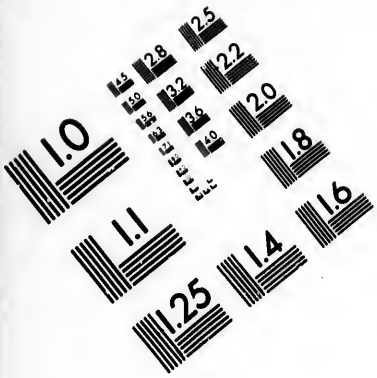


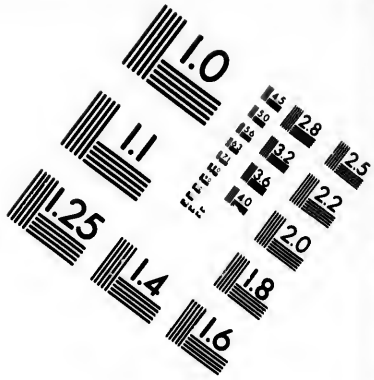
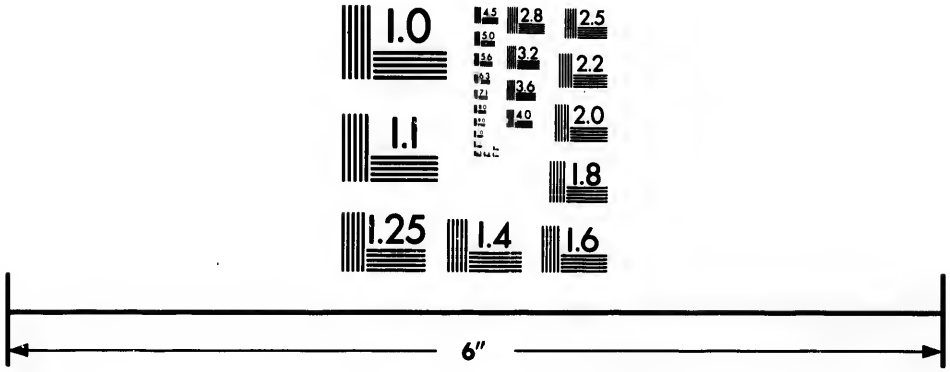
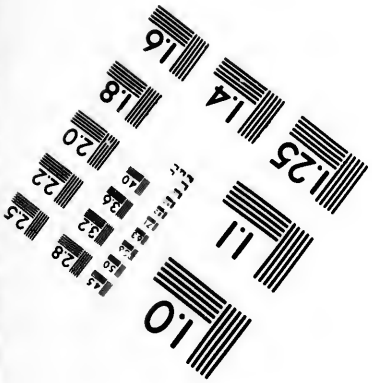
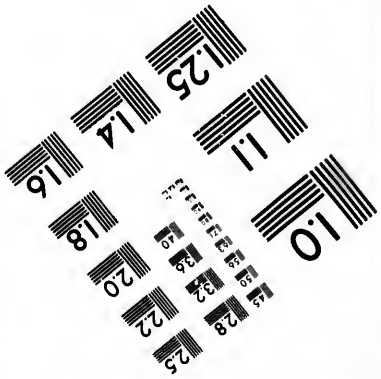


IMAGE EVALUATION TEST TARGET (MT-3)







Photographic Sciences Corporation

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

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.

- ☐ Coloured covers/ Couverture de couleur
- ☐ Covers damaged/ Couverture endommagée
- ☐ Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/ Le titre de couverture manque
- ☐ Coloured maps/ Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- ☐ Bound with other material/ Relié avec d'autres documents
- ☐ Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure
- ☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ 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.
- ☐ Additional comments:/ Commentaires supplémentaires:

- ☐ Coloured pages/ Pages de couleur
- ☐ Pages damaged/ Pages endommagées
- ☑ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached/ Pages détachées
- ☑ Showthrough/ Transparence
- ☐ Quality of print varies/ Qualité inégale de l'impression
- ☐ Includes supplementary material/ Comprend du matériel supplémentaire
- ☐ Only edition available/ Seule édition disponible
- ☐ Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/ 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.

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

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	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 → (meaning "CONTINUED"), or the symbol ▽ (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:

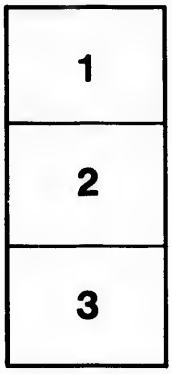
La bibliothèque des Archives
publiques du Canada

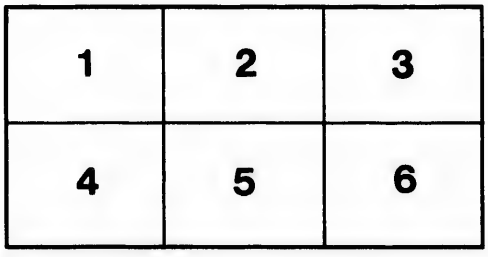
Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

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 → signifie "A SUIVRE", le symbole ▽ 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.





Che

E

GOL

PROF.

PRE

REPORT

ON THE PROPERTY OF THE

Chebucto Gold Mining Company

OF NOVA SCOTIA,

BY JOHN CAMPBELL, ESQ.,

GOVERNMENT GEOLOGIST OF NOVA SCOTIA.

WITH A SKETCH OF THE

GOLD REGION OF NOVA SCOTIA,

BY BENJAMIN SILLIMAN, JR.,

PROF. GENERAL AND APPLIED CHEMISTRY, YALE COLLEGE, NEW HAVEN, CT.

ALSO

A LETTER FROM B. C. WILSON,

AND THE

BY-LAWS OF THE COMPANY.

BOSTON:

PRESS OF GEO. C. RAND & AVERY, 3 CORNHILL.

1864.

1864
(47)

CHEBUCTO

GOLD MINING COMPANY

OF NOVA SCOTIA, HALIFAX COUNTY.

INCORPORATED UNDER THE GENERAL STATUTES OF MASSACHUSETTS.

Capital Stock, $500,000, in 100,000 Shares, of $5.00 each.

OFFICERS.

President.

CHARLES EDWARD POWERS.

Directors.

CHARLES E. POWERS, CHARLES A. PHELPS,
JOHN E. M. GILLEY, HENRY A. MORSE,
JOHN LOW.

Treasurer and Clerk.

JOHN E. M. GILLEY

Superintendent at the Mine.

B. C. WILSON.

OFFICE OF THE COMPANY.

Boston, 15 Merchants Exchange, State Street.

MEMORANDA.

