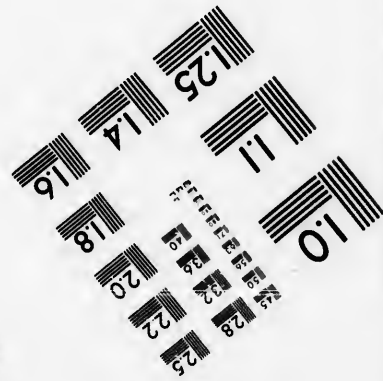
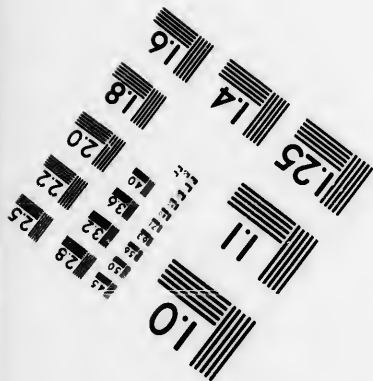
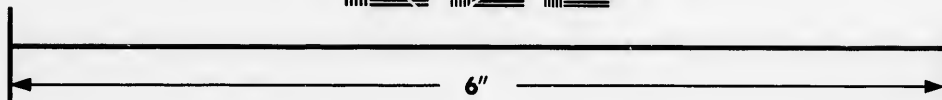
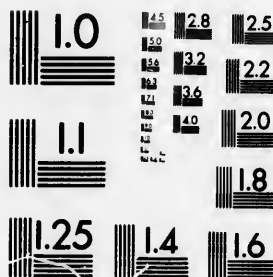


**IMAGE EVALUATION  
TEST TARGET (MT-3)**



**Photographic  
Sciences  
Corporation**

23 WEST MAIN STREET  
WEBSTER, N.Y. 14580  
(716) 872-4503



**CIHM/ICMH  
Microfiche  
Series.**

**CIHM/ICMH  
Collection de  
microfiches.**



**Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques**



**© 1985**

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- |   |   |
|---|---|
| <input type="checkbox"/> Coloured covers/<br>Couverture de couleur  | <input type="checkbox"/> Coloured pages/<br>Pages de couleur  |
| <input type="checkbox"/> Covers damaged/<br>Couverture endommagée   | <input type="checkbox"/> Pages damaged/<br>Pages endommagées  |
| <input type="checkbox"/> Covers restored and/or laminated/<br>Couverture restaurée et/ou pelliculée   | <input checked="" type="checkbox"/> Pages restored and/or laminated/<br>Pages restaurées et/ou pelliculées  |
| <input type="checkbox"/> Cover title missing/<br>Le titre de couverture manque  | <input checked="" type="checkbox"/> Pages discoloured, stained or foxed/<br>Pages décolorées, tachetées ou piquées  |
| <input checked="" type="checkbox"/> Coloured maps/<br>Cartes géographiques en couleur   | <input type="checkbox"/> Pages detached/<br>Pages détachées   |
| <input type="checkbox"/> Coloured ink (i.e. other than blue or black)/<br>Encre de couleur (i.e. autre que bleue ou noire)  | <input checked="" type="checkbox"/> Showthrough/<br>Transparence  |
| <input type="checkbox"/> Coloured plates and/or illustrations/<br>Planches et/ou illustrations en couleur   | <input type="checkbox"/> Quality of print varies/<br>Qualité inégale de l'impression  |
| <input type="checkbox"/> Bound with other material/<br>Relié avec d'autres documents  | <input type="checkbox"/> Includes supplementary material/<br>Comprend du matériel supplémentaire  |
| <input type="checkbox"/> Tight binding may cause shadows or distortion along interior margin/<br>La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure  | <input type="checkbox"/> Only edition available/<br>Seule édition disponible  |
| <input type="checkbox"/> Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/<br>Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées. | <input type="checkbox"/> Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/<br>Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible. |
| <input type="checkbox"/> Additional comments:<br>Commentaires supplémentaires:  |   |

This item is filmed at the reduction ratio checked below/  
Ce document est filmé au taux de réduction indiqué ci-dessous.

|                          |                          |                          |                                     |                          |                          |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| 10X                      | 14X                      | 18X                      | 22X                                 | 26X                      | 30X                      |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12X                      | 16X                      | 20X                      | 24X                                 | 28X                      | 32X                      |

The copy filmed here has been reproduced thanks to the generosity of:

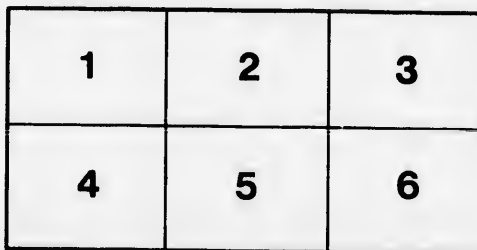
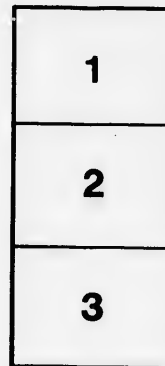
Library of the Public  
Archives of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol  $\rightarrow$  (meaning "CONTINUED"), or the symbol  $\nabla$  (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

La bibliothèque des Archives  
publiques du Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole  $\rightarrow$  signifie "A SUIVRE", le symbole  $\nabla$  signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

