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SUMMARY REPORT ON A MINERALLOGRAPHIC

STUDY OF

RENO & DENTONIA GOLD ORES

by

J. G. Gray in collaboration

with H. W. Agnew

April 19, 1934

ACKNOWLEDGEMENTS

The writer is indebted to Drs' H. V. Warren and S. J. Schofield who provided the material and advice in the preparation of this account. Also to E. Johnston and H. C. Edwards, who made the assay determinations described, which facilitated the compilation of the material. He wishes to express his appreciation of the amiable co-operation of H. W. Agnew, in the preparation of the ore specimens and polished sections. D. Pollock supervised the microphotographic work.

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MINERALOGRAPHIC STUDY OF DENTONIA GOLD ORE

INTRODUCTION

The Reno Gold Properties consisting of sixteen Crown granted claims and three claims held on location are situated at the head of Fawn Creek, a tributary of Sheep Creek. A branch road leaves Sheep Creek Road at an elevation of 3,1oo feet and climbs to the mine buildings at an elevation of 6,2400 feet above sea level. The total distance to Salmo, the nearest point of supplys and railroad communication is approximately 15 miles. The property was located in 1914 and brought into active development in 1928 with production following in 1929. Since then considerable mining has been carried on.

REGIONAL GEOLOGY AND MINERALIZATION OF THE AREA

The greater part of the area is underlain by sedimentary rocks which are intruded by large and small masses of the Nelson batholith. The sedimentary rocks include the Summit and Pend d'Oreille series of Daly which are the same rocks mapped as Lower Selkirk and Niskenlith by Brock and McConnell. The whole sedimentary succession is folded into a series of anticlines and synclines with northerly strikes exposing the lower part of the series in the eastern side of the map area and the upper part to the west. A shallow syncline striking about 15 degrees east of north lies close to the east side of the map area and is followed to the west by a shallow anticline striking roughly along the summit of the Nelson Range. These two folds expose the grits and quartzites of the lower part of the series. West of this anticline lies a deep syncline exposing the schists of the upper part of the series. This deep syncline is followed toward the west by a closely folded anticline overturned in part towards the west exposing the quartzites of the lower part of the series. The axis of this anticline strikes through Stagheap mountain, Mount Vernon and to the east of Reno Mountain. It pitches steeply to the south of Stagheap mountain. West of this anticline is a broad syncline followed by a broken anticline both structures exposing the upper schists.

MINERAL DEPOSITS

The mineral deposits are of two distinct types and are found in well defined belts. Zinc and Zinc-lead replacements in limestone are found along the westerly anticline and gold fissure veins are found along the central quartzite anticline. Some gold deposits lie to the east of this anticline and to the west between it and the zinc belt are some sulphide deposits carrying gold.

The gold deposits of what may be considered in the heart of the area, namely at the junction of Wolf and Sheep Creek, occur as fissure veins cutting quartzites and schists. The sediments strike north to 15 degrees east of North and dip from 50 degrees east to vertical and steeply west. The fissures strike 60 degrees east of north to east and the dips are generally high to the south to vertical.

Displacement on the fissures varies from a few feet to about 200 feet and in all cases observed the south wall has moved west in relation to the north wall.

The ore shoots appear to be confined to the quartzites and harder argellaceous rocks, the fissures being tight with little vein matter where they cut the schists.

GEOLOGY OF THE RENO PROPERTY

Two veins occur on the Reno ground but so far prospecting and development work has proved but one vein, namely the Reno, to carry commercial values. On No.4 level the vein is first seen about 95 feet from the portal where it is very tight and ill defined but can be followed for 60 feet when it splits the north split entering the north wall of the workings 15 feet from the split and the south split following the south wall for 27 feet to a small fault. The adit does no expose the vein for the next 60 feet or to point 225 feet from the portal. It is then exposed for 21 feet along the north wall between two small cross slips or faults. For 20 feet the vein is again lost when it reappearsin the north wall. It is possible that to this point the vein exposed is not the main fracture but a southerly split and that the main vein now appears for the first time. From this point it has been drifted on to the face and is seen to be a small fracture pinching and swelling. At 370 feet from the portal a raise connects with No. 3 level. Beside the raise galena appears in the iron stained quartz gangue, an indication that although the bottom of the exidized zone has not been reached a change is taking place and primary ore may be expected at any depth.

A cross cut has been driven 300 feet south from a point 315 feet from the portal without disclosing any parallel fractures.