THE Chebucto Gold Mining Company of Nova Scotia is a corporation organized under the General Statutes of the Commonwealth of Massachusetts, having a capital of Five Hundred Thousand dollars, divided into One Hundred Thousand Shares of five dollars each.

The mine is located in the Province of Nova Scotia, and can be reached in thirty-six hours from Boston. Telegraphic communication is open at both points.

The property consists of 51 areas of ¾ acres each of Mining Lands, which are considered by competent persons to be equal to any gold-mining region in the United States or British Provinces.

Two shipments of gold have already been received from the agent; and the first four days' work, with nine men, yielded over $1,000 in gold. The Company are now prosecuting the work vigorously; having forty men at work, and expect large shipments by every English steamer.

The stock of this Company has been subscribed for investment, and has been divided into small shares (on the European plan), to facilitate small investments in it, by its mining operatives and others, at any future time (to encourage which has always been deemed advisable).

The property has been personally and carefully examined by one of its Directors, as well as by two of the largest shareholders, in connection with the professional surveys.

The mine is only 12 miles distant from Halifax, and is considered by those in the vicinity, well experienced in gold-mining, to be a very valuable property.

It has a cash paid up working capital in the Treasury of TWENTY-FIVE THOUSAND DOLLARS, ($25,000.00).

CHEBUCTO GOLD MINING COMPANY.

REPORT OF PROF. CAMPBELL.

GENTLEMEN: —

In accordance with your instructions I have examined the Chebucto Gold Mining Company property in the Waverley Gold District, which is situated on the borders of one of the chain of lakes that forms the Shubenacadie Canal, and distant from the city of Halifax about fifteen miles by railway, and twelve miles by the Truro post-road, or by the canal.

This convenient geographical position is a very important element in estimating the value of mining property, and should not therefore be overlooked.

Gold mining localities of no greater value are eagerly sought after in the distant wilds of Oregon, Australia, and New Zealand by thousands, who in doing so forego all the comforts and advantages of civilized life, pay exorbitant prices for all the material required for mining purposes, for supplies of all kinds, and also for the necessary amount of labor, which may not yield after all more favorable results than can be obtained in the gold fields of Nova Scotia, — where life and property are always secure, supplies of all kinds cheap and abundant, and the price of labor moderate.

GEOLOGY OF THE WAVERLEY GOLD DISTRICT.

This gold field is located on a broad anticlinal, which is the fourth from the Atlantic coast of those great waves that form so important a feature in the stratigraphical arrangement of the gold-bearing rocks of the Province. The strata among which the auriferous leads or lodes occur belong to the quartzite group, and lie in that formation a little over half a mile of ver.

tical depth below the base of the overlying clay-slate group. The general strike of the rocks of this district is from S. 87° W. to N. 87° E., but in its western end, where the property of the Chebucto Gold Mining Company is located, the outcropping of the strata on the north side of the axis of the east and west line of upheavel are found to curve gradually more and more to the southwest; as they are traced in that direction, and on the south side of the axis, they will be found to curve in like manner, but to the northwest, until they join those curving from the north side, on the crown of the axis where they form arched beds, which descend by a slope or dip of one foot in nine or ten to the westward. Therefore, all the gold-bearing lodes which have been discovered in the north half of your property will also be found in their proper position in the south half of it, because the axis of this metalliferous band or line of upheaval runs across the lot very near the centre of it; this circumstance cannot fail in *greatly enhancing its value as a gold mining property;* for it gives you more than double the extent of ground along such rich lodes as the *Taylor* and *Tudor* Leads or lodes than you could have if your property had been located all on one side of the axis.

Near the northern boundary of your property you have a group of gold-bearing quartz leads or lodes, seventeen in number, ranging in thickness from two to six inches, and occupying a belt one hundred feet in width; three of the best of these lie within five feet of each other, and can, therefore, be mined in one working. At the distance of sixty feet south from this group you have the *Tudor Lode*, which is *fifteen inches* in thickness, also gold-bearing. This lode is worked extensively to the west of your western boundary. No less than twenty-five new and very neat shaft-houses are to be seen ranged along its outcrop; four of these are on your property (as I was informed). I should mention that there is a lode lying between the Tudor Lode and the group of seventeen, but I could not find its exact position on account of ice covering the pits sunk on its outcrop, but I am informed by Mr. Wilson that it is eight inches in thickness, and that the debris along its outcrop contains much fine gold. At the dis-

tance of one hundred and thirty feet south from the Tudor Lode you have the first of the Taylor Lodes, reached by a shaft eighteen feet deep through drift. This lode is ten inches wide and rich in gold: within the distance of forty-four feet south from this you have the other two lodes named the Taylor Lodes; they lie within four feet of each other and can be mined in one working, and their united width will make *twenty-four inches;* one of these yields 2 oz. 13 dwt. per ton. The first or most northerly of the Taylor Lodes yields on average $1\frac{3}{4}$ oz. per ton. I have this information from Mr. Wilson, who had charge of crushing the quartz. All the lodes above referred to have a northerly dip, ranging from an angle of 70° to 80° of inclination to the horizon. The angle of dip of the strata is found to get lower as we advance south or toward the axis of the line of upheaval; and at the distance of 300 feet south from the most southerly of the Taylor Lodes we find the Graham Lode (so-called) dipping to the northward at an angle of about 45°, and crumpled or rolled into barrel-quartz, thus indicating very clearly our near approach to the axis of the band at this point. The Graham Lode is nine inches wide, and gold-bearing. Mr. Wilson informed me that the quartz obtained from it yielded about 3 *oz. to the ton.* All the quartz beds or lodes that I have examined on your property occupy a belt of 634 feet of strata; but, as the whole breadth of this belt has not been explored, other lodes may yet be found in it. Whatever number of beds this band or belt of strata may be found to contain, a band or belt in the south section of the property will be found occupied by an equal number of quartz lodes or beds; or, in other words, the quartz beds found in the north section of the property, dipping to the northward, will be found to be repeated in its south section dipping to the southward. Of this there can be no doubt, for the reasons before stated. As regards the probability of gold being more plentiful in quartz mined at a great depth than in that got near the surface, the following statement of results obtained in a shaft on the Taylor Lodes is of much importance. From the surface to a depth of 40 feet the average yield was 1 oz. to the ton. From 40 down to a depth of 80

feet the average yield was 1 oz. 11 dwt. per ton; and down at a depth of 130 feet the yield increased to an average of 2 oz. 3 dwt. per ton. This is a point of much interest to you, for Taylor's shaft is not much over 400 feet from the east bound of your property, and the difference of level between these points is about 25 feet. A shaft put down near the eastern boundary of your property must therefore be sunk to a depth of about 200 feet to reach the zone of quartz removed in Taylor's deepest working, if the angle of dip or sloping of the anticlinal is 1 foot in 10 to the west as before stated. In my Report on the geology of the gold fields of the Province, made by order of the government in 1862, I called attention to this feature in the structural arrangement of the gold-bearing rocks.

