frequent dislocations by numerous dykes and elvan courses, which accompany the copper veins.

All these appearances are highly favorable to the existence of large deposits of copper ore. The rocks here may be classed with the lower silurian, so noted in the Urals for abounding in mineral wealth. Here then is a second Cornwall, with the superior advantage of safe and commodious harbors and a supply of wood and timber for centuries to come. Provisions and supplies of all kinds can be shipped for this location from Detroit and Cleveland at a very low rate, especially from Cleveland, where the dressed copper ore will most conveniently meet the coal for smelting, refining and rolling. I need not enumerate the advantages of this locality over the region of Lake Superior. They are at once palpable and obvious. It is sufficient to say that from Quebec and Montreal vessels may come with full freight, and, without any obstruction, anchor in a safe harbor on this location.

There will probably be one or two good water powers obtained near the outlet of the lakes on the northern part of the location, if they should be needed ; and with the aid of two or three locks on these same streams the whole northern part of the location can be rendered most easily accessible by boats. Probably no location will enjoy superior advantages in this respect. By means also of one lock and dam, a good canal will be completed without any further excavation nearly through the centre of the location from east to west on the stream that flows westerly into Portlock Harbor.

What more could be expected or asked on a mineral location, except the *full assurance* of a good supply of ore? Of this, I think, no reasonable doubt can be entertained. For to say nothing of the appearance of the copper on the south-western, western, and eastern middle portions of the tract, or of the very strong probability of the Bruce and Keating veins extending en-

tirely through the Hincks Location, there is on the northern half of it about four miles inland upon the eastern line, a large vein of quartz measuring nine feet or more in thickness. This vein is nearly vertical, and runs nearly east and west, as seen in the map. *It has all the strong characteristics of the Bruce veins, and probably shows quite as well as those veins did before there was any excavation. It yields readily both yellow and gray copper on the first blow of the hammer and pick, and has been traced by cross cuts on the location for nearly half a mile. This vein alone, independent of all others, I am confident, will be sufficient for the successful operations of a well organized Mining Company for many years. To this I would, therefore, direct your attention. The ore from this vein is chiefly the yellow copper ore, which is a double sulphuret of copper and iron. It contains:—*

34.8 sulphur,
34.8 copper,
30.4 iron.

If crushed and washed from its adhering veinstone and foreign matter, and properly smelted, it will yield eight parts of copper to every twenty-three parts of ore, or, in round numbers, thirty-three per cent. If the ore is imperfectly dressed, the yield will be less accordingly. It is for such ore mainly that the Messrs. Williams, Foster & Co. and Crown Company have paid nearly four hundred thousand pounds sterling the past year, and the Messrs. Vivian & Sons about three hundred thousand pounds. It is, in fact, *the ore on which the greatest dependence is placed in Cornwall.*

The purple or "horseflesh," and also the vitreous or gray sulphuret, are to be found in this highly promising vein.

Wherever they come in, the richness of the ore will be much increased; the purple yielding from fifty to sixty, and the gray from seventy to eighty, per cent. Veins are seldom worked out in depth. Upwards of five thousand tons of ore have been raised the past year at the Treasurian Mine, Cornwall, and a good portion of it from a depth of eighteen hundred feet; also about twelve thousand tons at the United Mines, and much of it from a depth of fifteen hundred feet. More than three hundred and eighty thousand dollars have been paid for the ore thus raised from the above two mines the last year, ending July 1st, 1847. (See Gryll's Annual Mining Sheet.) It is difficult for one without experience to imagine the disadvantages at which mining is carried on in Cornwall at such depths. The timber for preventing the vein walls from falling, &c., comes from Norway at a cost of sixteen pence, or more than thirty cents, per foot. This must all be taken down to the working level to guard

against the extreme superincumbent pressure. It is then necessary to have a blacksmith's shop far down under ground to facilitate in sharpening the tools of the miners for excavating in the hard rock: a supply of coal must be taken down for the smith's fire. The combustion of the coal generates an abundance of carbonic acid gas, which, with the smoke of gunpowder in blasting, greatly vitiates the atmosphere, so that the average age of the miner is shortened to about thirty years, and the average time of his working in the mines to 16 years. When we add to this the extreme heat of the air and water in mines at such great depths, frequently rising to 100 degrees of the thermometer, and the indescribable hard labor in descending and ascending the ladders, even below the reach of the "man engine," to say nothing of the increased hazard of human life, what would the miner *not* give to find the rich resources of these great depths immediately on the surface, as may be seen at the Bruce Mines and Hincks Location on the north shore of Lake Huron?