ire  
détails  
es du  
modifier  
er une  
filmage

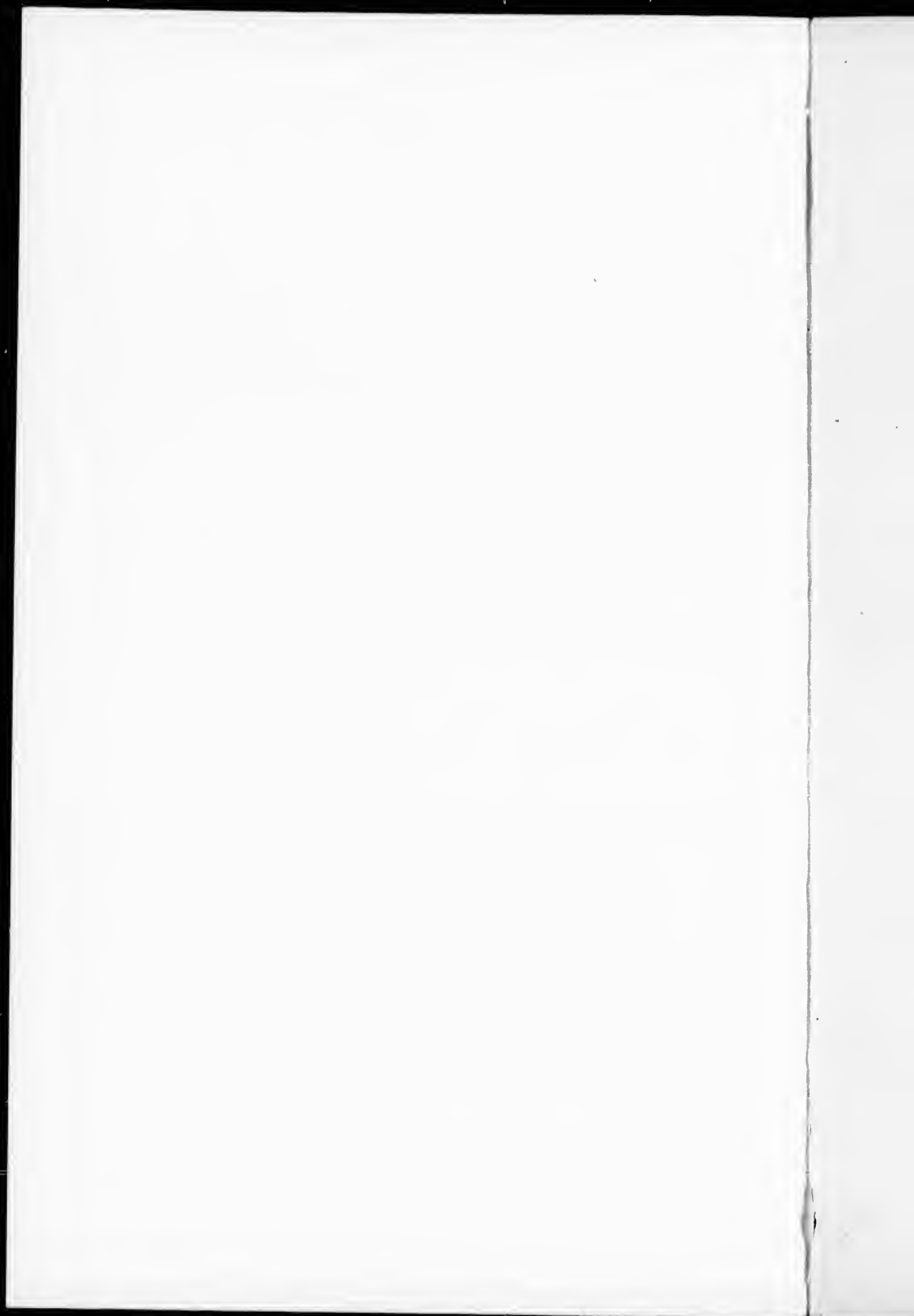
es

errata  
to

pelure,  
on à



32X



REPORTS

ON THE PROPERTY OF THE

Chaudiere Gold Mining Company,

SITUATED ON THE

FAMINE RIVER,

A TRIBUTARY OF THE CHAUDIÈRE RIVER,

CANADA EAST.

1863  
(31)

## CHAUDIÈRE GOLD MINING COMPANY.

---

### INTRODUCTORY REMARKS.

Although it has been long known that an extensive tract of country, watered by the Chaudière River and its tributaries, in Canada East, produced gold in considerable abundance, it has acquired much additional importance as a gold bearing region, from the extraordinary developments made upon it during the course of the present year. The amount of the precious metal realized in that time by the desultory and imperfect system of mining hitherto practised, make it abundantly evident that the gold region of Canada will eventually prove as productive as that of Australia or California.

The tract of land bordering on the Famine River, a large tributary of the Chaudière, has been proved to be rich in gold, and in addition to the alluvial deposits, numerous quartz veins traverse this property. From the quantity of gold already found in the streams as well as over the whole of the land, there is little doubt that these veins are the source of the gold found, and will prove to be very rich when thoroughly developed.

The Chaudière Gold Mining Company's property consists of five thousand acres, lying on both sides of the Famine River, and giving a frontage of five miles in length on both sides, as shewn by the accompanying map. The lands are held in fee-simple, the original deeds being patents from the Crown to the present owners.

The accompanying extracts from Sir Wm. Logan's Geological Report for 1863, Dr. C. T. Jackson's Report on the Abercrombie Mines, and Count de Rottermund's Report to the St. Lawrence Mining Company, together with the opinions of the press, illustrate the mineral richness of this district, which can only be adequately developed through the agency of a Joint Stock Com-



pany. The natural features of the country at this particular locality afford facilities for extensive and profitable operations, which are not enjoyed at many other points in the gold region. The abundance of water, and numerous falls on the river which traverses the property, will yield an unlimited water power, which will be available for crushing and washing the quartz, as well as for extracting the gold from the alluvial deposits by the Hydraulic process—a *new method of immense importance in gold mining both as respects economy of labor and increased yield of gold.*\*

These considerations offer the strongest inducements for the Company to enter at once upon the development of this property, which if carried out upon sound and scientific principles, cannot fail to secure an ample return upon the capital invested.

---

\* Full details of this process are embodied in the accompanying Reports.

## EXTRACTS FROM THE

OFFICIAL REPORT OF SIR WM. LOGAN, PROVINCIAL GEOLOGIST.

ON THE

## CHAUDIÈRE GOLD FIELDS.

---

The principal facts known with regard to the geological distribution of gold in Canada will be found on pages 518-520. Mention is there made of a quartz vein at St. Francis, on the Chaudière; where small grains of native gold have been found imbedded in quartz, together with argentiferous galena, and sulphurets of zinc and iron, both containing gold, and with arsenical pyrites. Since writing the above pages, much larger specimens of gold have been found in quartz, about one hundred yards from the locality just mentioned. It is probable that this and similar quartz veins, may be wrought with profit; but the gold hitherto obtained from this region has been from the superficial deposits of clay, sand and gravel which abound there, and appear to be derived from the breaking up of the rocks that contain the gold-bearing veins. These deposits probably belong in part to the ancient glacial drift or boulder formation, and in part to newer stratified clays and gravels, which consist of the materials of this, modified and arranged by the subsequent action of water. On the Magog River, about Sherbrooke, particles of gold occur in a hard-bound gravel 156 feet above the level of the St. Francis near by. On the Famine River, there is met with an extensive deposit of clay, everywhere overlaid by sand and gravel. Along the banks of the

river, a stratum of the oxyds of iron and manganese, in some parts six or eight inches thick, is seen near the top of the gravel, filling interstices among pebbles of the rocks of the region. Gold is found in this overlying gravel as well as in the clay beneath; both of which deposits appear to belong to the modified drift. It is met with in similar conditions throughout the banks of stratified material on the Metgermet, which attain a height of fifty feet above the bed of the river. Gold also occurs still more abundantly in the recent alluvions, found in the beds and along the flats of the streams which traverse this region, and in time of floods wash down the clay and sand from their banks, depositing the heavier portions along their course. In this way the gold is often caught in the fissures of the clay slates which frequently form the underlying rock, and are rich in alluvial gold.

