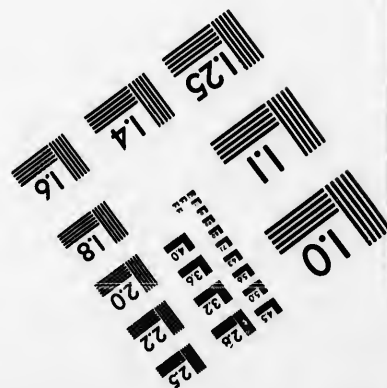
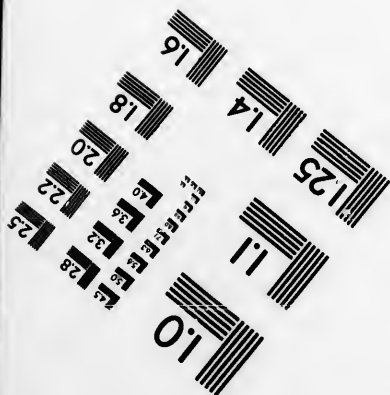
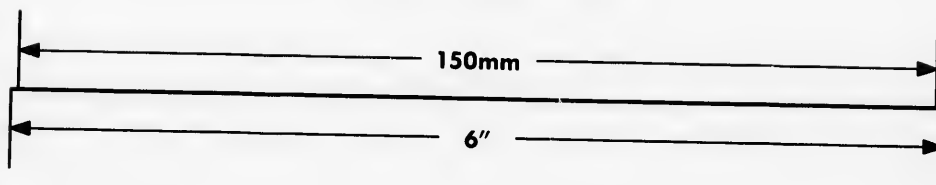
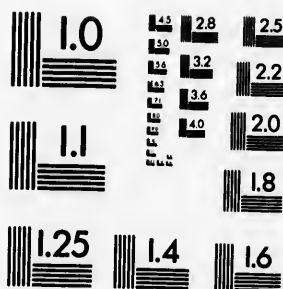
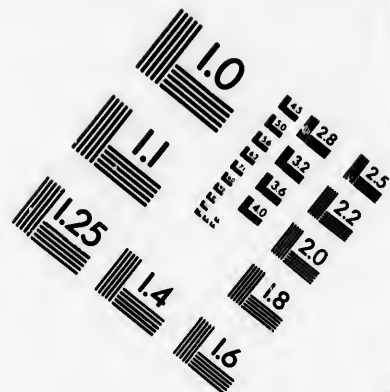
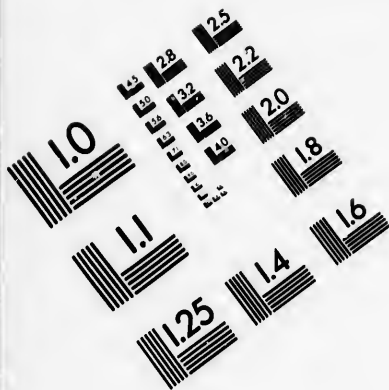


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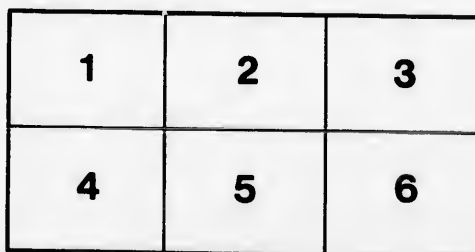
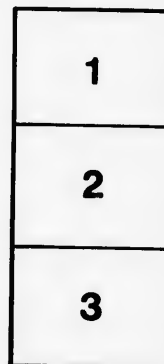
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REPORT

OF

MONSIEUR A. MICHEL,

GEOLOGIST,

ON THE

GOLD MINES OF THE RIVER CHAUDIERE

AND ITS TRIBUTARIES.

TO THE DIRECTORS OF THE DE LERY GOLD MINING COMPANY.

QUEBEC:

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GOLD MINES OF THE RIVER CHAUDIERE
AND ITS TRIBUTARIES.

To the Directors of the de Lery Gold Mining Company.

