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Report of Dr. M. H. Froberg on the Grace Mine.

War Eagle Property
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REPORT OF DR. M. H. FROBERG ON THE GRACE MINE

(WAR EAGLE PROP)

SSM-943-

To Mr. R. E. Hore, Consulting Geologist, Oakville, Ontario

Geological Report

on Grace Mine, Michipicoten Area, Ont.

LOCATION OF PROPERTY

The property of the Grace Mines is located in the Michipicoten gold area, District of Algoma, Ontario and consists of a group of forty claims covering an area of approximately 1240 acres.

The mine is easily accessible by means of the Michipicoten branch line of the Algoma Central Railway, Wawa Station being 6 miles distant from the property. During the navigable season, the Dominion Transportation Company maintains a bi-weekly steamboat service between Sault Ste. Marie, Ontario and the mouth of the Michipicoten River which is about 6 miles from the Grace Mine. During the last years, the existing roads in the area have been considerably improved by the Provincial Government so that the mine can be reached by automobile from either Wawa or Michipicoten River.

UNDERGROUND DEVELOPMENT

Previous work on the property was concentrated on the Grace Vein which is opened up by an inclined shaft with an average dip of about 70° to a depth of little over 400 feet. Lateral development work has been done on the second (187 ft. vert.) third (280 ft. vert) and fourth (369 ft. vert) levels. Most of the drift work was carried out on the fourth level which extends 600 feet North and South respectively of the Grace shaft. Stopping in the early history of the mine was confined to vein sections above the second level, the old workings reaching about 200 feet North and 125 feet south of the shaft. A small stope about 20 feet high and 35 feet long lies on the third level immediately north of the shaft station. During the last period of operations, drift backs of high grade portions of the vein on the third and fourth level have been taken out for testing purposes.

SURFACE DEVELOPMENT

Apart from the surface work along the strike of the Grace Vein, the shear zone of which has been followed about 2,500 feet, considerable stripping has been done on the Hyman Vein and the so-called West shear. The shear zone of the Hyman Vein has been traced over a total distance of 1,500 feet, of which about 800 feet lie within the Grace property while the remaining section is located within the adjacent claims S.S.M. 2402 and 2403. Stripping along the Nyman shear

within claim D.J.11 has revealed a well mineralized quartz vein which carries continuous gold values of commercial grade for about 200 feet.

The West shear lies in the Southeastern part of the property and represents a shear zone lying "en echelon" with the Grace shear. It has been traced more than 1,000 feet and auriferous quartz lenses are located along this shear structure at various places. Locally gold values were obtained over a width of 15 ft.

GENERAL GEOLOGY

The general geology of the Michipicoten Gold area has been dealt with Dr. T. L. Gledhill(1), E.S. Moore (2), M. H. Frohberg(3), The geology of the Northern part of the district has been described by W.H.Collins (4), and the previous investigators, while the area South of the Michipicoten River has been investigated by L.J. Weeks (5) and A. F. Matheson(6)

- 1.Gledhill, T. L. Michipicoten gold area, 36th Ann Rep. Ont. Dept of Mines, 1927
- 2.Moore, E. S. Mich. and Goudreau gold areas; 40th Ann. Rep. Ont Dept. of Mines, 1931.
- 3.Frohberg, M.H. Contributions to the knowledge of the tourmaline bearing gold quartz veins of the Mich. District, Ont. Dissert.Freiberg, Saxony, 1932.
- 4.Collins, W.H
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- 5.Weeks, L.J. Mich.River map areas.Can.Dept.Min. Summ. Rept. pt. C pp.1-11, 1928
- 6.Matheson, A.F. Mich.River area; Can.Dept.Min. Summ. Rept. pp.1-21, 1932.

The geological character of the Grace property in its essential features corresponds to the geology of the entire gold bearing region. Apart from Pleistocene and recent sediments, the area consists of Precambrian rocks. A higher metamorphosed complex of old volcanic flows, tufts, breccias and agglomerates, with subordinate interlacations and conglomerates, arkose and greywacke, are intruded by ingenous rocks that are generally regarded as Algomian.

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According to Collins, Weeks and Matheson, the ancient volcanic rocks and sedimentary interlocations of the gold bearing area including the Grace property belong to the post-Dorean group. As compared with the large masses of volcanic material, sedimentary rocks play an insignificant part in the neighborhood of the Grace Mine, although they are of great interest as they afford an insight into the structure of the pre-Algoman rocks. Such beds give evidence that the pre-Algoman rocks were steeply tilted before intrusion of the Algoman plutonic rocks. The Algoman igneous rocks to which the miner and prospector generally refer as granite and porphyry, according to their silica content, are rocks of intermediate composition. On the base of their composition and texture, the following rock types have been identified on the Grace property: granodiorite, diorite, quartz porphyrite and quartz-free porphyrite. These rocks form innumerable intrusive masses of minor size that may be termed as cupolas, bosses and dikes, and some of them form very irregular protruberances (?). An intrusion of feldspar porphyrite several hundred yards in diameter lies immediately East of the Grace shaft, and in places forms the country rock of the Grace vein. Numerous small intrusions of quartz porphyrite and granodiorite have been observed North and South of the Grace camp.

The great number of relatively small intrusions in the entire gold-bearing area suggests a continuous batholithic mass depth, the roof of which has been deeply though not uniformly eroded. The outline of this mass (?) hearth, for which Gledhill proposes the name of "Wawa batholith" is roughly elliptical, its contours being indicated by the regional distribution of granodiorite and porphyritic intrusions. The major axis of the ellipse extends from the West end of Lake Wawa in a South-easterly direction close to the Michipicoten River. It is within the roof rock formations of this batholith that the gold deposits of the Michipicoten area occur, and there seems to be little doubt that the gold-bearing veins owe their origin to magmatic rest solutions which were given off during the differentiation of the Wawa batholith. Older products of the differentiation process are the various Algoman

igneous rocks in which some of the gold deposits occur. As for the genetic relations, it seems significant that certain porphyries carry sulphides as primary constituents which show a slight gold content.

Judging by the distribution and the volume of the single intrusions, the surface of the batholith underlying the gold area dips steeply towards the West and rather gently on the East side. It is also probable that the roof of the batholith pitches slightly towards the Northwest, parallel to its major axis, along which the majority of the gold veins including the Grace and Nyman veins occur. It is suggested by the writer that this corresponds to a ridge-shaped elevation on the roof of the batholith which controlled the rise of the gold-bearing solutions. Since very large areas of granitic rocks are exposed South and East of the Michipicoten District, it is probable that the assumed batholith does not represent an isolated mass but forms merely an outward bulge of a batholith of considerably larger dimensions.

Younger than the granitic and porphyritic intrusions is a group of dikes consisting of diabase and lamprophyres. There are at least two sets of diabases of different age. It is interesting that near the Grace Mine the older diabase is intruded by quartz porphyrite, there it is traversed by the Grace and Nyman Veins. The lamprophyres as well as the younger diabases proved to be of great nuisance to mining since they cut up the gold veins and cause a considerable dilution of the ore in the stopes. Gledhill and Moore held that the lamprophyres represent a late facies of the granodiorite mass, while the diabases have been generally believed to be Keweenawan. Development work at the Grace Mine has shown, however, that the lamprophyres cut both sets of the diabase intrusions. While the old diabase is undoubtedly older than the old veins, the younger diabase and the lamprophyres dikes either are both late differentiations of the Algonian mass or as unrelated to the Algonian intrusions.

STRUCTURAL GEOLOGY

The structural interpretation of the roof complex of the Algonian intrusions is rendered very difficult by the lack of persistent and easily identifiable strata. Moreover, the great number of intrusive bodies have nearly everywhere interrupted and contact-metamorphosed the few sedimenting intercalations. Sedimentary beds at the Grace Mine as well as on the other properties

showing a northeasterly strike, are steep generally pointing steeply towards the South-East. Although folding has been very intensive, and complete, it has apparently had little effect in controlling ore deposition.

The various rock formations of the area are traversed by a great number of shear and fault zones of different age. Among the various lines of weakness two directions predominate over the others, one striking East-Northeast and the second North-Northwest. Both directions are common as lines of jointing and diking and play an important part with the majority of the gold deposits. On the Grace property, both sets of veins are represented by the Nyman and Grace vein which strike E N E and N N W respectively.

The gold veins display ample evidence of later tectonic influence although they have not been affected by major disturbances. Repeated release of tensions that gave rise to fractures and cracks in the vein quartz have had a controlling influence upon the deposition of gold-bearing sulphides. Local folding of the gold deposits began taking place after the mineralization process, in connection with the intrusion of the diabase and lamprophyre dikes. Displacements caused by such dikes are generally of no importance.

Later than rock formations of the Michipicoten area are numerous fracture zones which on the surface are marked as swamp covered depressions. Some of them attain a width of several hundred feet and display abrupt precipices. Minor fracture zones of this kind have been encountered in the underground workings of the Grace Mine. It is noteworthy that the Grace Vein is only slightly dislocated at such places although the vein appeared to be cut up considerably with the zones of disturbances for the origin of these zones which underground are frequently water-bearing, they are undoubtedly of post-mineralization age and, according to Gledhill, have been formed in connection with the origin of the Lake Superior syncline.

ECONOMIC GEOLOGY

The Grace Vein consists of series of more or less lenticular quartz bodies which occur along the distinct shear zone. The latter has been traced on the surface more than 2,500 feet and shows a general strike of 30° West of North. The dip of the vein between the surface and the third level averages 71° to the Northwest.

Below the third level, the vein flattens out dipping about 62°.

The horizontal extent of the quartz lenses varies between a few feet and about 150 feet, and their width ranges from fractions of an inch to more than 5 feet, the average width being about 18 inc. As a rule, the downward extension of the quartz lenses considerably exceeds their horizontal length. It is a characteristic feature of the quartz bodies that their longitudinal axis pitches at angles between 90 and 70 degrees towards the south. The single quartz lenses follow one another in varying distances or overlap at their ends. It is noteworthy that the overlapping may be observed along the strike as well as the dip. The peculiar lenticular form of the quartz bodies is found in many veins in Ontario, and represents a primary characteristic of the deposits. There are no indications which would suggest that the lenticular shape of the quartz bodies is the result of later diastrophic movements which squeezed a continuous quartz mass into a series of lenses.

The formation of the quartz bodies sit in the shear zone was apparently dependent on previous fissuring. For this reason, rocks like porphyry and granodiorite on account of their relatively greater rigidity play a preferred part on the country rock of quartz lenses. In various places, rock contacts have been favored the development of quartz bodies. Contrary to the opinion held by certain investigators, conglomerate beds have been found to be unfavourable to the formation of ore bodies.

A study of the mine map shows that the number and extension of quartz bodies occurring along the Grace shear increase in depth. This fact is particularly evident South of the Grace shaft. Here the Grace shaft is marked on the surface by a barren shear zone for several hundred feet while along the corresponding distance on the third level underground, quartz lenses are found which increase in number and size on the deepest level of the mine. It is noteworthy that similar observations have been made in the deeper levels of the Parkhill Mine. On the strength of these facts the writer is inclined to believe that the quartz occurs in more continuous bodies in greater depth. Since gold values are essentially confined to the presence of quartz, the size of workable ore bodies will probably increase in depth. Likewise, it seems reasonable to expect in depth more gold-bearing quartz lenses north and south of the present underground workings. Small sized mineralized quartz bodies were discovered on the surface. In various

places along the Grace shear North and South of the mine. It may be pointed out in this connection that no indication of the high grade quartz lens of the northern end of the fourth level has ever been found on the surface.

In general, the boundary between the quartz and the country rock is well defined. Locally, however, the outlines of the quartz were very irregular and may give the impression that the quartz body does not follow the strike and dip of the shear zone. Fragments of the country rock in the quartz play an important part in certain vein sections. A curtain-like form of the inclusions, lying parallel to the strike of the quartz bodies and frequently occurring in a series, is rather characteristic. The gradual fading out of such country rock remainders indicate that replacement processes have played a role in the formation of the quartz bodies.

The formation of the Grace vein was accompanied by an intensive alteration of the wall rock. Apart from sulphides, characteristic alteration products are biotite, chlorite, sericite and black tourmaline, white albite, epidote, clinozoisite and rutile are visible only under the microscope. Mineralization of the wall rock and of country rock fragments shows a varying intensity. While in some places the quartz is the main carrier of the gold value, in other places quartz and country rock are equally well mineralized. In a third case, the country rock appears well mineralized while the quartz is nearly barren. Although the sulphide impregnation commonly extends as far as the general alteration of the country rock, notable gold values are but rarely found more than 10 in. distant from the fissure wall proper. Where the country rock is sufficiently mineralized it adds considerably to the width of the workable ore.

Cavities lined with crystals are very rare in the Grace Vein, There are no indications for a banded structure. Locally, however, ribbons or streaks of sulphides may present an imitation of banding, but this ribbon structure is due to cracks in the quartz, in which the sulphides or tourmaline have been deposited.

The Grace Vein consists chiefly of quartz. As an average the share of the quartz in the vein filling amounts to about 90% while the remaining 10% consist of varying amounts of carbonates, tourmaline and sulphides. The quartz of the Grace Vein as well as

of the Parkhill, Minto and Nyman Veins displays a fine-sugar grained texture which stands in marked contrast to the coarsely crystalline quartz of most of the poor or barren veins on the property. In general, the color of the quartz is grayish white but may grade into a bluish-gray with a greasy lustre. As compared with the quartz, the other gangues like calcite, ankerite and tourmaline are of subordinate importance.

Apart from free gold, the Grace Vein carries the following : sulphides, named in the order of abundance: arsenopyrite, pyrite, pyrrhotite, chalcopyrite and microscopic amounts of sphalerite. The sulphides contained in the ore of the Grace Vein average about 1.5%. Locally the percentages may rise to as much as 6-7%. While arsenopyrite is practically absent in the Northern part of the Michipicoten gold are and occurs only in negligible quantities in the Nyman and Parkhill veins, it makes up about 80% of the sulphide content of the Grace Vein. In vein sections without free gold, arsenopyrite is an important carrier of locked-up gold of sub-microscopic size. Unlike pyrite which is an important carrier of locked-up generally indicative of good gold values, pyrrhotite contains practically no gold. Chalcopyrite occurs frequently in high grade ore but is found only in minor amounts which offer no difficulties to a cyanidation of the ore.

The precious metal occurs :

- as 1. so-called "free-milling gold" which includes all microscopically visible gold as well as particles of microscopic size which after sufficient grinding of the ore can be extracted by amalgamation:
2. Gold which, in extremely fine distribution, is contained in sulphides. The size of the particles is so minute that they invisible under the highest magnification. In this form, the gold is practically not amenable to amalgamation and can only be recovered by methods like cyanidation.

From a metallurgical standpoint, it is of great interest that the major part of the precious metal can be classified as "free milling gold". In extreme cases, theoretical tests have extracted more than 80% of the gold by amalgamation. Very important is the absence of tellurides in the ore. Fineness analyses of free gold from the Grace Vein between 1928 and 1930 gave results between 822 and 896.

Most of the free gold occurs together with sulphides in the vein quartz; in places, however, it is found in fragments of the country rock or in the wall rock. The free gold occurs as flakes, leaflets, plates, grains, as well as in irregular aggregates weighing as much as one-eighth of an ounce. Some of the smallest particles are of extremely fine size and measure only fractions of one micron.

Variations in the gold incor(?) of the Grace Vein depend on the occurrence of sulphides (?) gold. In nearly all places where high gold values are encountered, free gold is found which is either visible to the unaided eye or can be under the microscope. Workable vein portions have lenticular outlines, similar to the shape of the quartz bodies. As a rule single quartz bodies show a better mineralization than the others. Microscopic examination of the ore shows that the prerequisites of the mineralization of the Grace Vein has been a mechanical deformation of the quartz as well as of the country rock, which opened channels as later solutions sought their way upward. The better mineralized vein sections were obviously those which at the proper time were subjected to stresses. This relation is most evident in view of the absence of such signs of deformation in barren quartz veins.

It has been a matter of much speculation as to which factors have controlled the origin of the rich pockets which have been repeatedly found along the Grace Vein. It may be added that the character and size of such concentrations of free gold are similar to those encountered in the Parkhill Mine. Gledhill is inclined to believe that the lamprophyre dikes are responsible for the occurrence of pockets. There is little evidence to support this suggestion. Rich pockets on the second level North and in the raise from the fourth level North to the third level were not found in the neighbourhood of lamprophyre dikes. Moreover, sulphide aggregates occurring along the walls of lamprophyre dikes, are invariably barren of gold. This observation has been made not only at the Grace Mine but also in the other mines of Michipicoten area.

In a great number of cases the writer was able to establish an improvement of the gold tenor of the Grace vein near intersections with red-feldspar-carbonate veins which cut the Grace Vein nearly at right angles. Microscopic examination confirms the field observation that the main period of mineralization of the Grace Vein was concluded before the formation of the red-feldspar-carbonate veins.

Free gold, together with a later generation of chalcopyrite and carbonate, however, are reputedly contemporaneous with or later than the red feldspar-carbonate veins. This fact is evidenced by the fact that irregular frequently occurs in intimate association with the minerals of the red veins. In places, native gold is found with carbonate and feldspar in cracks which frequently are less than .02 millimeters wide. It is difficult to conceive how the gold might have been introduced at some later time without reopening of the cracks. No evidence, however, can be detected under the microscope indicating a reopening. It is supposed by the writer that native gold and some chalcopyrite have been introduced into the Grace Vein at intersections with feldspar veins and that older sulphides present in the quartz have exerted a favourable influence on their deposition. Similar observations have been made in the other veins of the entire area. Further investigations are necessary to establish a possible guiding rule in the search for rich pockets.

CONCLUSIONS

In the opinion of the writer the Grace Mine represents a far developed prospect with excellent possibilities, which undoubtedly merits the investment of more money for further development :

The present ore reserves between the second and fourth levels are estimated at approximately 9000 tons containing about \$70,000 of gold (1oz.Au=\$ 20.67). This amount is to be distributed as follows :

5000 tons of \$10.00 ore, contained in an inclined ore shoot extending from the second level (209-206a) to the third level from raise to raise) and to the fourth level (o402-404). Stopping width about 3 feet.

2500 tons of \$6.00 ore, extending from second level south (o220-o221) to fourth level south (o420-o421) stopping width 3 feet.

1500 tons of \$ 4.00 ore to be from various places on third and fourth levels.

This estimate does not include the ore shoot tapped on the Northern end of the fourth level, neither is an allowance made for the possible occurrence of rich pockets in the ore shoots under consideration. Pockets at the Parkhill Mine have contained from \$3,000 to \$10,000 of gold. Rich concentrations of free gold have been found at various places in the main ore shoot. It seems reasonable to assume that more pockets will be found in this shoot between the fourth and second levels.

In view of the fact that the Inspector of Mines will not permit any stoping operations in the Grace Mine without a new shaft, the possible profit from the ore reserves will cover part of the expenses for a new shaft. Thus any investment of capital has to be done with the understanding that it is for further development.

Surface work during the last period of operations has definitely proved the existence of gold-bearing shear zones paralleling the Grace Vein. There is conclusive evidence that the high grade quartz lens on the Northern end of the fourth level is not the extension of the Grace Vein, but represents a second parallel vein. This assumption finds strong support in the results of the diamond drilling campaign in 1926 during which the existence of two veins was proven. Due to faulty interpretations of the drilling results this second vein has not been located except accidentally on the fourth level north. Since parallel shears at the Parkhill Mine contain considerable ore, much attention should be paid underground, to the shear zones lying west of the Grace Vein.

As for the Nyman vein, the present surface showings are certainly worthy of investigation by means of diamond drilling. It is advisable to secure an option on the adjacent claims SSM-2401, 2402 and 2403 before any diamond drilling is done on the Nyman vein. The purchase of these claims is necessary for lateral and vertical development of the deposit.

The writer suggests further that development work should be initiated by diamond drilling the Nyman Vein, the Northern and Southern extension of the Grace shear and the so-called West Shear. The location of a new vertical shaft has to be selected on the basis of diamond drilling results. The costs for the new shaft can be considerably reduced if the shaft is raised from a crosscut driven from the fourth level. From this level, sinking should be continued to at least the eighth level. During the same time, the possibilities of parallel shears in the footwall of the Grace Vein should be tested by crosscutting from the fourth level.

Should diamond drilling of the Nyman Vein give encouraging results, development work in depth might be carried out by crosscutting from the deepest level of the Grace Mine. As the pitch of ore shoots in the Michipicoten area is generally to be right, a crosscut from the eighth level of the Grace Mine should strike the

Nyman Vein at a distance of approximately 1000 feet. Costs for crosscutting and raising a surface connection on the Nyman Vein should be less than the costs for sinking a new shaft on the Nyman Vein. Apart from this fact, a crosscut of this kind should be of great exploratory value.

The necessary capital required for this programme would be distributed the following way :

Diamond Drilling	\$ 10,000.00
Raising and sinking a new shaft to a depth of 800 feet, including new hoisting equipment etc.	\$ 75,000.00
The months of development work including crosscutting to Nyman Vein	<u>\$ 80,000.00</u>
	<u>\$165,000.00</u>

As for the Mill, some fundamental changes will be necessary to guarantee a satisfactory recovery of the gold. Provided the milling capacity is not to exceed 50 tons per day, these changes could be effected with the investment of little more than \$ 15,000.00. The Mill should be ready for operation at the end of 10-12 months after the beginning of the work on the new shaft.

(Signed) M. H. Frohberg
M. E. Dr. Eng.

Michipicoten, July 18th, 1934

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Judging by the distribution and the volume of the single intrusions, the surface of the batholith underlying the gold area ^{dips steeply} dips steeply ^{west} towards the East and rather gently on the East side. It is also ^{probable that the roof} probable that the roof of the batholith ^{batholith pitches slightly} pitches slightly towards the Northwest, parallel to its major axis, along which the ^{GREEN and HYMAN VEINS} majority of the gold veins including the Green and Hyman Veins occur. It is suggested by the writer that this line corresponds to a ridge-shaped elevation on the roof of the batholith which controlled the rise of the gold-bearing solutions. Since very large areas of ^{East} granitic rocks are exposed South and East of the Michipicoten District, it is probable that the assumed ^{batholith} batholith does not represent.

an isolated mass but forms merely an outward bulge of a batholith of considerably larger dimensions.

Younger than the granitic and porphyritic intrusions is a group of dikes consisting of diabase and lamprophyres. There are at least two sets of diabases of different age. It is interesting that near the Grace Mine the older diabase is intruded by quartz porphyrite, there it is traversed by the Grace and Hyman Veins. The lamprophyres as well as the younger diabases prove to be of great nuisance to mining since they cut up the gold veins and cause a considerable dilution of the ore in the stopes. Gledhill and Moore hold that the lamprophyres represent a late facies of the granodiorite magma, while the diabases have been generally believed to be Keweenawian.

Development work at the Grace Mine has shown, however, that the lamprophyres cut both sets of the diabase intrusions. While the old diabase is undoubtedly older than the ^{old} ore veins, the younger diabase and the lamprophyres dikes either are both late differentiates of the Algoma magma or are unrelated to the Algoma intrusions.

STRUCTURAL GEOLOGY

STRUCTURAL GEOLOGY:

Structural interpretation *Complex*
The structural interpretation of the roof complex of the Algoma intrusions is rendered very difficult by the lack of persistent and easily identifiable strata. Moreover, the great number of intrusive bodies have nearly everywhere interrupted and contact-metamorphosed the few sedimentary intercalations. Sedimentary beds at the Grace Mine as well as on other properties showing a North-easterly strike, are steep generally pointing steeply towards the South-East. Although folding has been very intensive,

and complex it has apparently had little effect in controlling ore deposition.

The various rock formations of the area are traversed by a great number of shear and fault zones of different age. Among the various lines of weakness two directions predominate over the others, one striking East-northeast and the second North-northeast. Both directions are common as lines of jointing and diking and play an important part with the majority of the gold deposits. On the Grace property, both sets of veins are represented by the Hyman and Grace veins which strike E N E and E N W respectively.

The gold veins display ample evidence of later tectonic influence although they have not been affected by major disturbances. Repeated release of tensions that gave rise to fractures and cracks in the vein quartz have had a controlling influence upon the deposition of gold-bearing sulphides. Local folding of the gold deposits has taken place after the mineralization process, in connection with the intrusion of the diorite and lamprophyre dikes. Displacements caused by such dikes are generally of no importance.

Later than rock formations of the Michipicoten area are numerous fracture zones which on the surface are marked as swamp-covered depressions. Some of them attain a width of several hundred feet and attain display abrupt precipices. Minor fracture zones of this kind have been encountered in the underground workings of the Grace Mine. It is noteworthy that the Grace Vein is only slightly dislocated at such places although the vein appeared to be cut up considerably within the zones of disturbances for

the origin of these zones which under ground are frequently water-bearing, they are undoubtedly of post-mineralisation age and, according to Gledhill, have been formed in connection with the origin of the Lake Superior syncline.

ECONOMIC GEOLOGY:

The Grace Vein consists of a series of more or less lenticular quartz bodies which occur along the distinct shear zone. The latter has been traced on the surface more than 2,500 feet and shows a general strike of 30° West of North. The dip of the vein between the surface and the third level averages 71° to the Northeast. Below the third level, the vein flattens out dipping about 62° .

The horizontal extent of the quartz lenses varies between a few feet and about 150 feet, and their width ranges from fractions of an inch to more than 5 feet, the average width being about 18 in. As a rule, the downward extension of the quartz lenses considerably exceeds their horizontal length. It is a characteristic feature of the quartz bodies that their longitudinal axis pitches at angles between 30 and 70 degrees towards the South. The single quartz lenses follow one another in varying distances or overlap at their ends. It is noteworthy that the overlapping may be observed along the strike as well as the dip. The peculiar lenticular form of the quartz bodies is found in many veins in Ontario, and represents a primary characteristic of the deposits. There are no indications which would suggest that the lenticular shape of the quartz bodies is the result of later diastrophic movements which squeezed a continuous quartz mass into a series of lenses.

