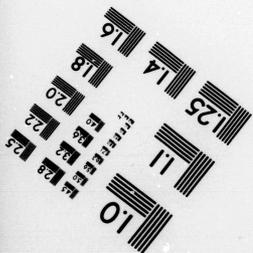
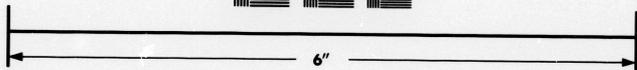
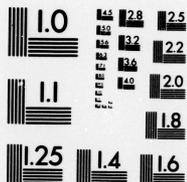
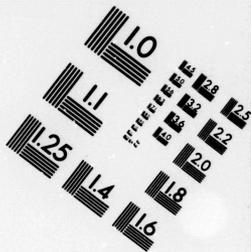
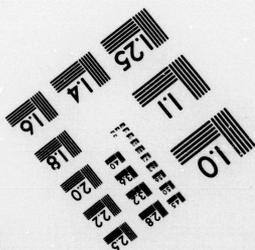


IMAGE EVALUATION
TEST TARGET (MT-3)



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

© 1983

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/
Couverture de couleur | <input type="checkbox"/> Coloured pages/
Pages de couleur |
| <input type="checkbox"/> Covers damaged/
Couverture endommagée | <input type="checkbox"/> Pages damaged/
Pages endommagées |
| <input type="checkbox"/> Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée | <input type="checkbox"/> Pages restored and/or laminated/
Pages restaurées et/ou pelliculées |
| <input type="checkbox"/> Cover title missing/
Le titre de couverture manque | <input checked="" type="checkbox"/> Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> Coloured maps/
Cartes géographiques en couleur | <input checked="" type="checkbox"/> Pages detached/
Pages détachées |
| <input type="checkbox"/> Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire) | <input checked="" type="checkbox"/> Showthrough/
Transparence |
| <input type="checkbox"/> Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur | <input type="checkbox"/> Quality of print varies/
Qualité inégale de l'impression |
| <input type="checkbox"/> Bound with other material/
Relié avec d'autres documents | <input type="checkbox"/> Includes supplementary material/
Comprend du matériel supplémentaire |
| <input type="checkbox"/> 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 | <input type="checkbox"/> Only edition available/
Seule édition disponible |
| <input type="checkbox"/> 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. | <input type="checkbox"/> 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. |
| <input type="checkbox"/> Additional comments:
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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

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

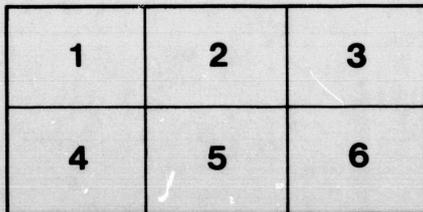
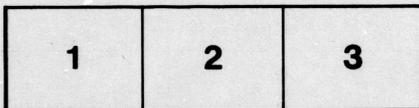
National Library of Canada

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 ∇ (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:

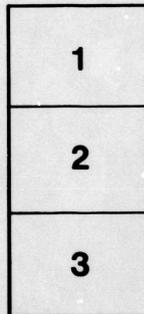
Bibliothèque nationale du Canada

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 ∇ 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.



V.—*Note on the Belmont Gold Veins of Peterborough County, Ontario.*

By E. J. CHAPMAN, Ph.D.

(Presented May 25, 1893.)

The crystalline rocks of the more western portion of North Hastings in Ontario are traversed, it has long been known, by a series of gold-bearing quartzose veins in which the gold is intimately associated with arsenical pyrites; but the occurrence of workable auriferous veins in the adjacent eastern portion of the county of Peterborough does not appear to have been hitherto described in any publication. A brief reference to these deposits in our 'Transactions' may not be considered therefore out of place.

These two series of auriferous deposits, although occurring only a few miles apart, offer some marked points of difference, evidently indicating distinct systems of formation. At the same time they show in the peculiar character of their gold certain points of affinity.