GENTLEMEN,—The valley of the Chaudiere, in Lower Canada, excites the admiration of all those who visit it. After a couple of hours' drive over the macadamised highway, which leaves Point Levi, we strike the *Chaudiere* River, on the confines of the Parish of St. Isidore. Then the road, skirting the right bank of the river, passes successively through the parishes of Ste. Marie, St. Joseph, St. Francois and St. George, and opens into the State of Maine at the place called "Kennebec," from which the road takes its name. An uninterrupted succession of farm houses, cultivated lands, and agricultural establishments please the eye while animating the scenery; and when the journey through the valley is made at midsummer, the tourist meets at every step with fields which promise an abundant harvest, interspersed, here and there, with rich pasturages.

The farmers of this district are the proprietors of the soil; hence the care exhibited in its cultivation. They are exclusively French Canadians, and have preserved intact the language, customs and religion of their forefathers. This population is very sympathetic and hospitable in its character. It is a laborious and industrial population; and to the persevering efforts of several *habitans*—who became miners after the gold discoveries—are due the principal results obtained up to the present time in the auriferous region of the Chaudiere Valley.

The Seignory of Rigaud-Vaudreuil, which at a later period became the Parish of St. Francois, is situated at about 50 miles distance from Quebec, in the most picturesque portion of this beautiful valley. It has an extent, along the *Chaudiere* River—which flows through and divides it into two equal sections—of nine miles in length, by a depth of six miles on each bank of the river, and has a general superficies of 84,672 *arpents*.

This territory is watered by four streams, which are the main tributaries of the *Chaudiere*, and by numerous creeks which, at several periods of the year, become swollen and torrentuous. The principal streams are the *Gouluume* or *Des Plantes* River, on the right bank of the *Chaudiere*, and the Rivers "Mill" and *Le Bras* on its left bank.

The lands on which rest the auriferous alluvion are constituted of schist and argillaceous gravel, crossed in many places by veins of quartz, some of which seem to conform to the general stratification of the locality, while others divide the strata with a dip differing from that of the beds of gravel.

It is mainly in the mica-schists and gravel of the Upper Silurian formation, that these quartz veins exist in great number, and here and there crop out, though, for the most part, hidden under layers of vegetable mould or alluvion, of variable thickness.

The progress reports made by the Government Geological Survey of Canada, as well as those of several geologists and mineralogists, among others that of Professor Henry Wurtz, have supplied full and valuable information as to the geological formation of this country; and their deductions relative to the future of the Canadian gold mines are replete with encouragement.

Having been appointed, at the close of last year, to examine the auriferous region of the *Chaudiere*, and to report upon the facts established and the results obtained since 1863, I embodied my observations in the report which I had the honor to address to Sir W. Logan, on the first of February last. It is only such of those observations and impressions as relate to the Seignory of Rigaud-Vaudreuil that I propose to sum up in the following pages, adding thereto the information gathered during my recent exploration, in this present month of August, though I was limited to the short space of fifteen days through want of time and motives of economy.

On approaching the Seignory of Rigaud-Vaudreuil we cross the River *Des Plantes*, near its confluence with the *Chaudiere*. The *Des Plantes* has its source in the northern part of this territory: it flows in two branches, which reunite at Lot 73 in the Concession St. Charles. Its principal branch flows from northeast to southwest in the Concessions St. Gaspard and St. Charles, and in the first range northeast of the Seignory; while the direction of the other, which flows down from the Concessions Frazer, is from southeast to northwest, through the Concession St. Charles.

Some years ago, above and near the Little Fall, after several explorations of an encouraging character, Dr. James Douglas, whose enterprising efforts greatly contributed to the discovery of gold in Lower Canada, undertook the working of the mines with very satisfactory results as to the quantity of gold obtained. Since that time the *habitans* have been constantly searching for the precious metal in the bed of the river, at times of low water, and they have always found gold in greater or lesser quantity, in proportion to the importance of their efforts.

I devoted several days, in October 1863, to the examination of this river, going up its bed between the two Falls, and I was exceedingly well satisfied with the results of the exploration. Recently, I visited that part of the river situated between the Great Fall and the junction of the two branches, and I also explored the southeast branch, as far up as two miles above the Fork.