The formation of the quartz bodies sit in the shear zone

was apparently dependent on previous fissuring. For this reason, rocks like porphyry and granodiorite on account of their relatively greater rigidity play a preferred part on the country rock of quartz lenses. In various places, rock contacts have favored the development of quartz bodies. Contrary to the opinion held by certain investigators, conglomerate beds have been found to be unfavorable to the formation of ore bodies.

A study of the mine map shows that the number and extension of quartz bodies occurring along the Grace shear increase in depth. This fact is particularly evident South of the Grace shaft. Here the Grace Vein is marked on the surface by a barren shear zone for several hundred feet while along the corresponding distance on the third level underground, quartz lenses are found which increase in number and size on the deepest level of the mine. It is noteworthy that similar observations have been made in the deeper levels of the Parkhill Mine. On the strength of these facts the writer is inclined to believe that the quartz occurs in more continuous bodies in greater depth. Since gold values are essentially confined to the presence of quartz, the size of workable ore bodies will probably increase in depth. Likewise, it seems reasonable to expect in depth more gold-bearing quartz lenses North and South of the present underground workings. Small sized mineralized quartz bodies were discovered on the surface, in various places along the Grace Shear North and South of the mine. It may be pointed out in this connection that no indication of the high grade quartz lens on the Northern end of the fourth level has ever been found on the surface.

✓ In general, the boundary between the quartz and the country rock is well defined. Locally, however, the outlines of the quartz are

very irregular and may give the impression that the quartz body does not follow the strike and dip of the shear zone. Fragments of the country rock in the quartz play an important part in certain vein sections. A curtain-like form of the inclusions, lying parallel to the strike of the quartz bodies and frequently occurring in a series, is rather characteristic. The gradual fading out of such country rock remnants indicate that replacement processes have played a role in the formation of the quartz bodies.

The formation of the Grace Vein was accompanied by an intensive alteration of the wall rock. Apart from sulphides, characteristic alteration products are biotite, chlorite, sericite and black tourmaline, while albite, epidote, clinoisite and rutile are visible only under the microscope. Mineralisation of the wall rock and of country rock fragments shows a varying intensity. While in some places the quartz is the main carrier of the gold value, in other places quartz and country rock are equally well mineralized. In a third case, the country rock appears well mineralized while the quartz is nearly barren. Although the sulphide impregnation commonly extends as far as the general alteration of the country rock, notable gold values are but rarely found more than 10 inches distant from the fissure wall proper. Where the country rock is sufficiently mineralized it adds considerably to the width of the workable ore.

Cavities lined with crystals are very rare in the Grace Vein. There are no indications for a banded structure. Locally, however, ribbons or streaks of sulphides may present an imitation of banding, but this ribbon structure is due to cracks in the quartz, in which the sulphides or tourmaline have been deposited.

The Grace Vein consists chiefly of quartz. As an average

the share of the quartz in the vein filling amounts to about 90% while the remaining 10% consist of varying amounts of carbonates, tourmaline and sulphides. The quartz of the Grace Vein as well as of the Parkhill, Minto and Nymn veins displays a fine-sugar grained texture which stands in marked contrast to the coarsely crystalline quartz of most of the poor or barren veins on the property. In general, the color of the quartz is grayish white but may grade into a bluish-gray with a greasy lustre. As compared with the quartz, the other gangues like calcite, ankerite and tourmaline are of subordinate importance.

Apart from free gold, the (Grace) Vein carries the following sulphides, named in the order of abundance: arsenopyrite, pyrite, pyrrhotite, chalcopyrite and microscopic amounts of sphalerite. The sulphides contained in the ore of the Grace Vein average about 1.6%. Locally the percentage may rise to as much as 6-7%. While arsenopyrite is practically absent in the Northern part of the Michipicoten gold area and occurs only in negligible quantities in the Nymn and Parkhill veins, it makes up about 80% of the sulphide content of the Grace Vein.

In vein sections without free gold, arsenopyrite is an important carrier of locked-up gold of sub-microscopic size. Unlike pyrite which is an important carrier of ^{locked-up} generally indicative of good gold values, pyrrhotite contains practically no gold. Chalcopyrite occurs frequently in ^{higher grade ore but} is found only in minor amounts which offer no difficulties to ^{cyanidation} of the ore.

precious metal occurs:
The precious metal occurs:

- 1. so-called "free-milling gold" which includes all microscopically visible gold as well as particles of microscopic size which after sufficient grinding of the ore can be size which after sufficient grinding of the ore can be

2. Gold which, in extremely fine distribution, is contained in sulphides. The size of the particles is so minute that they remain invisible under the highest magnification. In this form, the gold is practically nonamenable to amalgamation and can only be recovered by methods like cyanidation.

From a metallurgical standpoint, it is of great interest that the major part of the precious metal can be classified as "free milling gold." In extreme cases, theoretical tests have extracted more than 80% of the gold by amalgamation. Very important is the absence of tellurides in the ore. Fineness analyses of free gold from the Grace Vein between 1928 and 1930 gave results between 822 and 896.

Most of the free gold occurs together with sulphides in the vein quartz; in places, however, it is found in fragments of the country rock or in the wall rock. The free gold occurs as flakes, leaflets, plates, grains, as well as in irregular aggregates weighing as much as one-sixth of an ounce. Some of the smallest particles are of extremely fine size and measure only fractions of one micron.

Variations in the gold incor(?) of the Grace Vein depend on the occurrence of sulphides(?) gold. In nearly all places where high gold values are encountered, free gold is found which is either visible to the unaided eye or can be seen under the microscope. Workable vein portions have lenticular outlines, similar to the shape of the quartz bodies. As a rule single quartz bodies show a better mineralization than the others. Microscopic examination of the ore shows that the prerequisite for the mineralization of the Grace

Vein has been a mechanical deformation of the quartz as well as of the country rock, which opened channels as later solutions sought their way upward. The better mineralized vein sections were obviously those which at the proper time were subjected to stresses. This relation is most evident in view of the absence of such signs of deformation in barren quartz veins.

It has been a matter of much speculation as to which factor have controlled the origin of the rich pockets which have been repeatedly found along the Grace Vein. It may be added that the character and size of such concentrations of free gold are similar to those encountered in the Parkhill Mine. Clechill is inclined to believe that the lamprophyre dikes are responsible for the occurrence of pockets. There is little evidence to support this suggestion. Rich pockets on the second level North and in the raise from the fourth level North to the third level were not found in the neighborhood of lamprophyre dikes. Moreover, sulphide aggregates occurring along the walls of lamprophyre dikes, are invariably barren of gold. This observation has been made not only at the Grace Mine but also in the other mines of the Michipicoten area.

In a great number of cases the writer was able to establish an improvement of the gold tenor of the Grace vein near intersections with red-feldspar-carbonate veins which cut the Grace vein nearly at right angles. Microscopic examination confirms the field observation that the main period of mineralization of the Grace vein was concluded before the formation of the red feldspar-carbonate veins. Free gold, together with a later generation of chalcopyrite and carbonate, however, are reputedly contemporaneous with or later than the red feldspar-carbonate veins. This fact is evidenced by the fact that irregular

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frequently occurs in intimate association with the minerals of the red veins. In places, native gold is found with carbonate and feldspar in cracks which frequently are less than .02 millimeters wide. It is difficult to conceive how the gold might have been introduced at some later time without reopening of the cracks. No evidence, however, can be detected under the microscope indicating a reopening.

It is supposed by the writer that native gold and some chalcopyrite have been introduced into the Grace Veins at intersections with feldspar veins and that older sulphides present in the quartz have exerted a favourable influence on their deposition. Similar observations have been made in the other veins of the entire area. Further investigations are necessary to establish a possible guiding rule in the search for rich pockets.

CONCLUSIONS

In the opinion of the writer the Grace Mine represents a far developed prospect with excellent possibilities, which undoubtedly merits the investment of more money for further development.

The present ore reserves between the second and fourth levels are estimated at approximately 9000 tons containing about \$70,000 of gold (1 oz. Au-\$20.67). This amount is to be distributed as follows :

5000 tons of \$10.00 ore, contained in an inclined ore shoot extending from the second level (o209-o206a) to the third level from raise to raise) and to the fourth level (o402-404). Stopping width about 3 feet.

2500 tons of \$6.00 ore, extending from second level south (o220-o221) to fourth level south (o420-o421) stopping width 3 feet.

1500 tons of \$4.00 ore to be from various places on third and fourth levels.

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This estimate does not include the ore shoot tapped on the Northern end of the fourth level, neither is an allowance made for the possible occurrence of rich pockets in the ore shoots under consideration. Pockets at the Parkhill Mine have contained from \$5,000. to \$10,000. of gold. Rich concentrations of free gold have been found at various places in the main ore shoot. It seems reasonable to assume that more pockets will be found in this shoot between the fourth and second levels.

In view of the fact that the Inspector of Mines will not permit any stoping operations in the Grace Mine without a new shaft, the possible profit from the ore reserves will cover part of the expenses for a new shaft. Thus any investment of capital has to be done with the understanding that it is for further development.

Surface work during the last period of operations has definitely proved the existence of gold-bearing shear zones parallel the Grace Vein. There is conclusive evidence that the high grade quartz lens on the Northern end of the fourth level is not the extension of the Grace Vein, but represents a second parallel vein. This assumption finds strong support in the results of the diamond drilling campaign in 1920 during which the existence of two veins was proven. Due to faulty interpretations of the drilling results this second vein has not been located except accidentally on the fourth level North. Since parallel shears at the Parkhill Mine contain considerable ore, much attention should be paid underground, to the shear zones lying West of the Grace Vein.

As for the Hyman Vein, the present surface showings are

certainly worthy of investigation by means of diamond drilling. It is advisable to secure an option on the adjacent claims S.S.M. 2401, 2402, and 2403, before any diamond drilling is done on the Nyman Vein. The purchase of these claims is necessary for lateral and vertical development of the deposit.

The writer suggests that further development work should be initiated by diamond drilling the Nyman Vein, the Northern and Southern extension of the Grace Shear, and the so-called West Shear. The location of a new vertical shaft has to be selected on the basis of diamond drilling results. The costs for the new shaft can be considerably reduced if the shaft is raised from a crosscut driven from the fourth level. From this level, sinking should be continued to at least the eighth level. During the same time, the possibilities of parallel shears in the footwall of the Grace Vein should be tested by crosscutting from the fourth level.

Should diamond drilling of the Nyman Vein give encouraging results, development work in depth might be carried out by crosscutting from deepest level of the Grace Mine. As the pitch of ore shoots in the Michipicoten area is generally to the right, a crosscut from the eighth level of the Grace Mine should strike the Nyman Vein at a distance of approximately 1000 feet. Costs for crosscutting and raising a surface connection on the Nyman Vein should be less than the costs for sinking a new shaft on the Nyman Vein. Apart from this fact, a crosscut of this kind should be of great exploratory value.

The necessary capital required for this program would be distributed the following way:

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17.

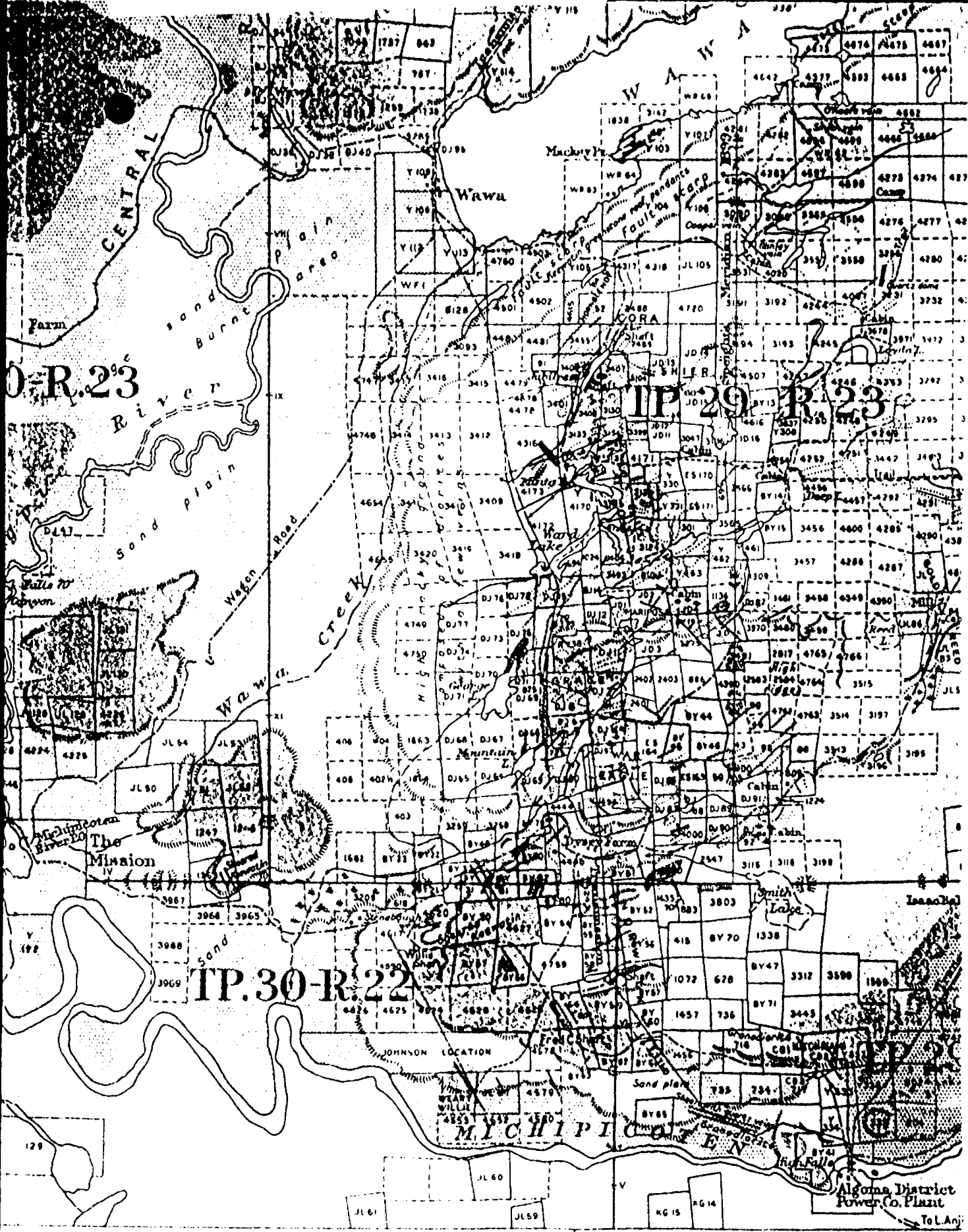
Diamond Drilling	\$10,000.00
Raising and sinking a new shaft to a depth of 800 feet, including new hoisting equipment, etc.	75,000.00
The months of development work including crosscutting to Hyman Vein	<u>80,000.00</u>
	<u>\$165,000.00</u>

As for the Mill, some fundamental changes will be necessary to guarantee a satisfactory recovery of the gold. Provided the milling capacity is not to exceed 50 tons per day, these changes could be effected with the investment of little more than \$15,000. The Mill should be ready for operation at the end of 10 - 12 months, after the beginning of the work on the new shaft.

(Signed) M.H. Froberg
M.E. Dr.Eng.

Michipicoten, July 18th. 1934.

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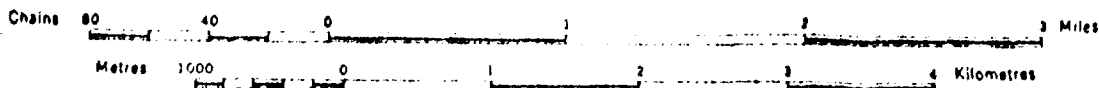
Map No. 36a

MICHIPICOTEN AREA

DISTRICT OF ALGOMA, ONTARIO

To accompany report by T. L. GLEDHILL, in Vol. XXXVI, Part 2, Ontario Department of Mines Annual Report, 1927.

Scale $\frac{1}{37520}$ or $\frac{3}{4}$ Mile = 1 Inch



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DARWIN GOLD MINES LTD.

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DARWIN GOLD MINES LIMITED

INTRODUCTION

The Darwin Mining property was examined on surface and underground during the last week of Oct. 1939, with the object of estimating the amount of ore in the mine or elsewhere on the mining claims. This mine has produced upto Dec. 1937, the date it was closed, approximately \$450,000 from rich quartz lenses located in sheared and fissured Keewatin greenstone. (Final figures gave 17.179 oz./Au worth then \$546,852 from 45,528 tons, for an average of 0.377 oz.Au/Ton (then worth \$12).

The Darwin company owns 40 patented mining claims in a group in Range 29, Township 23, District of Algoma, the total area being about 1200 acres.

A good truck road reaches the mine from Wawa station on the Algoma Central Railway, another road connects the mine with a steamer wharf at Michipicoten Mission. In summer heavy mine freight can be brought in cheaply by steamer.

The gold area is well supplied with electrical power from a modern power plant operated by the Great Lakes Power Company, at Michipicoten Falls, a few miles south of the mine. This power is as cheap as any in Ontario, costing about \$35.00 per horse-power-year.

SUMMARY

After an examination of the Darwin property it appears that there is not much ore of good grade left exposed in the mine, as it has been mostly stoped out. The East-West vein was found to be a stronger vein and more interesting than the original Grace vein and this East-West vein furnished the bulk of the ore. There are certain sections of the vein that remain to be explored above the 8th level, the deepest production level in the mine. There is a short drift on the 9th level, reached by a winze from the 8th level.

The East-West vein showed some good ore on the 9th level as far as it was opened up, so that the 9th level is not the bottom of the mine ore. In fact the mine has been opened up to only a shallow depth and there are abundant chances for ore below the 8th level.

The Nyman vein, another East-West striking vein, outcrops on surface several hundred feet east of the main shaft where three 40 ft. sections show good assays over mining widths. On the 3rd level north, a vein corresponding to the Nyman has been drifted on

and stoped and shows fair to good ore over narrow widths. Another parallel vein to the Nyman and 100 ft. south of it, shows some fair assays on the 3rd level. The Nyman vein, if developed, may turn out to be as interesting as the main East-West vein.

The original Grace vein contained good ore just north and south of the inclined shaft on this vein down to the 5th level. The Grace Vein has also been drifted on down to the 8th level from the vertical shaft.

The Grace Vein has some shoots of ore of good grade left between the 5th and 3rd level and there are several sections below the 5th level that can be mined but will produce a low grade ore of \$5 to \$6 per ton when mined out a 3 ft width (0.14oz./ton+)

There are chances of finding parallel veins underground in the Darwin besides the Nyman and the original East-West vein. There is an interesting vein on surface on claim 3492 that adjoins the Darwin group on the south that gives an assay of \$9.60 over a width of nearly 6 feet (0.274 oz./Au ton)

There is not enough ore tonnage in sight in the Darwin to start up the Darwin Mill but it would be quite feasible to mine whatever ore there is within easy reach of the present mine openings in the Darwin, and truck it to the Parkhill Mine. A skeleton crew is all that is needed for this purpose and the same assay plan etc. can be used at Darwin and Parkhill.

Some exploration for new ore can be carried on at Darwin in conjunction with mining. On the start this could be best done by some flat diamond drill holes from underground.

In order to follow out what I consider the most practical plan, it is necessary to acquire Parkhill and Smith properties. The Parkhill has cyanide mill that has a capacity of 80 tons a day that can be increased to 100 tons. From an examination of the Parkhill and Darwin assay plans it is possible to block out 60,000 tons of ore on these properties without much more development work in the way of new drifts or shaft sinking.

EQUIPMENT

The Darwin mine is equipped with an efficient 45-ton cyanide gold mill. The two electrically driven air compressors deliver about 1500 cu.ft. of air per minute. The hoist is good for at least 1500 ft. with a 4000 lb. load. This hoist could be moved to Parkhill and by increasing the size of motor on it to 120 H.P. it could be used to

3000 ft. There is a good machine, blacksmith shop and a good assay office. Drill stell, mine cars, and stoping machines are sufficient for some time.

At the Parkhill plant there is a hoist that could be moved to Darwin and would be useful until Darwin get down to 1200 ft. or so. The Parkhill mine is well equipped with drills, compressors etc. the only machine needed is a hoist and it can be obtained from the Darwin and the smaller hoist at Parkhill taken to Darwin.

EXAMINATION OF THE PROPERTY

The surface of the Darwin claims was first examined to discover, if possible, other veins that would supplement the possible ore in the present veins in the mine. Four veins were sampled on the surface, two on the Darwin property and two on the War Eage (claim No. 3492) One Vein in the southwest corner of claim 3492, which adjoins the Darwin, gave an assay of \$9.60 across a 5ft. 9 inches. This vein lies in a fairly strong north-south shear.

The Grace and the East-West veins were examined underground with the idea of discovering any new tonnage that might be left unmined above the 8th level. The drift on the 9th level reached by a winze was not examined as it was flooded.

There are some sections in the Grace vein that can be mined from the 8th to the 3rd level. The best section lies on either side or north and south of the original inclined shaft. This ore would probably run from \$5 up to \$15 per ton. The bulk of it would be of lower grade (0.143 to 0.428 oz.Au/ton). However, the mining costs of ore in this vein would be low as the vein has already been exposed on several levels and the costly development is already paid for.

Most of the better grade ore has been mined out of the East-West vein below the 5th level. This vein appears to apex at the 5th level. It might be possible to mine several thousand tons of ore above the 9th level in the East-West vein, however a survey would be needed before this cold be definitely shown.

The Nyman vein that appears to have been cut on the 3rd level north, has been opened up for 70 ft. along its strike. While the width is only about 1ft. the assays especially towards the east are good. For example, the last three, in the east drfit, gave \$3.95. \$13.60 per ton in gold(0.113 oz., 1.41 oz. & 0.39 oz.Au/ton)

100 ft. south of and parallel to the Nyman vein is another vein that gave some short sections that would grade about \$5 per ton. (0.143 oz/ton). The Nyman and this parallel vein may furnish a considerable amount of new ore because no ore in these mines has been mined above the 8th level.

The East-West vein on the 9th level shows two sections of low to good grade ore west of the winze, and some short sections of low grade east of the winze. Underground the East-West vein shows better structure than the original Grace vein. Other new east-west veins may be found underground as shown by the finding of the Nyman vein, which on surface assays well and stretches for several hundred feet east of the shaft.

A careful geological examination and map should be made of the surface near the present Darwin mine workings so that any veins that show promise can be tested on surface and from underground.

GEOLOGY OF THE DARWIN MINE

The Darwin mine is located in a mass of diorite and diorite prophyr, with minor volumes of lamprophyre and diabase dykes. A few dikes of acid rocks occur near the vein. A post-ore diabase dike crosses the north end of the Grace vein. Ore was found on both sides of this dike. There are two types of lamprophyre dikes, both are post-ore.

The good sections of the veins show shearing parallel to the vein walls and the vein quartz is well crushed. The best type of ore can usually be detected by its better structure and the appearance of the vein quartz. The vein walls do not carry appreciable amounts of gold.

The veins vary in dip from 70 to 20 degrees. The steeper dip is found in the Grace vein.

There is no reason why other veins just as good as the East-West vein may not be found near the present underground workings. Some diamond drilling from surface and underground will be needed to find them.

Only one fault of any consequence, known as the Star shear, occurs underground in the mine. The mine is not particularly wet but bulkheads might be used to seal off water coming in from the upper levels in the Grace vein stopes that were carried through to surface.

RECOMMENDATIONS

From an inspection of the Darwin Mine, there is some ore left in the mine above the 8th level in the Grace vein of a \$5 or \$6 grade over a 3-foot width. The East-West vein, above the 8th level, when more fully explored, will furnish some good ore. The present vein sections shown in the drifts and cross cuts should be resampled and a plan of the stopes made.

The Darwin mill is too small to make any profit from a \$5 or \$6 grade ore (0.14 oz. Au/ton). Therefore, I would recommend that this ore be stoped out and trucked to the Parkhill Mill which can handle 80 tons per day and where it could be mixed with ore of a \$15 grade (0.428 oz. Au) or higher grade from the Parkhill Mine. The Darwin mill should be left idle while the ore in the Darwin is mined above the 8th level. If milled with the Parkhill ore the Darwin ore could be treated for 60¢ per ton including the trucking. \$1.75 per ton should cover the mining cost. When the ore, now in sight at the Darwin, is mined out, a new attack on the East-West vein could be made by sinking the vertical shaft another three levels and putting out a long haulage cross-cut, say from 12th level to the East-West vein; or this vein could be developed from the present inclined winze that goes down on the East-West vein from the 8th level. There is at present a good hoist installed in this winze station on the 8th level that could hoist ore from 500 ft. using this inclined winze.

The Darwin mine is well equipped with plenty of machinery and no new equipment is needed at present. I would recommend an inventory of the present equipment and supplied at once as no list appeared to be at hand.

The only chance of making a success of Darwin is to amalgamate this mine with a large property like Parkhill that has larger ore bodies and a larger mill. The Darwin property at present is worth about \$25,000. If it is purchased, the purchase price could or should be paid out of production if possible.

The Parkhill property can be obtained for about \$25,000 and a block of stock, say 100,000 to 200,000 shares. The Parkhill's lowest level, the 14th, has a good grade of ore for a length of 125 feet that averages about \$15 (0.428 oz.) the average for the mine. From the 9th level to the 200-foot level on the Smith vein, there is a potential block of undeveloped ore of 50,000 tons. In order to obtain the ore locked up in the Smith vein, the seven Michipicoten gold claims

should be purchased. They are well located and include the Smith or claim No. 301. This can be done for \$4000 cash and 50,000 to 100,000 shares of stock in the amalgamated group i.e. Darwin, Parkhill & Smith.