The auriferous drift of Eastern Canada is spread over a wide area on the south side of the St. Lawrence, including the hill country belonging to the Notre Dame range, and extending thence south and east to the boundary of the province. These wide limits are assigned inasmuch as, although gold has not been everywhere found in this region, the same mineralogical characters are met with throughout; and in its continuation southward, in Plymouth and elsewhere in Vermont, considerable quantities of gold have been obtained from the alluvial deposits. In Canada, gold has been found in the St. Francis River, from the vicinity of Melbourne to Sherbrooke, in the townships of Westbury, Weedon and Duds-well, and on Lake St. Francis. It has also been found on the Etchemin and on the Chaudière, and nearly all its tributaries, from the Seigniori of St. Mary to the frontier of the state of Maine; including the Bras, the Guillaume, the Rivière des Plantes, the Famine, the Du Loup and the Metgermet. The country people from time to time, attempt the washing of the gravel, generally with the aid of a pan, and are occasionally rewarded by the discovery of a nugget of considerable value. In the years 1851 and 1852 an experiment of this kind, on a considerable scale was tried by the Canada Gold Mining Company, in the last named seigniori, on the Rivière du Loup, near its junction with the Chaudière. The system adopted for the separation of the gold from the gravel was similar to that used in Cornwall in washing for alluvial tin, and the

water for the purpose was obtained from a small stream adjoining. Great difficulties were however met with, from a deficient supply of water during the summer months. The gravel from about three-eighths of an acre, with an average thickness of two feet, was washed during the summer of 1851, and yielded 2,107 pennyweights of gold; of which 160 were in the form of fine dust, mingled with about a ton of black iron-sand, the heavy residue of the washings. There were several pieces of gold weighing over an ounce. The value of this gold was \$1,826, and the whole expenditure connected with the working \$1,643; leaving a profit of \$182. In this account is however included \$500 lost by a flood, which swept away an unfinished dam; so that the real difference between the amount of the wages and the value of the gold obtained should be stated at \$682. The average price of the labor employed was sixty cents a day.

In 1852, about five-eighths of an acre of gravel were washed at this place, and the total amount of gold obtained was 2,880 pennyweights, valued at \$2,496. Of this, 307 pennyweights were in the form of fine dust mixed with the iron-sand. A portion was also found in nuggets or rounded masses of considerable size. Nine of these weighed together 468 pennyweights, the largest being about 127, and the smallest about 11 pennyweights. Portions both of native platinum and of iridosmine were obtained in the washing, but the quantity of these was too small to be of any importance. The washing season lasted from the twenty-fourth of May to the thirtieth of October, and the sum expended for labor was \$1,888, leaving a profit of \$608. A part of this expenditure, was, however, for the construction of wooden conductors for bringing the water a distance of about 900 feet from the small stream. As this work would be available for several years to come, a proper allowance made for it would leave a profit in the year's labor of about \$680. It thus appears that from an acre of the gravel with an average thickness of two feet, there were taken \$4,323 of gold, while the expenses of labor after deducting, as above, all which was not directly employed in extracting gold were \$2,957, leaving a profit of \$1,366. The result of a week's working at this place, under the inspection of a member of the Geological Survey in 1852, showed a yield of 143 pennyweights of gold, valued at \$124;

while the amount paid for wages to the miners during that time was \$60. In a previous trial on the Touffe des Pins, a small tributary of the Chaudière, sixty bushels of the gravel from the bed of the stream were washed in a day, by means of a rocker, or kind of shaking table, and yielded 440 grains of gold, or about seven and one third grains to the bushel. The gold of this region is as usual alloyed with a portion of silver. The fineness of the gold dust was 871 thousandths. Another sample of gold in thin scales gave 892, and small masses 864; while a nugget from Vaudreuil yielded 867 thousandths of gold.

The composition of the heavy black sand which is obtained in the washing of the gravel, has been noticed on page 520. It is a mixture of magnetic oxyd and peroxyd of iron with chromic and titanitic iron ores. Rolled masses of these ores, sometimes several pounds in weight, are also met with in the gravel. Small crystals of rutile were obtained in the washings; and grains of red and pink sand, chiefly composed of grains of garnets, but including a few minute crystals having the form of zircon. The gold was not unfrequently incrustated with an earthy coating of black oxyd of manganese, and some specimens were white on the surface, from a coating of mercury; which is, however, at once driven off by heat, leaving the gold of its natural color. A single well-worn and rounded mass of native copper, several ounces in weight, was found in the gravel in this region; and in the washings at the Rivière du Loup were large quantities of leaden shot of various sizes, probably scattered by sportsmen.

Although the greater part of the gold at the Rivière du Loup was extracted from the gravel on the alluvial flats by the river side, a portion was obtained by washing the material taken from the banks above. As has been before remarked, the distribution of the gold-bearing drift over the surface of the country took place before the formation of the present water courses; and the greater richness of the gravel from their beds is to be ascribed to the fact that these rapid streams have subjected the earth to a partial washing, carrying away the lighter materials, and leaving the gold with the heavier matters behind. According to Mr. Blake, it is found in California that the gold in the alluvial deposits, which have not been subsequently disturbed by the streams, is not uni-

formly distributed, but is accumulated here and there in quantities greater than in other places. During the first deposition of the earth and gravel, the precious metal became accumulated in depressions of the surface rock constituting what are there called *pockets* by the miners.

It would appear from the facts here given, that the quantity of gold in the valley of the Chaudière is such as would be remunerative to skilled labor, and should encourage the outlay of capital. There is no reason for supposing that the proportion of the precious metal to be found along the St. Francis, the Etchemin, and their various tributaries, is less considerable than that of the Chaudière. What is called the hydraulic method of washing such deposits is adopted on a great scale in California, and to some extent in the States of Georgia and North Carolina. "In this method, the force of a jet of water, with great pressure, is made available both for excavating and washing the auriferous earth. The water, issuing in a continuous stream, with great force, from a large hose-pipe, like that of a fire engine is directed against the base of a bank of earth and gravel, and tears it away. The bank is rapidly undermined, the gravel is loosened, violently rolled together and cleansed from any adhering particles of gold, while the fine sand and clay are carried off by the water. In this manner hundreds of tons of earth and gravel may be removed, and all the gold which they contain liberated and secured, with greater ease and expedition than ten tons could be excavated and washed in the old way. All the earth and gravel of a deposit is moved, washed and carried off through long sluices by the water, leaving the gold behind. Square acres of earth on the hill sides may thus be swept away into the hollows, without the aid of a pick or shovel in excavations. Water performs all the labor, moving and washing the earth, in one operation while in excavating by hand, the two processes are of necessity entirely distinct. The value of this method and the yield of gold by it, as compared with the older one, can hardly be estimated. The water acts constantly with uniform effect, and can be brought to bear upon almost any point, where it would be difficult for men to work. It is especially effective in a region covered by trees, where the tangled roots would greatly retard the labor of workmen. In such places, the stream of water washes out the earth



from below, and tree after tree falls before the current, any gold which may have adhered to the roots being washed away. With a pressure of sixty feet, and a pipe from one and a half to two inches aperture, over a thousand bushels of earth can be washed out from a bank in a day. Earth which contains only one twenty-fifth part of a grain of gold, equal to one fifth of a cent in value to the bushel, may be profitably washed by this method; and any earth or gravel which will pay the expense of washing in the old way gives enormous profits by the new process. To wash successfully in this way requires a plentiful supply of water, at an elevation of from fifty to ninety feet above the bed rock, and a rapid slope or descent from the base of the bank of earth to be washed, so that the waste water will run off through the sluices, bearing with it gravel, sand and the suspended clay."