I found gold everywhere, on digging into the soil, in the bed of the river, and in the high banks. A washing with the "rocker" of about a ton and a half of gravel, made up from different excavations, gave nearly a dollar's worth of gold. I am persuaded that a systematic working of the alluvion of the River *Des Plantes* would be profitable, and that it would not be either difficult or expensive in the higher parts of the stream; the sinuous course of this river, and the peculiar configuration of the land on its banks, permitting a variety of cuttings and the sinking of canals, for drainage and to turn aside the river and lay bare its bed.

A quartz vein crosses the River *Des Plantes* below the Little Fall, and besides the numerous fragments of this mineral scattered here and there in the bed of the river, I met with very large blocks belonging to a vein—the cropping out of which I could not discover—in the southeast branch, at about a mile and a half above the Fork. Having assayed, mechanically, several pounds weight of this quartz, I found a few particles of gold in the sediment of the washing.

Some of the *habitans*, whom I questioned on the subject, assured me that quartz crops out of the soil in divers places in the Concessions Frazer and St. Gaspard, and I am of opinion that a special exploration of these Concessions would result in very interesting discoveries.

From the River *Des Plantes* to the residence of Mr. Louis Barbeau, for a distance of several miles, the road crosses a number of small streams, which fall into the *Chaudiere*, and in most of which gold in alluvion has already been found. One of these streams, "Marcoux Creek," on Lot 39 of the first range northeast, is traversed by a quartz lode running from northeast to southwest, which is known in the neighborhood as the "Rodrigue-Vein."

My attention was particularly attracted by those lots, in the first range northeast of the Seignory, which are washed by the *Chaudiere*, at the place called the "Devil's Rapids." Here the soil is uneven, ravined, and divided into mounds or bluffs, which fall away to the river in slopes that are often very abrupt.

Between Lots 48 and 55, on the property of Mr. Louis Barbeau, are visible several strips of schist and clayey gravel, cropping out in ridges above the soil, and traversed in every direction by veins and seams of quartz.

Certain croppings out of this mineral on Lots 50, 51, 52 and 53, seem to belong to lodes; but the indications in some excavations made here and there on these same lots, lead me to believe in the existence in this locality

of an immense and powerful mass of quartz, extended in the shape of an inter-stratified bed, and constituting an irregular layer, easy of being worked out.

A cropping out, designated as the "Barbeau Vein," is now in process of examination on Lot 53, by means of a trench terminating in a tunnel, which penetrates into the solid rock. Other croppings, of white quartz, also shewed themselves on this same lot, at the extreme end of which is the site of a Ten-Stamp Quartz Crushing Mill, to be driven by steam power, which is now in course of construction by your Company.

Having calcined and pulverised about 50 lbs. of quartz, taken from the property of Mr. Louis Barbeau, and having afterwards washed it with care, I obtained for result, by this mechanical assay, several very fine particles of gold. I have been assured, that quartz is frequently met with in the Concessions behind the property of Mr. Louis Barbeau.

Gold in alluvion has been successfully sought after in the *Chaudiere*, at the confluence of that river with several of the gold bearing streams. It is particularly at the Devil's Rapids, where the river suddenly takes a bend and flows from east-northeast to west-southwest, that gold has been abundantly found, in the cavities and fissures, and in the cracks of the clayey schists. These rocks stretch in parallel ridges in the direction above mentioned; they crop up above the level of the river, at low water, at which times it is possible for the *habitans* to break and search them to the depth of several feet. The fissures and cracks of these schists are filled with argillaceous gravel, in which is deposited gold in alluvion, and, during last summer, I was an eye-witness to the extracting of several dollars worth therefrom.

It is below the lode mentioned in one of the progress reports of the Canadian Geological Survey, known as the "O'Farrell-Vein," that deposits of alluvion gold exist, and they extend along the river for more than a mile. I have always been assured that gold has been found in great quantity and large nuggets in the vicinity of this lode, the cropping out of which (now broken away) has produced very rich specimens.

I am convinced that certain sections of the *Chaudiere* River may be worked with profit, during the season of low water, by such companies as would make the necessary outlay for preparatory works, and would provide themselves with a sufficient equipment and material for thoroughly exhausting their resources.