A surface sampling followed by diamond drilling should be made of several surface showings of veins known to contain gold on the Darwin, Parkhill and Smith properties. These veins are outside of the veins already known in the mines. Also there should be a carefully prepared surface geological map made, on a scale of 100 feet to the inch, of the different properties. Adjoining the Darwin property on the south, in the southeast corner of claim SSM-3492 a good-looking vein was found to carry \$9.60 per ton in gold over a 6-foot width. At least five other surface showings were inspected that showed quartz from 3 to 5 feet in width that merited surface development. In one of these veins coarse gold was noted. It has been demonstrated in the Little Long Lac area by the Newmont Mining Co. that it pays to truck gold ore to a custom mill. The trucking cost is about 10 cents per ton per mile.

When mining is started a mining engineer should be engaged to take charge who has experience in mining narrow, high grade gold veins.

CONCLUSIONS

The Darwin Mine has not enough ore in sight or potential ore to start the mill without doing about \$50,000 of development work. The Darwin's success at present depends on treating the easily available ore at a custom mill such as the Parkhill Mill.

The Parkhill Mill of 80-100 tons of daily capacity is a very efficient cyanide type of mill that gives high recoveries and can be started up on about three days notice. If the Parkhill property is obtained, the Parkhill mine should be de-watered and the ore stoped out above the 9th level to the top of the Smith vein. At the same time ore can be stoped above the 14th level and raised on. I feel that the ore has been missed on the 13th level. The Parkhill and Smith veins appear to be continuous.

There is enough equipment on surface at the Darwin and Parkhill at one-third its original purchase price to offset any payments that would be made under my recommendations for purchase of these properties.

Any payments in cash should be avoided except where debts are secured, in this case \$7000 at Parkhill and \$4000 for the 7 Michipicoten Gold claims ("Smith"). At present \$1000 might satisfy the Michipicoten

Gold Co. Their payment is necessary as a mortgaged of \$3500 against their group is maturing in a month or so.

The ore on the 14th level at Parkhill is as good as any in their best levels. It will take about \$6000 to de-water the Parkhill underground workings. This can be done in about 4 months but the time could be shortened by using larger pumps. The ore in the Smith-Parkhill shoot could also be reached by deepening the Smith shaft which is now down to 250 feet on the incline. The Smith vein to 250 feet has produced \$75000 (2142 oz. Au) from ore grading \$13.50 (0.386 oz. Au/ton) or so which would have been higher if the ore had less dilution. This dilution can be avoided by using a better system of mining "reusing" and hand sorting.

There are at least three other high grade gold vein on properties within reach of a custom mill, as that at Parkhill, that could be drawn on to swell the tonnage of such a mill. This ore could be purchased on reasonable terms and there is enough extra equipment around the Darwin and Parkhill plants to equip these outlying properties with a hoist and air compressor for milling underground.

A profit can be made in mining Michipictoen gold ores as shown by the Minto and Jubilee operations. The Parkhill Mill can be raised to 100 tons per day.

In Mining the above-mentioned properties in future, the ore should be sorted in the stopes, and instead of raising the waste rock it could be used in back-filling the stopes. The ore is usually quartz-rich and easily identified while the wall rock is dark and is too low-grade to mine. The lack of back-filling and the poor sorting methods at Darwin and Parkhill increased their operating costs and cut down their recoveries.

I am satisfied that there is about 60,000 tons of ore available in the Darwin, Parkhill and Smith mines combined, that can be cheaply mined out without much new development work. Most of the heavy development costs are unnecessary as the present levels are within easy reach of blocks of ore. There is some ore in the upper five levels of Parkhill that was unmined, as gold at the time of the development of these levels, was at the old price of \$20.57 per ounce.

The 60,000 tons of ore is enough to keep a 100-ton mill operating for two years. There will be no heavy outlay for equipment, as the Darwin hoist can be used at Parkhill and a smaller hoist from Parkhill can be moved to Darwin. The Newmont mining co. has used a custom mill to good advantage for their properties at Little Long Lac.

Sd/- T. L. Gledhill, Ph.D. Geologist
Nov. 15, 1939.



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T. L. GLEDHILL M.A. (TOR.), PH.D. (MANN. INST. TECH.)
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DARWIN GOLD MINES LTD.

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DARWIN GOLD MINES LTD.

Introduction:

The Darwin mining property was examined on surface and underground during the last week of Oct. 1939, with the object of estimating the amount of ore in the mine or elsewhere on the mining claims. This mine has produced up to Dec. 1937, the date it was closed, approximately

\$450,000 from rich quartz lenses located in sheared and fissured Keewatin greenstone. *Final figures gave 17,179 oz. Au worth then \$546,852 from 45,528 tons, for an average of 0.377 oz. Au/ton (then worth \$12).*

The Darwin company owns 40 patented mining claims in a group in Range 29, Township 23, District of Algoma, the total area being about 1200 acres.

A good truck road reaches the mine from Wawa Station on the Algoma Central Railway, another road connects the mine with a steamer wharf at Michipicoten Mission. In summer heavy mine freight can be brought in cheaply by steamer.

The gold area is well supplied with electrical power from a modern power plant operated by the Great Lakes Power Company, at Michipicoten Falls, a few miles south of the mine. This power is as cheap as any in Ontario, costing about \$35.00 per horse-power-year.

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-3-

Summary:

After an examination of the Darwin property, it appears that there is not much ore of good grade left exposed in the mine, as it has been ^{mostly} stoped out. The East-West vein was found to be a stronger vein and more interesting than the original Grace vein and this East-West vein furnished the bulk of the ore. There are certain sections of the vein that remain to be explored above the 8th level, the deepest ^{production} level in the mine. There is a short drift on the 9th level, reached by a winze from the 8th level.

The East-West vein showed some good ore on the 9th level as far as it was opened up, so that the 9th level is not the bottom of the mine. In fact the mine has been opened up to only a shallow depth and there are abundant chances for ore below the 8th level.

The Nyman vein, another East-West striking vein, outcrops on surface several hundred feet east of the main shaft where three 40 ft. sections show good assays over mining widths. On the 3rd level north, a vein corresponding to the Nyman has been drifted on and stoped and shows fair to good ore over narrow widths. Another parallel vein to the Nyman and 100 ft. south of it, shows some fair assays on the 3rd level. The Nyman vein, if developed, may turn out to be as interesting as the main East-West vein.

The original Grace vein contained good ore

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Summary: Cont'd.

just north and south of the inclined shaft on this vein down to the 5th level. The Grace vein has also been drifted on down to the 8th level from the vertical shaft.

The Grace vein has some shoots of ore of good grade left between the 5th and 3rd level and there are several sections below the 5th level that can be mined but will produce a low grade ore of \$5 to \$6 per ton when mined out to a 3-ft. width. (0.14 oz./ton +)

There are chances of finding parallel veins underground in the Darwin besides the Myman and the original East-West vein. There is an interesting vein on surface on claim 3492 that adjoins the Darwin group, on the south that gives an assay of \$9.50 over a width of nearly 6 feet. (0.274 oz. Au/ton)

There is not enough ore tonnage in sight in the Darwin to start up the Darwin mill but it would be quite feasible to mine whatever ore there is within easy reach of the present mine openings in the Darwin, and truck it to the Parkhill mine. A skeleton crew is all that is needed for this purpose and the same assay plant etc. can be used at Darwin and Parkhill.

Some exploration for new ore can be carried on at Darwin in conjunction with mining. On the start this could be best done by some flat diamond drill holes from underground.

T. L. GLEDHILL B.A. (TOR.), Ph.D. (1909, 1911, 1913)
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-4-

Summary: Cont'd.

In order to follow out what I consider the most practical plan, it is necessary to acquire the Parkhill and Smith properties. The Parkhill has a cyanide mill that has a capacity of 80 tons per day, that can be increased to 100 tons. From an examination of the Parkhill and Darwin assay plans it is possible to block out 60,000 tons of ore on these properties without much more development work in the way of new drifts or shaft sinking.

Equipment:

The Darwin mine is equipped with an efficient 45-ton cyanide gold mill. The two electrically driven air compressors deliver about 1500 cu. ft. of air per minute. The hoist is good for at least 1500 ft. with a 4000 lb. load. This hoist could be moved to Parkhill and by increasing the size of motor on it to 120 H.P. it could be used to 3000 ft. There is a good machine, blacksmith shop and a good assay office. Drill steel, mine cars, and stoping machines are sufficient for some time.

At the Parkhill plant there is a hoist that could be moved to Darwin and would be useful until Darwin gets down to 1200 ft. or so. The Parkhill mine is well equipped with drills, compressors etc., the only machine needed is a hoist and it can be obtained from the Darwin and the smaller hoist at Parkhill taken to Darwin.

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Examination of the Property:

The surface of the Darwin claims was first examined to discover, if possible, other veins that would supplement the possible ore in the present veins in the mine. Four veins were sampled on the surface, two on the Darwin property and two on the War Eagle (claim no. 3492). One vein in the southwest corner of claim 3492, which adjoins the Darwin, gave an assay of \$9.60 across a 9 inch vein. This vein lies in a fairly strong north-south shear.

The Grace and the East-West veins were examined underground with the idea of discovering any new tonnage that might be left unmined above the 8th level. The drift on the 9th level reached by a winze was not examined as it was flooded.

There are some sections in the Grace vein that can be mined from the 8th to the 3rd level. The best section lies on either side or north and south of the original inclined shaft. This ore would probably run from \$5 up to \$15 per ton. The bulk of it would be of lower grade. However the mining costs of ore in this vein would be low as the vein has already been exposed on several levels and the costly development is already paid for.

Most of the better grade ore has been mined out of the East-West vein below the 5th level. This vein appears to apex at the 5th level. It might be possible to mine several thousand tons of ore above the 9th level in the East-West vein, however a survey would be needed before this could be definitely

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CONSULTING MINING GEOLOGIST

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Examination of the Property: Cont'd.

The Hyman vein that appears to have been cut on the 3rd level north, has been opened up for 70 ft. along its strike. While the width is ^{only} about 1 ft., the assays especially towards the east are good. For example the last three, in the east drift, gave \$3.95, \$49.35, \$13.60 per ton in gold.
0.113 oz., 1.41 oz. + 0.39 oz. Au/ton
100 ft. south of and parallel to the Hyman vein is another vein that gave some short sections that would grade about \$5 (0.143 oz. Au) per ton. The Hyman and this parallel vein may furnish a considerable amount of new ore because no ore in these veins has been mined above the 6th level.

The East-West vein on the 9th level shows two sections of low to good grade ore west of the winze, and some short sections of low grade ore east of the winze. Underground the East-West vein shows better structure than the original Grace vein. Other new east-west veins may be found underground as shown by the finding of the Hyman vein, which on surface assays well and stretches for several hundred feet east of the shaft.

A careful geological examination and map should be made of the surface near the present Darwin mine workings so that any veins that show promise can be tested on surface and from underground.

T. L. GLEDHILL, M.A. (TECH.), PH.D. (EMERG. UNIV. TEXAS)
CONSULTING MINING GEOLOGIST

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Geology of the Darwin Mine:

The Darwin mine is located in a mass of diorite and diorite porphyry, with minor volumes of lamprophyre and diabase dikes. A few dikes of acid rocks occur near the veins. A post-ore diabase dike crosses the north end of the Grace vein. Ore was found on both sides of this dike. There are two types of lamprophyre dikes, both are post-ore.

The good sections of the veins show shearing parallel to the vein walls and the vein quartz is well crushed. The best type of ore can usually be detected by its better structure and the appearance of the vein quartz. The vein walls do not carry appreciable amounts of gold.

The veins vary in dip from 70 to 20 degrees. The steeper dip is found in the Grace vein.

There is no reason why other veins just as good as the East-West vein may not be found near the present underground workings. Some diamond drilling from surface and underground will be needed to find them.

Only one fault of any consequence, known as the Star shear, occurs underground in the mine. The mine is not particularly wet but bulkheads might be used to seal off water coming in from the upper levels in the Grace vein ^{stopes} that were carried through to surface.

T. L. GLEDHILL (I.A. 1704.), Ph.D. (MINE. IND. TECH.)
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-3-

Recommendations:

From an inspection of the Darwin mine, there is some ore left in the mine above the 8th level in the Grace vein, of a \$5 or \$6 grade over a 3-foot width. The East-West vein, above the 8th level, when more fully explored, will furnish some good ore. The present vein sections shown in the drifts and cross-cuts should be resampled and a plan of the stopes made.

The Darwin mill is too small to make any profit from a \$5 or \$6 grade of ore. Therefore I would recommend that this ore be stoped out and trucked to the Parkhill Mill which can handle 80 tons per day and where it could be mixed with ore of a \$15 grade or higher from the Parkhill mine. The Darwin mill should be left idle while the ore in the Darwin is mined above the 8th level. If milled with the Parkhill ore the Darwin ore could be treated for 60¢ per ton including the trucking. \$1.75 per ton should cover the mining cost. When the ore, now in sight at the Darwin, is mined out, a new attack on the East-West vein could be made by sinking the vertical shaft another three levels and putting out a long haulage cross-cut, say from the 12th level to the East-West vein; or this vein could be developed from the present inclined winze that goes down on the East-West vein from the 8th level. There is at present a good hoist installed in this winze station on the 8th level that could hoist ore from 500 ft. using this inclined winze.

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CONSULTING MINING GEOLOGIST

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Recommendations: Cont'd.

The Darwin Mine is well equipped with plenty of machinery and no new equipment is needed at present. I would recommend an inventory of the present equipment and supplies at once as no list appeared to be at hand.

The only chance of making a success of Darwin is to amalgamate this mine with a larger property like Parkhill that has larger ore bodies and a larger mill. The Darwin property at present is worth about \$25,000. If it is purchased, the purchase price could or should be paid for out of production if possible.

The Parkhill property can be obtained for about \$25,000 and a block of stock, say 100,000 to 200,000 shares. The Parkhill's lowest level, the 14th, has a good grade of ore for a length of 125 feet that averages about 315, the average for the mine. ^{0.428 oz.} From the 9th level to the 200-foot level on the Smith vein there is a potential block of undeveloped ore of 50,000 tons. In order to obtain the ore locked up in the Smith vein, the seven Michipicoten gold claims should be purchased. They are well located and include the Smith or claim No. 391. This can be done for \$4000 cash and 50,000 to 100,000 shares of stock in the amalgamated group i.e. Darwin, Parkhill and Smith.

A surface sampling followed by diamond drilling should be made of several surface showings of veins known to contain gold on the Darwin, Parkhill and Smith properties.

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CONSULTING MINING GEOLOGIST

-10-

Recommendations: Cont'd.

These veins are outside of the veins already known in the mines. Also there should be a carefully prepared surface geological map made, on a scale of 100 feet to the inch, of the different properties. Adjoining the Darwin property on the south, in the southwest corner of claim S.S.M. 3492 a good-looking vein was found to carry 39.60 per ton in gold over a 6-foot width. At least five other surface showings were inspected that showed quartz from 3 to 5 feet in width that merited surface development. In one of these veins coarse gold was noted. It has been demonstrated in the Little Long Lac area by the Rowmont Mining Co. that it pays to truck gold ore to a custom mill. The trucking cost is about 10 cents per ton per mile.

When mining is started a mining engineer should be engaged to take charge who has experience in mining narrow, high grade gold veins.

Conclusions:

The Darwin Mine has not enough ore in sight or potential ore to start the mill without doing about \$50,000 of development work. The Darwin's success at present depends on treating the easily available ore at a custom mill such as the Parkhill Mill.

The Parkhill mill of 80-100 tons of daily capacity is a very efficient cyanide type of mill that gives high recoveries and can be started up on about three days notice.

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CONSULTING MINING GEOLOGIST

-11-

Conclusions: Cont'd.

be de-watered and the ore stoped out above the 9th level to the top of the Smith vein. At the same time ore can be stoped above the 14th level and raised on. I feel that the ore has been missed on the 13th level. The Parkhill and Smith veins appear to be continuous.

There is enough equipment on surface at the Darwin and Parkhill at one-third its original purchase price to offset any payments that would be made under my recommendations for purchase of these properties.

Any payments in cash should be avoided except where debts are secured, in this case \$7000 at Parkhill and \$4000 for the Michipicoten Gold claims^(Smith). At present \$1000 might satisfy the Michipicoten Gold Co. Their payment is necessary as a mortgage of \$3500 against their group is maturing in a month or so.

The ore on the 14th level at Parkhill is as good as any in their best levels. It will take about \$6000 to de-water the Parkhill underground workings. This can be done in about 4 months but the time could be shortened by using larger pumps. The ore in the Smith-Parkhill shoot could also be reached by deepening the Smith shaft which is now down to 250 feet on the incline. The Smith vein to 250 feet has produced about \$75,000 from ore grading $\frac{2142 \text{ oz. Au}}{0.386 \text{ oz. Au/ton}}$ or so which would have been higher if the ore had less dilution. This dilution can be

T. L. GLEDHILL M.A. (TOR.), PH.D. (MARR. INST. TORONTO)

CONSULTING MINING GEOLOGIST

-12-

Conclusions: Cont'd.

avoided by using a better system of mining^{"resuing"} and hand sorting.

There are at least three^{other} high grade gold veins on properties within reach of a custom mill, as that at Parkhill, that could be drawn on to swell the tonnage of such a mill. This ore could be purchased on reasonable terms and there is enough extra equipment around the Darwin and Parkhill plants to equip these outlying properties with a hoist and air compressor for mining underground.

A profit can be made in mining Michipicoten gold ores as shown by the Minto and Jubilee operations. The Parkhill Mill can be raised to 100 tons per day.

In mining the above-mentioned properties in future, the ore should be sorted in the stopes, and instead of raising the waste rock it should be used in back-filling the stopes. The ore is usually quartz-rich and easily identified while the wall rock is dark and is too low-grade to mine. The lack of back-filling and the poor sorting methods at Darwin and Parkhill increased their operating costs and cut down their recoveries.

I am satisfied that there is about 60,000 tons of ore available in the Darwin, Parkhill and Smith mines combined, that can be cheaply mined out without much new development work. Most of the heavy development costs are unnecessary as the present levels are within easy reach of blocks of ore.

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T. L. GLEDHILL M.A. (TOR.), PH.D. (MANN. HESS. TECH.)
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-13-

Conclusions: Cont'd.

There is some ore in the upper five levels of Parkhill that was unmined, as gold at the time of the development of these levels, was at the old price of \$20.57 per ounce.

The 60,000 tons of ore is enough to keep a 100-ton mill operating for two years. There will be no heavy outlay for equipment, as the Darwin hoist can be used at Parkhill and a smaller hoist from Parkhill can be moved to the Darwin. The Newmont Mining Co. has used a custom mill to good advantage for their properties at Little Long Lac.

T. L. Gledhill Ph.D.

Geologist

Nov 15, 1939.

ALBERT HOPKINS
810 DUPLEX AVE.
TORONTO, CANADA
MAR 1977

PARKHILL GOLD MINES 1937 LIMITED

Assay values, ORE ZONES, 14th Level, 14-214

FACE SAMPLING

CAR SAMPLING

LOCATION	INS.	GRADE.	UNCUT DWTS	IN/CUT DWTS	IN TONS ORE	TONS IN ROUND	UNCUT GRADE	UNCUT GRADE	CUT GRADE	CUT VALUE		
33' W.S.W	9	8.00	72.00	72.00	11.2	14.4	5.20	58.24	5.20	58.20		
	10	39.00	394.00	394.00	11.2	12.8	9.20	103.04	9.20	103.00		
	22	16.00	396.00	396.00	14.4	15.2	50.00	720.00	14.20	204.50		
	8	161.20	1289.00	626.00	12.0	12.0	7.20	80.64	7.20	80.64		
	8	11.40	91.20	91.20	10.4	12.0	1.60	16.64	1.60	16.64		
	10	12.40	124.00	124.00	14.4	15.2	34.00	489.60	10.50	151.00		
	8	16.00	128.00	128.00	15.2	15.2	21.60	328.32	17.40	264.20		
39' W.9.W	16	129.60	2073.60	626.00	12.8	12.8	8.00	102.40	8.00	102.40		
28" W.9.W	11	124.60	1354.00	626.00	11.2	12.0	30.40	340.48	11.40	116.50		
3 W.9.W	5	152.80	764.00	626.00	11.2	12.0	12.00	134.00	12.00	134.40		
3 W.9.W	14	14.00	196.00	195.00								
							6891.80	3905.20	13600	1464.00	2973.76	1267.86

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PARKHILL GOLD MINES 1987 LIMITED.

Assay Values, ORE ZONES, 14th LEVEL. 14-214.

LOCATION.	FACE SAMPLING.				CAR SAMPLING.						
	INS:	GRADE.	UNCUT IN/CUT IN	TONS/TONS	IN/UNCUT/UNCUT/CUT	CUT	VALUE				

	D/PS:	D/PS:	ORE.	ROUND.	GRADE	GRADE	GRADE.	VALUE			
33' W.S.W.	9	8.00	72.00	72.00	11.2	14.4	5.20	58.24	5.20	58.2	
	10	39.00	394.00	394.00	11.2	13.8	9.20	103.04	9.20	103.0	
	22	15.00	396.00	396.00	14.4	15.2	50.00	720.00	14.20	204.8	
	8	151.20	1289.00	626.00	12.0	12.0	7.20	80.64	7.20	80.64	
	8	11.40	91.20	91.20	10.4	12.0	1.60	16.64	1.60	16.64	
	10	12.40	124.00	124.00	14.4	15.2	34.00	489.60	10.50	151.0	
	8	15.00	128.00	128.00	15.2	15.2	21.60	326.32	17.40	264.36	
1'9" W.9.W.	16	129.60	2073.60	626.00	12.8	12.8	8.00	102.40	8.00	102.0	
1'8" W.9.W.	11	124.60	1354.00	626.00	11.2	12.0	30.40	340.48	11.40	115.8	
5' W.9.W.	5	152.80	764.00	626.00	11.2	12.0	12.00	134.40	12.00	134.0	
1' W.9.W.	14	14.00	196.00	196.00							

			6891.80	3905.20	135.	1464.		2,973.76		1,267.46	

PARKHILL GOLD MINES 1937 LIMITED

Assay values, ORE ZONES, 14th Level, 14-228

FACE SAMPLING				CAR SAMPLING						
LOCATION	INS.	GRADE.	UNCUT IN/CUT IN	TONS	TONS	IN	UNCUT	UNCUT	CUT	CUT VALUE
		DWTS	DWTS	ORE	ROUND	GRADE	GRADE	GRADE		
8.5W 4W	6	2.80	16.80	16.80	9	19	1.20	10.80	10.80	
4.0 W	8	100.00	800.00	174.24	9	17	52.00	468.00	184.80	
6.8 W	8	23.20	185.60	174.24	12	16	12.00	144.00	144.00	
2.7 W 5W	24	6.40	153.60	153.60	11	18	.80	8.80	8.80	
2 W 5W	14	1.60	22.40	22.40	10	16	22.40	224.00	205.00	
2 W 5W	20	.80	16.00	16.00	12	18	1.20	14.40	14.40	
2 W 5W	20	14.40	288.00	174.24	14	18	18.00	252.00	252.00	
2 W 5W	36	2.00	72.00	72.00	15	19	50.00	750.00	304.00	
2 W 5W	12	.40	4.80	4.80	2	19	26.80	53.60	40.10	

9 x 36
324

4.84 1559.20 808.32 94 160 20.50 1925.60 1163.90

2.49

Cut Grade \$ 10.93
0.312 oz. Au/Ton.

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PARKHILL GOLD MINES 1937 LIMITED.,

Assay Values, ORE ZONES, 14th LEVEL, 14-228

LOCATION.	INS:	PAGE SAMPLING.			CAR SAMPLING.			UNCUT GRADE.	CUT GRADE.	
		GRADE.	UNCUT IN/DFTS:	CUT IN/DFTS:	CARS/TONS IN GRADE.	ROUND.	GRADE.			
3.5 W 4W	6	2.80	16.80	16.80	9	19	1.20	10.80	10.80	
1.0 "	8	100.00	800.00	174.24	9	17	52.00	468.00	194.80	
3.8 "	8	23.20	185.60	174.24	12	16	12.00	144.00	144.00	
1.7 W 5W	24	6.40	153.60	153.60	11	18	.80	8.80	8.80	
5.0 " "	14	1.50	22.40	22.40	10	16	22.40	224.00	205.00	
1. " "	20	.80	16.00	16.00	12	18	1.20	14.40	14.40	
5. " "	20	14.40	288.00	174.24	14	18	18.00	252.00	252.00	
3. " "	36	2.00	72.00	72.00	15	19	50.00	750.00	504.00	
1. " "	12	.40	4.80	4.80	2	19	26.80	53.60	40.10	
<u>9 x 56</u>										
	<u>334</u>	4.34	1559.20	803.32	2.49	94	150	20.50	1925.60	1163.90
								Cut Grade \$10.93		
								9.312 oz. Au/ton.		

PARKHILL GOLD MINES 1937 LIMITED

Assay values, ORE ZONES, 14th Level, 14-246

FACE SAMPLING				CARS		CAR SAMPLING				
LOCATION	INS.	GRADE.	UNCUT IN/CUT IN DWTs	UNCUT IN/CUT IN DWTs	TONS TONS ORE	IN ROUND	UNCUT GRADE	CUT GRADE	CUT GRADE	VALUE
27' W/X-C	7	7.60	532.00	53.26	10	18	3.20	32.00	32.00	
	12	8.50	102.00	102.00	14	18	42.00	588.00	308.00	
	12	70.60	848.00	258.00	19	21	3.60	68.50	68.50	
	12	39.20	470.00	258.00	16	19	23.50	376.00	352.00	
	12	8.20	98.40	98.40	13	17	44.00	572.00	286.00	
	24	1.70	40.80	40.80	11	19	4.40	48.40	48.40	
	14	7.40	103.60	103.60	7	18	23.20	162.00	154.00	
	14	9.80	137.00	137.00	5	14	12.80	64.00	64.00	
	16	29.20	467.00	258.00	9	18	42.00	378.00	198.00	
<u>36 X 9</u>		7.15	2320.00	1309.00	104	162	22.00	2288.90	1570.90	
<u>324</u>				4.03						
										Average cut grade \$ 14.52 = 0.415 oz. Au/Ton

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PARRILL GOLD MINES 1937 LIMITED.