The above description has been copied from a report on the gold mines of Georgia, by Mr. William P. Blake, who had carefully studied this method of mining in California, and by whose recommendation it has been introduced into the Southern States. He tells us that in the case of a deposit in North Carolina, where ten men were required, for thirty-five days, to dig the earth with pick and shovel and wash it in sluices, two men, with a single jet of water, would accomplish the same work in a week. The great economy of this method is manifest from the fact that many old deposits in the river beds, the gravel of which had been already washed by hand have been again washed with profit by the hydraulic method. The auriferous earth, lying on hills and at some distance above the level of the water-courses would in the ordinary methods, be excavated by hand, and brought to the water; but by the present system, the water is brought by aqueducts to the gold deposits, and whole square miles, which were before inaccessible, have yielded up their precious metal. It sometimes happens from the irregular distribution of the gold in the diluvium in California that the upper portions of deposit do not contain gold enough to be washed by the ordinary methods; and would thus have to be removed at a considerable expense, in order to reach the richer portions below. By the hydraulic method, however, the cost of cutting away and excavating is so trifling, that there is scarcely any bank of earth which will not pay the expense of washing down, in order to reach the richer deposits of gold beneath.

The aqueducts or canals for the mining districts of California are seldom constructed by the gold workers themselves, but by capitalists who rent the water to the miners. The cost of one of these canals, carrying the water of a branch of the Yuba River to Nevada County, was estimated at a million of dollars; and another one, thirty miles in length, running to the same district cost \$500,000. The assessed value of these various canals in 1857 was stated to be over four millions of dollars of which value one-half was in the single county of Eldorado. The Bear River and Auburn Canal is sixty miles in length, three feet deep, and four feet wide at the top, and cost in all \$1,600,000; notwithstanding which, the water rents were so great, that it is stated to have paid a yearly dividend of twenty per cent; while other similar canals paid from three to five and six per cent., and even more, monthly. The price of the water was fixed at so much the inch, for each day of eight or ten hours. This price was at first about three dollars, but by competition it has now been greatly reduced.

From these statements it will be seen that the great riches which have of late years been drawn from the gold mines of California, have not been obtained without the expenditure of large amounts of money and engineering skill. This last is especially exhibited in the construction of these great canals, and the application of the hydraulic method to the washing of auriferous deposits which were unavailable by the ordinary modes of working, on account of their distance from water-courses, or by reason of the small quantity of gold which they contain.

In order to judge of the applicability of this method of washing to our own auriferous deposits, a simple calculation based upon the experiments upon the Rivière du Loup will be of use. It has been shown that the washing of the ground over an area of one acre and with an average depth of two feet, equal to 87,120 cubic feet, gave in round numbers, about 5,000 pennyweights of gold, or one and thirty-eight hundredths grains to the cubic foot; which is equal to one and three-quarter grains of gold to the bushel. Now, according to Mr. Blake, earth containing one forty-fourth part of this amount, or one twenty-fifth of a grain of gold, can be profitably washed by the hydraulic method, while the labor of two men with a proper jet of water suffices to wash one thousand bushels in a day;



which, in a deposit like that of Rivière du Loup, would contain about twenty-three pennyweights of gold. It is probable, however, that a certain portion of the finer gold dust, which is collected in the ordinary process, would be lost in working on the larger scale. It has already been shown that the gold in Canada is not confined to the gravel of the river channels, and the alluvial flats, but is found on the Metgermet and St. Francis Rivers, at from fifty to a hundred and fifty feet above their beds; and although its proportion were to be many times less than in the gravel of the Rivière du Loup, these thick deposits, which extend over great areas, might be profitably worked by the hydraulic method. The fall in most of the tributaries of the Chaudière and of the St. Francis throughout the auriferous region is such that it would not be difficult to secure a supply of water with a sufficient head, without a very great expenditure in the construction of canals; and it may reasonably be expected that before long the deposits of gold-bearing earth, which are so widely spread over south-eastern Canada, will be made economically available.

# REPORTS

ON THE

## CHAUDIÈRE GOLD REGION.

ABSTRACT OF REPORT ON THE GOLD MINES OF  
THE ST. LAWRENCE MINING COMPANY.

BY COUNT DE ROTTERMUND.

The past year was employed in making choice of the lands bearing gold and copper, and in purchasing them. This present year my attention was principally directed towards the examination of the importance of the mines, and of the localities where we should commence operations.

Although the gold appears to be spread over an extent of 10,000 square miles, according to certain vague data gathered from different individuals; and although the reports, given in to Government during a number of years, state that the auriferous clays and gravel, proceed from the washings of an unknown vein, such is not the case; the gold found in Lower Canada is generally due to the same material cause as all the other metals and minerals which are found in veins, both native and mixed or associated with other metals; I have not been able to find any character whatever in them denoting an alluvial nature.

Some places of very small extent contain gold, which is denominated alluvion; but such is not generally the case, and moreover such is not the case with regard to the different auriferous properties held by this company. The gold veins traverse the mountains; in some places they are in the rivers and small streams, and the veins

are cut by them, which is the cause why certain portions of the rivers or streams contain a quantity of gold in their beds, and this is the case with regard to a location granted under the name of Richard Oatey.

The lands acquired during the past year for this company, contain—

1. Gold upon the clay, under which is to be found an aluminous soil filled with white pyrites, quartz and pieces of rock of different dimensions, with decompositions of granite, and of crystalline slate full of corindon. Having had an excavation made of four or five feet in depth, by from five to six feet in length, I found that this clay contained a large quantity of auriferous sand, corindon, small jaspers and quartz pebbles.

2. We have gold also in veins of quartz cutting the slate rock. These veins are of different thicknesses, and are generally porous, and contain white pyrites, oxide and hydroxide of iron, white topazes, spinel rubies, carbonate of lime, magnesia, chlorite and galena containing silver.

3. I feel also satisfied that we must have diamonds, for according to all appearances and the composition of the ground, it is exactly identical with that wherein the diamonds are found. The search for diamonds requires much more particular care in washing than the gold does, on account of the difference in density.

This is the description of the land belonging to the Company on the south of the River St. Lawrence, in the Townships of Linière, Jersey and Shenley, and in the Seigniories of Aubert Gallion and Aubin de l'Isle.