No. 3 level is 138 feet vertically above No. 4 and the portal is 220 feet easterly from No. 4 portal. In August 1929 this had been driven 732 feet. The vein was intersected 96 feet from the portal and kept in the north wall of the drift for 111 feet then lost for 30 feet, again opened and kept in the north wall for 60 feet to a small slip with about 5 feet displacement carrying the vein to the south wall of the drift. Twenty four feet from the slip the vein splits and the workings followed the southerly slip which seem dried out. A crosscut to the north shows the main fracture crossing it. For 235 feet the adit is to the south of the vein which is again encountered and followed for 160 feet to the face. Two are shoots occur on this level, the first starting where the vein was first cut at 96 feet from the portal and the second where the vein was intersected 160 feet from the face.

No. 1 level 123 feet above No. 2, is 162 feet east from it. It is a short adit splitting at 30 feet with a 39 foot branch to the northeast and an 84 foot branch to the east. A vein shows in the last 12 feet of the northeast branch which appears to be the main fracture. A minor fracture shows along the east drift.

Surface stripping has shown the vein to continue easterly to the top of the hill 510 feet from the portal of No. 1, adit and 230 feet above it in elevation.

The Reno vein cuts a series of quartzites, argellaceous quartzites and siliceous argillites which come at the top of the series of quartzites and form a transition between it and the highly argellaeious series higher in the section. The argellaeious series starts just west of No. 4 portal and continues westerly. The series which the Reno vein cuts is about 1600 feet thick and below it or to the east in the section is about 900 feet of colcareous and argellaeious schist and limestone and then the main quartzite series.

The face of No. 3 level is about 300 feet west of a point vertically under the crest of the ridge. The distance from the face easterly to the contact with schists and limestones is about 550 feet.

From about 125 feet from the face, the vein should cut uniformly harder rocks than has been so far encountered. Whether oxidation will reach the depth of No. 3 level farther into the hill and whether ore shoots will be found only development can prove. There is, however, favorable ground so far as the rock formations are concerned ahead of the present face for some 500 feet on No.3 level.

The above account has been taken from the Canadian Geological Survey Summary Report Part A for 1929, pages 253-255 and 264-265 and written by J. F. Walker who reported on the property in August 1929. Since that time considerable further development has been carried on and from the accompagnying sketch of the mine workings drawn by the writer from the original loaned by Dr. S. J. Schofield and compiled at the mine during 1933 it is to be noted that mining is now being carried on some 350 feet below the level of the workings as seen by Dr. Walker. Judging from the ore samples upon which this report is based they show no signs of oxidation,being wholly of primary nature, it is interesting to note that Dr. Walkers prediction of a departure from the oxidized to primary zone within the vicinity of the third level has been proven out.