It is only by means of vertical sections, or by showing it in model, that the subject can be sufficiently illustrated. The original owners of the property you now hold at Waverley might have done much better by it if they had been a little sharper, and had taken advantage of information placed within their reach; but they did not do this, and the property passed out of their hands without having been explored as it should have been. They did not know that the same lodes found in the north section of the lot, with northerly dips, are repeated in the south section of it with southerly dips, and that the yield of gold from quartz-veins having a southerly dip is very likely to be much larger than that obtained from those dipping to the northward. This is the case in all our gold fields, but the cause is not known; it is, however, probably due to the direction from which the force was applied to fold the strata and place them in the attitude in which we find them. I have been studying the natural history of the gold-bearing rock of this Province since 1849, at which time I first discovered evidence of their being auriferous by finding gold in detritus removed from them by glacial action. During the years 1857 and 1858 I endeavored to secure gold-mining rights on Sable Island, which lies 80 miles from the south coast of the Province, but was refused, and the gold is allowed to remain there as it was. And I may as well inform

you now that, during the spring of 1862 I endeavored to get hold of the very property you now hold at the Waverley gold field, but was too late. I would, in conclusion, advise you to have the centre and south sections of your property explored as soon as possible, for when this is done, if it is done properly, you will find that your mining claims are *not surpassed in value by any gold-mining property in this Province*, and that they *will far exceed your most sanguine expectations.*

J. CAMPBELL,

PROVINCIAL GEOLOGIST TO THE PROVINCE OF NOVA SCOTIA.

FROM PROF. SILLIMAN'S REPORT.

The following Sketch is taken from PROF. SILLIMAN'S REPORT to the Montague, Waverley, and other Gold Mining Companies of Nova Scotia.

REMARKS ON THE GOLD REGION OF NOVA SCOTIA. — ITS GEOGRAPHICAL EXTENT AND POSITION.

THE entire Atlantic coast of Nova Scotia, from Cape Sable on the west to Cape Canso on the east, a distance of about two hundred and fifty miles, is bordered by a fringe of hard, slaty rocks, sometimes micaceous schists, more usually argillaceous, and occasionally granitic. These rocks, when stratified, are always found standing at a high angle, sometimes almost vertical, with a course, in the main, east and west. They seldom rise to any great elevation, the promontory of Aspatogon, about five hundred feet high, being the highest land on the Atlantic coast of the province. The general aspect of the shore is low, rocky, and desolate, strewn often with huge boulders of granite or quartzite, and when not bleak and rocky, is covered with forests of spruce and white birch.

This zone of metamorphic rocks varies in width from six or eight miles, at its eastern extremity, to forty or fifty miles at its widest points, preserving in its northern boundary only a rude parallelism with its southern margin.

This district comprises about six thousand square miles of surface, and may, geologically speaking, be called the Gold region of Nova Scotia. Not that gold is to be found in all parts of it, but it is not unreasonable to search for the precious metal anywhere within this region, where the occurrence of quartz veins — the almost sole matrix of the gold — is shown by boulders on the surface.

It is true that gold has been found outside of the limits here assigned, as at the head of St. Mary's Bay in Digby County, and on Breton Island in Inverness County, and it is by no means improbable that these discoveries may extend to the newer metamorphic rocks in other parts of the province, the analogy of other gold regions leading decidedly to that belief.

A large part of the district named is little better than an unexplored wilderness; and the fact that the discoveries which have been made are, in a majority of cases, on the sea-shore, where the country is open and the search is easy, by no means diminishes the probabilities that continued search in the less frequented portions of the region will be rewarded with new discoveries as important as any which are now known.

GEOLOGICAL AND PHYSICAL CHARACTER OF THE GOLD REGION.

There is no positive evidence of the geological age of the auriferous rocks of the Atlantic border. No trace of a fossil has yet been found in any of the slates or associated rocks. Opinion seems to favor the belief that they belong to the Silurian age; but as yet no place has been found where the rocks next higher in the geological column may be seen resting upon these. Dr. Dawson, in his "Acadian Geology" (p. 347), evidently favors the belief that they are probably metamorphic Silurian rocks. That the rocks are highly altered (metamorphosed) is very evident to the most careless observer, as well as that they have been greatly changed from their original position of horizontality, as sedimentary rocks, by upheavals, which have tilted them up to a position almost vertical. The same causes have also resulted in the segregation or infiltration of the sheets or layers of white and mottled quartz, which are now the gold lodes, and charged the slates with arsenical and cubical pyrites in all the mineralized bands.

The most striking physical feature of this whole region to

the eye of a geologist, next, perhaps, to the uptilted state of the slaty rocks, is the universal evidence of a high degree of glacial action, which has so worn down and polished the rocks that their edges everywhere resemble the leaves of a book which has been cut with a dull knife in the binder's press, in a direction at right angles to that of the leaves.

Over very considerable areas, the glacial scouring has been so thorough that nothing whatever is left on the rocks but the groves and striae which accompany their polish. In other cases, the glacial drift is seen, composed of angular, rarely-rounded fragments of quartzite and clay slate, imbedded in a tough clay resting on the surface of the polished rocks. This detrital matter is auriferous, but a large amount of coarse angular fragments of rocks would render it very difficult to wash, even where it occurs in situations where water could be conveniently obtained for sluicing. The gold which it contains is coarse and angular, often still attached to the quartz, and showing but little evidence of long transportation. The "Boulder Lot" at Sherbrook has yielded a considerable amount of gold from this glacial drift, and is rewarding its owners handsomely. Probably too little attention has been given in the province to this source of gold, the quartz veins alone having been the chief object of attention.

Everywhere over this whole district, the eye of the observer is constantly arrested by the long lines of granitic and quartzite boulders which have been left in trains by the glaciers upon the surface of the polished rocks. These at times recall strongly the moraines of the Swiss glaciers, and rival them in the magnitude of the transported blocks. Some of the most striking cases of this sort which I saw were in the vicinity of Musquodobit Harbor, also on the flanks of the Musquodobit Mountains, and on the elevated plateau between Jeddore Bay and Ship Harbor known as the "Barrens." Here the boulders of white quartz are also very conspicuous. Some very striking examples of a like character occur also on the hills north of Oldham, in the vicinity of Gay's River.