As to the richness and value of the produce of mining, and for further information, I will merely state that our specimens have been examined at the mint of Paris by M. Peligot, chemist, member of the Institute of France, and president of the commission *des Monnaies et Medailles* of Paris; his letter of the 1st February, 1854, states that the fine gold contains, in 1000 parts, 873 parts of gold and 127 parts of silver, and the large pieces 860 parts of gold and 140 of silver. It is therefore certain that the gold from the mines of the St. Lawrence Mining Company is of the greatest purity and value.

I have the honor to present you with an extract from the "*Annales des Mines*," upon the auriferous formation belonging to the St. Lawrence Mining Company.

"The gold is found in sand, in clay, in schist, in the decomposed granite, in the quartz veins and united with iron pyrites. The sand is always black, and is full of titaniferous iron, rubies and quartz. The more there are of white milky quartz pebbles, with yellowish spots of tubercular form, the greater the quantity of gold is; the larger these tubercles are, the larger are also the pieces of gold. The clay which contains gold, is of a bluish grey color, sometimes it is whitish.

The auriferous schist is sometimes talcose, sometimes argillaceous, and of a color varying from blue black to ashy grey. The blue schist contains the purest gold, especially when the stratification is inclined to the south; in the strata of schist inclined towards the north the gold disappears, and only shows itself in the copper pyrites, and in very small quantities. Up to the present time I have not found any pure gold in the schist where the stratification is inclined to the north.

The strata of schist are traversed by veins of quartz varying from an inch and a half to two feet in thickness. The gold abounds especially in those veins which are large and of a white opal color, spotted with different shades of a brownish yellow.

The schist supports large pieces or boulders of syenite, porphyry and other rocks in a state of decomposition, filled with grains of gold. The stratification of this schist is followed by veins of very hard sandy free-stone and by veins of quartz, and in them I have found the gold mixed with small specks of platina, especially in the neighborhood of serpentine stones. I have also observed that the gold is found in the schist which contains jasper, and a species of porphyry in a state of decomposition. The auriferous iron pyrites is found in the blue schist, and in the schist decomposed almost to a state of clay.

The streams which contain gold are filled with a large quantity of blocks of free-stone, jasper, quartz, serpentine and porphyry rocks, although all the mountains which surround them bear the continued stratification of schist.

I also found gold in the valleys, at the bottom and on the banks of the streams of water, at a distance of more than 200 feet from their beds, at a few feet in depth ; and also in the mountains, both at their base and at an elevation of several hundred feet, particularly near those places where the rocks are displaced."

It only remains for me now to give you the plans and means of working the auriferous deposits. As I have described the several different states in which the gold is found, I am also obliged to employ different systems of working according to the different localities.

Washing upon the spot is requisite, particularly where the schist is, the gold being between the lines of lamination ; therefore by breaking the laminæ, the small grains of gold are found sticking to the aluminous matter produced by the decomposition of the schist. The larger grains of gold become detached, and fall into the cavities which are made by a separation of part of the stratification, and which cause a division in the lower part. As the ground always naturally contains water which constantly fills up the excavation, the pumps used to remove the water from the spot where the work is carried on, should also be used for washing ; which will do away with the necessity of scraping and washing each separate piece of schist and other stone, and will also facilitate the separation of the different mineral products, which being once transported to the boxes for concentration, may become mixed up with the heaps of stone and other substances, as being useless, and thus be thrown away together ; therefore to avoid loss, this operation should be gone through. We therefore see that sucking and forcing pumps, provided with flexible pipes, of a certain length, are indispensable.

As to the mode of concentration I have ascertained by several practical experiments that the smallest particle of native gold may be preserved by the following method :

Throw everything upon a spout where the water rushes with sufficient swiftness to carry off all kinds of rocks and stones of five or six cubic inches in size ; and all this substance carried away merely by the swiftness of the water, should fall into a box of at least two or three feet in height, raised a few inches above the level of the water, from which box the workman should remove the stones with

a rake. The useless sand will be carried off by the water, and the sand and substances remaining at the bottom of the box, should be separated from each other with the greatest care, as all the gold and platinum are at the bottom, and should be separated from the sand either upon a piece of linen or by means of different kinds of sieves.

As to the separation of the gold from the pyrites and other substances which will require melting, I would advise the Company not to come to any decision for the coming year, but to have such minerals stored away.

As to the process of crushing, I would propose that the directors should make arrangements for machines, in order that they may be at our disposal when required. We have a very considerable extent of land where the veins cross the rivers and streams, where we use nothing but the pick axe, levers and blasts, and where the gold is already laid bare, either by itself or combined with pyrites. In order to render available the mineral substances contained in the massive rocks, works on a larger scale would be requisite.

DE ROTTERMUND,

*Geological Director of the St. Lawrence  
Mining Company.*

REPORT OF DR. JACKSON ON THE PROPERTY OF  
THE ABERCROMBIE GOLD MINES.

BOSTON, 29th January, 1863.

GENTLEMEN: I have recently made an examination of a lot of specimens of native gold from the Abercrombie Gold Mines in Canada East, which are now in your office, and would express my opinion upon them, so far as I can without a geological survey of the mines themselves.

There are several points upon which I may be able to give a reliable opinion, merely by a careful inspection and chemical examination of the specimens, since I am very familiar with the gold deposits in the Southern States, and know well the geological and

mineralogical associations of native gold in various parts of the world.

*I have since 1845 known of the occurrence of gold nuggets in the Seigneurie Vaudreuil*, having had specimens of them placed in my hands for assay during that year, and since. I was aware of the fact that, at that time, the gold had not been discovered *in place*, or in the rocks of Canada, and that it was wholly alluvial gold that was brought to me. Since then, the gold has been found *in situ*—an important point, so far as concerns the business of mining for that metal.

Although I have seen the written testimony to the fact that the specimens I saw at your office were taken from veins in the fixed rocks, I thought it might be desirable to take the testimony of the rocks themselves on that subject, and therefore have put samples of them to a chemical examination, bringing them face to face with rocks that are known to be in place near the premises, namely, those of the Megantic, Harvey Hill and St. Margaret's copper mines.

The rocks in which native gold chiefly abounds are known under the name of talcose slates; rocks consisting in part of the hydrous silicate of magnesia, with other silicious minerals. Now on analysis of the slate attached to one of the quartz veins rich in gold, which is in the collection at your office, and on similar analysis of the Megantic copper-bearing slates, I find that they are both *talcose slates*, and nearly identical in composition. I say nearly, since there is a little more magnesia in that associated with the gold, evidently because it occurs near serpentine rocks; but both are clearly talcose slates, identical with those of the best known gold formations. There is no geological or chemical reason to doubt that the native gold of the Abercrombie Mines is really *in place in the talcose slate rocks of that region*, and the gold occurs in the quartz veins in the usual manner; and the heavy nuggets which have been found in the streams and in the branch washings were derived from veins in the rocks of the immediate vicinity. The size and number of nuggets found indicate a productive vein or veins in the talcose slate rocks.