MEGA SCOPIC EXAMINATION

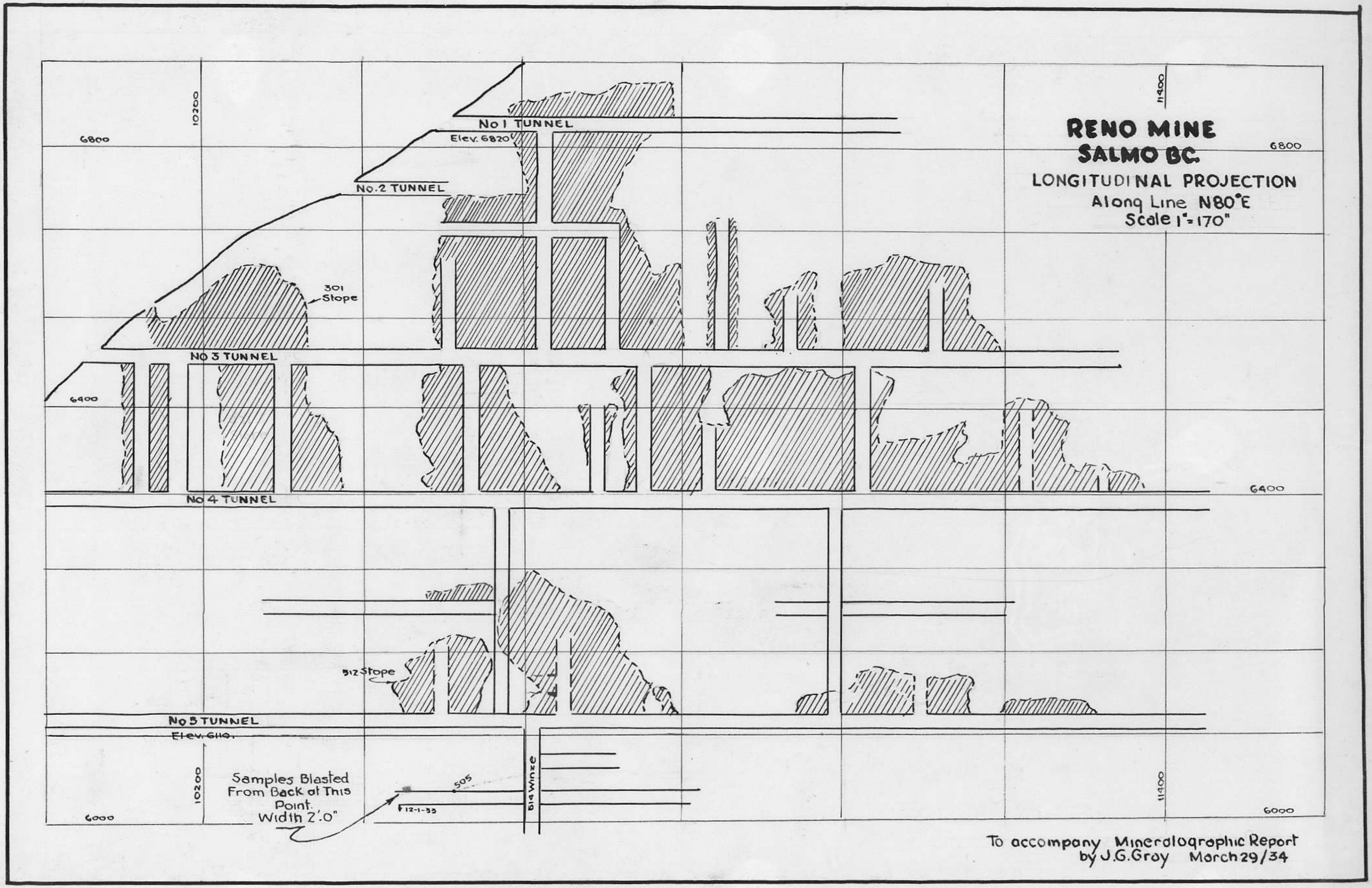
The ore specimens sent in by the operators and obtained in the mine at the point noted in the accompagnying sketch were recieved by the writer on Feb. 20, 1934. They consist of the following-

SACK NO.1-- Country Rock

SACK NO.2-- Ore

SACK NO.3-- Chip Sample taken across the vein.

From each sack representative samples namely R101AG to R107AG were selected and upon megascopic examination the following points were noted.


RENO MINE
SALMO BC.
LONGITUDINAL PROJECTION
Along Line N80°E
Scale 1"=170"
No 1 TUNNEL
Elev. 6820
No. 2 TUNNEL
No 3 TUNNEL
No 4 TUNNEL
No 5 TUNNEL
Elev. 6110.
301 Stope
512 Stope
514 Winze
505
12-1-33
Samples Blasted From Back at This Point. Width 2'.0"
6800
6400
6000
10200
11400
To accompany Mineralographic Report by J.G. Gray March 29/34

R 101 AG

Pyrrhotite replacing quartzite showing banding. The pyrrhotite is only slightly magnetic.

R 102 AG

Galena Sphalerite, Pyrrhotite and Chalcopyrite with quartz the latter showing the characteristic sugary appearance. The sphalerite exhibits good cleavage. Chalcopyrite is only thinly desseminated through the ore.

The characteristic iridescent stain on the pyrrhotite appears in all samples.

R 103 AG

Small stringer of Pyrrhotite veining the quartz. The quartz is also carrying galena and minor amounts of chalcopyrite.

R 104 AG

Sample showing gneissic character of the ore due to metamorphism and development of sericite with slickensided surface. Chalcopyrite, Pyrrhotite, Spholerite, and Galena are present with a good deal of quartz.

R 107 AG

Ore Sample rich in Sphalerite showing Adamantine lustre and prominent cleavage.

R 106 AG

Quartzite wall rock having a gneissic banding. A good deal of sericite is developed which has produced the banded character of the ore.

R 105 AG Representative specimens from the chip sample taken across the vein and submitted for assaying.