Between the Devil's Rapids and the confluence of the *Gilbert* River, several streams fall into the *Chaudiere*. Near one of these, called "Bolduc Creek" on Lot 59 A of the first range northeast, some surface working has exposed to view a mass of mineral, formed by an agglomeration of quartz, schist and calcareous gravel, having the appearance of a lode, running from northeast to southwest. A mechanical assay of 20 lbs. of quartz taken from the "Frechette-Michaud-Vein" gave me for result a few fine particles of gold. This same lode was the subject of another examination, undertaken by Mr. Longtin, in the Concession St. Charles.

The greatest quantity as well as the largest nuggets of Canadian gold, up to the present time, have been gathered in the *Touffe des Pins* or *Gilbert River*. Like the *River Des Plantes*, the *Gilbert River* takes its rise in the north, flowing in two branches, which reunite on Lot 16 of the Concession St. Charles. The main branch flows from north to south in the Concessions De Lery and St. Charles; it takes a bend on Lot 7 of the latter Concession, and then traverses the first range northeast, directing its course from northeast to southwest.

It is the rich products of the alluvion of the *Gilbert River* which have principally attracted public attention to the auriferous deposits of the *Chaudiere*; I therefore felt that a special exploration was due to this portion of the Seignory.

Notwithstanding the favorable results of the works undertaken by Dr. James Douglas, sixteen years ago, gold in alluvion has not yet been actively sought for in that part of the *Gilbert River* which waters the first range northeast of the Concession St. Charles. Nevertheless, a mining effort undertaken in the course of last summer, on Lot 75 of the first range northeast, gave satisfactory results, one of which was a nugget weighing six ounces.

Gold has also been found in the Concession St. Charles; notably at "Caron-Creek," as well as on the Lot 14, where four associated miners took out four ounces in one week.

The alluvions which have produced a considerable quantity of gold, without their richness being yet exhausted, are on Lots 18, 19 and 20, of the Concession de Lery.

On the occasion of my first visit to the *Gilbert River*, in October, 1863, Lots 18 and 19 were occupied by about a hundred miners, whose labors, carried on in the open air, consisted of a series of excavations, sunk one near the other, without method or regularity, and constituting on the whole a general working without system or order.

It is in this deplorable state that the organized companies, up to the present time, have abandoned the alluvial gold diggings to the industry of the *habitans*; and these diggings—often very productive, notwithstanding their irregularity, more or less actively pursued since 1863, even during the winter months by means of wells and tunnels—extend at the present time, with like success, on Lots 16 and 17, at the junction of the two branches of the river.

In all those excavations the gold is found in the gravel resting on the hard-pan, formed sometimes of schist, sometimes of gravel, often of both these formations interstratified: but the precious metal is found lodged particularly between the leaves of the schist, and the cracks of the gravel, where the latter has penetrated and become hardened.

It is certain that the alluvions of this locality have already produced much gold, among which were many nuggets varying in value from \$25 to

\$300. I have heard the value of the gold already extracted from the alluvion of the *Gilbert River* estimated at \$300,000; this I consider a very large result, taking into account the limited area worked, and the defects of the system of operations pursued. However, it is difficult to estimate, even approximately, the quantity and value of the gold produced by these labours, for the reason that they were not subject to any control, and that private interests as well as individual character, may have caused some miners to conceal, while others have exaggerated their profits.

I explored the northeast branch of the *Gilbert River*, in October last, following the stream up through the Concessions de Lery and Chaussegros, which it crosses at Lot 16. Several experiments in seeking for gold convince me of the working value of the alluvions, and I remarked a lode which intersects the current at Lot 16 of the Concession Chaussegros, running from north-north-east to south-south-west. A mechanical assay of 20 lbs. of quartz taken from this vein gave me a few fine particles of gold.

Having heard recently that operations were being carried on at its southwestern prolongation, and that the washings of the gravelly soil resting on the quartz were giving, among the ordinary alluvion gold, different sized particles of rugged gold of a greenish hue, I paid a visit to the place but experienced the disappointment of finding the work suspended. As to the greenish gold in question, the pieces which I examined seemed to have been but recently detached, and not to have suffered either from rolling or from friction with other solid bodies by the action of water.