I noticed the minerals associated with the native gold, and they are also very valuable witnesses. They are mispickel, or arsenical



sulphuret of iron, often containing crystals and small particles of gold in them, arsenical iron or arseniuret of iron, also containing gold, brown iron pyrites, a frequent companion of gold, and which undoubtedly contains fine particles of the precious metal, argentiferous galena, which is also probably auriferous, and black zincblende, or sulphuret of zinc and iron, which is an associate with the native gold of Vermont, as is also the argentiferous and auriferous galena. These minerals are all found in good company in your specimens, and testify in their favor.

Now as to the working of these gold mines, I would say that you must first have the localities thoroughly and carefully explored by some one who is well acquainted with minerals and with gold deposits, that you may be directed in the best way as to mining for the gold.

Secondly, you must have proper machinery for the separation of the gold, and it must be properly and chemically treated in preparing it for amalgamation, for the arsenical ores and the galena present in the quartz veins with the gold will interfere with the ordinary California method of separating and obtaining the gold, and the arsenic and lead will make mischief with the mercury used in amalgamation.

The ore, or auriferous quartz, is first to be broken to the size of filberts, and then must be *thoroughly roasted at a red heat in a reverberatory furnace*, to expel the arsenic in vapor, and to oxidize the lead, and remove the sulphur from the pyrites. Then the whole must be stamped or ground fine, and be ground in quicksilver until the gold is all taken up. Then the earthy matters, pulverized rock and oxide of iron are to be washed away from the amalgam, and the amalgam is to be squeezed in buckskin, or closely woven bed ticking, the free mercury being pressed out, and the amalgam, containing forty per cent. of gold, will be obtained in solid lumps. These are to be put aside until a sufficient quantity is obtained for "retorting," or distilling off the mercury so as to obtain the gold as a residue. The lumps of amalgam are to be wrapped up in letter paper before they are put into the iron retort, so that the charred paper will prevent the adhesion of the gold to the iron. The nose of the retort is to be just covered with water, and the mercury distilled off and saved. Then the retort-head is un-



clamped, and a lump of gold enveloped in burnt or charred paper will be found.

As to the mills, the *Chilian* will be the best,—better than stamps,—and *Arastra* mills may be also employed in finishing up the work ; both these mills being charged with quicksilver to take up the gold as fast as it is exposed by crushing and grinding. The “tailings” may be washed over again in long rockers by boys, each boy moving half a dozen rockers. This last work is best done on *tribute*, as it incites the boys to activity and diligence.

The methods named by Prof. Philips and Capt. Kent, in a report you handed to me, will not answer any economical end, for an immense loss, will ensue if such coarse processes as “*tin streaming*” or washing by “*strake and tie*” are followed. They were probably proposed under the impression that no skill in gold-working existed in Canada, and they supposed the ore would have to be carried to England for separation of the gold.

The whole work, to be done thoroughly, must be done at the mines, and an able and faithful superintendent will be required to oversee the work, and to see that the company is not robbed by the workmen.

From what I have learned concerning the Abercrombie Gold Mines, I anticipate very valuable results, as the ores are rich, and the best methods of working are well known in the United States. Only slight modifications of the usual methods employed in Virginia, South Carolina, Georgia and California, are required in the treatment of these gold ores, as I have above suggested.

Respectfully, your obedient servant,

CHARLES T. JACKSON, M. D.,  
*Geologist and State Assayer.*

---

## EXTRACTS FROM THE PRESS.

---

### THE CHAUDIERE GOLD REGION.

(*Quebec Chronicle.*)

The Chaudiere gold region, little over fifty miles from our own city, is beginning to attract the attention of adventurers from all

parts of the Province. An Australian miner, writing to the *Montreal Witness*, says that, in his opinion, the location is as rich as Australia or New Zealand, and far superior to British Columbia. Another miner gives a detailed account of his experience, published in the *Montreal Commercial Advertiser*, which is by far the most circumstantial statement yet given by the public, and by which it appears that even on a claim which has only been worked during the last seven weeks, several of the diggers are making a good thing of it. Another account says that several parties, working only a few feet below the surface, are making from \$20 to \$25 per day. Of course there will doubtless be some exaggeration in many of these rumors. An official report, however has been made to the Commissioner of Crown Lands, on the subject, and this, we suppose, will be made public without delay.

---

#### GOLD IN LOWER CANADA.

(From the *Commercial Advertiser*.)

We have been favored by a friend, a practical gold-miner, who spent some years in the placers of California engaged in gold-mining, with an account of his exploration of the Chaudière gold district, during the present summer. Our informant spent two months in prospecting the country from the junction of the Du Loup and Chaudière rivers, where the Montreal Company is now working, to the Maine and New Brunswick boundary lines. The season has been one of the worst ever known for prospecting, the water in the rivers and brooks being at flood height, and the ground saturated with moisture by the constant rain. He was therefore prevented from examining the beds of the streams, and from sinking trial shafts to the necessary distance to obtain an accurate knowledge of the nature and extent of the distribution of the precious metal. But with these unfavorable circumstances his general exploration was highly successful. He found gold in the banks of every stream examined, in the ditches by the road-side, in the gravel beds adjoining water-courses, on the tops of the hills far removed from water, and in other localities which cannot have been submerged for many ages. The general character of the gold, of which we

have many specimens now before us, is great purity and exceeding coarseness; some of it is much water-worn, and other specimens appear to have been only recently dislodged from the quartz matrix. The country generally exhibits broad exposures of slate, traversed by numerous quartz veins, and resembles in every respect the gold region of California, with the exception of the absence of volcanic evidences. We have now to announce the discovery of a large quartz vein in the Chaudière district carrying an usually large amount of gold in prills and nuggets, many of them weighing several ounces; and the discovery of other leads showing similar indication of the precious metal, and proving conclusively that these quartz veins may be worked in Canada, as in Australia and California, with a prospect of very large returns. One mass of quartz taken from the large vein was thickly set with nuggets of gold from an ounce up to six ounces in weight, carrying the gold not in regular strings, but in isolated lumps throughout its substance; a quantity of quartz estimated at five hundred weight having yielded to the discoverer seven hundred dollars worth of gold by the simple process of breaking out the larger pieces with a hammer; and still containing a large amount of finer gold only to be obtained by crushing.

Our informant states that he saw nothing equal to this mass in the most productive quartz leads of California, and if the remainder of the vein from which it was taken is at all like it, its value is incalculable. It was discovered last year by some habitants of the district, who kept its locality a secret. It was from this vein that the large nuggets sold in Quebec last November were taken. We have before us some specimens, showing its exceeding richness.

The gold in the different streams varies much in character: in some it is exceedingly fine, as fine indeed as that of Fraser's River; in others, and some of the smallest, it is coarser than that found in California, the fine gold being apparently the result of the decomposition of auriferous pyrites, and the product of quartz veins.

