To Hon Abbott Lawrence

Sir,

By your request I visited the Ives copper Mine in the Township of Bolton on Friday last, in company with Dr McLeod and other gentlemen and, with the assistance of my son Mr S. M. Dawson assistant of the Royal School of Mines had examined the works at the location and the mode of expense of the ~~Pre-~~ bound and its operation ~~Shaft~~ for the mutual benefit of your purpose as far as the Lower shaft on about two thirds of a mile. In ~~the latter comments we have~~ ~~the advantage of the presence of~~ ~~Dr McLeod~~.

The facts which we compared the statements in the printed reports of Dr Hunt, Mr Shepherd & Mr Bell with ~~reference to~~ the character and extent of the ore-bearing land. Beyond this as a test of Chemical science, we tested parts of its thickness & with a view with copper pyrites that this constituting the predominant material. In the place the slate predominates and the ore exists in lesser quantity. ~~The ore alone~~ ~~bounds is what the ore is not~~ ~~copper but the pyrites~~.

The existing works have exposed a thickness of about 50 feet of this band. In what thickness in this band there appears to be contained a seam of from 1 to 12 feet of coal being rich sufficient and to yield with no great waste coke in the depth of band ~~to a depth of~~ 12 feet for cent and a large variety of what 3 sorts per cent use where we have in beds varying from 1 to 12 feet. This material "Rock" is capable of being deposited to a higher percentage than that of the present band & deposit. It is also evident that there such variety exists a much larger thickness exhibited, as we take a section of 14 feet in ~~average~~ ~~thickness~~ used by the extraction machine deposit, what the same extraction takes of the band used ~~[illegible]~~ and which ~~[illegible]~~ they leave waste of the. When we have ~~[illegible]~~ repeated.

As the band probably the upper one is a regular measure of the stratigraphy of the country and ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ with the early works in a practical way there can be no doubt of its continuation in depth beyond the limit of any probable mining operations.

The works today the one band can be traced continuous for the whole length of the

3

2/3rds of a mile distant

property to the Lewis Shaft ^ and
~~the~~ the explorations of the Geological Survey
show that they are continued
beyond the property of the Lewis Company into
that of the Wellington Mine. According to
the same explorations they are traced onward
the outcrop in [illegible] subsequent course the ~~[illegible]~~
northern limit of the Lewis property, and
are repeated in a second line of
outcrop ~~traversing~~ ~~[illegible]~~ this property, which
has not however, been explored.

At the extreme northern end
of the property a small exposure ~~this~~ adjoining ~~to the~~
to the East of the Road shows
detached rich copper ore with a
strike of N 60° E. This either belongs
to the ~~trace~~ of the ore ~~found~~ ~~[illegible]~~ between this & the Sult Shaft
in which case there must be a considerable ~~is~~ ~~[illegible]~~
~~the~~ end of the continuation ^ or
~~[illegible]~~ either of the ^ belongs to a second band may
of the eastern of that which has
been worked. The exposure is not
sufficient to develop the quality of the ore
at this place. From this ~~[illegible]~~ the
veins apparently with the ore can be
traced along the road ~~to the~~
beyond about 500 yards, the
Sult Shaft about. N 30° E and N 22° E.
strike changing to

Both the Sult and Bridges shafts
which are ~~seen~~ about 300 feet apart ~~to each other~~ are on
the outcrop of ~~the~~ the band ~~that~~ previously
has been found in other shafts to
a depth of 50 fathoms

Southward of the Bridges shaft where the beds are curling centrewards they have been worked as far as the Tenth shaft, the depth of which is about 8 fathoms and which was been carried through the beds until they appeared to the westward of the most productive part of the land where structures has not been explored at this place.

The ore of this mine is copper pyrites arranged in more or less regular centrewards mapes and layers among the Slate & the Slate fabric of the country. The ore of other minerals which appear are the pyrites for the most part in distinct layers which can be separated by hand and quartz which is found in places among the workings of the ore, though not very plentifully.

Our main point should for the only and simple reason is that the trend as now worked is capable of supplying the pitches shaft & Mr. ( ) that there is a valid probability that this particular will extend ~~as the ore~~ & therefore the existence of the ore in this neighbourhood that the ore belts exist ~~in~~ and that it will be worth ~~the~~ manufacture & ~~type mine~~ opened, and that will help the Mining Machinery and ~~[illegible]~~ cable

great extent of the mists — a very large part of the mainland will be permeable. Further it is evident that if a pipe pierced to a depth of 600 feet the pressure of the mine might be reduced enough to permit a greater depth than is usual in Lodes of copper pipes to exhaust

+ The large lenticular masses seen from more continuous in depth than horizontally and are probably more ~~lenticular~~ ~~[illegible]~~ in the de-lund than the present stages which follow Pentersan stages lived indirectly


Hand

To Sir Alexander T. Galt K.C.M.G.