Assay Values, ORE ZONES, 14th LEVEL. 14-246

LOCATION.	FACE SAMPLING.				CAR SAMPLING.				
	INS.	GRADE.	UNCUT DPTS:	IN/CUT DPTS:	CARS/ ORE	TONS ROUND.	IN/ GRADE.	UNCUT GRADE.	CUP GRADE.
77' W/X.C.	7	7.60	53.20	53.20	10	18	5.20	32.00	32.00
	12	8.50	102.00	102.00	14	18	42.00	588.00	308.00
	12	70.60	848.00	258.00	19	21	3.60	68.50	68.50
	12	39.20	470.00	258.00	16	19	23.50	376.00	352.00
	12	8.20	98.40	98.40	13	17	44.00	572.00	286.00
	24	1.70	40.80	40.80	11	19	4.40	48.40	48.40
	14	7.40	103.60	103.60	7	18	23.20	152.00	154.00
	14	9.80	137.00	137.00	5	14	12.80	64.00	64.00
	16	29.20	457.00	258.00	9	18	42.00	378.00	198.00

$\frac{36 \times 9}{324}$

7.15 2320.00 1309.00 4.03 104 162 22.00 2288.90 1510.90

Average cut grade, \$14.52 =

0.415 oz. Au/Ton

PARKHILL GOLD MINES 1937 LIMITED

SUMMARY OF PRODUCTION BY LEVELS

June 1931 to December 1937 Incl.

LEVEL	Ore from development	Ore from raises and stopes	Total tons ore hoisted	Grade	Value at \$20.67 Gold
1	—	4,808.84	4,808.84	9.04	43,448.90
2	—	7,000.32	7,000.32	7.90	55,280.10
3	9.36	8,515.08	8,524.44	11.97	102,109.03
4	3.60	7,472.72	7,476.32	13.28	99,272.75
5	742.32	7,379.28	8,121.60	19.82	161,043.49
6	181.36	6,893.72	7,066.28	13.48	109,368.33
7	853.20	10,095.04	10,948.24	9.06	99,236.86
8	1,090.08	14,226.64	15,316.72	5.81	89,135.59
9	320.80	14,519.80	14,840.60	9.78	145,147.09
10	608.40	11,943.92	12,552.52	8.87	111,330.13
11	156.80	12,528.20	12,685.00	7.45	94,507.05
12	279.20	7,578.40	7,857.60	7.33	57,644.91
13	282.40	2,685.60	2,978.00	2.04	6,091.75
14	536.00	3,406.40	3,942.40	3.34	13,159.24
TOTALS	5,063.52	119,044.13	124,107.68	(9.56)	\$1,186,777.20

0.4780Z-Am

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PARKHILL GOLD MINES 1937 LIMITED.

SUMMARY OF PRODUCTION BY LEVELS.

June 1931 to December 1937 inclusive.

LEVELS.	ORE FROM DEVELOPMENT.	ORE FROM RAISES AND SLOPES	TOTAL TONS ORE HOISTED.	GRADE	VALUE AT \$20.67 GOLD.
1	-	4,808.84	4,808.84	9.04	43,448.90
2	-	7,000.52	7,000.52	7.90	55,280.10
3	9.55	8,515.08	8,524.44	11.97	102,109.05
4	5.50	7,472.72	7,478.22	13.28	99,272.70
5	742.52	7,579.28	8,321.60	19.82	161,045.49
6	181.50	6,885.92	7,067.20	15.40	109,588.53
7	855.20	10,095.04	10,950.24	9.00	99,255.85
8	1,090.00	14,225.64	15,315.72	5.81	89,135.59
9	520.80	14,519.80	14,540.60	9.78	143,147.09
10	608.40	11,945.92	12,554.32	8.87	111,350.13
11	156.80	12,528.20	12,685.00	7.45	94,507.05
12	279.20	7,578.40	7,857.60	7.55	57,544.91
13	282.40	2,639.60	2,922.00	2.04	6,091.75
14	555.00	3,405.40	3,960.40	5.54	15,159.24
TOTALS:	8,055.52	119,044.15	127,099.67	9.50 0.47827 Au.	\$1,126,777.20

DARWIN OPERATIONS - MONTHLY BASIS

1937
COSTS AND PROFITS

Surface (Hoistman, Dockman)	\$ 9.45	\$ 9.45
Underground :		
3 Machinemen	\$15.60	
2 Muckers	\$ 8.50	
1 Cage tender and Pumpman	<u>\$ 4.25</u>	<u>\$28.35</u>
Total wages per day		\$37.80
		<u>X 30</u>
Total labour per month		\$1134.00

Supplies

Power	\$550.00	
Explosives	\$350.00	
Assays and Supplies	\$ 90.00	
900 tons ore milled @.60 per ton	\$540.00	
Trucking ore and supplies	<u>\$300.00</u>	<u>\$1830.00</u>
Total per month		\$2964.00
Add 10% for contingencies		<u>\$ 296.00</u>
		\$3260.00
30 tons per day of \$8.00 per ton recovery		240.00 per day
30 days per month Gross Recovery		7200.00
Net Profit \$7200.00-\$3260.00		3940.00
Less 10% Leasing fee		<u>394.00</u>
Net to Parkhill per month from Darwin operation		<u>\$3546.00</u>

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TO FOLLOW**

T. L. GLEDHILL, M.A., (TOR.) PH.D. (MASS. INST. TECH.)
 CONSULTING MINING GEOLOGIST

DARWIN OPERATION--MONTHLY BASIS

1937

COSTS AND PROFITS.

Surface (Hoistman, Beckman).....	\$ 9.45	9.45
Underground		
3 Machinemen.....	15.60	
2 Muckers.....	8.50	
1 Cage Tender and Pumpman.....	<u>4.25</u>	<u>\$28.35</u>
Total Wages per day		\$37.80
		<u>X 30</u>
Total Labor per month		\$1134.00

Supplies

Power.....	\$550.00	
Explosives.....	350.00	
Assays and Supplies.....	90.00	
900 tons ore milled @ .60 per ton.....	540.00	
Trucking ore and Supplies.....	<u>300.00</u>	<u>\$1830.00</u>
Total per month		\$2964.00
Add 10% for contingencies		<u>296.40</u>
		\$3260.40
30 Tons per day of \$8.00 per ton recovery.....		240.00 per day
30 days per month Gross Recovery.....		7200.00
Net Profit \$7200.00-\$3260.00.....		3940.00
Less 10% leasing fee.....		<u>394.00</u>
Net to Parkhill per month from Darwin operation..		\$3546.00

T.L.G. 11.12.37

1939

ORE ESTIMATES DARWIN MINES

From unmined sections of veins

A. Blocks of ore remaining in Grace vein between the second and fifth levels	16,968 tons
This ore grades \$22.06=0.316 oz.Au/ton	
B. Blocks of ore available in East-West vein above ninth level	5,000 tons
Probable ore grade \$20.00=0.286 oz.Au/ton	
C. Blocks of ore in Grace vein between fifth and eighth levels	5,000 tons
Grade about \$6.00=0.171 oz.Au/ton	
	<hr/>
	26,968 tons

Mining and milling costs on this developed ore \$3.70 per ton.

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TO FOLLOW**

MAPS
REPORTS
EXAMINATIONS
SUPERVISION

T. L. GLEDHILL, M.A., (TOR.) PH.D., (MASS. INST. TECH.)
CONSULTING MINING GEOLOGIST

1939

ORE ESTIMATE DARWIN MINE

From unmined sections of veins.

- A. Blocks of ore remaining in Grace vein between
the second and fifth levels..... 16,968 tons
This ore grades \$11.06 = 0.316 oz. Au/ton.
- B. Blocks of ore available in East-West vein
above ninth level..... 5,000 tons
Probable grade \$10.00 = 0.286 oz. Au/ton.
- C. Blocks of ore in Grace vein between fifth
and eighth levels..... 5,000 tons
Grade about \$6.00 = 0.171 oz. Au/ton.
-
- 26,968 tons.

Mining and Milling costs on this developed ore \$3.70 per ton.

SSM-942 -

ALBERT HOPKINS
810 DUPLEX AVE.
TORONTO, CANADA
M4R 1W7

113

4.00/0.4
6.00/0.9
10.30/1.1
3.40/0.4
2.40/0.4
0.40/1.5
10.20/2.5

4.00/0.0
5.40/0.5
1.40/0.2
23.00/3.7
6.70/0.0
7.40/0.0
16.00/0.0
11.50/0.0
6.30/0.0
7.00/0.0
5.40/0.0
4.00/0.0

3.50/0.6
4.00/2.2
6.70/2.0

0.10/0.0
10.00/0.0
10.00/0.0
10.00/0.0
10.00/0.0
16.20/0.0
5.00/0.0
0.10/0.0
3.40/0.0
5.00/0.0
0.00/0.0

5.20/0.1
4.30/1.0
5.00/1.0
4.20/0.0
20.70
7.00/1.0
5.70/0.0
3.40/1.0
7.30/1.6

2.70/1.0
0.00/1.2
0.00/1.2
4.14/2.2
3.40/0.1
6.00/4.2
6.70/5.3
3.40/4.2
1.30/4.0
6.10/3.2
13.40/3.2

10.10/3.5
16.50/2.6
5.10/1.0
3.35/2.2
7.70/4.4
3.40/3.8
7.70/3.7
1.34/3.1
2.00/3.5
7.70/4.5
10.10/3.5
1.34/3.8
6.10/4.4

423 RAISE

4.70/0.0
4.40/0.4
1.00/0.0
10.20/1.0
10.00/0.0
10.00/0.0
4.70/0.0
50.00/4.2

323 RAISE

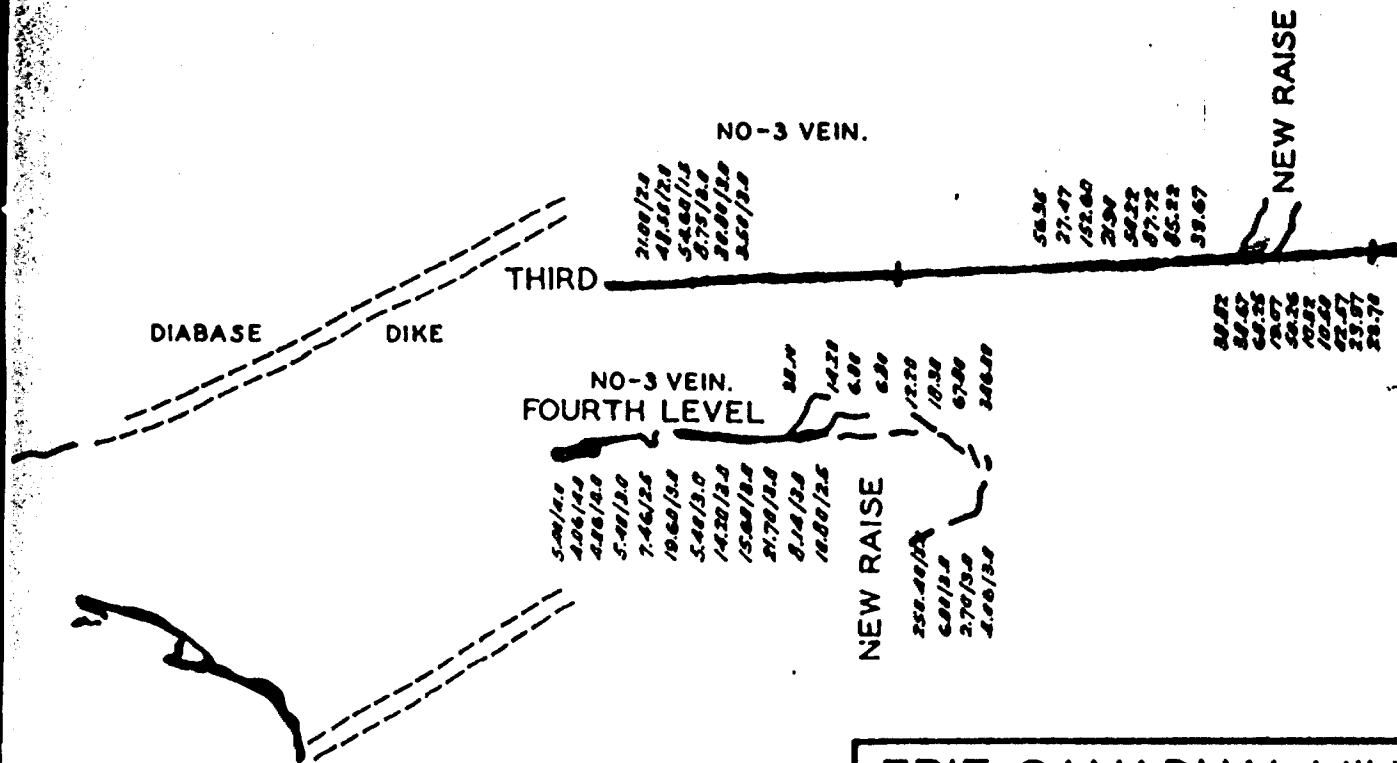
12.40/3.5
5.10/1.0
21.10/3.0
2.10/2.0

SECOND

FIFTH

3/3

85M-943-



1" = 35'

NOT TO BE REMOVED FROM
THE OFFICE OF THE DISTRICT
GEOLOGIST, ONT. DEPT. OF MINES
SAULT STE. MARIE, ONT.

ERIE CANADIAN MINES

DRAWING
LOCATION

SCALE
DRAWN BY
AFTER
REF. NO-50

ASSAY PLAN.
DARWIN GOLD M. LTD.
MICHIPCOTEN AREA
1" - 35'.
K.O.M.
DARWIN G.M. DWG.
DATE - MAR. 9-38.

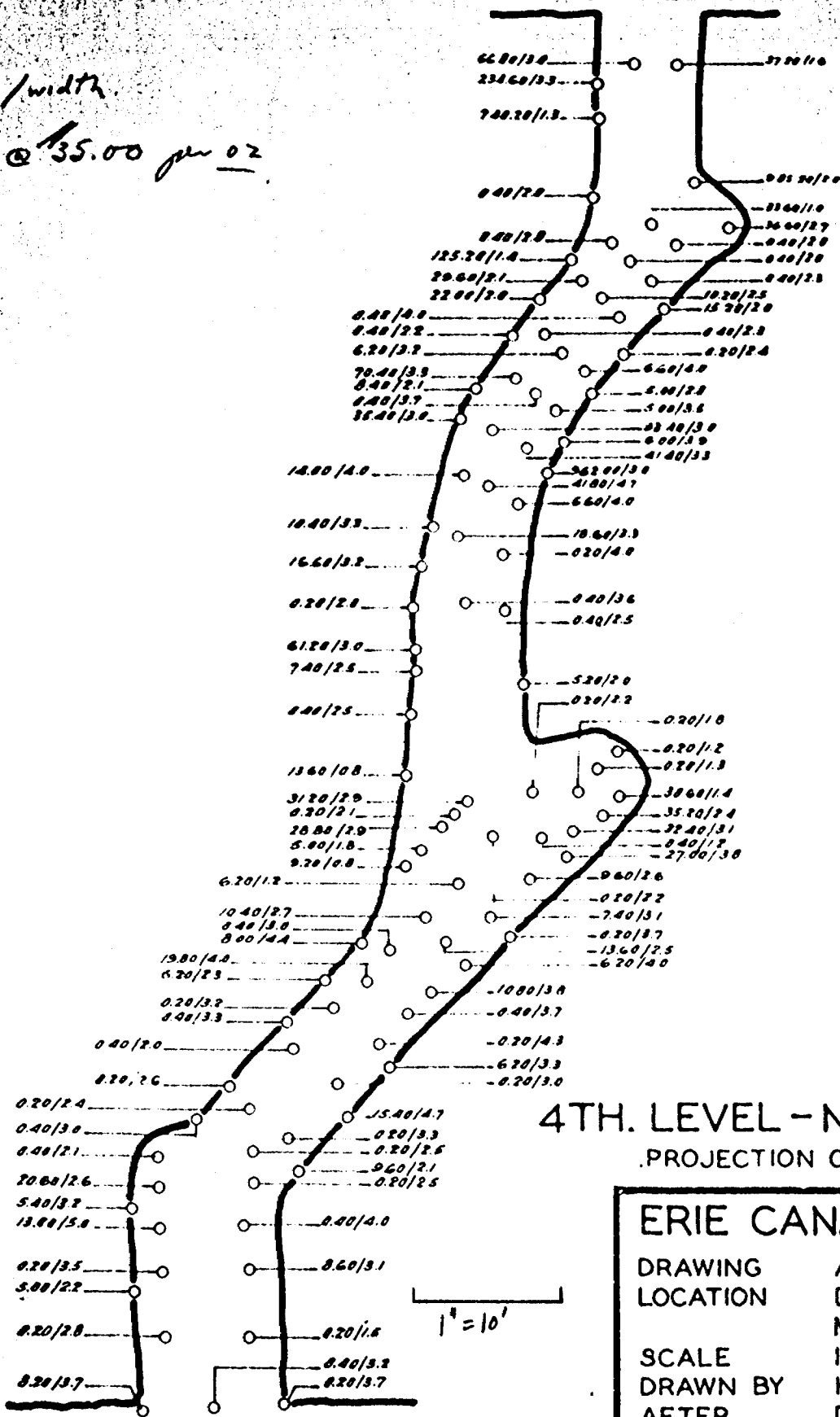
VED

1962

GEOLOGIST
MARIE

1/width
 Au @ 135.00 per oz

3RD. LEVEL



4TH LEVEL

1" = 10'

RECEIVED

1962

RESIDENT GEOLOGIST
 SAULT STE. MARIE

NOT TO BE REMOVED FROM
 THE OFFICE OF THE RESIDENT
 GEOLOGIST, ONT. DEPT. OF MINES
 SAULT STE. MARIE, ONT.

4TH. LEVEL - N. RAISE - 403-A.
 PROJECTION ON PLANE OF VEIN.

ERIE CANADIAN MINES

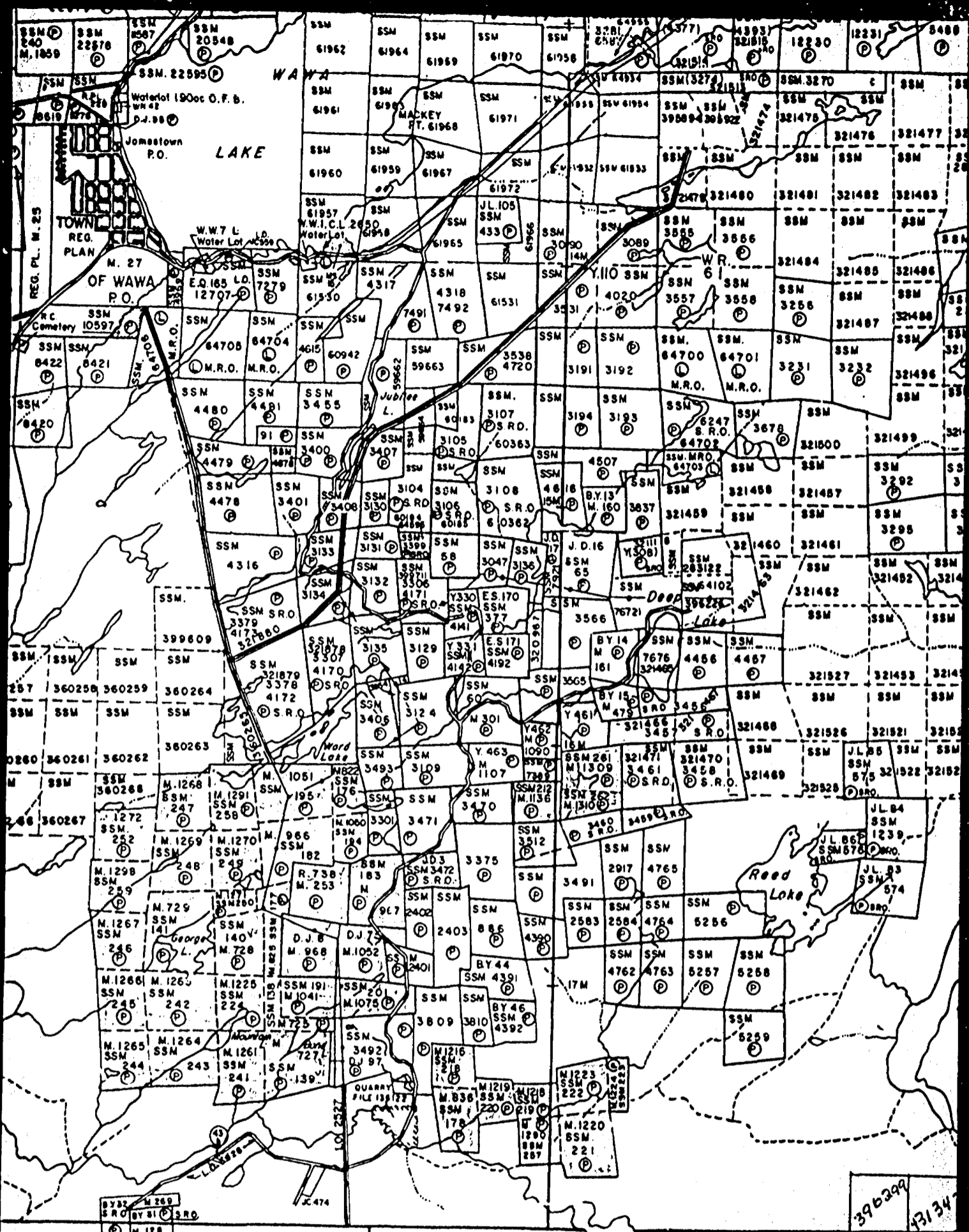
DRAWING LOCATION

ASSAY PLAN.
 DARWIN GOLD M. LTD.
 MICHIPICOTEN AREA.

SCALE
 DRAWN BY
 AFTER
 REF. NO.
 DATE

1" = 10'
 K.O.M.
 DWG. BY R. CAYLOR.
 50
 MAR. 7-38.

S SM - 943



ABAZO Tp.
(M. 1556)

Mc Murray Tp.

NAVEAU TR.
(M. 1546)

Scale: 1" = 1/2 mile.

Note: SSM-943

Darwin Gold Mines Ltd.

Oct. 13, 1977

New Darwin Gold Mines Ltd. - from
Darwin G. M. L., former Grace Mine.

McCurray Twp.

Main workings on claim D. J. 7, approx.

40 claims in property.

Taxes on D. J. 7 & 39 other claims in this
township now being paid by:

A. A. Weiss

Apt. 2502

30 Hillsboro Ave.

Toronto MSR 157.

Account A. 35.

SSM-943

Included in this account (A. 35) are the following claims:

S.S.M. 138, 139, 140, 141

176, 177, 178, 182, 183, 191, 194, 195

201, 212, 218, 219, 220, 221, 222, 223,

224, 241, 242, 243, 244, 245, 246,

247, 249, 249, 250, 252, 257, 258,

259, 261, 262.

D. J. 7, D. J. 8, R. 738

These claims are plotted on attached sheets

PLS.

SSM-040

D.H.M.

A Review of Published Data on

The Darwin (Grace) Gold Mine

by

Hopkins Mining Consultants Ltd.

Grace Mine (1)

The ore-body is a quartz vein, varying in width from a few inches to 5 feet, and averaging $2\frac{1}{2}$ feet, that strikes about 165° and dips 70° E. It can be traced for about 200 ft. along the surface, and is said to have been located at intervals across several of the claims. It consists mainly of a gangue of white, rather sugary quartz with some calcite and siderite, carrying small quantities of pyrite, chalcopyrite, arsenopyrite, pyrrhotite, and free gold. At the surface gold is said to have been plentiful, and according to superintendent Nissen in 1901, an average gold value of \$12 (at \$20 gold) a ton was being found in the mine. The vein had tight, definite walls against a country-rock of dark green porphyrite carrying small oblong crystals of feldspar. Mine is on mining claim DJ.7.

Mining operations were commenced in July 1900 by the owners, the Algoma Commercial Co., and were continued until about the end of 1903. When examined on 12 Aug. 1903, a main shaft $4\frac{1}{2}$ by 9 ft. inside measurements with 2 compartments, on for ore and the other a manway, had been sunk along the vein at an inclination changing from 67° E. at the surface to 80° near the bottom, to a depth of 304 ft. Drifts had been run at the 100, 200, and 300-ft. levels. Output of gold commenced during the last quarter of 1902.

From the end of 1903 until the autumn of 1907 the mine was idle. Then it was purchased from the Algoma Commercial Co. by the LePage Gold Mining Co., which also secured the Manxman or Norwalk mine in 1910. A hydro-electric plant had been constructed by the Algoma Power Co. at High falls on the Michipicoten river in 1907, and the new owners of the mine set about obtaining a supply of electric power and converting their steam-driven mine plant to operation by electricity.

Under the management of the LePage Gold Mining Co. the Grace mine was operated during 1908 and produced some gold. The Manxman mine was also operated. The Grace mine was idle during 1909, but some gold was produced in 1910. In the latter part of 1917 it was pumped out and sampled for a Pittsburgh syndicate, and in 1919 had become the property of the Grace Mining Co., pres. W.A. Burmeister of Chicago. Early in 1922 the A-Gold-Ma Mining Synd. was formed by H.H. Lang of Toronto to take over the property,

Manxman or Norwalk Mine (1)

This property is situated about 2 miles south of the Grace mine, in twp. 29, range 22. At the main shaft, on claim no. 1229, there is a schistose zone about 15 ft. wide which strikes N. and S. across a formation of dioritic rock. The schist, which dips 75° W., carries bands and lenses of quartz. Both schist and quartz contain pyrite and pyrrhotite, thickly disseminated and in compact lenses. This material is said to contain gold and silver values, as well as traces of nickel, and from trace to over 1% cobalt. Half a mile north of the main shaft a body of quartz porphyry, said to carry some gold over a width of 30 ft. and also to contain a narrow richer streak, was quarried.