The general course of the strike of the rocks is east and

west. Between Hammond Plains and Tangier, for a distance of nearly one hundred miles, this east and west course so marked that it may be considered universal. This course is not usually over 5° or 6° away from the magnetic meridian, and is usually south by that quantity. But to the east and west of the points named, the strata bend round to the sea, so that the whole system assumes very much the form of a bow, whose arc or string is the coast line, the strata at each end losing themselves in the ocean.

Consequently, for a great part of the whole coast the glacial scratches, or course of the glacial drift, has been almost at right angles to the strike of the rocks. A most conspicuous example of this may be seen at the Round Tower near Halifax, where a large surface of the harder slates is completely denuded, and shows splendidly the whole phenomena of glacial action. These facts bear in a most important manner, it will be seen, upon the occurrence of the gold. They account, in fact, for

THE GENERAL ABSENCE OF ALLUVIAL GOLD.

If we consider for a moment the physical and geological features just described, it at once becomes evident that the great mass of loose materials which came from the scouring off the country by glacial action has gone into the Atlantic Ocean, where the gold is safely deposited. Sable Island, which by Mackinlay's map is distant about one hundred miles from the shore, is a sand-spit thirty miles long by about half a mile wide, shaped like a bow, and consists entirely of an accumulation of loose white sands. Mr. Campbell, the Provincial geologist, informs me that he washed gold from these sands in 1857, and that it was in very small, highly-polished scales, like the fine gold of California; that it came with the sands which it accompanied from the scouring off of Nova Scotia, no geologist can doubt for a moment. It follows from this view of the case that the occurrence of extensive diggings in Nova Scotia is a thing not to be expected. No long Sacra-

mento valley has retained here the spoils of the glacial epoch, and the fact appears to have been practically recognized from the outset, as comparatively few efforts have been made to obtain gold from any source but from the quartz vein.

The success following the washings of the sands near Lunenburg was, however, encouraging, and there are, doubtless, places of considerable extent in the numerous harbors and bays of the coast, where auriferous sands exist in remunerative abundance. The bottoms of some lakes, which can be drained, furnish considerable deposits of alluvial gold, and the same is true, no doubt, of certain river estuaries and marsh lands, which have hitherto attracted too little attention. Such, probably, are the flats bordering on Chedabucto Bay.

CHARACTERISTIC ROCKS OF THE GOLD REGION.

QUARTZITE.—The most noticeable rock in the gold regions of Nova Scotia is a dark gray, almost black, rock, which is called by the miners "Winn," or "Whin," a Scotch term for an igneous rock resembling trap or diorite. The rock to which this name is applied in Nova Scotia is in reality a granular quartz rock called quartzite. It is a very hard, compact rock, consisting of grains of quartz or sand consolidated into an extremely fine mass. Its lines of bedding are quite distinct, and it has three very well-defined planes of cleavage (one of which is the bedding), by which it breaks out into very regular shaped masses, so regular often as to simulate artificial surfaces. It is usually dark gray, often almost black, in color, but on exposure, weathers very nearly white, so that on the surface it presents often an almost glaring appearance in the sunshine. It shows frequently abundant stains of iron, from the decomposition of arsenical pyrites (mispickel) and yellow iron pyrites, with which it is always highly charged in the metalliferous districts. The fresh cleavage surfaces of the rock often glisten, as if with scales of mica, but in reality with the brilliant cleavage planes of pyrites.

This rock attains an enormous thickness, and is undoubtedly

the fundamental or basement rock of the region. Mr. Campbell, in his Report on the Gold Fields, made by authority of the Provincial Legislature, estimates it as over a mile in thickness; and he informs me that in the section of the railroad at Schubenacadie, he has measured it of that thickness. It frequently forms the foot-wall of the gold-bearing veins.

This rock, according to the section which Mr. Campbell has prepared, comes to the surface six times between the Atlantic coast and the northern boundary of the gold district, say thirty or forty miles. As in each case the associated rocks accompany it, and with them the auriferous quartz, it is plain that if this structure is clearly established as that of the district, there must be not less than twelve parallel zones, at an average distance of not more than three miles from each other, in which the explorer may reasonably look for the occurrence of gold-bearing quartz. My own explorations were not sufficiently extended to enable me to satisfy myself of the accuracy of this generalization, which, if true, is of the highest importance.

Slates.—Of the accompanying slates in which the gold-bearing quartz appears, and of the quartz itself, I shall speak in sufficient detail under other heads. Nor is it needful to dwell in this connection on the granites of the Musquodobit range or of the Eastern district.

The middle districts are remarkable for the absence of micaceous schists, and of magnesian rocks. Not an example of talcose slate occurs, so far as I have observed, between Hammond Plains and the Tangier River; but to the east of that point, magnesian rocks make their appearance; and at Wine Harbor, the gold occurs in a greenish magnesian rock, closely resembling serpentine or indurated talc.

Chloritic rocks appear in the Tangier district, but they are rare compared with the argillites, which form, next to the quartzite, the predominant feature in the geology of the Middle districts.

MINING AND DRAINAGE OF MINES.

One peculiar physical feature of this region, which strikes the observer at once, and which is also connected with its geological structure, is the remarkable number of small lakes. They seem to be as numerous as the little islands which dot the shores, or the countless harbors which everywhere indent them on the Atlantic border. It appears that these lakes exist in consequence, primarily, of the extreme compactness and tightness of the rock-strata, which, although turned up on edge, are so tight bound as to shut out almost completely the percolation of surface-water. This fact has an unexpected relation to mining, in the remarkable absence of water, which is a consequence of it. In no place which I visited had the water proved, thus far, a matter of sufficient moment to require other aid in its removal than a few buckets daily would supply. In one case, in Waverly, the levels are extended at the depth of one hundred and ten feet below the water in Lake Thomas, which is distant but a few paces, and still the water accumulating in these mines was only one bucketful in twenty-four hours.

I conversed with Captain Opie, an intelligent Cornish-man, in charge of the mines and mills of the English Company, and he assured me that nowhere in the Province was there a wet mine, or likely to be. There is a large element of compensation in this fact in the hardness of the rocks, and the consequent cost of mining. And the same quality has compensation also in the diminished cost of timbering under-ground,—almost all the levels I have seen being strong enough to stand without timber.

The drainage of some of the lakes, which are favorably situated for sluicing, will, also, beyond doubt, furnish an available source of alluvial gold, as already proved at least in one case.

ON THE GOLD-BEARING QUARTZ.

There are two classes of quartz veins in Nova Scotia: — 1. Those which cut across, or intersect at various angles the stratified rocks. 2. Those which occur parallel to the rocks, or are, in geological phrase, conformable to the strata.