The veins of North Hastings occur chiefly in the townships of Marmora and Madoc, and especially in the district immediately west of the granitic or syenitic range known as the Huckleberry Hills. They run in a course not far removed from north and south, and consist of several roughly parallel veins in which auriferous mispickel is disseminated, in some places very thickly, through a quartz gangue. They are commonly regarded as "bedded veins," running parallel with the stratification or foliation of the country rock; but this, as I have found in the case of the gold-bearing veins of Belmont, is probably not absolutely correct, although appearing to be so as a general rule. These veins dip westerly with the inclosing rock at an average inclination (in Marmora) of between 40 and 60 degrees. The country rock, which consists of ordinary gneissoid strata, belongs either to the higher portion of the Laurentian or to the succeeding Huronian series—the veins being probably of the latter age. About half way between the Huckleberry Hills and the village of Marmora the crystalline beds are overlaid by practically horizontal strata of Black River or Trenton limestone. Eight or ten miles northwest of these veins, or about four miles west of the village of Marmora, the crystalline strata again occupy the surface, but their strike is here for the greater part roughly east and west. They are traversed by quite a number of quartz veins running mostly in the same general direction. These differ essentially from the Marmora veins by the total absence of arsenical minerals in their gangue. The gold is carried essentially by ordinary pyrites; but a small amount of copper pyrites, and in places some specks of galena are occasionally seen. Mispickel, the real ore of the Marmora veins, appears in this district to be completely absent.

Although these auriferous veins are indicated over a considerable area, they have only been worked as yet in the township of Belmont, lot 20, con. 1, where the "Crawford or Belmont gold mine" is situated. On this lot the ground presents several ridges or high

knolls with intervening spaces, produced by denudation, of low and more or less swampy ground. Along the rocky knolls several quartz veins carrying auriferous pyrites are clearly traceable across at least the more eastern portion of the lot. On the more northern of these veins three or four trial pits have been opened, and a shaft has been sunk vertically to a depth (at this date) of 122 feet. The upper part of this vein is decomposed into earthy oxidized matter which pans richly throughout the course of the vein. A sample taken, without selection, from one of the pits gave me by fire assay no less than 4 oz. 13 dwt. 8 grs. of gold per ton of 2,000 lbs. of ore, equivalent in value to \$94. Another sample of solid vein-stuff (quartz and pyrites), taken personally from the bottom of the shaft, yielded \$16 per ton; and other samples from different places gave from five to twenty-four dollars. The shaft shows this northern vein to dip at an angle of about 80° towards the south, the dip being rather steeper than that of the inclosing rock—so that a very characteristic chloritic schist which forms the foot wall at the surface becomes the hanging wall on descending. The thickness of the vein, at its outcrop, varies from about two to three or four feet. It then increases considerably; but suddenly at a depth of about 50 feet it becomes choked or pinched to less than a foot in width. In this pinched condition it continues for about twenty feet, and then again opens out, until at the present depth of the shaft (122 feet) it shows a width of at least six feet with good promise of increase.

At the time of my visit to the mine one mill only was in operation. In this the broken ore was ground by balls, and about ten tons per day were being put through; but a more powerful mill with cone crushers on the Crawford principle, in which from fifteen to twenty tons per day would be treated, was in course of erection. At this period (May, 1893,) all the stuff put through the mill consisted of surface croppings mixed with weathered rock and soil, and of the vein-stuff taken from the upper part of the shaft, with much wall-rock where the vein had narrowed, but the monthly "cleanings up" gave an average of ten dollars per ton; and several handsome ingots were exhibited in ocular attestation of the value of the ore mine. The ore was used in an unroasted state; and, judging from the low yield of the tailings, the mill appeared to be giving good results.

Although the Belmont ore is so different in composition from the Marmora gold-bearing arsenical ore, the gold in each presents a remarkable similarity of character, inasmuch as it carries a very low amount of silver, and thus comes out with full yellow colour on the cupel. The silver, in the gold of both localities, varies from a mere trace to something under 4 per cent, the fineness of the gold being thus between 23 and 24 carats.