Operations were begun in July 1901 by the Manxman Gold Mining Co., and were continued until early in 1903. The mine was then idle until 1908 when it was acquired by the Norwalk Mining Co., under whose management it was worked during most of 1909. In 1910 it was transferred to the LePage Gold Mining Co. and some work was done during that year. It was secured in 1919 by the Grace Mining Co., and underground work was begun in Jan. 1920, but continued only until 6 May.

When work finally ceased a shaft had been sunk for 254 ft., 240 ft. at about 45° W. and the remaining 14 ft. at 75° . At 110 ft. drifts extended for about 100 ft. in all, and at 200 ft. a second level consisted of 120 ft. of drifts. Some stoping had been done on the second level, and on the first level the ore had been stoped to a height of 30 ft. The quarry on claim 641 was 120 ft. long, and a crosscut had been made for 20 ft.

The mill, situated on Mabe lake, 1300 ft. S. of the quarry, and connected with it by a tramway, was powered by a 50 h.p. electric motor., power coming from High falls.

The Grace and Manxman mines were apparently the only ones in the Wuwa area which received active attention in these early years, but during the first period of activity between 1897 and 1903 numerous other discoveries were made and developed, but finally abandoned. An inclined shaft 8 ft. by 12 ft. and 208 ft. deep was sunk on claims JD.1, 2, 3, and 4, known as the Mariposa property, and situated just northeast of the Grace mine. Various other still smaller enterprises are described by Inspector Boyd in the annual reports of the Ont. Bureau of Mines between 1897 and 1903.

Grace Mine (2)

~~THESE SECTIONS ARE IN THE MICHIPICOTEN GOLD CAMP~~ This most important mine of the area, produced during 1902, 1903, 1907, 1908, and 1910 gold bullion valued at \$71,124. On the first level at a depth of 100 ft. the ore has been stoped out for 150 ft. along the vein to the surface. In the north drift on this level, 90 ft. from the shaft a winze has been put through to the second-level stope. At the second level 200 ft. in depth, the drifts north and south are 100 ft. and 180 ft. in length. The north stope has been carried through to the first level, while south of the shaft stoping is being done. On the third level at a depth of 300 ft. drifts have run north and south 80 and 50 ft. respectively. No stoping had been done on this level.

Grace Mine (3)

The Grace vein, lying near the centre of the Michipicoten gold camp, was the chief gold producer in the camp's early days, and had been mined to a depth of 300 ft. It consisted of a group of 42 claims covering 886 acres, to which had been added the Star property. The outline of the group is nearly square.

The ore was reduced by stamps and then run over amalgamation plates. This method was wasteful, as 60 to 80 percent only of the gold was recovered. As a result, a quantity of fairly rich tailings remained from the earliest milling. The arsenic in the ore necessitated flotation methods in order to make an efficient gold recovery.

The principal rock bordering the vein is a porphyrite or diorite porphyry, which forms the larger part of the ridge near the mill and shaft. This rock has been jointed and crushed, and hydrothermally altered near the vein. The jointing is indicated by the pattern on the differential weathered surface, which is light-coloured, the feldspar phenocrysts standing out in relief.

To the north greenstone schist is more prominent and occupies a large sheared zone on the first large NE-SW displacement north of the shaft. To the west intrusions of quartz diorite are common. A large sheared zone in the Keewatin rocks lies along the W. boundary of DJ.8 and strikes a little E. of N. Diabase appears in several places as N-S dykes and crosses the N. end of the Grace vein in a NE. direction. A dyke of coarse pink granite was seen N. of the large greenstone shear zone and E. of the N. part of the vein. A high granodiorite ridge outcrops at the N. end of the main vein.

The quartz veins on this group of claims are in 2 sets, one striking a little W. of N. and the other NE. The veins of this latter set appear to be less mineralized. They carry small amounts only of sulphides, are glassy in appearance, and have a gangue of ankerite and tourmaline. In a few places, for example several hundred ft. N. of the main Grace vein, these barren veins cut the shear structure on the strike of the main vein. One of these poorer types of veins is located in a sheared area of greenstone beside the road near the NE. corner of claim DJ.11.

The productive vein ranges in width from a few inches to 5 ft. and averages 2½ ft. The strike is about 345° and the dip 70°E. The vein can be traced along the surface for about 200 ft., and the faulted and sheared structure on the strike of the vein for several hundred feet further, especially to the N. The northward continuation has been cross-faulted and does not contain large or continuous quartz veins, but consists of schist with biotite alteration and impregnations of arsenopyrite. The large continuous quartz vein with proven commercial qualities appears to terminate at its N. end at a cross-dyke of lamprophyre.

In the vein the quartz has been intensely crushed, and sheared porphyrite has been included in it. The vein has definite walls with little gouge. The wallrock material in the vein is chiefly sericite and has been replaced by pyrite, pyrrhotite, arsenopyrite, chalcopyrite, and native gold. At the surface the vein is said to have contained some spectacular specimens of native gold.

The lamprophyre dykes that cut the Grace mine could not be studied underground, as the mine was then flooded. It is reported that the ore was richer against these dykes.

Several small veins have been found on the Grace group, but they are most abundant near the main discovery. A few veins were discovered on the shores of a small lake at the N. end of claim DJ.63. A vein striking N.-S. and carrying gold with arsenopyrite is located at the N. end of Mountain lake, at the S. central part of claim DJ.66. A small vein outcrops near the NE. corner of claim DJ.12.

In prospecting, it is well to keep in mind the location of ridges of quartz porphyry. Such a ridge is found several chains S. of the S. side of Bond lake on the power-line. Another ridge is on the power-line on the W.-central part of claim DJ.16. These quartz porphyry ridges are shown on the accompanying map.

The ore-shoot at the Grace mine is at present about 200 ft. long at the surface and pitches at a steep angle towards the S. It is difficult to say much about the distribution of valuable ore on account of the lack of first-hand information in a water-filled mine. An old assay chart shows that the valuable ore is unequally distributed and ranges from very high to low. This is probably due to the structural differences, and the pinching and swelling in the vein.

(4) Power & Mines Corp. Ltd. was incorporated in 1927 to develop the Grace mine under E.D. Brewer of Montreal, manager, and W.E. Simpson of Swastika as consulting engineer. The shaft was deepened from 300 to 400 ft. depth, and 200 ft. of lateral work was done on the 400-ft. level. 32 men were employed.

(5) In 1928 under J.A. Koussao of Hawk Junction, manager, development consisted of:-

2-comp. 60° shaft	443 feet
400-ft. level lateral work	980
300-ft. level lateral work	540
200 ft. level lateral work	5
400 ft. level raises	65
300 ft. level raises	35

Total 2068 feet.

(6) The property, including the "Star", consisted of 43 mining claims (1240 acres) of which DJ.7 and DJ.8 contained the mine workings, in Twp. 29, range 23. The two major "breaks" are the Nyman and the Grace. All underground work to date was on the Grace. At Feb. 1929 development work totalled 3851 ft.

(7) In 1929 a 50-ton pilot test mill was built, using amalgamation and flotation. This replaced the old California stamp battery which worked on the Grace ore in 1930.

(8) In 1930 the Grace mine reported gold production of only \$588.00 and closed down. The Power and Mines Corp. appeared to be always short of working capital, and had to close down every year for lack of funds.

(9) In 1934 Darwin Gold Mines Ltd. was formed, with Reg. E. Hore and Robt. Fennell among the directors, to take over the property of United Algoma Mines Ltd. which included the old Grace mine. This new company performed an additional 353 ft. of development work besides repairs and rehabilitation, bringing development in 1934 up to about 4200 ft. An electric hoist and compressor were installed, power coming from the High falls plant of the Great Lakes Power Co. Mr. M.H. Bronberg was in charge, with 16 employees.

(10) Near intersections with E-W veins, the Grace vein, which strikes 340°, is generally folded and slightly displaced. It is also significant that the E-W veins of the Darwin mine carry practically no arsenopyrite, whereas this mineral constitutes the chief sulphide of the Grace vein. Remarkable drag folds with overthrusts along the vein structure amounting to several scores of feet were observed in the underground workings of both the Darwin and Parkhill mines. Such folds are termed "rolls" by the miner, and generally pitch at flat angles, to the right of an observer looking down the dip of the sheared structure. This rule appears to hold true with all the gold veins, irrespective of their strike. A reverse fault causing a vertical displacement of nearly 100 ft. coincides with a wide quartz diabase dyke encountered in the underground workings of the Darwin mine.

(12) Owing to financial difficulties the operations of the Power and Mines Corp. came to a standstill in March 1930, and later during the same year the entire property, including all titles, reverted to the owners, United Algoma Mines Ltd. In 1934 the Grace mine was taken over by Darwin Gold Mines Ltd., which new company extended the old inclined shaft to 500 ft. and sank a new vertical shaft to a depth of 830 ft., adding 3 new levels at vertical depths of 600, 700, and 800 ft.

The rocks in the vicinity of the Darwin mine are made up of a series of old volcanics which are intruded by small masses of porphyries, diorite, and granodiorite. Prominent in the volcanic group is a band of agglomerate, striking roughly 30° , of which outcrops can be seen on the main road near the Darwin cook camp. The agglomerate dips about 35° NW between the surface and the 3rd level and steepens considerably between the 3rd and 4th levels. Outcropping near the 2 shafts is a diorite porphyry, which is locally referred to as the "Grace" porphyrite. It forms a rather irregular mass, pitching at a moderate angle toward the north. Although it is distinctly intrusive into the Keewating volcanics, it is of interest that in a number of places the agglomerate contains fragments of a porphyry that closely resembles the "Grace porphyrite". Both the diorite porphyry and an intrusion of fine-grained diorite, which occurs immediately S. of the Grace camp, are cut by dykes of older diabase. The latter, in turn, are intruded by small masses of granodiorite a short distance W. of the old inclined shaft.

The Darwin veins traverse all rocks except dykes of late quartz diabase and lamprophyre. They are also cut by red felspar-carbonate veins. A late diabase dyke over 60 ft. wide displaces the Grace vein in the northern part of the mine. Striking 40° and dipping at a steep angle to the SE, this diabase intrusion coincides with a reverse fault causing a vertical displacement of nearly 100 ft.

There are two veins at the Darwin, the Grace vein, which has a gen. strike of 330° and a dip of 70° NE, and an E-W vein dipping 40° S. Like the veins of the Parkhill mine, the Darwin veins occur along definite shear zones and consist of a succession of lenticular quartz bodies, most of which are less than 100 ft. long, their width varying from a few inches to more than 5 ft. The vein quartz is of a granular type and is accompanied by subordinate quantities of carbonates and tourmaline. In contrast to the Grace vein, which is mineralized chiefly with arsenopyrite and minor amounts of pyrrhotite, pyrite, and chalcopyrite, the E-W vein is practically free of arsenopyrite; pyrrhotite and pyrite are the prevailing sulphides. As a rule, native gold is visible in ore containing more than half an ounce of gold per ton. Spectacular coarse gold has been found repeatedly in the Grace vein.

Underground operations have located 3 ore zones along the Grace vein and two ore shoots on the E-W vein. The only ore zone extending to the surface was the original discovery of the Grace vein, on which the old inclined shaft was sunk. The quartz bodies of the E-W vein apex a short distance above the 6th level, and above this horizon the vein is represented by a barren shear zone devoid of any quartz or mineralization. The ore shoots of the Grace vein have a rake of about 60° S. The ratio of horizontal to vertical extent of the ore bodies of the Grace vein was found to be approximately 1 to 3, the horizontal length being about 100 ft. Below the 500-foot horizon, gold values in the Grace vein showed a general decline below the economic limit, altho the vein, as such, continues structurally unaltered.

As a rule, junctions of parallel branches of the gold-bearing shear zones are favourable locations for ore concentrations, whereas inter sections are without any noticeable enrichment.

(13) During 1935 the Darwin reports production of \$17,750.

(14) The inclined shaft was deepened to 543 feet in 1934 and also a new vertical 3-comp. shaft sunk to 418 ft. by that year end. In 1935 another 882 ft. of development work was performed, bringing the total up to about 5080 ft. The 50-ton amalgamation-flotation mill was converted to a 42-ton amalgamation-cyanidation mill in 1935. A steel headframe was erected for the new shaft, and more durable buildings built. Employment was now 61 (30 underground).

(15) In 1936 production was \$231,401.

(16) The 3-comp. shaft was completed at 827 ft. in 1937.

(17) In 1937 the Darwin produced \$214,707. During the year a 2-comp. 4-comp. winze was sunk 180 ft. on the incline from the 800-ft. to the 900-ft. level. Development work now totalled:-

Drifting	10,426 feet
Cross-cutting	2,722
Raising	4,017
Shafts & winzes	1,550
Total	18,715 feet.

During 1937 14,604 tons of ore were hoisted and 14,720 tons treated in the 42-ton mill. An average of 72 men were employed. In Dec. 1937 the company went into bankruptcy and its assets were acquired by Baroda Co.

Mines Ltd. in February 1938.

(19) Total production was as follows:- (up to and including 1937)

	tons	\$
x Prior to 1910	10,297	69,923
1911	60	2,020
1923-1925		194
1930	750	588
1935-1937	34,421	463,858
Total	45,528	536,583

giving an average recovery of \$11.75 per ton of ore.

x means operated by the Algoma Commercial Co. in 1902 and 1903, and by the Le Page Gold Mining Co. from 1907 to 1910.

(21) In 1944 the old Darwin mill was cleaned up and \$481 recovered.

(22) Final total production was as follows:-

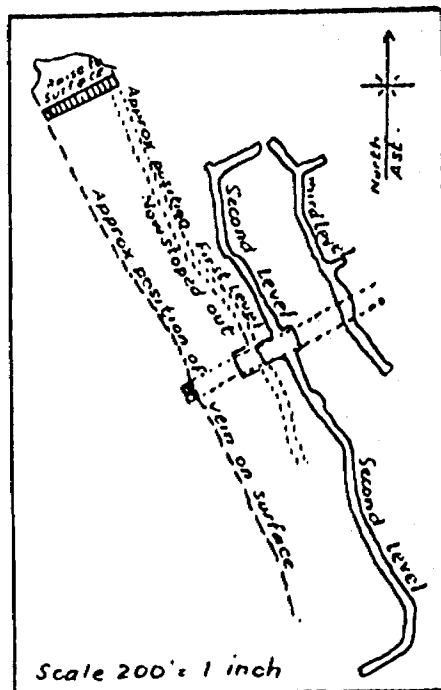
	tons	\$
Prior to 1910	10,297	69,923
during 1911	60	2,020
1923-25		194
1930	750	588
1935-37	34,421	463,858
1940		7,614
1943		2,165
1944 (cleanup)		481
Total	45,528	546,852

giving a final average recovery of \$12 per ton of ore.

(23) In 1951 the Darwin is still reported to have a 50-ton mill on the property.

References:-

- (1) "Michipicoten Iron Ranges" by Collins, Quirke, and Ellis Thomson in Memoir 147, G.S.C., 1926.
- (2) "Ont. Gold Deposits" by P.E. Hopkins, 1921, from Ont. Dept. of Mines (ODM) Annual Report No. 30, part 2, page 19.
- (3) "Michipicoten Gold Area" by T.L. Gledhill, 1927, O.D.M. Report 36, part 2, pp. 30-34.
- (4) O.D.M. Report 36, part 1, p.131.
- (5) O.D.M. Report 37, Part 1, p. 139.
- (6) O.D.M. Report 38, part 1, p. 141.
- (7) O.D.M. Report 39, part 1, p. 121.
- (8) O.D.M. Report 40, part 1, p. 7.
- (9) O.D.M. Report 44, part 1, p. 45.
- (10) O.D.M. Report 44, part 1, p. 87.
- (11) O.D.M. report 44, part 8, pp. 49-50.
- (12) O.D.M. report 44, part 8, pp. 81-83.
- (13) C.D.M. report 45, part 1, p. 10.
- (14) O.D.M. report 45, part 1, p. 98.
- (15) O.D.M. report 46, part 1, p. 14.
- (16) O.D.M. report 46, part 1, p. 122.



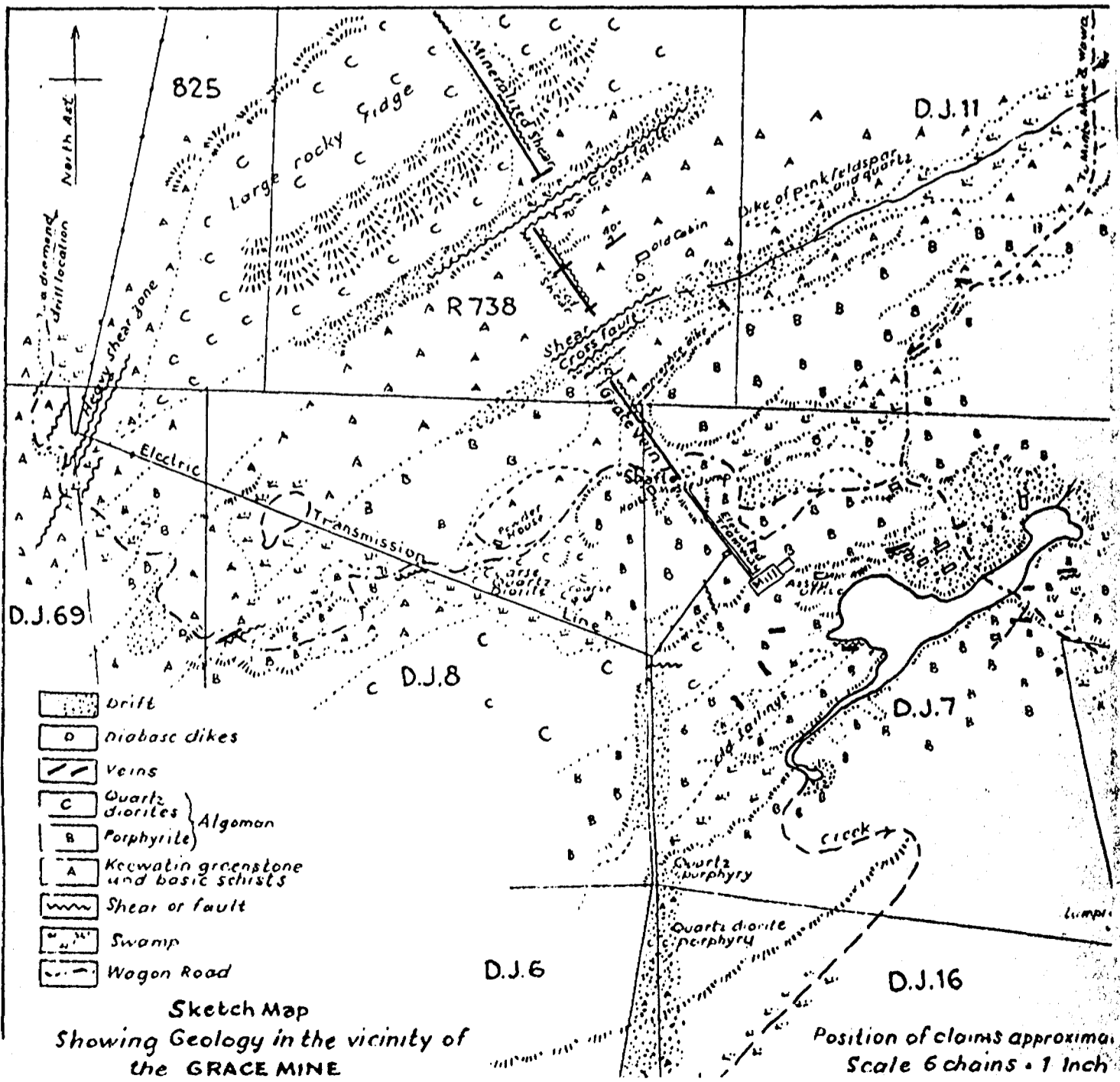
Plan showing Workings
GRACE MINE

(continued on page 6)

- (17) O.D.M. report 47, part 1, p. 10.
- (18) O.D.M. report 47, part 1, pp. 110-111.
- (19) O.D.M. report 49, part 1, p. 18.
- (20) O.D.M. report 49, part 1, page 26.
- (21) Ont. Dept. Mines report no. 54, part 1, page 10.

The above compilation was prepared by

Albert Hopkins
 Albert Hopkins, B.A.Sc.
 HOPKINS MINING CONSULTANTS LIMITED.



Secondary Offering

In consideration of the Underwriters' agreement to purchase 1,000,000 underwritten shares, the Corporation has agreed to pay the Underwriters a commission of \$40,500 to be satisfied by the issuance to the Underwriters of 150,000 fully paid and non-assessable common shares (the "commission shares") of the Corporation following receipt by it of payment in full for the 1,000,000 underwritten shares. The 150,000 commission shares together with an additional 200,000 common shares to be acquired by the Underwriters (see "Principal and Selling Shareholders") for a total of 350,000 common shares, will be offered for sale by the Underwriters over-the-counter as described on the facing page hereof after all of the underwritten shares have been sold. Although there is no present intention to do so, the secondary shares may be offered at prices lower than those set forth on the cover of this Prospectus. If a material change occurs in the affairs of the Corporation that justifies an increase in the then current offering price for the secondary shares, a Prospectus amendment will be filed before implementation of such increase.

The underwritten and secondary shares may be sold to other registered dealers acting as principals for resale by them, or such secondary shares may be offered for sale by registered dealers acting as agents on behalf of the selling shareholders and who will be paid commissions not exceeding 25% of the public offering price, and any such sales would be made within the price ranges set forth above.

Adjustment of Proceeds to the Corporation

The Underwriters have agreed that if the sum of \$297,000 is less than 35% of the gross proceeds paid by the public for the shares comprising the new and secondary offerings, the Underwriters will pay to the Corporation an amount which, when added to \$297,000 will yield a sum equal to 35% of such gross proceeds. The "gross proceeds paid by the public" for shares of the Corporation means the net total amount paid by the public to the Underwriters in the purchase of common shares of the Corporation offered under this Prospectus, up to and including the date the Underwriters complete distribution.

SPECULATIVE NATURE OF THE SECURITIES

The Property does not contain a known body of commercial ore and the funds to be received from the sale of the common shares offered by this prospectus are to be used to explore same. If the recommended programme is successful, additional funds will be required in excess of those to be provided by the present offering for further exploration work to prove an economic ore body and to bring such ore body to production. The only source of future funds presently available to the Corporation is through the sale of equity capital.

The underwriters referred to under "Plan of Distribution" are not obligated to buy back common shares except to the extent that they may have oversold the offering. In the event of their repurchasing common shares, the buy-back price may be significantly lower than the original selling price. If overselling does occur, it will not exceed 10% of the number of common shares offered for sale by this prospectus.

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As indicated on the cover of this prospectus, 50% of the monies paid by investors to purchase the underwritten shares will accrue to the Corporation and 50% will accrue to the Underwriters. The following table reflects the distribution of the proceeds received from the sale of the shares comprising the secondary offering assuming an average selling price of 80¢ per share:

	No. of Shares	%	Sales Proceeds Received	% of Sales Proceeds Received
Received by Underwriters	150,000	42.8	\$226,000	80.8
Received by Vendor	100,000	28.6	27,000	9.6
Received by Promoter	100,000	28.6	27,000	9.6
	<u>350,000</u>		<u>280,000</u>	

Note — The shares received by the vendor and the promoter will be sold to the Underwriters at 27¢ per share.

Upon completion of this offering, and after deducting anticipated expenses, the net proceeds to the Corporation are estimated at approximately \$256,000 and the net tangible book value of the 1,350,005 common shares then outstanding would be 22.7¢ per share calculated on the basis of assigning a book value of \$31,700 to the Property (100,000 common shares issued and arbitrarily valued at 27¢ per share and \$4,700 cash). Purchasers of common shares will accordingly suffer an immediate dilution, the effect of which will depend upon whether an investor purchases underwritten shares at the offering price of 54¢ per share or shares under the secondary offering. The following tables summarize the information concerning dilution (excluding the exercise of Warrants), the second table assuming a secondary offering price of 80¢ per share:

Purchase of Underwritten Shares

Public offering price per share	54.0¢
Tangible book value per share after offering	22.7¢
Dilution per share to investors	31.3¢

Purchase of Secondary Shares

Public offering price per share	80.0¢
Tangible book value per share after offering	22.7¢
Dilution per share to investors	57.3¢

USE OF PROCEEDS

The gross proceeds to the Corporation from the sale of the underwritten shares will be \$270,000. The costs of this issue are estimated at \$19,000. The underwriters will pay their proportionate share thereof of approximately \$4,925. The Corporation will receive an additional \$27,000 through the

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subscription by Messrs. Harper and Tokarsky for 100,000 common shares at 27¢ per share. Such net proceeds will form the working capital of the Corporation and will be used as follows:

Implementation of development programmes recommended by Mr. Archibald	\$133,100
Corporation's share of costs of issue	14,075
Settlement of accounts payable	8,200
Administrative expenses during next 12 months	15,000
General corporate purposes (1)	126,625
	<u>\$297,000</u>

(1) Future administrative expenses not provided for above and the possible expenditure of additional funds to carry out exploration and development work on the Property and the carrying out of exploration and development work on other properties as referred to below.

Additional work on the Corporation's Property may be carried out depending upon the results achieved from the programmes recommended by Mr. Archibald.

While the Corporation has no plans in this regard at the present time, monies in its treasury as available may also be used to defray the cost of programmes of acquiring, staking, exploring and developing other properties either alone or in concert with others and generally to carry out exploration programmes as opportunities and finances permit, but no such properties will be acquired and monies will not be expended thereon without an Amendment to this Prospectus being filed if the securities of the Corporation are then in the course of distribution to the public.

Monies not immediately required for the Corporation's purposes as set out in the Prospectus will be deposited in interest bearing accounts with Canadian chartered banks and/or trust companies.