The first are usually more or less irregular in their course, and are seldom or never auriferous, or if so, only to a limited degree. Such veins are known in Nova Scotia by the local name of "Bull Veins." They consist, as far as I have seen them, of compact white quartz, sometimes ferruginous, but not metalliferous, and what a Cornish miner would call "unkindly for ore;" a well-known example is the cross vein in the Tangier set.

The second class of quartz veins is the one which furnishes a matrix for the gold. They are always parallel to the associated slaty rocks, and partake of the foldings and irregularities to which these are subject. They are of all dimensions as respects thickness, from a mere line or fraction of an inch up to eight or nine feet or more; the largest, which I have myself measured, being at Hammond Plains, where the Mitchell Lode measures over eight feet, and the Middle Lode six and one-half feet.

As a rule, the quartz veins in Nova Scotia are not large, being more usually from four to fifteen inches; and the largest veins in thickness are not usually the richest in gold.

There are two very distinct classes of quartz veins among the auriferous lodes. The first are composed of crystalline quartz, often quite white, sometimes mottled, having the gold usually in coarse, visible particles, and showing a decided tendency to crystallization, also, in the associated minerals. Such are the "Negro" Lode, at Tangier, the Montague Lode, Taylor's South Lode, at Waverly, and some of the lodes at Hammond Plains.

The second class I should designate as veins of a slaty structure; the quartz being lamellar or fissile in planes parallel to the bedding; the faces of the laminæ being striated like the surface of the slates: the color being usually dark, sometimes blue or blackish, sometimes ferruginous, and of an oily lustre. The gold is usually disseminated more finely in these veins, or lies in plates on their borders, and sometimes is quite invisible. Of this class are the Field Lode Copper's Lake, the Leary Lode, and Lake Lode, at Tangier, the

Blue Lode at Oldham, the smaller veins at Wine Harbor, and many others. It is impossible to say to which class the preference should be given, although undoubtedly the first is the one which conforms most closely to the character of mineral veins in general; but on the other hand, some of the most productive veins in the province belong to the latter class.

As regards the wall-rocks, between which the quartz lodes are confined, in a majority of cases, which I have myself seen, the upper or hanging wall is quartzite, and the lower or foot-wall is blue slate; sometimes both walls are slate, but I do not find in my notes an example in which both walls were quartzite.

The associated sulphurets as a rule show a tendency in some cases — perhaps in a majority of instances — to segregate on the lower or foot-wall side. In other cases, they seem to be pretty evenly disseminated through the body of the quartz. But the gold is almost invariably associated with the sulphurets when it is visible, and most frequently of all with the mispickel or arsenical pyrites, although I often saw it with zinc blende, and more rarely with galena.

The mispickel or arsenical pyrites, is frequently found in considerable masses on the foot-wall, occurring as bunches, oftentimes of many pounds weight, imbedded in blue slate, and, as far as I have observed, always auriferous. This is especially the case in the Montague vein at Lake Loon, in the Leary and Negro Lodes, at Tangier, and at the "White Head," at Oldham. Sufficient attention has not been paid to this feature of the Nova Scotia veins, and there is good reason to believe that in many cases the miners have failed to take down the foot-wall slate when it was pyritous, not being aware of its value, since, by the process of crushing and amalgamating alone, but a small part of the gold contained in the matrix can be saved. It demands an entirely different treatment, which will be mentioned in its proper place. At Montague, indeed, it is evident to the most uninstructed person that the Mispickel is auriferous, as hardly a lump of it can be broken without exposing scales of the precious metal; and the de-

tached bits of the pyrites are not unfrequently held together by gold-threads, or little veins, which are occasionally strong enough to require to be cut apart by a chisel.

As regards the extent of the quartz-lodes and their depth, as well as the uniformity of diffusion of the gold in them, it may be said that the smaller veins are rarely, if ever, continuous for any great distance, or more than a few hundred feet. Probably they never run across the intervening valleys to reappear in the opposite hill-side; but, on the other hand, they are not unfrequently succeeded by another series; or, perhaps, the same vein is now shut off, the slate-walls dividing it entirely; and then, after an interval, opening again with its former appearance and thickness. The larger veins are, as a rule, continuous for much longer distances, — not always without faults, as at "Montague," where there is an offset of thirty-five feet or more (but this is common, also, to all the smaller veins of the set), but the vein as a whole has been opened more than half a mile; and the more powerful veins at Hammond Plains extend, probably, over a mile, and those at Tangier about fifteen hundred feet.

In depth there is no doubt they also extend as far as it is probable they will ever be explored. As regards improvement in depth, it may be said there are numerous examples of several small parallel veins separated at the surface by thin partings of slate, which, at a moderate depth, have been found united into one powerful lode. No doubt the same fluctuations will be found in depth which are noticed in width, along the surface line, and the same changes in productiveness. There is a tendency in particular veins to the accumulation of gold along certain lines of structure in the vein, where the yield is much above the average; but in such cases the adjacent parts are comparatively poor. It has been observed that, wherever a remarkable nugget was found in a vein, the adjacent portions were well-nigh sterile at a short distance from the rich deposit. A remarkable example of this occurred in the Barrel quartz of Laidlaw's Hill two years ago, when a mass of the quartz vein of perhaps two cubic feet capacity yielded, as I

was informed. forty-five hundred dollars in gold, and the price of stock went up in a few hours from five dollars to forty dollars; but the adjacent portions of the quartz for a considerable distance proved to be quite barren. Other things being equal, those are undoubtedly the most desirable lodes in which there is a moderate amount of gold evenly diffused in a powerful body of quartz, which can be taken out at a small cost of mining, and supplied in large and steady quantities to the stamps.

In illustration of this point I will here quote a passage from a paper on gold mining, by John Arthur Phillips, Esq., of London, well known on both sides of the water for his skill as a mining engineer. This paper was read, May 16, 1860, before the Society of Arts, in London. Mr. Phillips says (p. 424, Vol. 10 of the Society's Journal), —

"As an instance of the small yield of gold, which even in Australia, is at the present time remunerative, I quote the following results of the Colonial and Port Philip Company. It must, however, be observed that, to obtain a satisfactory profit from ores of this class, it is necessary not only that large quantities should be treated, but also that the greatest economy should be observed in every department of the manipulation.

"The quantity of quartz crushed by this Company between October 1, 1860, and September 30, 1861, was 32,258 tons, from which the produce was 24,336 oz. 6 dwts., being an average of 15-2 dwts. per ton. The quantity crushed during the preceding year was 21,693 tons, and the produce 17,466 oz., being an average of 16 dwts. per ton, showing an increase in crushing of 10,563 tons, and on the yield of gold of 6,870 oz. over the same period of the previous year.