Hitherto the streams alone have been worked, and the operations on them were conducted with so little skill, that our informant is surprised that any gold was obtained; as it was, the whole of the fine gold was washed away.

Yet, in one instance, 15,000 dwts. were taken from little more than half-an-acre of a bar; in another, nine pounds weight were got

from a single hole, and more recently \$2,000 were obtained in two days, after damming a considerable stream, nearly all being coarse gold.

Our informant is of opinion, and as a thoroughly practical man his opinion is entitled to the highest consideration, that the dry diggings in the Chaudière district will be found more productive than the streams. He says that on the whole the California streams have not repaid the expense of working them. He believes that the streams contain no more gold than has been displaced by the water from the rocks traversing them; and that the whole country in their vicinity would be found as rich, and in many cases much richer, if mined in the same manner as similar lands are in California and Australia, by sinking shafts through the gravel down to the rock or clay beds beneath. He says that in no part of California could he obtain the same quantity of gold by the same means as he obtained upon the Chaudière and its tributary streams; that the surface prospects, in spite of the unfavorable season, were superior to any he had ever found before; and that with ordinary skill, by simply panning on the river banks, large wages can be made with certainty.

### IMPORTANT GOLD DISCOVERIES IN THE COUNTY OF BEAUCE.

(*Morning Chronicle, Quebec.*)

Considerable excitement has been caused in the South Shore parishes by extensive gold discoveries in St. Francois de la Beauce. It appears that along the banks of the Riviere Gilbert, in the third concession of that parish, the richest deposits have been found. There is doubtless considerable exaggeration in many of the rumors which prevail; but the prospects, nevertheless, are promising in the extreme. A correspondent of *Le Canadian*, writing on Saturday last says that within the last six weeks about \$12,000 worth of gold has been taken out. A man named Fereol Poulin, with three companions, in a single day, realized the amount of \$1100. Some of the nuggets are said to be worth between \$200 and \$250. There has already been a considerable rush of diggers to the spot anxious to secure a share of the "filthy lucre," and at last accounts about 450 persons were at work.

## GOLD-MINING IN CANADA.

*(Correspondence of the N. Y. Times.)*

QUEBEC, 16th September, 1863.

Year by year an attempt is made to bring into notice the gold-field on the Chaudiere River near Quebec, and year by year, as the nuggets found increase in size, the attempt more nearly attains success. At length a sort of gold fever has been induced, and from 300 to 500 men are now at work on the diggings, with the varying success which appears to attend gold-mining all the world over. Some men go up and find nothing; others make their \$50 per diem, — a good deal of the difference depending on the character of the claims taken up; more, perhaps, on the industry and perseverance of the miners. A fine lot of nuggets, weighing about nine pounds, were brought down from the diggings last week by one person, the largest weighing just ten ounces, and being valued at \$200. Specimens of quartz, with fine pieces of gold in it, are also shown; but no machinery for crushing has as yet been sent up to the spots where the quartz occurs.

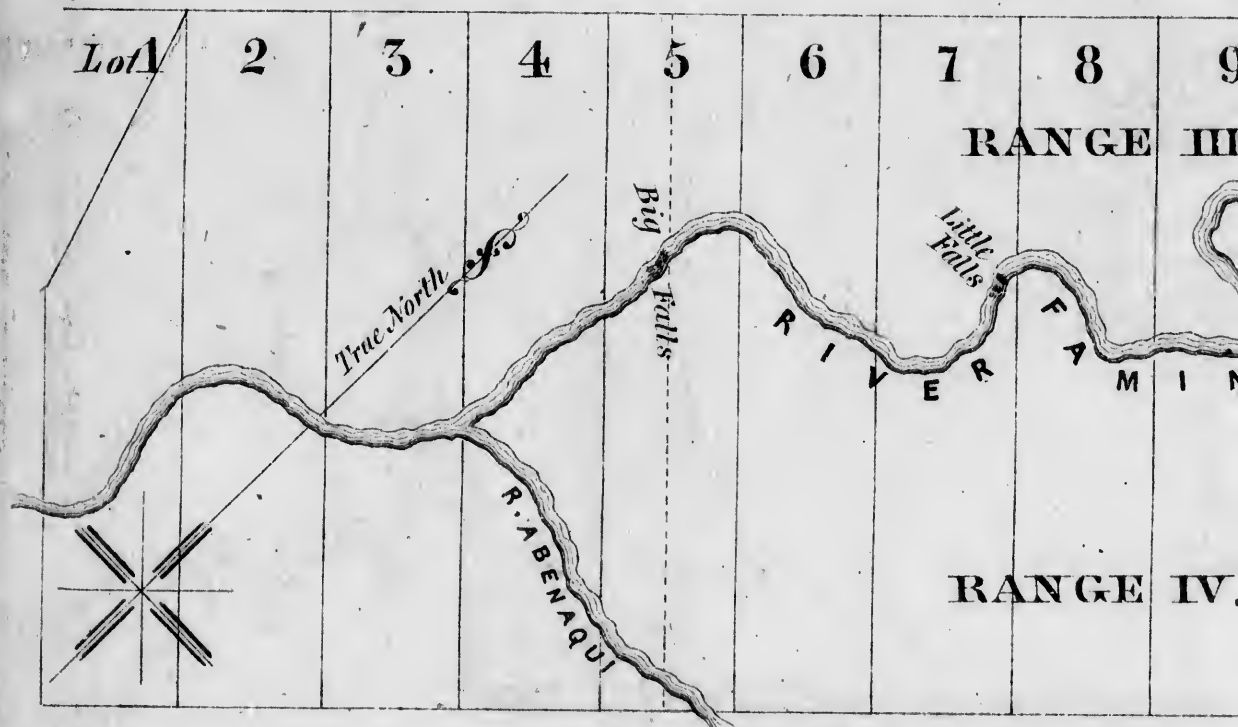
The drift gold of the Chaudiere differs in appearance from that of Australia or California. There is none of what is often called "dust gold" here, but it is replaced by small pieces resembling shot of various sizes, pressed and crushed out of shape. The largest pieces have the same battered appearance, which, it strikes me, is possibly due to the action of ice. The gold is yellow rather than red, and very pure. I suppose \$50,000 worth has been got out this season. Within the past fortnight a company have built sluices and "dals" on the Gilbert river, a tributary of the Chaudiere, and we may therefore soon look for better results than have hitherto been obtained without appliances of this kind. Their success will probably determine whether there is or is not to be another gold excitement on a grand scale. My belief is that there is plenty of the precious metal, and in great nuggets too, and that ere long Canada will take a high rank as a gold-producing country.