No part of the proceeds will be deposited outside Canada or be advanced or disbursed in any way to other companies or persons except to the extent necessary to enable the Corporation to implement and complete the exploration and development programmes as set forth in this Prospectus and Amendments thereto. No part of the proceeds will be used to invest in securities other than securities in which a company registered under Part III of the Canadian and British Insurance Companies Act may invest its funds without availing itself for that purpose of the provisions of Sub-section 63(4) of the said Act. If the Corporation wishes to use the proceeds for purposes other than those set out in this Prospectus, it will obtain the prior consent of the shareholders and will provide 21 days prior notice to the Ontario Securities Commission.

CAPITALIZATION

Designation of Securities	Authorized	Outstanding as of June 30, 1980	Outstanding on Completion of this Financing
Common shares	5,000,000	100,005	1,350,005 (1)
without par value		(\$27,005)	(\$364,505)
Preference shares	2,000,000	500,000	500,000
with a par value of 1/10th of 1¢ per share	(\$2,000)	(\$500)	(\$500)

(1) Gives effect to the issuance of 1,000,000 underwritten shares, 150,000 commission shares to the Underwriters, 100,000 shares to the vendors of the Property and 100,000 shares subscribed for by the promoters. All references to the foregoing are to common shares.

(2) 250,000 common shares are reserved for exercise of warrants.

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DESCRIPTION OF SECURITIES

Common Shares

Each of the common shares without par value carries one vote at all meetings of shareholders, is entitled to dividends as and when declared by the directors and is entitled upon liquidation to a pro rata share of the assets of the Corporation distributable to the holders of common shares, subject only to the prior right of holders of preference shares to receive an amount equal to the par value thereof. The common shares carry no conversion or pre-emptive rights. Upon completion of this issue, all issued and outstanding common shares will be fully paid and non-assessable. Under its Articles of Incorporation, the Corporation may purchase its common shares.

Preference Shares

Each of the preference shares with a par value of 1/10th of 1¢ per share carries one vote at all meetings of shareholders but is not entitled to receive any dividends or to participate in the assets of the Corporation in the event of its dissolution other than to receive, in priority to the common shares, a sum equal to the par value thereof. The preference shares, or any part thereof, are redeemable at their par value at any time at the option of the Corporation with the consent of the holders. All outstanding preference shares are redeemable in any event on July 15, 1985. Preference shares are redeemable at an earlier date at par on the basis of one share to be redeemed for each common share of the Corporation purchased pursuant to the share purchase warrants referred to hereunder. The preference shares are not transferable without the prior written consent of the Ontario Securities Commission. All of the presently issued preference shares are fully paid and non-assessable.

Warrants

The Corporation has authorized the issuance of up to 500,000 warrants entitling the holders thereof to purchase one common share of the Corporation for each warrant held. The Corporation will issue, upon receipt of the sum of \$270,000 from the sale of the underwritten shares, warrants entitling the promoters of the Corporation, to purchase 250,000 common shares of the Corporation at the price of 33 1/4¢ per share until July 15, 1985. No common shares so purchased will be offered for sale within a period of six months from the date of the issuance by the Ontario Securities Commission of a receipt for this prospectus and thereafter without the written consent of the Underwriters if the shares offered by this prospectus are then in the course of distribution to the public. Up to an additional 250,000 warrants will be issuable to the promoters on the basis of warrants being issued entitling them to purchase one common share of the Corporation for every four additional common shares of the Corporation sold by it from its unissued common shares. The purchase price payable on the exercise of such additional warrants will be 125% of the purchase price paid to the Corporation's treasury and said warrants will be exercisable for a period of five years from the date of their respective issuance. Warrants may not be transferred without the prior written consent of the Ontario Securities Commission. The warrants will contain anti-dilution provisions including among other things provisions for appropriate adjustments in the class, number and price of shares issuable pursuant to any exercise of the warrants upon the occurrence of certain events including any subdivision, consolidation or re-classification of common shares, the payment of stock dividends, and the consolidation or merger by the Corporation with or into another corporation or the sale, conveyance, lease or other transfer by the Corporation of all or substantially all of its assets.

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MANAGEMENT

The names and home addresses of the directors and officers of the Corporation and the position presently held by them in the Corporation are as follows:

<u>Name</u>	<u>Address</u>	<u>Position</u>
Hugh Grant Harper, P.Eng.	314 Hendon Avenue Willowdale, Ontario	President and director
Irwin Arthur Wallace	2500 Bathurst St. Apt. 508 Toronto, Ontario	Vice-President and director
John Thomas Tokarsky	90 Peckham Avenue Willowdale, Ontario	Secretary-Treasurer and director
Thomas Richard Heale	431 Crosby Avenue Richmond Hill, Ontario	Director
George Arthur John Monteith	2679 Bloor St. West Etobicoke, Ontario	Director

The principal occupation of the directors and officers during the past ten years is as follows:

- Mr. Harper professional engineer and designated consultant providing exploration services to the mining industry through Harper Consulting Services Inc. during the past 3 years and prior thereto consulting engineer and geologist, self-employed.
- Mr. Wallace self-employed notary public, insurance agent and real estate broker.
- Mr. Tokarsky accountant and corporate secretary, self-employed and controlling shareholder of Tokarsky Corporate Services Limited since September 1974, previously Tokarsky Corporate Services since November 1971, between October 1969 and September 1971 in the employ of Shlesinger Corporate Services Limited.
- Mr. Heale consulting geologist, self-employed. Retired since January 1975.
- Mr. Monteith geologist, self-employed since May 1975, between 1970 and 1975 a University student in geology, and prior thereto a student at The School of Mines, Haileybury.

It is not anticipated that the Directors or Officers will devote more than 5% of their time to managing the affairs of the Corporation. They will, however, be available to carry out their duties and responsibilities as required. Mr. H. G. Harper will render professional services to the Corporation in the carrying out of its exploration and development programme and will make available such portions of his time as may be required to this end from time to time.

Reference is made to the caption "Certain Particulars Relating to Management and the Promoters" respecting certain background information relating to the parties described above.

Messrs. Harper and Tokarsky have agreed with the Underwriters that until December 31, 1985, they will vote all shares of the Corporation, the voting of which they control or direct to cause two nominees of the Underwriters to be elected as Directors of the Corporation.

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REMUNERATION OF MANAGEMENT

To date no aggregate direct remuneration has been paid or is payable to the directors and senior officers of the Corporation, other than for accrued directors' fees of \$1,000. During the current financial year directors will be paid a fee of \$100 for each meeting of the board of directors or meeting of shareholders which they attend. A monthly fee not exceeding \$400 will be paid to Tokarsky Corporate Services Limited based upon services provided to the Corporation consisting of head office accommodation, accounting, administrative and secretarial services. Mr. Harper, the President and a director of the Corporation who is a mining engineer will be paid for time expended by him on the Corporation's behalf.

PRIOR SALES OF SHARES

Five shares of the Corporation have been issued and sold at \$1.00 per share.

ISSUANCE OF SHARES IN SETTLEMENT OF INDEBTEDNESS

Following the issuance of a receipt for this prospectus, the Corporation, pursuant to agreement with Messrs. Harper and Tokarsky, will be indebted to them in the amount of \$27,000 representing \$47,000 payable to the vendors of the Property and \$22,300 advanced by them by way of loan to the Corporation. The total amount of such indebtedness will be satisfied by the issuance by the Corporation to them equally of a total of 100,000 common shares issued at a price of 27¢ per share. By agreement between Messrs. Harper and Tokarsky and the Underwriters dated June 20, 1980, these shares will be purchased by the Underwriters from them at 27¢ per share following the acceptance of filing of this prospectus by the Ontario Securities Commission. The 100,000 shares so acquired by the Underwriters will form part of the shares referred to under "Secondary Offering" on the facing page of this prospectus. The Underwriters may advance monies to Messrs. Harper and Tokarsky on account of the purchase price of said shares. The aforementioned sum of \$27,000 represents a payment allocation as follows: Messrs. Harper and Tokarsky — \$4,700; accounts payable — \$3,500; costs of issue — \$19,000.

PROMOTERS AND INTEREST OF MANAGEMENT AND OTHERS IN CERTAIN TRANSACTIONS

Messrs. H. G. Harper and J. T. Tokarsky, directors and the President and Secretary-Treasurer of the Corporation respectively, are its promoters and are the vendors of the Property. By agreement dated June 20, 1980, Messrs. Harper and Tokarsky equally subscribed for and the Corporation issued to them a total of 500,000 preference shares of the Corporation for an aggregate consideration of \$500. Pursuant to said agreement, the Corporation, subject to earlier redemption as hereinafter described, will redeem these preference shares at par on July 15, 1985 unless such redemption date is

DARWIN GOLD MINES LIMITED

(Incorporated under the Laws of the Province of Ontario)



CAPITALIZATION

3,000,000 Shares with Nominal or Par Value of \$1.00 per Share.

1,650,000 Shares to be issued for property, including plant and past development work, and to provide for liquidating all outstanding debts and liabilities incurred in development of the company's mining property to date of incorporation of new company.

1,350,000 Shares in Treasury to provide the funds necessary to develop sufficient ore to justify bringing property to production.

*This Issue—500,000 Shares
55 CENTS PER SHARE*

OFFICERS AND DIRECTORS

President: COL. GEORGE C. ROYCE, Toronto.

Secretary: Corporation Management and Executives Limited
703 GENERAL ASSURANCE BLDG., BAY ST., TORONTO.

DIRECTORS:

H. H. LANG, Toronto
R. E. HORE, Toronto

ROBERT FENNELL, K.C., Toronto
R. A. DARWIN, Montreal

Solicitors
FENNELL, PORTER & DAVIS
TORONTO

Registrar & Transfer Agents
CHARTERED TRUST & EXECUTOR LIMITED
Toronto

A commitment having been made for the purchase of the shares offered in this issue, the proceeds will not go to the treasury of the company.

H. R. BAIN & COMPANY, LTD.

CABLE ADDRESS
"RUBAINCO"
TORONTO

INVESTMENTS
300 BAY STREET
TORONTO

TELEPHONE
AD. 4274

March 18th, 1935

Dear Sir:

Darwin Gold Mines Limited

Please find enclosed a circular regarding the newest Bain-sponsored issue, —Darwin Gold Mines Limited. As you will see from the reports of our engineers, this property shows remarkable promise, and we believe that the shares of this company present an outstanding opportunity in gold mining investment.

We would call your attention to the following points: (1) The mine is a former producer, and is equipped with a complete mining plant, now operating, and a 50-ton mill; (2) Development since work was resumed six months ago under the sponsorship of the H. R. Bain organization has shown such excellent results that work is now planned to a depth of 800 feet; (3) Under our sponsorship, more than \$100,000 has been spent in development in the past six months, in advance of any public issue of shares. Altogether, more than \$300,000 has been spent by ourselves and former operators, to overcome the preliminary mining hazards and prove the ore bodies; (4) In particular, we would call your attention to the competent management under which operations at the property are directed. Mr. H. A. Kee, who has recently become associated with the Bain organization, is Director of Mining Operations. Mr. Reginald E. Hore is consulting geologist, and work at the mine is under the direct management of Dr. M. H. Frohberg.

The Darwin is adjoined on the north by the Parkhill and Minto mines, both established producers. Parkhill in the ten months ending September 30, 1934, produced over \$271,000 in gold, while the Minto in its latest fiscal year showed earnings of well over \$2.00 per share.

During the period in which we have been sponsoring gold mining companies, we have offered to the public the following outstanding issues: (1) Pickle Crow Gold Mines Ltd., slated to be Canada's next gold producer, with ore of \$35 grade. (2) Greene Stabell Mines Ltd., a regular producer of gold and copper. (3) Murwood Gold Mines Ltd., developing steadily in Tiblemont Township, Quebec. (4) Macjoe Sturgeon Gold Mines Ltd., in the spectacular Sturgeon River area, where fine showings have been found on surface.

We now feel that Darwin is eminently qualified to take its place in the family of Bain-sponsored share issues, and have no hesitation in recommending its purchase.

Previous issues have been heavily oversubscribed, and so we urge that you make use of the enclosed application, mailing it to us at once, that we may reserve your requirements.

Yours very truly,

H. R. BAIN & CO. LTD.



President.

Why We Have Reopened and Financed Darwin Gold Mine

DARWIN Gold Mines Limited has been organized to take over the Grace Mine in the Michipicoten area of Ontario.

● With private funds furnished through H. R. Bain & Co. Limited, the mining plant, mill, shaft and mine workings to a depth of 400 feet, were rehabilitated some six months ago. Upon the completion of this work an active mining programme was commenced to develop the ore bodies of the mine. This work has been proceeding with encouraging results for several months, under the direction of Dr. M. H. Froberg, mine manager, with Reginald E. Hore, our own consulting geologist, representing our interests at the mine.

● The Grace Mine has produced a considerable tonnage of ore in the past, but has lacked the capital to carry on complete development. It was highly recommended by Dr. Froberg, who has made an exhaustive examination and complete sampling of the property, and by other engineers. In our interests, Mr. Hore examined the mine, checked the sampling and recommended the present development campaign with a view to bringing in sight sufficient ore to keep the company's mill in steady operation and to give the mine a complete rather than fractional development.

● *We regard the Darwin Mine as one of the most promising mining ventures in the Province of Ontario, and have supported our conviction by a commitment of \$360,000 of which approximately \$100,000 has been paid during the last six months in advance of any public offering of shares.*

● A number of veins are known to exist on the property. Only one has been explored. This is the Grace vein. It has been opened up by drifting on the 400 foot level for a distance of 1,000 feet; two ore bodies have been located and numerous sections of the vein give most interesting values and several spectacular occurrences. The high-grade ore discovery just announced is most encouraging and regarded as of outstanding importance by our engineer and geologist.

● In our opinion, this mine has possibilities equalling those of many of the Junior Gold Mines which have given such remarkable results in the last two years. It is among the most advanced developments offered the public at such a price in many years.

● The difficult preliminary work, for which the total expenditure reaches a sum in excess of \$300,000 provided by ourselves and former operators, has been taken care of. The mine is in operation. A substantial amount of ore is in sight. The drills are working in two ore bodies at the 300 and 400 foot levels. Most attractive sections will be developed and it is proposed to carry operations to a depth of 800 feet, raising a new and adequate shaft to surface, and placing the property in a position to expand operations and explore the favourable areas.

● With its 1,200 acres of favourable formation; with the Michipicoten district attracting experienced operators and capital as never before in its history;

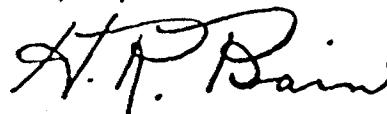
● With ore proven at a depth of 800 feet at adjoining operations;

● With the higher prevailing price of gold and the richness of the typical Darwin ore;

● With the property reorganized and rehabilitated with private funds and operating steadily in ore, under competent management;

● Darwin Gold Mines affords an opportunity in sound mining procedure which conforms to the exacting standards we have set up for properties offered under our sponsorship. In our opinion, the shares of this company provide an outstanding opportunity to become associated with an unusual mining venture into which we have placed a substantial amount of private capital in the conviction that the Darwin Mines will become a steady producer of gold and dividends.

Yours very truly,



DARWIN GOLD MINES LIMITED

Summary of Salient Features

LOCATION AND AREA

THE GRACE MINE is situated in the Sault Ste. Marie Mining Division, Province of Ontario, Township 29, Range 23, about 6 miles southeast of Wawa, a station on the Algoma Central, approximately 180 miles north of Sault Ste. Marie, Ontario. The property comprises 31 claims, 1,240 acres of patented mining ground, practically in one solid block.

ACCESSIBILITY AND TRANSPORTATION



The property is at the front door of accessibility to the outside world, being directly connected by motor road both with rail and steamship lines. It is six miles from the Algoma Central Railway, which affords constant express and freight service, and an equal distance to the steamship line at Michipicoten Mission, the facilities of which are available in the navigable season for shipments of coal and other heavy freight.

HISTORY OF DEVELOPMENT

The Grace Mine (now Darwin) was first opened and operated as a gold producer by the famous Clergue steel interests. When the Clergue interests encountered difficulties, the president wished to continue operation as he believed he could retrieve his fortunes from the gold in the mine. Receivership of Clergue interests prevented this. The mine was reopened several times but was never provided with adequate capital for continuous operation. It has been examined and favourably reported upon by many engineers. Dr. Froberg, the present manager, was one of the engineers who was familiar with the mine and made an exhaustive study of its ore occurrences and possibilities. The recent reopening was brought about after thorough examination by H. R. Bain & Co.'s consulting geologist, who with Dr. Froberg laid down the programme of rehabilitation of plant and mine which has been carried on since June last. For the first time, the mine now is in a position to be given thorough development, with such factors as capital structure, mine equipment and management properly provided for.

HYDRO ELECTRIC POWER



Electric power is available from the Great Lakes Power Company plant at High Falls and power is being delivered at the property at a rate of \$35.00 per horse power year, which is among the lowest rates enjoyed by any mine in Ontario.

TIMBER AND FUEL

Mining timber is plentiful on the property, while large timber and lumber are available from nearby mills. Cheap coal is available by boat route and firewood is plentiful in the district.

PLANT AND EQUIPMENT

The company owns a complete mining plant, including compressor, hoists, drills, electric motors, drill sharpener, all of which has been overhauled and renewed as required by the present operators. The present equipment is suitable, with some additions, to conduct mining operations to a depth of 800 feet, the objective of the development programme now outlined.

BUILDINGS

New buildings have recently been constructed and old buildings repaired to provide for the housing and feeding of a crew of 50 men. These include compressor house, staff office, blacksmith shop, engineers' house, bunkhouse, cookery, powder house, stables, etc.



MINE MILL

The property is equipped with a mill of 50 tons daily capacity. Alterations to bring this unit to high efficiency will cost in the neighbourhood of \$15,000.

PAST DEVELOPMENT

The mine has been developed wholly on the Grace vein by means of an incline shaft with four levels opened up. Former operators took out practically all the known ore above the second level in the immediate vicinity of the shaft. Deeper development has been carried on at the third and fourth level. On the fourth level the drifts extend 500 feet north and 500 feet south of the shaft.

DEVELOPMENT PROGRAMME



It is proposed by Dr. Froberg and also recommended by Mr. Hore that an exploration and development programme be carried on which will develop existing ore and explore the mine on lower levels both by diamond drilling, drifting, and raising. The present shaft, while adequate for immediate operations, is inadequate for a producing mine and a shaft will be raised from the fourth level to surface, while sinking will be carried on from the same level with an objective of 800 feet.

EXTRACTS FROM ENGINEERS' REPORTS

By R. E. HORE,

Consulting Geologist,

For H. R. Bain & Co. Limited

DARWIN GOLD MINES LTD.

(No Personal Liability)

357 Bay St., Toronto, Ont.

MR. H. R. BAIN,

350 Bay St., Toronto, Ont.

Jan. 1, 1935.

Dear Sir:

In accordance with your request, beg to report as follows:

Darwin Gold Mines Ltd. have re-opened the Grace Gold Mine in Michipicoten. This mine was a producer thirty years ago when several thousand tons of ore were mined and treated. This ore came from less than 200 feet from surface. Later development has shown that there is ore below that which was mined and that there is reasonable expectation of opening other ore bodies by more extensive lateral and deeper exploration.

The mine workings have been carefully re-examined during the past few months by Dr. M. H. Froberg and myself. We both recommend that development be resumed. Dr. Froberg had previously thoroughly sampled the vein wherever exposed and my check samples satisfied me that Dr. Froberg's sampling can be thoroughly relied upon. I recommended that when mining was to be resumed, Dr. Froberg should be engaged as Mine Superintendent. Dr. Froberg has a more thorough knowledge of the Grace Vein than has any other man and he believes that he can find enough ore to make it a profitable producer.

Funds have been privately subscribed to put the old mine in shape for development. All mining equipment at the property has been overhauled and repaired and necessary new equipment has been purchased. The old buildings have been repaired and some new ones constructed. The shaft has been reconitioned to make it safe for operation and the miners are now at work on the third and fourth levels under the direction of Dr. Froberg. This work is giving very encouraging results.

By Dr. M. H. FROBERG,

Operating Manager,

Darwin Gold Mines.

NOTE:—From an Exhaustive Report by Dr. Froberg, July 18, 1934, on the geology, structure, veins and ore occurrences on the property of Darwin Gold Mines, it is possible here to present only a few statements and conclusions. A Copy of the complete report may be secured on request.

"The Grace Vein consists of a series of more or less lenticular quartz bodies which occur along the distinct shear zone. The latter can be traced more than 2500 feet."

"A study of the mine map shows that the number and extension of quartz bodies occurring along the shear zone increase in depth. This fact is particularly evident south of the Grace shaft. Here the Grace Vein is marked on the surface by a barren shear zone for several hundred feet, while along the corresponding distance on the third level underground, quartz lenses are found which increase in size and number on the deepest level of the mine. It is noteworthy that similar observations have been made in the deeper levels of the Parkhill Mine. On the strength of these facts, the writer is inclined to believe that the quartz occurs in more continuous bodies in greater depth. Since gold values are essentially confined to the presence of quartz, the size of workable ore bodies will probably increase in depth. Likewise, it seems reasonable to expect in depth more goldbearing quartz lenses north and south of the present underground workings."

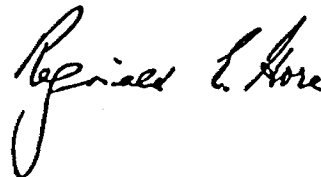
"It has been a matter of much speculation as to which factors have controlled the origin of the rich pockets which

Sampling on the second, third and fourth levels and in a raise from the fourth to the third level indicates a shoot 100 feet long pitching to the South from the second level. On the second levels the samples in this shoot range from traces up to over ten ounces per ton for a width of three feet. Similar ore shows on the third level and in the raise from the fourth. Visible gold is seen many places in this shoot and is responsible for most of the assays that run over a quarter of an ounce per ton. The very high assays obtained from some of the samples make it impossible to estimate exactly the average value of the ore in this shoot until it has been more thoroughly developed. It is, however, reasonable to count on one-half ounce per ton, which is the figure used by Dr. Froberg.

Darwin Gold Mines has a large property, only a small part of which has been thoroughly prospected. In a limited area several gold bearing veins have been found and one of those, the Grace Vein, has been partially developed. The work that has been done on the Grace vein shows that parts of it carry high gold values and also show that the vein is a very persistent one, that it is of good length and that it can be counted upon to go to considerable depth. Examination of the Grace vein and experience in deeper work on the similar vein at the adjoining Parkhill Mine give good reason for confidence that lower level exploration on the Grace vein will disclose rich ore there.

It is planned first to prove up the ore indicated in the present workings and explore for additional ore at these levels. Then development at greater depth will be undertaken and a new shaft raised to permit production and facilitate the deeper work.

(Signed)



have been repeatedly found along the Grace Vein. It may be added that the character and size of such concentrations of free gold are similar to those encountered in the Parkhill Mine."

"In the opinion of the writer the Grace Mine represents a far-developed prospect with excellent possibilities which undoubtedly merit the investment of more money for further development."

DR. M. H. FROBERG.

TELEGRAM COPY

R. E. HORE,

Darwin Gold Mines,

357 Bay St., Toronto.

Wawa, Ont., Jan. 22, 1935.

Am favorably impressed fourth level North Raise verifying continuity and estimated grade main ore shoot. Stop. Recent work essentially confirms opinion in my report. Stop. Estimating definite ore six thousand tons, ten dollars probable ore, five thousand tons eight dollars. Stop. Parkhill development strongly recommends further exploration in greater depths.

M. H. FROBERG.

NOTE:—Dr. Froberg reports values on old standard price of gold, \$20.67 per ounce. On his estimate the mine at present has total estimated ore of \$167,000, new price of gold.

Core and Gold Values at the Darwin Gold Mine

All figures from the Official Mine Assay Plans—Sampling by M. H. Froberg, Mine Manager, recalculated at \$35 per ounce. Sampling at intervals of approximately 5 feet showing total length of ore and sections showing promising values of about 900 feet.

The Assay Plan shows the Drift on the Grace Vein to be approximately 1000 feet on the Fourth Level and approximately 900 feet on the Third Level—Ore has been mined out from above the Second Levels in the Immediate Shaft Area.