"It will be perceived that the yield of gold per ton had experienced a variation of 22 grs., equal to 5¾ per cent.

"The total expenditure per ton has been 12s.; in the preceding year it was 16s.

"The profits on the quartz-crushing for the year ending September 30, were £22,958, 16s. 5d."

IS THE GOLD CONFINED TO THE QUARTZ?

While beyond doubt the quartz-veins are the chief gold-bearing rocks, it yet remains to be proved that they are the only ones. It is common to see the gold in the blue slate adjacent to the quartz, and I have seen a zone of quartzite in the Montague district, mixed with slate, which showed "sights" of gold in the quartzite, and gave over an ounce to the ton on some tons which were tried as a sample. A talcose slate at Wine Harbor, which I have seen, is beautifully plated with gold; and McDonald Sutherland, of Oldham, owner of a quartz mill, informed me that he had crushed a slate from that region which yielded him over an ounce to the ton. Investigation is certainly required to ascertain the truth in this matter; but, from analogies of other gold districts, we are authorized in expecting that the associated rocks will sometimes be auriferous.

REMARKABLE INSTANCES OF PRODUCTIVENESS IN THE NOVA SCOTIA VEINS.

While the prudent adventurer will regard with superior interest the reliable average yield of auriferous veins as the only safe basis of expectation, it is always pleasant to see the prizes which the lottery offers, — not forgetting the blanks. I took pains to collect such authentic examples as fell in my way while in Nova Scotia, the official character which is given by law to the mining records rendering it easy to do so.

Two poor men at Isaac's Harbor, almost without capital, commenced work on a quartz lode of six inches, which, at a depth of 30 feet became two feet, and in 402 days' work they obtained 246 ounces of gold, and had each a profit of over $2,000 for their labor. This was claim No. 12, on the lode, and No. 13, the next one adjoining, is turning out even better, the month of November giving 8½ ounces of gold for all the quartz raised.

"The Triad Company," for July, from 22 tons obtained

145 ounces, or over 6½ ounces to the ton; and the same company, in August, obtained from 26 tons 900 pounds, 83 ounces of gold; for October, from 35 tons, 140 ounces.

The Hattie Lode, at Wine Harbor, has yielded 60 ounces to the ton, and 66 ounces from 1¼ tons of quartz.

Butler & Co., at Wine Harbor, for September, from 29 tons took 69 ounces, and for October, from 30 tons 800 pounds, took 95 ounces.

At Lake Loon (the Montague property), Robinson & Co. took a nugget of gold, found in the mispickel, which weighed 22 ounces; and the stuff from the vein has yielded from 4 to 6 ounces to the ton.

A lot of 2,500 pounds of selected quartz, from the South Taylor Lode, in Waverly, crushed by Huff, yielded 22 ounces of gold, and a lot of the same lode, unselected, yielded 2¾ ounces to the ton.

At Oldham, is a small vein of about an inch or two in thickness, which is owned by four workmen, who have taken from it 60 ounces to the ton of quartz.

Mr. Frankfort Davis, owner of a crushing-mill at Oldham, gave me the following statement of remarkable products, from his official returns, on the quartz from various lodes in Oldham: —

4	tons	yielded	16	ounces	5 dwt.
1	"	"	20	"	3 "
6	"	"	21	"	17 "
2	"	"	5	"	12 "
14	"	"	65	"	6 "
1½	"	"	65	"	10 "
13	"	"	59	"	10 "
2	"	"	9	"	12 "
1	"	"	3	"	8 "
12½	"	"	78	"	— "
2	"	"	33	"	5 "
17½	"	"	57	"	— "

Or in round numbers an average of 5 ounces to the ton, on about 100 tons of quartz crushed. While on the other hand,

442 tons from the same district yielded an aggregate of 821 ounces, or not quite 2 ounces to the ton.

At Wine Harbor a group of veins, on the Middle Lode, has yielded, to the present depth of 40 feet, over 5 oz. of gold to the ton of quartz.

Mr. O'Conner, one of the four owners of a claim on the Montague vein, informed me that a lot of the quartz from that vein, estimated at 800 lbs., yielded, on dry crushing, in a hand-mortar, 21½ ounces of gold, leaving, still, all the small gold, in the tailing, which would probably swell the whole yield to 24 ounces for 800 lbs., or 60 ounces to the ton of 2,000 lbs.

These examples might be multiplied,—as every district has its remarkable stories,—but I have confined myself to a portion of the examples which came to my knowledge.

THE GOLD COMMISSION.—TENURE OF GOLD LANDS.

By the law of the Provincial Legislature, the conditions of mining are substantially as follows: The fee of the mineral lands is in the Crown, and all mines are worked on a royalty, amounting, in the case of gold, to three per centum of the gross returns. A district having been determined to contain gold, it is declared by the Gold Commissioner to be within assigned limits a Gold District. It is then surveyed, and laid off into "areas," which, as the law now stands, are three-fourths of an acre each, or 150 feet on the supposed course of a vein, and 250 feet in the other direction. Any individual who has discovered a new locality of gold, becomes, in virtue of the right of discovery, entitled to one "free claim" or "area," which he is at liberty to select where he pleases. If the owner of the land, on notice being given, declines or neglects to exercise his prior right of occupancy (he paying the same royalty, however, but a less sum down), then the Gold Commissioner may sell, to the first applicant, as many "areas" as are called for; the applicant paying down, for each "area," the sum of ten dollars, which is an advance on royalty. The purchaser then becomes obligated

to work the "areas" he has purchased, to the extent of one hundred days in each year, for each lease of not over five "areas;" but he may elect on which of any number of such contiguous areas he will work, and may expend all the labor required for the whole upon that one, as in sinking a shaft, etc. He is also required to make to the Gold Commissioner a quarterly return of the amount of labor expended, and the quantity of gold obtained; neglecting to do which, he forfeits his claim, and the Gold Commissioner then has the right to sell it to another purchaser. All owners of quartz mills are also required to send official returns, under oath, in a form prescribed by law, of all quartz crushed, stating from what mine, and for whose account, and the quantity obtained. This is designed as a check on the miner, as the two statements must, if correct, balance each other.