The two branches of the River *Gilbert* are intersected by veins of quartz, which come down to the *Chaudiere*, passing through the Concessions de Lery, St. Charles, and the first range northeast; their direction being from northeast to southwest. I saw a cropping out which measured from three to four feet, a little way above the excavation which I made on Lot 26 of the Concession de Lery.

Several veins cross Lots 20 and 21 of this Concession, and that known as the "Dr. Reid Vein" has been prospected along both banks of the current. Having assayed mechanically 20 lbs. of the mineral taken from the excavation on the right bank, I counted twenty-two very fine particles of gold in the sediment of the washing.

The chemical assays—otherwise called the dry process—of the specimens from this vein, sent to Dr. T. Sterry Hunt, of Montreal, and to Dr. A. A. Hayes, of Boston, gave a result of from \$15 to \$16 worth of gold per ton.

Mr. Kilgour sunk another well on this same lode, in Lot 21 of the Concession St. Charles. An assay made by Dr. A. A. Hayes of the mineral taken from the "Kilgour-Vein," gave a result in gold of \$77.56 per ton; while five assays, made by Dr. T. Sterry Hunt, reduced the product to an average of \$25.66 per ton.

On Lot 62 of the first range northeast a quartz cropping out of from four to five feet in thickness, known in the locality as the "Loubier-Vein" was, I am informed, subjected to some assays, one of which, made at New York, attributes to the mineral taken from it a production in gold of \$15 per ton; and this value was increased to \$106 per ton, by another assay made by Mr. Colvin.

A very slight surface working, consisting of a trench sunk to a depth of from two to three feet, exposed to view on Lot 19 of the Concession St. Charles, a bed of quartz which has been named the "Loulzon-Loubier-Vein." The assay of this quartz by Dr. A. A. Hayes assigns it a value in gold of \$70.95 per ton; a value which six assays, made by Dr. T. Sterry Hunt, reduced to an average of \$24.71 per ton.

Finally, a well has been sunk on another lode, on Lot 83 of the first range northeast. I assayed mechanically 20 lbs of quartz taken from this, the "Rigg-Vein," and found some particles of gold in the sediment of the washing.

Thus, operations of a superficial character, opened at the croppings out of several beds of quartz in the Seigneurie, have enabled me to establish their existence, to determine the directions in which they run, and to extract from them a certain quantity of mineral,—the repeated assays of which have proved, in the case of some of the specimens, a well pronounced value in gold. But the conditions of regularity or irregularity, the average richness and capacity, and the continuity of depth,—that is to say, all the conditions necessary for the more or less profitable working out of a quartz vein,—must remain in doubt, until a solution is determined by operations of greater magnitude than have been hitherto attempted in the Chaudiere gold mines.

The mines of the Seigneurie of Rigaud-Vaudreuil, situated on the left bank of the Chaudiere, have not yet been explored. It is known, however, that the alluvions of the Rivers *Le Bras* and "Mill" are gold bearing; for grains of the precious metal have been found in both these principal streams, as well as in most of the creeks which either flow into them or fall directly into the Chaudiere. Recently, I went over the Concessions of this section of the Seigneurie, and I remarked numerous croppings out of quartz at the River *Le Bras*, where the gravels and clayey schists are intersected by veins and seams which cross each other and run in every direction. Some of these veins have a width of several feet, and those are the ones which appeared to me to be most regular in character.

The lands watered by "Mill" River, in the Concessions of St. Etienne and St. Guillaume, are also traversed by large ridges of quartz, associated with schist, the croppings out of which I saw at Lake St. Francois, and the course of which I followed through the townships of Lambton and Forsyth. Those croppings out are again met with on the road from Lambton to St. Francois, and at Lakes Volet and Rond, in the Seigneurie of Rigaud-Vaudreuil.

The veins which I pointed out on the right bank of the *Chaudiere*, among the alluvions of the *Gilbert* River, are discovered in the prolongation of these ridges; besides which, I would also mention two other lodes, already examined, on the left bank of the *Chaudiere*, one on the boundary line of Lots 70 and 71, in the concession St. Joseph; the other, at a few arpents to the south of Mr. de Lery's mills on the first range southwest.