All which is respectfully submitted by

Your obedient servant,

(Signed)

FORREST SHEPHERD.

NEW HAVEN, }

10th November, 1847. }

REPORT OF FORREST SHEPHERD

UPON THE LOCATION

NORTH OF ECHO LAKE.

TO THE TRUSTEES OF THE LAKE HURON SILVER AND
COPPER MINING COMPANY.

GENTLEMEN,—

In pursuance of my engagement with you to visit, examine and report upon your mineral location, situated on the north side of Echo Lake, in the Lake Huron District, allow me to offer, very respectfully, the following observations.

Echo Lake is only about three miles north-westward of Lake George, or about eight miles from Church's Steam-boat Landing, or twenty-five miles from the Sault St. Marié. It is a beautiful lake from four to five miles in length and one and a half to two miles in breadth. It is connected with Lake George by a river navigable for large barges, and which, with some little excavation, would probably serve for steam-boats. The water in the Lake is deep, and the adjoining hills rise abruptly from its shores to the height of 800 or 1000 feet.

The whole tract, five miles in length, north of this Lake, and of an average depth of two miles, containing ten superficial miles or 6,400 acres, was, I understand, granted in block by the Government to the original locatees, who divided it into two equal parts, each two and a half miles in length, from east to west. One of these parts, the western, is your property. It has an area of five superficial miles or 3,200 acres. The eastern portion, of the same location, is the property of the Echo Lake Company.

As the north shore of the Lake forms, in part, the south side of your location, and as its western limit can be correctly ascertained by measuring two and a half miles from the western mark, by which the Government grant is decided, there can be no difficulty whatever in having the limits of your property definitely marked whenever it is considered desirable. Indeed I would have marked it myself, but from an anxiety to devote the whole of my time to the close exploration of the location, and more particularly as I found that to form a safe opinion of its

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mineral resources, I was compelled, by the lie of the mountains, the direction of the veins and stratification, &c., to extend my examination generally over the whole tract, north of the Lake. Having done so, I considered it advisable not to confine myself in this report to a description of your property alone, but to give you the result of my examination generally, inasmuch, as independent of the many advantages and mineral indications which are apparent on your property, the existence of the veins and other favourable appearances in the portion eastward, and *immediately adjoining* it, of course tend strongly further to confirm the high estimate that my explorations have led me to form of the value of your property. The following, therefore, you will understand as a general description of the highly interesting and promising mineral tract, north of Echo Lake. But the portions of the descriptions which relate directly to your own property, will be obvious. Several streams water the tract, but Caribon River, the only one capable of supplying water power to any considerable extent, is on the *eastern part* of the location. It is a very permanent and valuable stream for propelling machinery. This river has a rapid fall for a quarter of a mile before it enters Echo Lake, and here it is that large quantities of red and white pine lumber may be expeditiously prepared for market by the aid of a saw-mill to saw the numerous and lofty pines that grow upon the tract. If I am not mistaken in regard to the boundaries, no location in the country can vie with this in its supply of excellent pine timber. The east branch also of Carabon River affords a succession of mill seats, while, as may be seen by the map, it flows over several copper bearing veins. Upon this stream is a remarkable natural mill-dam, and flume about five feet wide and fifteen feet deep, cut as if by art through the centre of the dam, and all, both dam and flume, consisting of solid rock. In short every thing is here ready for the erection of a mill.

Should mining be prosecuted on the banks of this stream, as it probably will be, the water power may be very advantageously employed in raising the ore and pumping out water in the same manner as is seen at Wheat Friendship, in Cornwall, performing as it were spontaneously the labor of an expensive steam-engine.

Still higher up the stream, above the flume, are two small lakes which may serve as important reservoirs in dry seasons. In addition to the pine timber above mentioned, there is upon the location a heavy growth of maple, hemlock, spruce, birch, cedar, fir, larch, &c. Much of the soil on the location will be found fertile, especially along the vallies, where some farms of superior quality may be selected.