SECOND LEVEL

Sections in Drift North of Shaft—Grace Vein

Width	Value	Width	Value	Width	Value
2.5 feet	\$ 6.70	3 feet	\$ 3.70		
2.5 feet	6.70	3 feet	1429.00	3 feet	\$ 1.36
2.2 feet	8.40	3 feet	373.00	2 feet	3.40
2.2 feet	279.50	3 feet	2146.00	3 feet	31.80
3 feet	398.00			3 feet	10.50
3 feet	13.50	3 feet	13.50	3 feet	41.60
3 feet	15.60	3 feet	5.40	3 feet	Tr.
3 feet	6.70	3 feet	33.80	2.5 feet	8.48

FOURTH LEVEL

Samples in Drift from Shaft North—Approx. 100 feet—Gold at \$35.00

Width	Value	Width	Value	Width	Value
2.8 feet	\$56.20	2.6 feet	\$44.70	4.3 feet	\$ 4.06
2.6 feet	4.02	1.6 feet	13.55	2.6 feet	10.15
2.3 feet	8.10	3.2 feet	6.77	3.2 feet	8.80
2 feet	5.40	2 feet	4.74	2.4 feet	5.40
2 feet	30.50	3.7 feet	7.45	1.2 feet	16.40
3 feet	2.02	4.3 feet	10.15	0.5 feet	22.30
3.2 feet	3.40	3.6 feet	4.74	0.4 feet	25.90
4 feet	6.70	4.3 feet	8.14		

THIRD LEVEL

Sections in Drift North of Shaft Grace Vein

Width	Value	Width	Value	Width	Value
3 feet	\$43.20	1.8 feet	\$ 5.40	3 feet	\$ 3.16
3 feet	29.40	2.3 feet	9.80	4 feet	2.20
3 feet	17.80	3 feet	12.50	3 feet	52.80
3 feet	14.30	3 feet	6.60	3 feet	5.60
3 feet	29.00	3.5 feet	427.00		
2.5 feet	58.00	1.5 feet	120.60	3 feet	15.60
2 feet	100.00	2 feet	101.40	3.6 feet	74.60
2 feet	582.00	2.1 feet	18.30	3.6 feet	30.80
1 feet	4.90	3 feet	116.00	2 feet	32.64
1.3 feet	10.50	3 feet	10.16	2 feet	5.10

RAISES—FOURTH LEVEL

No. 1 Raise

Width	Value	Width	Value	Width	Value
3 feet	\$376.00	2.5 feet	\$ 4.74	3 feet	\$12.03
2.5 feet	7.40	3 feet	7.60	3 feet	18.90
3 feet	8.10	2 feet	8.12	3 feet	16.90
3 feet	28.40	2.2 feet	10.10	3 feet	7.40
3 feet	49.40	2.4 feet	16.90	3 feet	7.40

THIRD LEVEL

Sections in Drift South of Shaft

Width	Value	Width	Value	Width	Value
2 feet	\$ 8.10	1.8 feet	\$18.90	4 feet	\$ 1.30
3 feet	21.70	3.2 feet	10.20	4.2 feet	3.90
1.6 feet	5.10	3.5 feet	1.30	5.2 feet	6.70
3.5 feet	12.90	2.4 feet	5.40	4.2 feet	6.00
		3 feet	4.70	3.1 feet	9.40
4.2 feet	58.80	3.2 feet	13.90	3.2 feet	4.74
3 feet	4.70	3.2 feet	6.10	1.2 feet	8.80
3.5 feet	18.90			1.2 feet	8.80

RAISES—FOURTH LEVEL

No. 2 Raise Now in Work

Width	Value	Width	Value	Width	Value
18 inches	\$59.50	44 inches	\$41.60	36 inches	\$44.80
20 inches	54.40				

FAVORABLE SECTIONS ON FOURTH LEVEL

South of Shaft—Grace Vein

Width	Value	Width	Value	Width	Value
3 feet	\$ 4.06	3 feet	\$10.00	3 feet	\$11.50
3 feet	5.40	3 feet	10.80	3 feet	16.90
3 feet	3.40	3.5 feet	8.10	3 feet	7.80
3 feet	8.10			3 feet	6.70
3 feet	5.00	3 feet	4.00	3.7 feet	23.00
3 feet	16.20	3 feet	5.40	3.5 feet	1.40
3 feet	10.80	3 feet	Tr.	3.3 feet	5.05
3 feet	10.00	3 feet	6.10	3 feet	4.04

Width	Value	Width	Value	Width	Value
4.4 feet	\$ 6.10	2.5 feet	\$10.50	1.8 feet	\$ 4.20
3.5 feet	10.10	3.5 feet	10.10	3.1 feet	5.20
4.5 feet	7.70				
3.5 feet	2.80	1.6 feet	7.30	2.5 feet	10.20
3.1 feet	1.35	1 feet	3.40	1.5 feet	8.40
3.7 feet	7.78	0.8 feet	5.70	3 feet	8.40
3.8 feet	3.40	1 feet	7.80	4.1 feet	18.30
4.4 feet	7.78	2 feet	28.70	3 feet	6.90
2.2 feet	3.55	2 feet	4.20	3 feet	4.00
1 feet	5.10				

DARWIN GOLD MINES LIMITED

(Incorporated under the Laws of the Province of Ontario)

Late Information on the New Discovery at Darwin Mines

AN OUTSTANDING JUNIOR GOLD ISSUE
OF THE PRESENT YEAR

Toronto, March 4th, 1935.

To the Investing Public;

The information contained on this page deals with the latest remarkable ore developments at the Darwin Mine. We have found high-grade ore in a location never before developed and we have proved up the valuable ore on the Grace vein between the 300 and 400 foot levels. We have many other gold showings underground which hold the definite possibility of providing a very substantial reserve of typical Darwin high-grade ore before milling commences.

With private funds we have made of Darwin a mine with a distinct outlook for success. It is developed to the 400-foot level and has all mining equipment, with a few minor changes, necessary for production. Real results in ore have attended practically every foot of new development work.

In my opinion the public has never before had the opportunity at the current price of participating in an issue of gold mining shares which offer a mine at such an advanced and promising stage of development as the Darwin Mine. We confidently expect an ever-broadening ore situation and a decision to set the Darwin mill in operation within the next six months. We have no hesitation in recommending the shares of Darwin Gold Mines as an outstanding Junior Gold of the present year.

(Signed) H. R. BAIN.

DARWIN GOLD MINES LIMITED

Dear Mr. Bain:

Exploring from the third level north drift at the Darwin Gold Mine for the upward extension of a vein that had previously been seen only at the fourth level has resulted in the finding of high grade ore a short distance from the north end of the old workings. A crosscut 45 feet in length reached the vein last week. The first round in the vein showed free gold in white quartz similar to that of No. 3 vein. Where cut, the quartz is two feet wide. The enclosing rock is well mineralized. Drifting has been started and the first rounds have exposed the vein for a length of 14 feet, showing gold in many places.

This discovery is an important one, as it indicates that the No. 3 vein, in which there is some very high grade ore at the fourth level, extends upwards for some distance into virgin ground. It is planned to open the vein at the third level and raise from the fourth to the third. Later the second level drift will be extended to search for the continuation of the ore shoot.

Another important development at the Darwin is the exploration of the Grace vein by raising from the fourth to the third level. This work in addition to proving the expected half ounce ore, has disclosed high grade streaks that will materially increase the average grade of the quartz exposed in the raise.

The excellent results obtained from the exploratory work done during the past few months at the Darwin, warrant thorough exploration of the ground already partially explored from surface to the fourth level, and also of opening deeper levels.

Now that it has been demonstrated that exploration at the Darwin gives the hoped for results, I advise that money be raised to push the work more rapidly. The mine is now well equipped for exploratory work, and for an enlarged scale of operations only minor additions to equipment are required.

Yours very truly,

(Signed) REGINALD E. HORE,
Consulting Geologist.

Darwin Gold Mines Limited.

February 28th, 1935.

Assays from No. 3 Vein at the 400-foot level Described in Mr. Hore's Letter. This Vein Found on No Other Level Until Recently

Width	Value	Width	Value	Width	Value
3 feet	\$19.60	3 feet	\$38.00	3 feet	\$67.80
3 feet	5.40	3 feet	14.20	3 feet	346.00
3 feet	14.20	3 feet	6.70	3 feet	4.00
3 feet	15.60	2.5 feet	6.80	3 feet	2.70
3 feet	21.70	3 feet	12.20	3 feet	6.80
3 feet	8.14	3 feet	18.30	3 feet	250.40
2.5 feet	10.80				

First Channel Assays from No. 3 Vein on 300 Foot Level

THOMAS HEYS & SONS

Toronto Arcade, Yonge Street

Toronto, Feb. 28/35.

The Darwin Gold Mines,
per R. E. Hore.

Dear Sirs:—

We hereby certify that we have made a careful assay of the samples of ore (6 samples) received from you and report results as follows:—

Samples Marked	Gold Oz. Valued at \$35.00 per oz.	Value per ton
(Width)		
1. (24 inches)	0.60	\$21.00
2. (24 ")	1.37	48.55
3. (18 ")	1.56	54.60
4. (36 ")	0.25	8.75
5. (36 ")	0.88	30.80
6. (36 ")	0.10	3.50

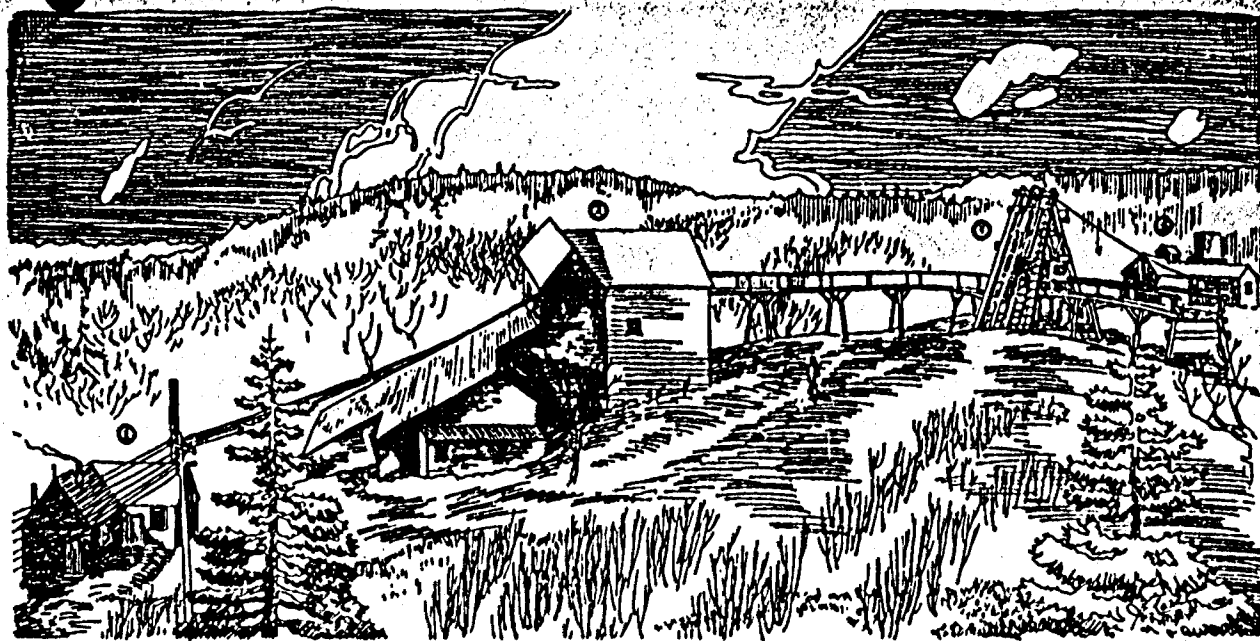
THOS. HEYS & SONS,
Wm. A. Hays, Manager.

These samples were taken from the recently opened No. 3 vein at 3rd level north. This vein had been previously known only at fourth level—where it was called the "footwall" vein. Samples are from 14 ft of vein, all that was opened when samples were taken. No. 5 and No. 6 are from same face.

"JUSTIFIES EXPECTATION" Dr. Froberg

In his most recent statement to the management of Darwin Gold Mines, Dr. M. H. Froberg, mine manager, stated that the favourable results in the raise on the No. 1 Ore Body and the discovery of the upward extension of No. 3 Vein justify the expectation of bringing the Darwin Mine into production. He describes as good the chances of finding additional ore by lateral development.

An Artist's Sketch of the Darwin Gold Mine in Michipicoten where the Grace Vein is being Developed at Depth through the Bain Private Subsidiary



1. Assay Office
2. Mill Buildings

3. Head Frame
4. Hoist and Compressor House



All information in this circular has been secured from reliable sources and we believe it to be correct, but we do not guarantee accuracy of the same.

GE

MASTER FILE

We offer the unsold portion of:

600,000 Common Shares without Nominal or Par Value

Power and Mines Corporation, Limited

Fully Paid Up, not subject to call—No Personal Liability. Incorporated under "The Companies Act (Canada)"
OFFICES: 260 St. James St., Montreal.

RECEIVED
APR 10 1972

CAPITALIZATION

	Authorized	Issued
7% Cumulative Preference Shares of the par value of \$5.00 each	300,000 Shares	30,000 Shares
Common Shares without nominal or par value	1,500,000 Shares	1,500,000 Shares

Issued
30,000 Shares
GEOLOGIST
SABRY STE. MARIE

Of these shares 1,000,000 shares have been fully paid up and assigned in trust to be sold from time to time to provide funds for the Company for Working Capital and otherwise.

OFFICERS AND DIRECTORS

President, Major-General SIR FREDERICK O. W. LOOMIS, K.C.B., C.M.G., D.S.O. *Vice-President*, GRANVILLE GILMORE
Secretary-Treasurer, W. H. PERRAM
Consulting Engineer, W. E. SIMPSON, M.I.M.M., A.R.S.M.

DIRECTORS

THOMAS JONES: Mutual Life Insurance Company of Canada, Manager for District of Montreal.
MAJOR-GENERAL SIR FREDERICK O. W. LOOMIS, K.C.B., C.M.G., D.S.O.: G. Loomis & Sons, Montreal, General Contractors.

GRANVILLE GILMORE: President, Gilmore Tool Company, Montreal.
NAP. G. KIROUAC: President, Royal Paper Box Company of Quebec.

R. A. DARWIN:

Owner of a number of Departmental Stores in Montreal and Ottawa.

- Registrar and Transfer Agents: - QUEBEC SAVINGS & TRUST COMPANY, Montreal.
- Solicitor: - COLVILLE SINCLAIR, Montreal.
- Auditors: - RITCHIE BROWN & Co.

LOCATIONS AND HOLDINGS

The Company owns outright a Silver Lead Property at Pearl, Ontario, 30 miles east of Port Arthur, known as The Enterprise Mine. This property consists of 400 acres adjoining the Canadian National Railways and within one and a half miles of the Canadian Pacific Railway and five miles from Lake Superior. Electric Power from the Ontario Hydro-Electric Power Commission is available. In addition, the Company has under consideration the acquisition of options on other property in the same district, totalling approximately 1,000 acres.

The Power & Mines Corporation, Limited, have a working option agreement with the United Algoma Mines, Limited, to develop and operate the GRACE AND STAR Mines in the Michipicoten Mining Area of the Algoma District, Ontario. There has already been expended by the Power & Mines Corporation, Limited, under this contract, approximately \$200,000 in respect of which, shares have been delivered. A total sum of \$325,000 is to be expended over a period of years ending in 1930. At the end of that period Power & Mines Corporation, Limited, will hold control of the capital stock of the United Algoma Mines Limited.

The following engineers' and Government reports are taken from the prospectus of the United Algoma Mines Limited.

EXTRACT OF REPORTS, BUREAU OF MINES, ONTARIO GOVERNMENT: MICHIPICOTEN AND GOUDREAU

"The deposits are lodes containing sugary and glassy quartz, carrying pyrite, pyrrhotite and chalcopyrite arsenopyrite and visible gold in intermixed schist. They occur in Keewatin sericite schists, and quartz porphyries not far from Post-Keewatin granite and gneiss."

"GRACE, the most important mine in the area."

"A geological examination discloses a formation of porphyritic dark green diorite, with the feldspar in small white crystals, the rock having no marked schistosity and presenting a very blocky appearance due to several jointage planes."

"At the Grace Mine, bands of coarsely granular quartz run parallel to the strike of the gray or greenish gray schists, about 140 degrees and dip 70 degrees to the east. Near by are massive looking gray rocks, apparently greatly weathered porphyrite. The vein has been traced 200 feet on the surface, a greatest width of about five feet but pinching at several points. The quartz contains pyrite, pyrrhotite, chalcopyrite and arsenopyrite, as well as free gold; and some of the adjoining grayish schist is gold-bearing."

"On the first level, at a depth of 100 feet, the ore has been stoped out for 150 feet along the vein and to the level. In the north drift of this level, 90 feet from the shaft a winze has been put through to the second level stope. At the second level, 200 feet in depth, the drifts north and south are 100 feet and 180 feet in length."

"The north stope has been carried through to the first level, while south of the shaft no stoping has been done. At the third level, at a depth of 300 feet, drifts have been run north and south, 80 feet and 50 feet respectively."

"No stoping has been done at this level."

POWER & MINES CORPORATION, LIMITED COMMON STOCK

S SM-943 PRICE \$1.00 PER SHARE

S SM-943

PROFESSOR H. N. WINCHELL:

The following is an extract from report by Professor H. N. Winchell, former Geologist for the State of Minnesota, Re Grace:

"The writer was engaged by one of the Minneapolis Stockholders to make an examination of the mine and premises and had his instructions to report to him for his personal information.

I sampled the mine thoroughly and examined all the underground workings, the shaft and the drifts. I came to the conclusion that the mine was very valuable The assays were made by Dean Appleby, of the Minnesota School of Mines. The average of all the assays made for me reached the sum of \$47.67 ton in gold and the highest assay gave \$332.00 per ton.

(Signed) H. N. WINCHELL.

HERBERT SILVERS, Colorado Mining Man, Re Grace:

After fifteen years practical experience in the Cripple Creek District of Colorado, where I have been employed in every mining capacity, I have never seen such a property lying idle with such an outlook for want of sufficient funds to operate same. The ore comparatively is much richer than the ore which made Cripple Creek famous and there is absolutely no reason to believe that it does not continue to an indefinite depth.

"A grab sample of screenings from the shoots of the 200-foot level runs \$12.00. I got several samples of the vein at the top of the 300-foot station, which ran about \$25.00 per ton on the average.

"While actual data is lacking regarding the past output of the mine, I have authentic information that the mine to its present development has produced over \$300,000. One mill report shows values on 30 tons sent out for treating of \$34.20, and another report shows that the cost of mining and milling ran as high as \$6.50 per ton, which can be materially reduced under efficient management.

"Unlimited electric power is delivered to the mine from the plant of the Algoma Power Company, five miles distant."

(Signed) HERBERT SILVERS.

\$38.83 IN GOLD PER TON

ASSAY VALUES OF THE GRACE VEIN

A cross-section showing the underground workings of the Grace Mine prior to the construction of a mill and before any stoping had been done, has been furnished by R. H. Patterson, Superintendent of the Mine, and succeeding Peter N. Nissen, Mining Engineer. From this cross-section and assay plan the following information is compiled:—

Mill run of 50 tons from the first hundred feet of No. 1 shaft gave \$38.83 in gold per ton.

Average of 66 assays from first hundred feet of No. 1 shaft gave \$18.26 in gold per ton.

Average value of 24 assays No. 2 shaft gave \$16.50 in gold per ton.

Average of 42 assays between first and second levels, \$7.89 in gold per ton.

Average of 55 assays on drifts A, E, C, D, E, and J respectively on the 100, 200 and 300 foot levels gave a general average of \$20.07 in gold per ton.

Several months ago a cablegram was sent to Colonel Peter N. Nissen, Mining Engineer, London, England, reading as follows:—

"Contemplating Operating Grace Mine. Kindly cable average assay of ore mined by you.—Thanks." Colonel Nissen replied to the above cable as follows:—

"From recollections over one ounce. Consider strong orebody will be found north. Excuse delay — away."

In England it is usual to mention the gold content of ore in ounces, whereas in Canada and the United States it is figured in Dollars. One ounce of gold per ton is the same as \$20.67 in gold per ton, and you will notice that Colonel Nissen states that the ore mined and milled by him ran over \$20.67 in gold per ton. The significance of this can be gained from the fact that Homestake Mining Company, producing gold from ore running only \$3.00 to \$4.00 per ton, has paid \$42,178,719 in cash dividends, or \$190.28 per share.

The above cablegram of Peter N. Nissen confirms the average of the above mentioned 55 assays set forth on the Cross-Section and assay plan of the underground workings.

The following is a recommendation by Messrs. Pellew-Harvey & Company of London as to Mr. W. E. Simpson's ability. Mr. Simpson has been engaged to act as Consulting Engineer for the Company.

PELLEW-HARVEY & COMPANY, Mining Engineers and Metallurgists, 59a London Wall, London, E.C. 2.

Dear Sir:—

23rd October, 1924.

We thank you for your letter of the 10th instant with regard to Mr. W. E. Simpson. He is everything stated in your first paragraph. Mr. Simpson is a man of great experience and he stands well in his profession. His work has extended over many years, during which he has held responsible mining appointments and managed very important properties, with distinction to himself and success to his clients.

Yours very faithfully,

PELLEW-HARVEY & Co.

PRELIMINARY REPORT ON THE DIAMOND DRILLING CAMPAIGN AT THE GRACE MINE TO DATE

By W. E. SIMPSON, M.E.

February; 6th, 1925.

"In accordance with your instructions to examine the diamond drill work in progress at the Grace Mine . . . Not only was the Grace Vein tapped in close proximity to where it had been expected at about a depth of 460 feet, but an entirely new vein was encountered at about 390 feet, showing high values and about which nothing previously has been known . . .

"Rather rough assays were done on the property by Mr. W. W. Smith, who is responsible for the operating of the drill and the results he obtained were \$35.00 for the 10-foot section at 390 feet, \$25.20 at 460 feet and \$4.80 at 520 feet.

"To have found these values at all is of the greatest importance, as even with only the first hole completed, the best possible indications are now available that the Grace has the makings of an industrial venture of great promise . . .

"With the past record of the property as an actual gold-producer, its present appearance, as containing considerable quantities of ore, and its future, as now being unfolded by the results of the diamond drill, it can be confidently asserted that its potential merits are steadily becoming established and that its outlook as an industrial concern is excellent."

(Signed) W. E. SIMPSON.

In addition to the above reports the Power & Mines Corporation, Limited, has the following reports on file signed by W. E. Simpson, M.I.M.M. A.R.S.M.

Under date of November 5th, 1920, Mr. Simpson writes in part as follows regarding the Grace Mine:

"The general outlook for successful operation was never so good as at the present moment. The vein system showing underground is as promising of profitable values as any examination at the surface would lead one to expect. A systematic exploration of the Grace property will probably lead to the development, in the future, of ore just as rich as that mined in the past, while, in the Star section of the area the probabilities are that large ore bodies in long sheets will be encountered, the stripping done at the surface some months ago fostering the belief that large tonnages can be made available through exploration at depth. This belief is further strengthened as the result of the discoveries made by our immediate neighbors, the Pioneer Syndicate, who seem to have met with such success as had led them to secure all the claims obtainable adjoining to the United Algoma Property.

"An abundance of electrical power is now at hand connected right into the Company's buildings, transportation is much improved, sufficient labor is at call, and as has already been mentioned, the general outlook is better than at any time in the history of the enterprise."

(Signed) W. E. SIMPSON, Mining Engineer.

Under date of December 8th, 1920, Mr. Simpson reports as follows regarding Grace Mine:

"Development work at the mine has been steadily progressing since the resumption of operations in May last, with highly satisfactory results. The underground workings have been dewatered and the vein system got ready for systematic exploration. The shaft-limber has been renewed where required but has been found generally to be in an excellent state of preservation. The shaft itself, which follows the vein to an inclined depth of over 300 feet, has been straightened where practicable and all is now in readiness for continued cross-cutting, drifting and sinking as soon as the compressor, now on the way, reaches the mine.

533-040

533-243

"The lowest level will probably be the scene of most concentrated activity and drifting will be started both north and south as soon as the necessary compressed air is available. Cross-cutting and sinking to a depth of 500 feet or 600 feet will immediately follow. The electrical hoist has been removed from its former position and re-erected on the foot-wall side of the vein where it can be of best economic service. An entirely new head-frame has been constructed and a new compressor-house built alongside the hoist-house and foundations prepared on which to place the compressor on arrival at the property.

"Additional accommodation is being prepared and increased facilities for transportation are having attention. The road from Wawa on the Michipicoten Branch Railway Line has been improved and a new road is being constructed to the Algoma Central Main Line, which will shorten the route for winter traveling by several miles.

"The year's work has proven entirely satisfactory, the results of examination and sampling have fully justified my expectations and the outlook was never better than at this present time."

(Signed) W. E. SIMPSON,
Mining Engineer.

Report from the Twenty-Fifth Annual Report of the Ontario Bureau of Mines, 1916, being Vol. XXV, Part II, "LEAD AND ZINC DEPOSITS IN ONTARIO AND IN EASTERN CANADA," by W. L. Uglow.

ENTERPRISE MINE

(a) Location—

The property is situated in the Township of MacTavish at a distance of three or four miles west of the shore of Black Bay on Lake Superior.

(b) Ore Occurrence—

A rich vein of lead ore occurs in a pale red indurated marl. Professor Chapman says of it: "The vein consists of a gangue of quartz, with enclosed portions of wall-rock, and some heavy spar, etc., carrying a very strong lode of intermixed copper pyrites and galena. The vein itself appears to average about ten feet in width; but at present it is to a great extent uncovered. The copper pyrites and galena although scattered more or less throughout the vein run principally in a solid lode of at least four feet in width. The course of the vein is about N. 65 degrees E.; and so far as this can be determined in the present undeveloped state of the vein, the dip or underlie, is towards the southwest, at an angle of about 80 degrees." In one sample he found 8.10, and in another 11.62 per cent of copper. One of these samples also yielded 47.56 per cent of lead. Another gave 38.35 per cent of lead, nearly one ounce of silver and half an ounce of gold to the ton of lead.

OTHER DEVELOPMENTS

In the Michipicoten mining area and adjoining the Grace and Star Mines, is the Pioneer Mining Corporation headed by Dr. MacIntosh Bell, the well-known and successful mining engineer of the Huronian Belt Company of London, England. To Mr. Bell's vision, perseverance and ability are due the success of such mines as Keeley Silver, Vipond Gold, etc., etc.

Dr. MacIntosh Bell is operating the Minto, Jubilee and Cooper properties, as well as the Wawa Group and Michael Syndicate claims and others immediately adjoining the Grace and Star properties. The shaft on the Minto is now being continued to 350 feet in depth while cross-cutting and diamond-drilling proved up a large tonnage of commercial ore, and we understand a milling plant of about 350 tons daily capacity will soon be erected.

SUMMARY

GRACE AND STAR MINES (GOLD)

The total area of these properties is approximately 1,240 acres, with rich showings and commercial grade ore. The shaft is down 430 feet, with cross-cuts and drifts at the different levels and a number of diamond drill holes to a depth of 500 feet showed considerable ore available. 1,150 feet compressor with hoists and all the necessary machinery and electric motors to economically develop the property are now installed and supplied with hydro-electric power at a minimum cost. The property has a sufficient number of buildings to house all the men required, and hoist and shaft house, etc., capable of developing the property for years.