Sir,

By your request I visited the Ives Copper mine in the Township of Bolton on Friday Aug 30, in company with Sir W.E. Logan & other gentlemen, & with the assistance of my Son Mr G. M. Dawson Associate of the Royal School of Mines, examined the works at the location & the surface exposures of the ore-band & its associated strata from the northern boundary of your property as far as the Ferrier Shaft, or about two-thirds of a mile.

The facts observed fully confirm the statements in the printed reports of Dr Hunt, Prof Chapman, & Mr Robb with reference to the character & thickness of the ore-bearing band. I regard it as a bed of chloritic schist in certain parts of its thickness so richly charged with copper pyrites that this constitutes the predominant material. In other places the slate predominates & the ore exists in less quantity.

The existing workings have been confined to a thickness of about 40 feet of this band, in which thickness there appears

to be contained in the part at present worked a ~~band~~ bed of ore-bearing rock from 2 to 12 feet wide sufficiently rich to yield by simple spalling a large proportion of 12 per cent ore, estimated at 4 tons to the cubic fathom. ~~a large amount of~~ ~~besides the~~ The residue, which would req. for machine dressing ~~contains about 4 per cent~~ & lies in heaps awaiting the erection of proper ~~dressing~~ machinery. The shaft smalls, estimated at half the amount of the spalled ore, and capable of yielding from 4 to 6 per cent, are also at present neglected, but from the small proportion of iron pyrites & friable nature of the slate are admirably adapted to concentration by jigging machinery & would give a product of high per centage.

It is also evident that were such machinery erected a much greater thickness, estimated as we believe moderately by Prof Chapman at an average of 14 feet would pay for extraction & dressing, while the more systematic working of the band thus rendered possible would undoubtedly expose many masses of ore now ~~neglected~~ overlooked.

As the band holding the copper ore is a regular member of the series of rocks constituting the country, & belonging to the Lauzon division of the Quebec Group of Sir William Logan, & as with the containing rocks it is nearly vertical, there can be no doubt of its extension in depth beyond the reach of any possible mining operations.

The rocks holding the ore have been traced continuously from the Northern limit of the Ives property to the Ferrier Shaft two thirds of a mile distant, & the explorations of the Government Geological Survey show that they extend Southward to the limit of this property & over the Huntington area beyond. According to the same explorations they are bent round the end of an anticlinal near the Northern limit of the Ives property & are repeated in a second line of outcrop traversing the property, which has not however, been explored

At the extreme northern end of the Ives area a small exposure to the East of the road shows Chloritic schist & copper ore with a strike of N 60° E. This either belongs to the turn of the ore towards the end of the anticlinal, in which case there must be a considerable flexure or break between this place & the Gaslt Shaft — or, which is perhaps more likely this is a second band running to the Eastward of that which has been worked. In either case the main ore-belt would extend to the Northern limit of the property. From this place the rocks associated with the ore can be traced along the road to the Gaslt Shaft about 500 yards, the strike changing to N. 30° E. & N. 22° E.

In the Gadlt & Brydges Shafts which are about 300 feet apart & connected by workings which follow the course of the ore-band, its productiveness has been proved as above stated, to a depth of 50 fathoms.
Southward of the Brydges Shaft while the beds are evidently continuous no opening has been made as far as the Ferrier Shaft, the depth of which is about 8 fathoms, & which has been carried through ore-bearing rock, though it appears to the Westward of the most productive part of the band, the thickness of which has not been determined at this place.

The ore of this mine is Copper pyrites arranged in lenticular masses, or more or less regular layers conforming to the stratification of the slate. The large lenticular masses seem to run more continuously in depth than horizontally, & are probably more uniformly distributed in the ore-band than the present stopes which follow particular ~~masses~~ would indicate. The only other minerals which appear are Iron pyrites for the most part in distinct layers, largely crystalline & easily separable from the copper ore by preliminary hand dressing; & Quartz which in places, though rarely is the matrix of the ore.

Our impression derived from the workings & surface exposures is that the band as now worked upon is capable of affording the produce stated by Dr Hunt in his printed report, that there is a rational probability that this productiveness will continue throughout the extent of the ore-band in this property, that other ore-belts exist in addition to those now opened, & that with proper dressing machinery & adequate extension of the works a much greater proportion of the ore-band would be profitably workable.

Further it is evident that by the prosecution of a proper amount of exploratory work the output of the mine might be large & uniform, probably more so than is usually possible with lodes of copper properly so called.

J. Thomson Duncan
Secy.
Consol. Copper Co
of Canada
No Glasgow