The Chief Gold Commissioner resides in Halifax, but has his deputies in each gold district, whose duty it is to see that the provisions of the law are carried out, and returns duly made each month, accompanied by a report on the condition of the industry in the district represented. From these returns the Gold Commissioner prepares a Quarterly Exhibit, which he issues in a "Royal Gazette." The Gold Commissioner also makes an Annual Report to the Provincial Secretary, giving an account of the mining operations in the several gold district of the Province during the previous year. This Report, for the year 1862, is a valuable document, in which the then Chief Commissioner, Mr. Creelman, gives a large amount of interesting and important information.

The Provincial Law, respecting the gold fields, was plainly conceived, in its first draft, in the natural idea that there was to be a repetition in Nova Scotia of the experience of California and Australia, and that thousands of adventurers would flock to the "diggings," with the expectation of washing gold from auriferous sands. How completely different from this the actual experience in Nova Scotia is has already been explained. I have given good physical and geological reasons why it should be so. It is plain that gold

mining in Nova Scotia, as in California, can, as a rule, be carried on only by well-organized companies, with sufficient capital to make systematic and long-sustained explorations. For this purpose the small "areas" (20 by 50 feet), at first laid off, were found totally inadequate, and those now made, of three-quarters of an acre, are much too small, taken singly.

It is only where many such "areas" are taken consecutively, that a sufficient stretch on a vein is obtained to authorize regular mining.

Such, it will be seen, has been the course adopted by all companies from the United States. The law has lately received important modifications with a view to compel negligent occupants of adjoining claims to bear their part of the burden of keeping the vein free of water, on pain of forfeiture for neglect, after 20 days' notice. Suitable provisions are also needed to authorize the extension of levels through the claims of intervening proprietors in depth, on equitable terms, and here, no doubt, the principle of the common law, by which an owner has right of access to his land over the land of another, in certain cases, will apply.

METHODS OF DRESSING AND AMALGAMATING GOLD ORES, IN NOVA SCOTIA.

The quartz is best reduced by stamping mills, and is cracked by a machine which resembles Blake's stone breaker, preparatory to stamping. The use of fire to calcine the quartz is frequent although not universal, and opinion is divided upon the desirableness of this treatment; not that there is any doubt of the saving of labor and time in crushing, but whether the additional cost is not more than a balance for its advantages. The best stamps are those which have an iron rod, and revolve with the lifter, falling from 50 to 120 blows per minute in batteries of four or six. The English Mills, erected under the direction of Messrs. Phillips and Darlington, of London, are excellent examples of the best kind of non-revolving stamps. They strike in iron mortars, with movable linings

and soles. The shoes which wear longest and most evenly are cast from the well-known Franklinite iron, a variety remarkable for hardness and great strength combined: the screens vary in fineness from 40 to 80 holes to the linear inch. Where the use of mercury in the battery is adopted, the mortar bed is heated by steam or hot water.

The old Chilian mill, an edge-wheel, is still in use, and it is said that upon the barrel quartz of Laidlaw Hill it has made better returns than the stamps, which may be very true without commending either system very highly,* as it is certainly true, that very few of the mills have done as well as they should do in saving gold.

The usual amalgamation process in the Nova Scotia mills is by amalgamated plates of copper, boxes of mercury set before the stamps, rifles, shaking tables and blankets. A few use the round iron pan, with mercury, somewhat similar to the California pan. Such is essentially the case in the English mills, and in these alone did I observe a Haudts buddle at the end of the system, to concentrate and save the pyrites.

Experience has shown in California that the old plan of amalgamation, by rifles and the system of copper plates covered with mercury, is very imperfect and unsatisfactory, and in its best state can save not over 60 to 75 per centum of the gold which the fire assay shows to be present. Hence the almost universal adoption of the system of concentration by the iron pan with mercury, which is only a very highly improved and methodized "arrastra" mill. The one most usually adopted is Wheeler's pan and agitator, or Hepburn and Peterson's pan, which is a somewhat more complicated system than Wheeler's. Those pans, when properly conducted, save, it is said, on the authority of Küstel, a mining engineer of experience, not less than 95 per cent. of all the gold shown to be present by the fire assay.†

* Assays made under my directions on the waste or tailings from "barrel quartz," run through a stamping mill at Waverley, showed the presence of nearly fifteen pennyweights of gold to the ton of tailings, not over eight pennyweights having been saved in the original working.

† *Nevada and California Processes of Silver and Gold Extraction*, etc. By GUIDO KÜSTEL, mining engineer and metallurgist. Illustrated by accurate engravings. San Francisco: F. D. CARLTON. 1863. 8vo. pp. 327.

COMPARATIVE ADVANTAGES OF GOLD MINING IN NOVA SCOTIA AND ELSEWHERE.

In the same paper, already quoted, Prof. Phillips speaks as follows of the gold bearing veins of Nova Scotia:—

"The thickness of its auriferous veins is perhaps less than those of California and some other countries, but they are generally speaking richer, in visible gold, than the average of those I have seen in any other part of the world. It must also be taken into consideration, that Nova Scotia possesses many decided advantages over both California and Australia. Each of these countries is situated at a great distance from Europe, and can only be reached after a long and expensive passage, and, as a natural consequence, wages were for a long time exceedingly high, and provisions proportionally dear. Nova Scotia, on the contrary, is within an easy distance both from Europe and the United States of America, and possesses a considerable settled population, of intelligent, industrious, and sober people, eminently adapted, after a little experience, to become steady and efficient miners. The whole of the gold-bearing portion of the province, also, lies within a convenient distance from the coast, which abounds with magnificent harbors, affording ample security to shipping, whilst wood, in large quantities, is to be everywhere procured for all descriptions of mining purposes, and an abundant supply of water is generally to be met with for the purposes of washing and amalgamation.

"From these circumstances it is impossible that wages can ever reach the extravagant rates that mainly led to the failure of nearly all the gold mining enterprises of 1852. Since which period many of the mines have been advantageously worked, which were then abandoned on account of the enormous expenditure necessary to carry on the operations."

EXTRACT FROM LETTER OF B. C. WILSON,

SUPERINTENDENT CHEBUCTO GOLD MINING CO.

NOVA SCOTIA, March, 1864.

GENTLEMEN: —

The Company adjoining your property, since you were here, have crushed from lot 168, close to our western boundary, one lot of ore which yielded *two and one-half ounces per ton*, and have another raised which looks equally promising. I anticipate *handsome returns from this lead*, and shall give it my particular attention.