63.

gold-  
ar, as  
ttains  
l from  
rying  
over.  
diem,  
f the  
rance  
unds,  
n, the  
speci-  
out no  
spots

mat of  
dust  
not of  
rgest  
ne, is  
then  
n got  
built  
rière,  
ther-  
s will  
xcite-  
f the  
Can-

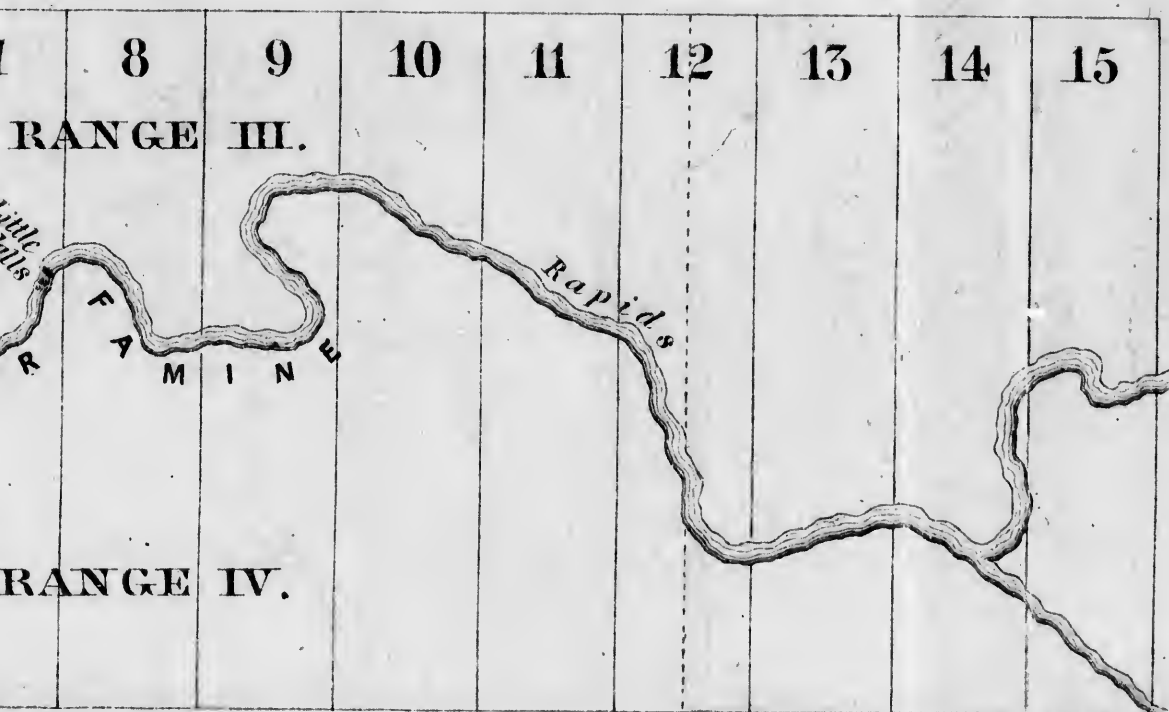
PLAN  
 OF THE  
*Chaudière Gold Mining*  
*on the Famine*  
 Canada East



Scale of Miles.  
 1    3/4    1/2    1/4    0



**PLAN**  
 OF THE  
*Mining Company's Locations,*  
*Famine River,*  
*Canada East.*



1      8      9      10      11      12      13      14      15

RANGE III.

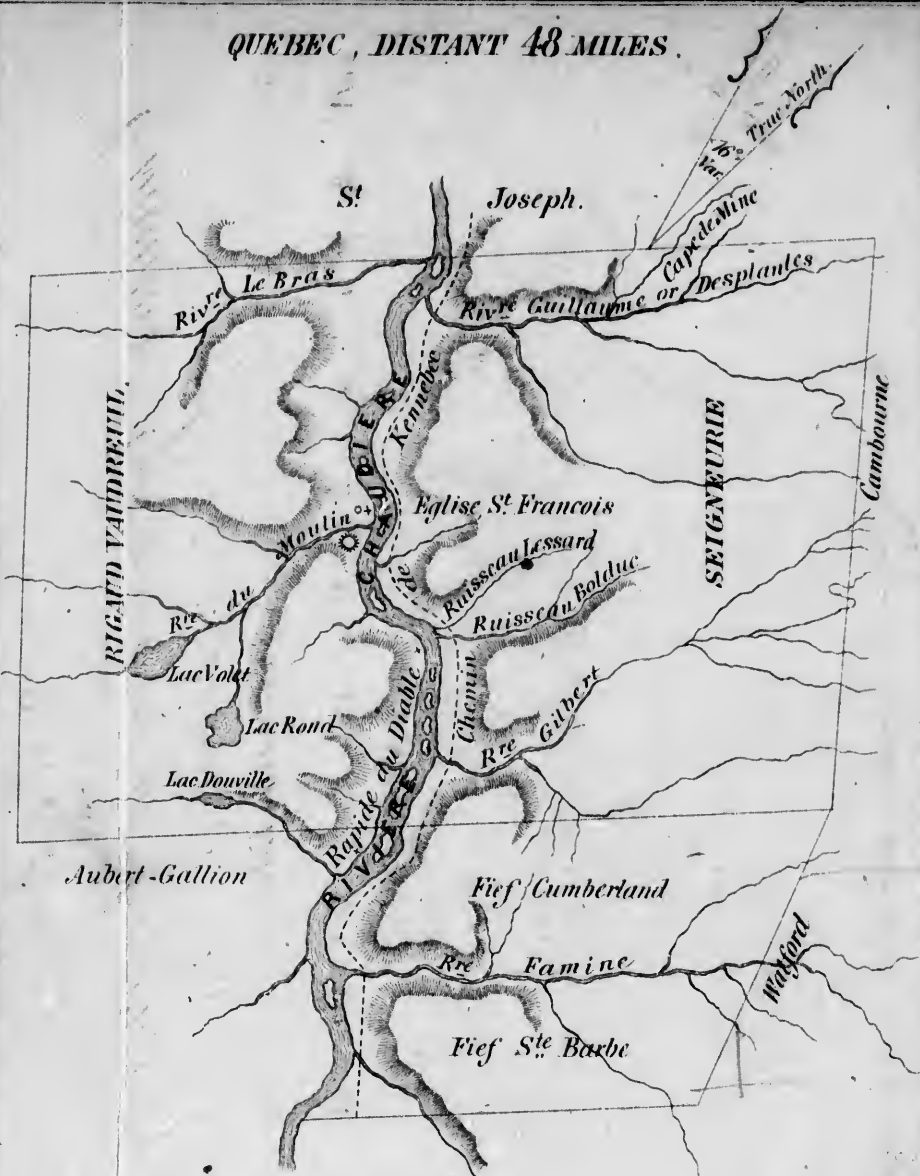
RANGE IV.

Scale of Miles. 1 2 miles.

C. Robb. M.E.



QUEBEC, DISTANT 48 MILES.



( M A P )

OF THE  
*Gold Region of the Chaudière*  
Canada East.

Scale of Miles.