MICROSCOPIC EXAMINATION

With the co-operation of H. W. Agnew they were then prepared by means of grinding and polishing in the usual procedure preceding the microscopical examination. Following the method of M. N. Short the polished sections were ~~them~~ subjected to microchemical analysis and the following minerals were identified, Pyrrhotite, Sphalerite Galena, and Chalcopyrite in a gangue of quartzite ~~and it~~ the latter shows considerable development of sericite and an impregnation of pyrrhotite along microscopic fissures.

After a careful investigation of the polished sections the accompagnying diagrams were drawn and the signifigance of their features may be noted.

R 106 S--A

This reproduction represents the early stages of the advancement of the pyrrhotite through the spholerite and apparently following small parallel fractures. The close association with the quartz suggest that the pyrrhotite entered along small channels already partly filled with quartz and then small veinlets of pyrrhotite dissolved their way out along the minute fractures.

R 106 S--B

A later stage in the advance of the pyrrhotite where it has either completely surrounded the quartz by dissolving out the sphalerite or has carried it in solution.

R 107 S--A

Here we have a development of galena showing cleavage pits and enclsoing a small island of sphalerite and showing corrosion of the quartz along the main contact. It is interesting to note in this section that the galena, as shown by the small red patches, has entered in part through the intersections of small fractures in the quartz suggesting that the quartz is older than the galena and was subjected to metamorphism and fracturing just prior or during the mineralization. This is to be noted as from later consideration we will attempt to show that there are two generations of quartz and that which appears here is of the first generation.

R 107 S--B

A later development of galena enclosing small bodies of quartz and pyrrhotite and also veining the main quartz mass. From this we conclude that the galena is older than both the quartz and pyrrhotite.

R 102 S--A

Pyrrhotite as shown here is definitely younger than bothe the quartz and chalcopyrite.

R 102 S--B

From this diagram we may derive the relation of the four minerals. It is obvious that the quartz was already mineralized by sphalerite and chalcopyrite before the later generation of Pyrrhotite enclosed the three minerals.

R 104 S--A

This sections supplies an interesting feature for consideration in that the quartz (brown) is seen to be surrounding small masses of quartzite, which is the wall rock, and which in turn appears to have been mineralized by the pyrrhotite previous to the intrusion of the quartz. In all our other sections the pyrrhotite is definitely younger than the quartz but there it appears that the quartz is younger than the pyrrhotite and the conclusion drawn from this is that the quartz as shown in this sample is of second generation and also it is younger than the metamorphic period in that the quartzite appears to have been mineralized before movement or fracturing took place as shown in R 103 S.

R 103 S

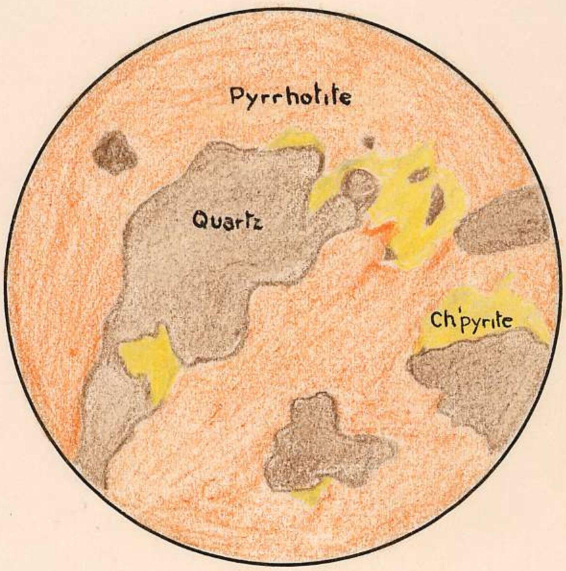
This shows the mineralization of the wall rock and the gneissic banding of the quartzite due to the development of sericite. There appears to be some evidence of movement here at a period later than the mineralization but before the intrusion of the second generation of quartz as the minerals are fractured and the fractured portions are displaced in relation to one another yet there is no appearance of fracturing in the quartz itself suggesting that it is younger than the movement and its very irregular contact indicates corrosion of the quartzite by solution.