The rocks on this location will probably be ranked among the lower silurian, and like many similar in the Urals, have been greatly altered, dislocated and broken up by the intervention of numerous dikes of trap and green stone. A dense chloritic slate rock, in appearance approaching green stone, serves chiefly as a foundation. Upon this is seen a very compact and altered sand rock, over which lies another porphyritic or brecciated slate, and upon the latter a highly siliceous limestone. The mineral veins are composed of quartz and ore of a later formation than the rocks. They cut through the different strata of the above rocks without distinction, are nearly vertical, and their course is generally a few degrees north of west and south of east. Some ten or twelve veins have been discovered on the location, all of which yield yellow copper ore. I have never seen *in any place such a general distribution of this valuable ore*. In some places, over the surface of many acres, it is difficult to break a stone without finding copper. Such is the case along the bluff eastward of Carabon River. The vein stone, although chiefly quartz, is accompanied by ferruginous carbonate of lime, and also carbonate of iron, which are very favorable indications in the mines of Cornwall. Rich gossans are also found along the veins, an indication always acceptable to a practical miner.

The above veins vary in thickness from one to four or five feet. They cut through indiscriminately every kind of rock upon the location; and hence copper is seen in the slates, conglomerates, sand stone, and lime stone, as well as the upheaving trap and sienite. In the hard sand stone, and very dense rocks, the veins are smaller in proportion as the rocks harden, and will therefore probably be less productive.

Although there are traditional reports of silver having been found upon this location, I have no positive evidence of its existence here. If found, it will probably occur in cross courses, cutting the east and west copper lodes at right angles. Such cross courses exist in the bluff east of Carabon River, but have not yet been explored. Blue and green carbonates of copper make their appearance in some of the above mentioned veins, but the yellow, or double sulphuret of copper is here as at the Bruce Mines, and in Cornwall the prevailing ore. Its composition is—

34.8. Copper,
34.8. Sulphur,
30.4. Iron,

100.0.

Upwards of two hundred thousand tons of twenty-one cwts. each, principally of this description of ore, have been raised in Cornwall and Wales the last year ; for which more than one million and a half pounds sterling have been paid ; and from which more than twenty thousand tons of fine copper have been produced. (See Grylls's Mining Street, No. 16.)

Only one vein (called "Peirce's Vein"), has been explored to any extent on the tract. It is situated towards the eastern side of the portion of the location belonging to the Lake Huron Silver and Copper Mining Company, and is about 300 ft. above the lake, on the steep declivity of the mountain. It runs inland as seen upon the map, a few degrees north of west, dips to the north at an angle of 80 degrees, and is from two and a half to three feet in thickness. The vein stone is quartz filled throughout with a large amount of the double sulphuret of copper. Several tons of specimens have been already excavated from this vein, which are on their way to New York. They shew at once the quality of the ore, and its accompanying vein stone. Judging from surface appearances, this vein, by common consent, is allowed to stand in reputation "*second only to the Bruce veins.*" The exploration of another season, however, will better determine its true character, for as yet it is only slightly opened, and that upon the surface. This vein is in a porphyritic slate rock, and only one of five or six others, some of which are larger, all running parallel on the same hill side, and all bearing copper, with the extraordinary advantage of three hundred feet of spontaneous drainage.

The veins on the east branch of Carabon River, are very similar to those above described. They measure from two and a half feet to four feet in thickness. The ore is the yellow copper, but the rock more chloritic, and of a lower grade in the geological series. For want of time, the only exploration of them has been to ascertain simply that they contain copper. Another vein about two feet in thickness, and composed almost entirely of rose-colored calcareous spar may be seen on the eastern extremity of the bluff, near the large river that flows into the east end of Echo Lake. The spar in this vein is of a highly promising character. Another interesting vein, showing a small amount of yellow copper, may be seen in the lime stone on Lime Stone Point. Many of the rich deposits of copper in Russia are connected with lime stone in like manner. This lime stone, especially where it is highly charged with iron, may be useful as Roman Cement, or hydraulic lime. The stone of the large hill north-west of the point, will probably burn and slack well for ordinary cement. Good clay for bricks is found in great quantity upon the location, and in short almost

every thing that can be economically used in the operations of a successful mining company.

I can only add, in conclusion, that this location, from its position, variety and *very favorable surface indications*, is to me one of peculiar interest. Years will elapse before it will probably be thoroughly explored, and fully appreciated. My sincere conviction is, that it is destined to hold *a high rank among the choicest localities* of this recently discovered but *highly promising mineral région*.

Very respectfully,

Your obedient servant,

FORREST SHEPHERD.

NEW HAVEN, }
9th November, 1847. }