ENTERPRISE (LEAD) MINE

This property has a strong vein on the surface with outcroppings for about 3,000'. A shaft 180 feet in depth with drifts of 225 feet showing the vein at that depth rich in lead five feet in width. A number of new buildings have been erected and a small plant for further developing the property is now being installed.

It is proposed to erect a concentrating mill and later a smelter, as soon as sufficient ore is blocked out.

The property is immediately on the railroad and economical operation can be conducted as there is sufficient labor at all times, and it is within 30 miles of Port Arthur on a good automobile highway.

LIMITED SHARE OFFERING

Until further notice and subject to prior sale and advance in price with right reserved to reduce or reject any or all applications, a limited number of shares of the Capital Stock of the POWER & MINES CORPORATION, LIMITED, are offered by the undersigned at the price and on the terms quoted in accompanying letter or application form. This is a pro-listing offer, and in due course it is intended to make application to list the shares of the POWER & MINES CORPORATION, LIMITED, on established and recognized exchanges.

Orders may be telephoned or telegraphed to our expense.

Address communications and make payments to—

CANADA CO-OPERATIVE FINANCE CORPORATION,

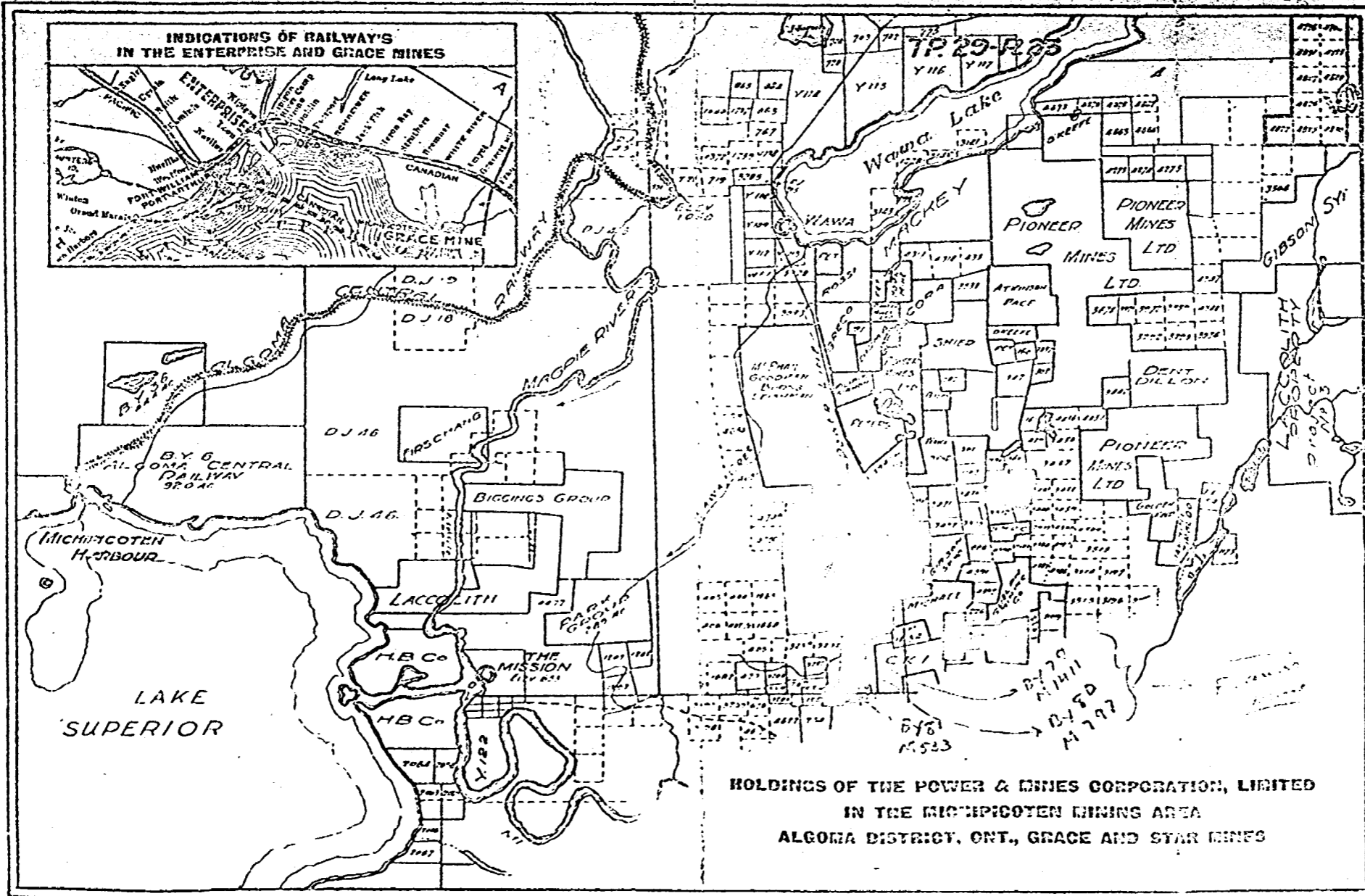
Room 307, Bank of Toronto Building,

260 St. James Street,

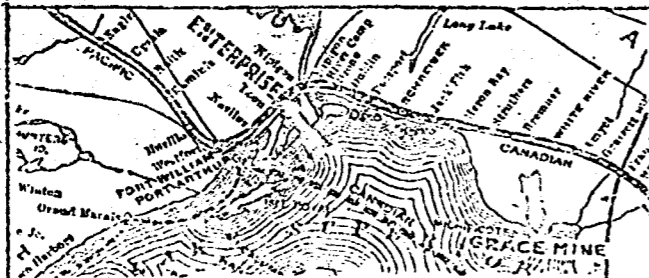
MONTREAL, CANADA

MAin 8066

The information contained herein has been very carefully compiled and is therefore believed to be thoroughly reliable and dependable although not guaranteed.



**INDICATIONS OF RAILWAYS
IN THE ENTERPRISE AND GRACE MINES**



**HOLDINGS OF THE POWER & MINES CORPORATION, LIMITED
IN THE MICHIPICOTEN MINING AREA
ALGOMA DISTRICT, ONT., GRACE AND STAR MINES**

SYNOPSIS OF REPORT ON THE GRACE MINE
Michipicoten District
Ontario - Canada.

BY
W.E. SIMPSON.

The location of the property is 5 1/2 miles from Michipicoten on the North-east shore of Lake Superior.

An excellent steamer service in Summer Connects Michipicoten with Sault Ste. Marie, whil, in winter, transportation is effected by sleigh-road from Anjigami on the Algoma Central and H.B. Railway main line. A still better route to the Railway can be created through Wawa, a flag station on the Michipicoten branch of the Algoma Central, which will bring Toronto within 24 hours travelling from the mine.

The property was operated as a gold producer on ore worth over \$20.00 per ton, over 20 years ago, when practically nothing was known of the economic geology of the district, the management left much to be desired, the operating costs were high, and the methods of gold-saving were of the crudest possible description.

Recent exploration work in stripping the surface in many parts of the property has proved the similarity of the geology of the Grace Mine to that of the Porcupine District, and sedimentary formations have been uncovered which indicate the probable existence at depth of ore-bodies of infinitely greater importance than anything so far worked in this neighbourhood. The value of these ore bodies can be determined by the use of a diamond drill.

A series of drill holes to test the veins at 500 feet deep should be undertaken and on these proving successful, another series should be drilled to explore the neighbourhood of 100 feet in depth.

There is an incline shaft 304 feet deep already on the property and on the drill holes proving satisfactory, the depth of exploration by shaft-sinking should be extended to at least 600 feet.

A mill, erected on the property over 20 years ago, can be modernized rapidly and, as Hydro-Electric transmission lines, from the Michipicoten Falls power plant, 5 miles distant, actually cross the property, an abundance of electrical power can be quickly brought into commission and the mine made a gold-producer in an almost incredibly short time.

The sum of say \$50,000. should be available for diamond drilling; \$100,000. for mine development, and another \$100,000. for re-organizing the mill to a capacity of 100 tons daily.

The most favourable geology, accessibility, comparatively small capital outlay, and the rapidity with which the Grace Mine can be made a gold-producer, renders it one of the most attractive prospects offering in Canada today.

October 1st, 1924.

Assoc. Royal School of Mines,
Mem. Inst. Mining and Metallurgy,
Mem. Canadian Mining Institute.

**DUPLICATE COPY
FOR QUALITY ORIGINAL
TO FOLLOW**

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SYNOPSIS OF REPORT ON THE GRACE MINE

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Ontario

Canada.

BY

W.E. SIMPSON.

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Mem. Inst. Mining and Metallurgy,
Mem. Canadian Mining Institute.

Report on Grace Mine and Adjoining Properties-Michipicoten Area

Location: The Grace Mine is situated east of Michipicoten Mission on Lake Superior and is reached from that point by a wagon road 5 1/2 miles long, which is passable for a team and wagon. Michipicoten Mission is about 6 miles south of Michipicoten harbour, by motor launch, which is reached from Hawk Junction of the Algoma Central Railway by a spur of the railway 26 miles long, on which there is a service by gasoline car. Michipicoten Mission may also be reached from Wawa on this spur by a wagon road about 6 miles long.

In winter-time Michipicoten Mission is reached from Mile 148 on the Algoma Central by a winter road 19 miles long.

General

Geology: The area in question is underlain by volcanic flows and sediments, probably of the Keewatin formation, generally classed as "greenstone", with Algoman granite about 2 miles to the north. On the Grace and adjoining claims, however, the greenstone has been very largely intruded by a basic feldspar porphyry, so that only remnants and inclusions of the original greenstone are left. This feldspar porphyry has evidently been again intruded by granitic porphyry with large quartz crystals, in some places being almost a granite; the whole forms a somewhat tangled complex, which, owing to the heavy overburden, is difficult to work out.

There are four main zones of schisting in the area, as shown on the accompanying plan. The chief one of these is the one running slightly east of north through the centre of the Grace property on to the "Frances Group" to the south. These schisted zones are probably wider and more irregular than as actually shown, but the overburden does not allow them to be definitely defined.

There are numerous quartz veins in the area, but time and an imperfect knowledge of the ground did not permit me to examine all the showings except the principal ones.

Most of the quartz veins are extremely irregular in width and strike, in most cases cutting the schisting at an angle, and do not seem run for any great distance.

Copied by MEB.
Trail, B. C.,
Dec. 8, 1925.

SEE MAP FILE

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MINES	4219
Register No.	3915
Indexed by	_____
Date	_____

Copied by MEB.
Trull, F. C.,
Dec. 8, 1925.

SEE MAP FILE

*Suggest indexing
as all on property
Cross referenced
credit to Grace
have been made
for others.*

Past History

The first gold shipped from the mine was in 1903 when it belonged to the Algoma Steel Co. The average gold content of the ore at that time was reported to be \$20.00 per ton (after hand-sorting) and about 25 tons were milled a day.

The property has passed through several hands since then, with some little production, and now belongs to Mr. Angus Gibson and others of Toronto, who have optioned it to the Canada Gold Syndicate, of which Col. Royce is president.

To date the shaft on the Grace vein is down 327' with a total of 700' of drifting on the 100', 200', and 3-0' levels. The underground workings are now completely flooded, so could not be examined without considerable expense, but the ore is reported to be stoped out from the 200' level to the surface for a distance of approximately 150' on each side north and south of the shaft with some stoping started on the 300' level.

Last year the Canada Gold Syndicate did considerable trenching on the various shear zones to the north and south of the mine and also put in three diamond-drill holes on the vein itself.

Inefficient managemtn and old-fashioned milling methods is given as the reason for the mine's failing to develop in its early stages. The Algoma Steel Co. are said to have had 50 men working on the property with only 16 underground. There is a dump of concentrates by the mill said to assay \$17.50 per ton (300 tons), and it is reported that the tailings from the mill average around \$2.50 per ton.

There are very conflicting reports as to the values found in the waste-dump. It is said that free gold may be found in some specimens and the present caretaker informed me that at one time the then owners of the property allowed him to make a mill-run for himself and that he cleaned up about \$4,800.00, by careful picking.

Equipment

All machinery was originally run by steam, but with the establishment of the power plant at Michipicoten Falls was converted to electricity. There are three boilers at the mill, one in fair condition, and two at the shaft-house worn-out; one ordinary single-cylinder steam engine for running the mill and one 50 H.P. electric motor; two steam driven 3-drill compressors (could probably be put in commision) and one electrically-driven 6-drill compressor with motor and one hoist converted from steam to electricity, hoisting a 1 1/2 tons skip. The latter compressor and hoist are in fair condition. There is also a small boiler for hte pumps, of which there are 4 steam pumps, one in working order and one electrically-driven piston-pump with 7 H.P. motor, which is said to be able to handle all the water in themine.

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POOR QUALITY ORIGINAL
TO FOLLOW

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The mill consists of a 60-ton ore-bin feeding to a Blake crusher crushing to about 1" feeding to two 5-battery stamp mills with amalgamation plates. There are also three concentrating vanners of an obsolete pattern for treating the tailings. The mill, although of antiquated design, could probably be put into operation and is said to have a capacity of about 25 tons per day (two 12-hour shifts) using 60-mesh screens with the stamps.

The mill-house is of corrugated iron and in fair condition. There is a transformer to step-down the 10,000 volt current delivered by the present power plant at Michipicoten Falls to the mine's requirements.

The cook-house, mine office and assay office are all in good condition, but the bunk-houses, with a capacity for 30-4- men are somewhat dilapidated.

There is a small diamond drill on the property capable of drilling a 600-foot hole and said to be in good working order.

Power

At Michipicoten Falls the Algoma Power Co. some years ago established a plant generating about 1300 H.P. delivering current to the mines at 10,000 volts. The plant and powerline are still intact, although the powerline is somewhat in need of repairs. There is a drop of over 100' at the falls and there are at present two units, one of 600 K.W. and one of 450 K.W.

The Insull interests of Chicago now are said to have an option on the powersite and are contemplating largely increasing the power for transmission to Sault Ste. Marie and to any mines that may start up at Goudreau or Michipicoten. There is said to be a possible development of over 25,000 H. P.

General Description
of Showings:

The original Grace vein (hereafter referred to as the "Grace Vein") strikes N. 25° W. and lies on the north end of the line between claims D. J. 7 and D. J. 8. Nothing could be seen of the outcropping of the vein as to the south of the shaft it is entirely covered by the waste dump, while to the north the only place where it was exposed has been stoped out. (Location of Number 2 Shaft).

The vein dips about 70° to the east. The hanging wall is a basic feldspar-porphry and the footwall probably a highly altered greenstone. The walls are practically unshisted and only mineralized in the immediate vicinity of the quartz. The quartz seems to average 2-3' in width.

At the 200' level, the shaft is said to leave the original vein and to continue on another intersecting vein, which does not reach the surface.

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TO FOLLOW

The vein is evidently not traced for a total length of more than 250'-300'. About 100' northwest of the shaft along the strike, there is a narrow belt of conglomerate and some sediments or greenstone with a northeast schisting and some oxidisation which appear to cut off or deflect the vein; it is thought by some that the vein is deflected here and becomes what is known as the "mariposa contact vein", following the contact between the porphyry and greenstone, striking N. E. across claim D. J. 11. I was unable to find any evidence of this vein, except some schisted and slightly oxidized porphyry from which low assays have been obtained, what few trenches there were having caved in. There is, however, considerable work done on what is evidently the same vein on claims J.D. 2 and J. D. 4-the "Mariposa property" where considerable free gold is said to have been found and a grab-sample assaying \$316.00. These workings, however, were completely flooded and nothing could be seen except some quartz on the dump.

The Grace vein, on the other hand, is said to have been followed underground to the boundary of the "Star" claim to the north (originally the Star Mine) underneath the conglomerate and sediments mentioned above. It may have been again picked up in a shaft on the Star claim, 450' northwest of the Grace shaft on the strike; this, however, was completely flooded and timbered and nothing could be seen; samples taken here some years ago for Mr. Roth, the then owner of the Star Mine, are said to have run \$10.20 and \$6.20. Between this shaft and the Grace shaft, however, is an intrusion of diabase which probably cuts off the vein. Another sample said to have been taken on this shaft last year is reported \$4.20 and a sample from the dump \$1.00.

To the northwest of this shaft again on the Star claim is another shaft exposing an 18" quartz vein striking N.E.

To the west of the Grace shaft a parallel quartz vein 18" wide in greenstone schist is exposed. I took sample No. 748 here across 2 1/2'. This vein is said to have again been picked up to the northwest on the Star Claim with assays taken for Mr. Roth, running \$3.20 and \$1.40, but I was unable to find any workings.

Towards the east side of the Star claim is a shaft exposing another parallel vein striking northwest. Samples taken here for Mr. Roth are said to have run \$17.50, \$14.60 and \$22.60 and a sample taken last year \$1.00 and two samples off the dump \$1.20 each.

What is probably a continuation of the Grace vein is picked up south of the mill near Trout Creek. The quartz, however, is here only a few inches wide. A sample taken last year is said to have run only \$3.20.

To the north of the Star claim are two parallel zones of schisting striking about N. 40° E. and intersecting the main north and south zone running through the centre of the property.

On the most southerly of these two zones near Royce

The vein is evidently not traced for a length of more than 250'-300'. About 100' northwest of the shaft along the strike, there is a narrow belt of conglomerate and some sediments or greenstone with a northeast schisting and some oxidation which appear to cut off or deflect the vein; it is thought by some that the vein is deflected here and becomes what is known as the "Mariposa contact vein" following the contact between the porphyry and greenstone striking N. E. across claim D. J. 11. I was unable to find any evidence of this vein, except some schisted and slightly oxidized porphyry from which low assays have been obtained. A few trenches there were having caved in. There is, however, considerable work done on what is evidently the same vein on claims J. D. 2 and J. D. 4-the "Mariposa property" where considerable free gold is said to have been found and a grab-sample assaying \$316.00. These workings, however, were completely flooded and nothing could be seen except some quartz on the dump.

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To the northwest of this shaft again on the Star claim is another shaft exposing an 18" quartz vein striking N. E.

To the west of the Grace shaft a parallel quartz vein 18" wide in greenstone schist is exposed. I took sample No. 748 here across 2½'. This vein is said to have again been picked up to the northwest on the Star Claim with assays taken for Mr. Roth, running \$3.20 and \$1.40, but I was unable to find any workings.

Towards the east side of the Star claim is a shaft exposing another parallel vein striking northwest. Samples taken here for Mr. Roth are said to have run \$17.50, \$14.60 and \$22.60 and a sample taken last year \$1.00 and two samples off the dump \$1.20 each.

What is probably a continuation of the Grace vein is picked up south of the Mill near Trout Creek. The quartz, however, is here only a few inches wide. A sample taken last year is said to have run \$3.20.

To the north of the Star claim are two parallel zones of schisting striking about N. 40° E. and intersecting the main north and south zone running through the centre of the property.

On the east southerly of these two zones near Royce

Lake is a quartz vein cutting the schisting at an angle running east and west and reported to have given samples of free gold; the vein has been exposed for about 200', but is very irregular in some places being over 10' in width and narrowing down to 2' and pinching out towards the west end. The quartz and schist is slightly mineralized. A sample of decomposed schist taken last year ran \$0.40. Sample No. 736 was taken by myself across 3' of quartz. The country rock here is basic porphyry. This shear zone cuts the main north-south zone in porphyry and greenstone with some traces of oxidization. Sample No. 740 was taken by me here across 5' of slightly oxidized and weathered greenstone schist.

The northerly of the two N. E. schisted zones has been extensively trenched and consists of a series of small "breaks" in a complex consisting of basic feldspar porphyry intruded by granitic porphyry with some greenstone inclusions. These breaks show signs of considerable oxidisation, but do not appear to be very continuous; some have small intrusions of quartz. Sample No 737 was taken across 6' (chip sample) across one of these breaks, about 600' from the intersection with the main shear zone in very oxidized granitic porphyry; Sample No. 738 was taken across 5' of slightly oxidized schisted porphyry with some quartz at the intersection with the main shear zone, and Sample No. 739 was taken across 5' of slightly oxidized schist in the main shear zone at this intersection. No trenching has been done on either of these schisted zones west of their intersections with the north-south zone.

The main shear zone has been traced from Ward Lake on the north to Mountain Lake on the south. On its northern end it is chiefly in altered basic porphyry; the centre is chiefly greenstone with slight oxidization. Assays all in the neighborhood of \$0.20 were obtained here last year.

Near Mountain Lake the country rock is entirely granitic, probably granodiorite, and schisted over a considerable width. On the east end of Mountain Lake is a quartz vein about 18" wide running with the schisting, but evidently not continuous. An assay taken here last year ran \$0.60.

About 200' to the west is another vein 4' wide cutting the schistosity at right angles and slightly mineralized; samples taken in this neighbourhood last year are reported to have run \$74.00 and \$14.00. A 4' sample No. 741 was taken by me across this vein. It is not known if this vein continues.

There is said to be a schisted zone running east from here across Bond lake, but no evidence of this could be found, owing to overburden. A vein said to cross Bond Lake running north and south gave low assays last year, but nothing can be seen of it except some float.

The main north-south shear zone evidently continues on south across the Frances group, which is described hereafter.

War Eagle and Sunrise Groups

Reports on these claims are included with the Grace report as the veins found seem to be part of the system found

Lake is a quartz vein cutting the schisting at an angle and running east and west and reported to have given samples of free gold; the vein has been exposed for about 200', but is very irregular in some places being over 10' in width and narrowing down to 2' and pinching out towards the west end. The quartz and schist is slightly mineralized. A sample of decomposed schist taken last year ran \$0.40. Sample No. 736 was taken by myself across 3' of quartz. The country rock here is basic porphyry. This shear zone cuts the main north-south zone in porphyry and greenstone with some traces of oxidization. Sample No. 740 was taken by me here across 5' of slightly oxidized and weathered greenstone schist.

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The main north-south shear zone evidently continues on south across the Frances group, which is described hereafter.

War Eagle and Sunrise Groups

Reports on these claims are included in the Grace report as the veins found seem to be part of the Frances group.

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on the Grace property.

The "War Eagle" claim is marked D. J. 97 and belongs to the Michael Syndicate of which Mr. Pinard of Sault Ste. Marie is the representative and which also owns claims examined by me in Goudreau.

The "Sunrise" group is the group immediately to the south of this and is owned by Mr. W.W. Smith of Sault Ste. Marie, Michigan, and also was in charge of operations on the Grace property for the Canada Gold Syndicate last year. (I am given to understand that Judge Chapman of Sault Ste. Marie, Mich., now holds this group).

Through the centre of the War Eagle claims runs a schisted zone striking N. 40° E., which is again picked up on the corner of D. J. 86, belonging to the small detached group of claims belonging to Grace property to the east; at this point the schisted zone is in feldspar porphyry and is evidently very little mineralized and samples taken last year ran very low.

In the Centre of the War Eagle claim considerable work has been done on this zone; at this point the shearing is intense across a width of about 20', with considerable oxidation and mineralization-chiefly arsenopyrite. The country rock is feldspar-porphyry intruded by granitic porphyry. The schisting is cut by a 3'-4' quartz vein striking slightly west of north and thought by some to be a continuation of the Grace vein-this, however, seems highly doubtful in view of the irregular character of the quartz veins in the area. The vein where it cuts the schisting is offset and soon pinches out, but seems fairly strong on the north side. A 5' sample No. 747 was taken across this vein north of the shear zone.

100' to the southwest this shear zone is intersected by a second schisted zone, or possibly by a small fault. This second zone strikes east and west, but only continues a short distance to the west. At the point of intersection a large quartz vein up to 15' in width has been intruded with a strike east and west. Sample No. 746 was taken across 8' of this vein (chip sample). It is uncertain whether this vein continues farther; it is reported to have been picked up to the east on the detached portion of the Grace group, but I was unable to locate this place.

Further to the southwest the main schisted zone is cut by another quartz vein on the Sunrise Group. This vein is about 1/2' wide and strikes N. 35° W and is stripped for about 100'. Assays of \$28.50 and \$8.80 are reported by Smith. Sample No. 749 was taken by me across 3 1/2'.

I am not quite clear whether the War Eagle Claim is included in the option of the Canada Mines Syndicate, as it is marked as being included in the Grace property in one of the maps in my possession and not in the other. This is a point which can doubtless be ascertained.

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Conclusions and Remarks

It seems perfectly clear that any ore-bodies on these properties will be of the nature of small, fairly high-grade quartz vein, rather than any wide widths of mineralized schist with commercial average values. The one exception to this statement is the shear zone on the War Eagle claims, which seems fairly well mineralized for a short distance at any rate, and from which assays running around \$7.00-\$8.00 are said to have been obtained; these, however, must have been taken in oxidized and decomposed matter, as I did not see any place where the solid was exposed where a reliable sample could be taken.

It seems to me that in the work done last year for the Canada Gold Syndicate, too much attention was paid to the so-called shear zones on the property, which I judge to be somewhat barren and do not anticipate any very good results from the samples I took there, even though they were of necessity taken in somewhat oxidized and decomposed schist.

As matters stand, very little can be seen on the surface of the quartz veins on the original Grace and Star claims, which, on the whole, still seem to be the most promising as they have been known to produce pay ore, although for all that can be told to the contrary, most of the best ore may have been extracted.

Outside of the above, the best looking veins seem to be the one near Royce Lake, the one near Mountain Lake and possibly the one on the Sunrise Group. There are other veins marked as having been found, but I was unable to locate them and I do not believe that they are of much account.

It will be noticed that the veins are what may be called "fissure veins" for the most part, that is, they cut across the schistosity and for that reason seem to be extremely irregular and in all probability are not very long.

For that reason, I would judge that there is not much possibility of there being anything in the nature of a big mine on the property, although there may be some short ore-shoots of high-grade ore. As stated above, the one possible exception to this may be the War Eagle, but more work would be necessary below the oxidized surface to prove that there is any likelihood of sufficiently high values.

I am told that a working option on the War Eagle group and the Sunrise may be had very reasonably.

Copied by MEB.
Trail, B.C.,
Dec. 9, 1925.

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P. F. O'plan