Paragenesis

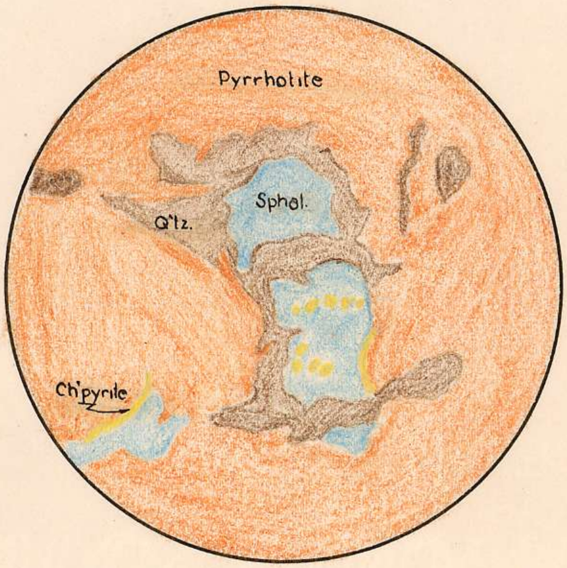
From the foregoing considerations the following paragenetic relation of the minerals has been derived;

PLATE 1

Section R102S A & B



R 102 S
A



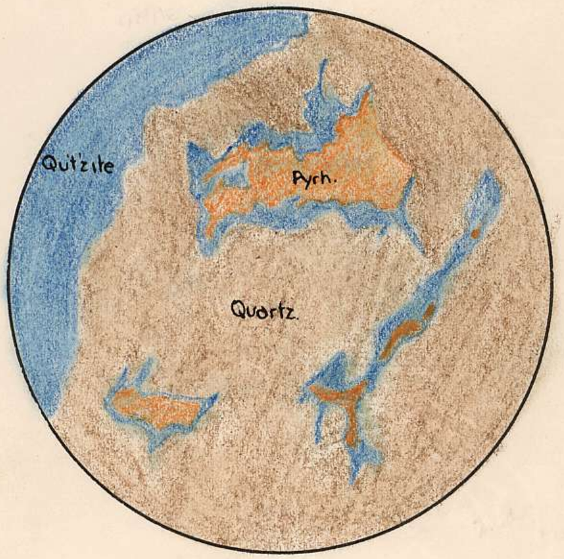
R 102 S
B

x40

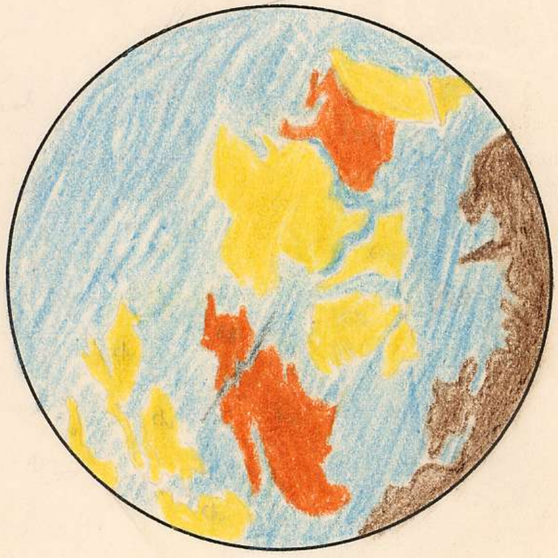
PLATE 2

Section R 104 S A

" R 103 S



R104S
A

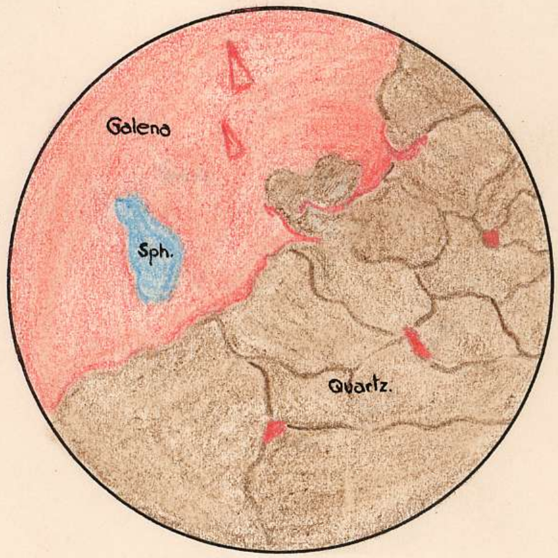


R103S

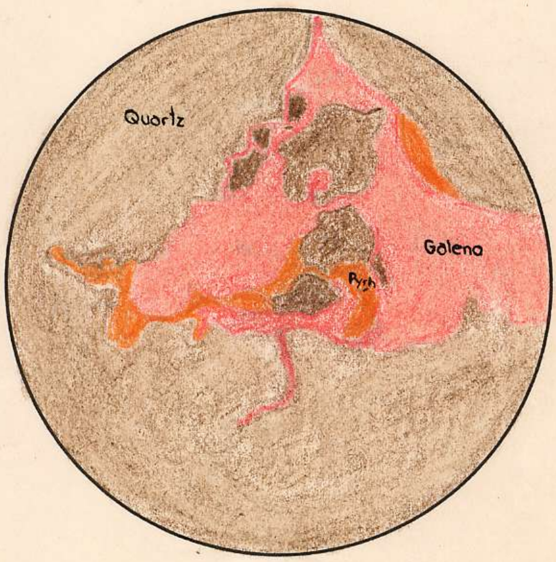
X40

<u>PLATE 3</u>

Section R 107 S A & B



R 107 S
A

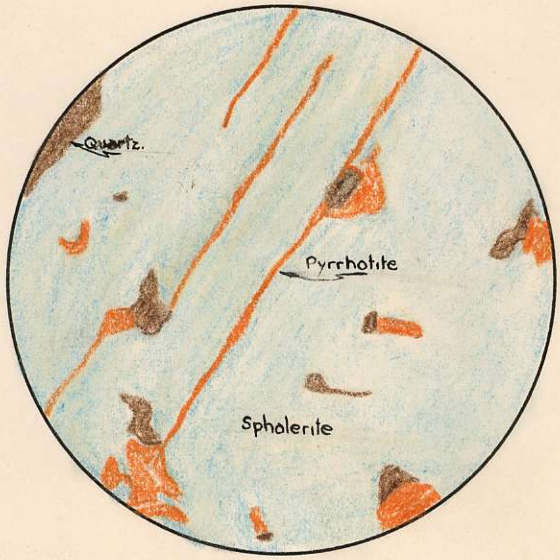


R 107 S
B

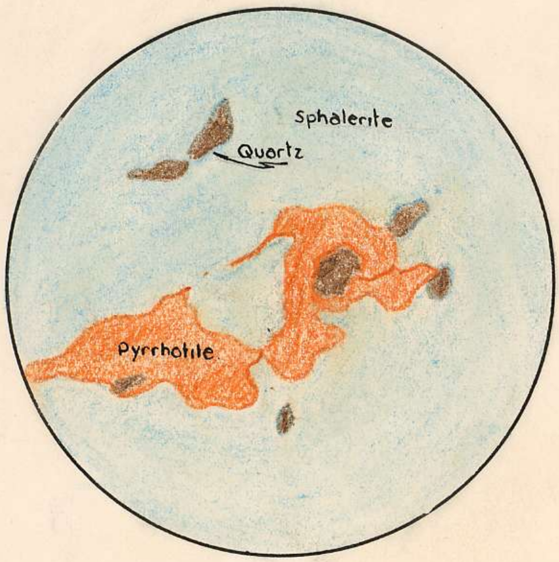
X 40

PLATE 4

Section R 106 A & B



R106S
A



R106S
B

X40

Quartz- (1st generation)

Sphalerite--Chalcopyrite

Pyrrhotite

Galena

Quartz-(2nd generation)

RELATION OF THE GOLD TO THE SULPHIDES

From an examination of the ore specimens under the binoculars no signs whatever of free gold were found and it is concluded that from this part of the mine at least the gold is in some phase linked with the sulphides. For the purposes of comparison, assays were made of the sulphides which were available in sufficient quantity to enable a relatively pure and representative sample to be obtained.

A fragment of Specimen No R 102 AG from which section No 102 S (plate 3) was made was taken & crushed to 10 mesh and from the screening about 10 grams of material were picked out under the binoculars and assayed as pure pyrrhotite, although as shown by the section there are minor amounts of quartz, chalcopyrite and sphalerite present. However as shown in the accompagnying analysis the sample consists of 76.25 % phrrhotite and for our purposes we will consider it pure pyrrhotite and the values obtained in it are indicative as such. The Sphalerite from which Section No. R 106 S (Plate 1) was made was treated in the same manner and the gold values obtained were considered as those carried by pure Sphalerite although as shown it is only 88.7 % pure.