I have now finished stating in detail all that I saw, remarked and noted, of a favorable character to the future of the gold bearing lands of the *Seignory of Rigaud-Vaudreuil*, and affording encouragement for their development. But, besides the striking local facts, which, of themselves, already give an incontestable value to this extensive property, I augur in its favor serious and greater expectations from the recent discoveries made in California and Australia, privileged gold-bearing regions of undoubted character, yet with which, within certain limits, the exceptional products of the *Gilbert* River permit us to make comparisons.

In Australia and California the later, or contemporary alluvions, resting on the Silurian formation, at the level of the earth or within a few yards of its surface, naturally were those first discovered and turned to account; for the working of this class of alluvial mines is that alone possible to those improvised miners who rush to the gold fields from the moment that fame has pointed them out to the seekers after gold.

However, since the exhaustion of those deposits, in which the precious metal was very capriciously distributed, but which, nevertheless, produced immense wealth, discoveries have been made of more ancient alluvions, hidden by deposits of later date,—buried so deep, in Australia, that to reach them necessitated mining through layers of argile, sand and basalt, to a depth varying from 45 to 400 feet. After some cautious attempts this kind of mining was perfected, and to-day it has attained a marvellous degree of success and prosperity.

These enterprises are of that kind which exact considerable time, capital and perseverance; yet the profits are generally so great, that a share in the proprietary of a shaft is often a real fortune. In fact, the richness of the ancient alluvions is sometimes so much superior to that of the modern deposits, that the question has been asked, "if those alluvions are really produced by the disintegration of the quartz lodes which pierce through the Silurian formation, or if there might not be underneath the solid crust of the globe an immense reservoir from whence this gold comes, and where, no doubt, much more remains?" The writer who gives utterance to this thought adds, with reason, that we dare hardly risk hypothesis on this subject, and that its examination would be without object, seeing that if there should exist, within the bowels of the earth, real agglomerations of native gold, they must assuredly be at a depth impossible to reach.

But whatever may have been the origin of the ancient alluvions, does it not seem probable that they may have contributed, in certain localities, to

the enriching of the later deposits; and may not this supposition be admitted in respect of the deposits so profitably worked out on the *Gilbert River*?—supposition which naturally leads to the belief in the existence of ancient and very rich alluvions in the gold fields of Lower Canada!

The incessant washings, by the operation of which nature forms the modern alluvions,—washings which appear insignificant when compared with the resistance offered by those rocks which enclose gold,—become very effective when the subterranean waters, disturbed by exceptional causes, react upon and upheave the ancient alluvions.

Such may be the origin of those unusual deposits of gold met in with the modern alluvions, and it is in reliance upon these considerations that I have always believed that the search after the alluvial wealth of Lower Canada, received a strong guarantee from the mining results of the *Gilbert River*!

Moreover, we must not lose sight of the fact, that there exist many sections of modern alluvion in the *Seignory*, capable of being advantageously worked out by the Californian methods, which permit the profitable washing of gravelly alluvion when the minimum return in gold reaches only about 10 cents per ton.

The crushing of quartz which does not give a gold value of at least \$7 per ton, becomes unprofitable in California and Australia, owing to the high price of labour; this would not be the case in Lower Canada, where labour is proverbially cheap. I have pointed out the abundance of quartz beds already discovered in the lands of the *Seignory*, as well as the favourable results of the assays applied to the mineral extracted from the several veins. Yet, as I have already said in another report, the distribution of gold in quartz is so irregular, it might often be dangerous to receive with too much confidence, (with a view to operating,) the average richness of a bed given by assays of specimens, even when those assays are numerous.

In conclusion, gentlemen, the certainty of the gold bearing quality, in a very high degree, of several of the quartz beds in the *Seignory* is already an important fact; and everything leads to the belief that the crushing mill in course of erection will soon prove, by its results, that the working out of the quartz of the *Seignory* of Rigaud-Vandreuil, as well as of its deposits of alluvion, is worthy the attention of those interested in gold mining and the confidence of capitalists.

I have the honor to be, gentlemen,

Your very humble and obedient servant,

A. MICHEL.

St. Francois, County of Beauce, }
August 16th, 1866. }