On the Tudor Lead I have twenty-eight men at work; it is now opened 850 feet in length. Most of the labor for the past fortnight on this lead has been expended in opening new shafts and preparing it for greater convenience of operating rather than raising ore, and as a result I may mention that the last contract given for raising the quartz was at $4.50 per ton against $6.50, the price at first given. This lead will eventually, I believe, be *worked at less expense than any in the Province.* It also perceptibly improves as we go deeper, and the prospects from some of our pits are very encouraging. Our neighbors to the west of us, down some forty feet deeper than we, *are quite jubilant over recent successes.*

I enclose a statement of proposed operations for the coming season, with estimate of cost and requisite capital, to which I respectfully call your attention. It is true a less amount of capital might do; this will depend in a great measure to what extent the Company may wish operations pushed. I speak advisedly in saying that they have scope and property enough to employ double the amount named if deemed advisable. But whatever amount may be required too much caution cannot be exercised in expending it, and not continue expendi-

ture when reason dictates it should be suspended, nor yet suspend because a week or fortnight's returns are discouraging. I have been upwards of nine years practically engaged in gold mining, and have seen a great deal more capital invested than ever yielded a dividend, and my estimate upon the $20,000 is simply this: that it should either place the mines in requisite position to yield good dividends, or, in case of further discoveries and more capital being required, to demonstrate so fully its feasibility, that the *result shall be more a matter of certainty than speculation.* Without making any predictions as to future results, I would point to one fact: that it is now two and a half years since the discovery of gold in the district, and yet, in the face of total inexperience in mining matters and, comparatively speaking, with no capital, each party depending upon the month's returns to meet the month's bills, with inefficient and expensive machinery, the mines have steadily continued to improve, obtaining a reputation second to none in the Province, and a *reputation too, which has a solid foundation.* Therefore, on these grounds I predicate a large remuneration.

B. C. WILSON.

BY-LAWS

OF THE

CHEBUCTO GOLD MINING COMPANY

OF NOVA SCOTIA.

ARTICLE I.

THE Annual Meeting of the Stockholders of the Chebucto Gold Mining Company of Nova Scotia shall be held in the city of Boston, on the first Tuesday of every March, at such time and place as the Directors shall appoint, and such meetings may be adjourned from time to time and from place to place without publishing or giving further notice.

ARTICLE II.

The officers of the Company shall be five Directors, one of whom shall be President, a Treasurer and Secretary, who may be one and the same person. The Directors, also the Treasurer and Secretary, shall be chosen by the Stockholders, at their first meeting, and thereafter at the annual meetings of the Company: and shall continue in office until the next succeeding annual meeting, or until others are chosen and accepted in their places.

The President shall be chosen by the Board of Directors from one of their number, at their first meeting after election, or at some adjournment thereof; and thereafter at their first meeting next succeeding the annual meeting.

ARTICLE III.

The President shall preside at all meetings of the Company, and of the Directors; and in the event of his absence, resignation, or inability, a President *pro tempore* may be appointed.

ARTICLE IV.

The Treasurer shall have the custody of all moneys, valuable papers, books, and accounts of the Company, subject, at all times, to the inspection and control of the Directors. He shall give or negotiate such notes or bills of exchange for such amounts and at such times as the business of the Company may require, and at the Directors' order, but for no other purpose; and he shall or may endorse notes, checks, or bills of exchange received by the Company in the prosecution of their business, making careful records thereof in the books of the Company. He shall record all transfers of stock, shall cancel and carefully preserve certificates of all stock transferred, and shall perform all duties pertaining to the office of Treasurer. He shall take suitable vouchers for all moneys paid out by him on account of the Company: but no money shall be so paid unless by written approval of one or more of the Directors. He shall give a bond for the faithful performance of his duties in the sum of ten thousand dollars, satisfactory to the Directors.

ARTICLE V.

The Secretary shall keep a record of the proceedings and doings of the Corporation. In event of his absence or inability, a Secretary *pro tempore* may be chosen.

ARTICLE VI.

The Corporation seal shall be a circle, on which shall be borne the name of the Company, and the year of its organization. It shall be in the custody of the Treasurer.

ARTICLE VII.

The Directors shall have the general supervision and control of the Company affairs. They shall hold their first meet-

ing upon due notice being given by the Secretary, and thereafter shall meet at such times and places as they may deem needful and convenient. The Secretary shall notify meetings of the Directors upon the request of any two of their number, by giving written or printed notice of the time and place thereof to each Director. The Directors may appoint such agents or superintendents as they may deem best, and may fix the compensation of the Treasurer or of any other person employed by the Company. They shall also, from time to time, order such division of the profits of the Company as they may think advisable; and at any of their meetings three Directors shall constitute a quorum for the transaction of business.

ARTICLE VIII.

The capital stock of the Corporation shall be $500,000, to consist of 100,000 shares, of the par value of five dollars, certificates of which, signed by the President and Treasurer, shall be issued to the several Stockholders, under the seal of the Corporation, and be duly recorded by the Treasurer, upon their first issue, and upon every subsequent transfer of the same; said certificate shall be as follows: —

No. Certificate.

No. transfer.

From

To

For

Boston, 186

Received certificate as above.

STAMPS

SHARES

Chebucto Gold Mining Company

OF NOVA SCOTIA.

No. [redacted] *CAPITAL, $500,000.* [redacted] Shares.

THIS CERTIFIES That of is entitled to shares numbered in the capital stock of the CHEBUCTO GOLD MINING COMPANY OF NOVA SCOTIA, incorporated under the 61st Chapter of the General Statutes of the State of Massachusetts, subject to the By-Laws of the Company, and transferable by assignment and surrender of this certificate.

IN WITNESS WHEREOF, the President and Treasurer have affixed their signatures hereto this day of 186

TREASURER.

PRESIDENT.

100,000 Shares.....Par value $5.

The following is adopted as the form of transfer, to be printed upon each certificate: —

FOR VALUE RECEIVED, hereby sell and assign to shares in the CHERUCTO GOLD MINING COMPANY.

Dated this day of 186

ARTICLE IX.

Special Meetings of the Company may be ordered by the Directors at such times as they may deem best; and they shall order the same to be called on the written application of persons owning one-quarter in value of the shares of said Company; all which meetings shall be held at such time and place as the Directors shall order, in the city of Boston; and the Secretary shall give notice of the time and place of every annual and special meeting, by publication in some newspaper printed in the city of Boston, seven days, at least, previous to the time specified for holding such meeting, and by printed or written notice, sent to each stockholder, of record. The Secretary shall record the date on which he publishes each notice upon the Record Book of the Company, and such record shall be conclusive evidence of the fact. At any Annual or Special Meeting, persons or corporations holding or representing one-quarter part in number of the shares of the Company, shall constitute a quorum to transact business.

ARTICLE X.

These By-Laws may be altered or amended at any Annual Meeting of the Company, or at any Special Meeting, in the call for which notice shall be given that an alteration will be proposed.