To obtain the average value across the vein at this point an assay was made of the chip sample sent in by the mine (see Appendix A)

To obtain the average value across the vein a

The returns are as follows:

Pyrrhotite	--	17.64 oz/ton)	Assayer
Sphalerite	--	4.39 oz/ton	H. C. Edwards
Galena	--	Values shown)	
Chip Sample	--	9.90 oz/ton	E. Johnston.

In the case of the pyrrhotite, sphalerite and Galena the material selected was broken from fresh, washed samples. The chip sample was submitted for assaying as recieved from the mine operaters.

From the above results the signifigance of the Sphalerite and pyrrhotite content of the ore is readily seen and the relative proportions of the various sulphides in the ore are approximately as follows:

Pyrrhotite	---	20.61 %
Sphalerite	---	18.50 %
Galena	---	6.82 %
Chalcopyrite	---	4.5 %

ANALYSIS OF THE ORE

Proportions of the different sulphides and gangue material as computed from a consideration of 2 dimensions in the polished section reproductions which are considered to have been taken from representative samples of the ore as a whole and including the mineralized wall rock as a gangue material.

To obtain an average value in each specimen two different views of each section are considered.

SECTION NO	PYRRHOTITE	SPHALERITE	GALENA	CHALCOPYRITE	QUARTZITE	QUARTZ
R 106 S(A)	.68	5.79	0	0	0	.13
R 106 S(B)	.55	5.92	0	0	0	.13
	1.23	11.71	0	0	0	.26
PERCENTAGE--	9.3%	88.7%	0	0	0	1.90%
R 107 S(A)	0	.13	3.00	0	0	3.47
R 107 S(B)	.30	0	1.51	0	0	4.79
	.30	.13	4.51	0	0	8.26
PERCENTAGE--	2.27%	1%	34.10%	0	0	62.56
R 104 S	.47	0	0	0	1.365	5.13
PERCENTAGE--	7.12%	0	0	0	20.68%	77.7%
R 102 S(A)	4.725%	0	0	.52	0	1.355
R 102 S(B)	5.34	0	0	.07	0	.68
PERCENTAGE--	76.25%	3.8%	0	4.4%	0	15.4%
R. 103 S	8.33%	18.4%	19.9%	0	55.3	0
TOTAL -	103.27	92.6	34.10	22.8	75.98	177.4
ORE AVERAGE	20.61%	18.5%	6.82%	4.5%	15.2%	35.5%

CONCLUSIONS

From the investigation of this suite of ores by means described in this paper the following conclusions may be drawn. The Reno Mining Property is now being exploited in the primary zone of mineralization, the minerals being Pyrrhotite, Sphalerite, Galena, and Chalcopyrite in a gangue of quartz which is of two generations and the quartzite wall rock is mineralized to some extent. The gold content is in some phase linked with the various sulphides the largest persentage being found in the pyrrhotite and lesser amounts with the other minerals, very little, if any being found in the free state. At the point marked in the mine sketch, the ore contains approximately 20.61% Pyrrhotite, 18.5% Sphalerite, 6.82% Galena, 4.5% Chalcopyrite, 15.2% Quartzite, and 35.5% Quartz.

The ore body is of the high mesothermal replacement type, as indicated from the mineral association.and nature of the carrying rock which is a metamorphosed quartzite.

NOTES

A sample of the Pyrrhotite described under Secion R 102 S was submitted for assaying by the HATTON IMPROVED AMALGAMATION PROCESS and the returns showed considerable quantity of fine gold having been extracted from the sample. According to the writers understanding amalgamation can only separate gold when it is in the free state and as the inventor of the above process holds a similar contention in the application of his separation method by mercury then it is apparent that there must be some of the gold, at least, which is not in a combined phase with the pyrrhotite, and similarly the other sulphides, which has yielded to amalgamation. Unfortunately just what the percentage is, in comparison to extraction by fire assaying, cannot be given as the returns of Hatton's assay, which is in the possession of W. H. Patmore, who performed the recovery, is not in an available form for weighing up.

As no free gold was seen in the polished section, sample was taken under a magnification of 40, or in the various other samples, returns from the amalgamation would indicate that it is present and thus we must conclude that it is minutely disseminated amongst the sulphides, and our methods of polishing have not been of sufficient fineness to bring the polish out or that the magnification has been too low.

However, from previous personal observations of Mr. Hattons' ~~means~~ of which he prefers to keep secret, the writer does not wish to stress the point at the present time but merely offers it as a consideration the value of which will only be proven by a clarifying scientific investigation of the above mentioned process of gold recovery.

APPENDIX A

(1) CORRELATION BETWEEN THE POLISHED SECTIONS AND NUMBERED SPECIMENS

POLISHED SECTION NO.	PLATE NO.	SPECIMEN NO.
R 102 S	3	R 102 AG
R 103 S	2	R 103 AG
R 104 S	2	R 103 AG
R 106 S	1	R 106 AG
R 107 S	4	R 107 AG

(2) CORRELATION BETWEEN NUMBERED SPECIMENS AND SACK NUMBERS

SPECIMEN NUMBER	SACK NUMBER
R 101	3
R 102	3
R 103	3
R 104	1
R 105	3
R 106	2
R 107	3

(3) CORRELATION BETWEEN ASSAY SPECIMENS-- SECTION NUMBERS AND VALUES

POLISHED SECTION NO.	PLATE NO.	BOTTLE NO.	GOLD CONTENT	VALUES (at $20 per oz)
R 102 S	3	1	17.69	$355.60
R 106 S	1	2	4.39	$97.80
Chipped Sample		Tray No. 4	9.89%	$197.80

PART B

A MINERALOGRAPHIC STUDY OF THE DENTONIA MINES GOLD ORE

INDEX

Introduction

The Dentonia Mining property consists of a group of nine claims including fractions, namely" Jewel," " Anchor," "Ethopia," "Massachusetts," "Enterprise" "Imperial" fraction "Gem," fraction, "Lakeside" fraction and "Perserverance."

The mine is situated in the Greenwood mining area and the nearest point of supplies and railroad communication is the town of Greenwood to which it is connected by a truck read 8 miles in length.

The mine workings and camp are situated at an elevation of 3598 feet above sea level. The vein outcrops at an elevation of from 400 to 500 feet above Long Lake and near the summit of a timbered ridge which forms the easterly side of a narrow valley occupied by the Lake.

Geology

The area covers a contact zone between granodiorite and quartzites in which latter there appear to be sills of a basis flew rock resembling diabase in composition. Tongues of granitic rock have been injected into the adjoining formation onthe vicinity of the contact where also the intrusion of lamprophyre and parphyritic basalt-dykes have added to the complexity of the geology in this section of the mine. However, the fissuring is persistent except where foulted and slightly displaced by post mineral dykes, the vein from which most of the ore has been mined is described as a strong well defined fissure striking North and South.

The fissure zone can be traced from the Jewel workings to the "Etheopia", a distance of three thousand six hundred feet.

WORKINGS

The old mine works which adjoin the southern Boundary of the "Jewel" claim are extensive and consist of 5 levels which develop the vein to a depth of 539.6 Feet on the slope on to a vertical depth of 344 feet.

To the north from the main shaft the various drifts entered the disturbed area of the contact zone in which no ore of any great importance seemed to have been mined, judging by the old mine map. In the lowest level on No.5 the old records show a 120 foot length of ore that will average $8.00 on the south side of the shaft.

THE NO.1 LEVEL

This level which has recently been re-opened consists of an adit tunnel driven along the vein for 230 feet at which point it pinches to a narrow width. From here a 60 foot crosscut was driven to connect with the drift run on a parallel vein from the bottom of the "Rowe" shaft. Ore has been stoped to the surface for 65 feet from a point 35 feet from the portal.

The parallel or Westerly vein has been drifted on for 175 feet to the "Rowe" shaft but, owing to the greatly disturbed conditions surrounding the contact zone, the ore of mineable width only occurs in small shoats with doubtful continuity. Hence, while the values are good, no large tonnage can be expected between this level and the surface, which lies from about 100 to 150 feet above the level. In a small riase just beyond the "Rowe" shaft the vein suddenly ends and not enough work has been done at this point to determine the reason.

No. 1 INTERMEDIATE DRIFT

This drift has been driven from the Rowe shaft at an elevation of 50 feet above the No. 1 level. Near the shaft a small area has been stoped, past this point the vein consisting of a well defined shear without any ore, has been followed to a point directly under the "White" shaft.

Just why no ore occurs between the "Rowe" and "White" shafts either on the surface or underground is difficult to explain. It may possibly be due to the character of the wall rock, which in this locality appears to be an intrusive sill and hence not being as favorable as the granite or quartzites to form competent walls for the vein filling.

THE WHITE SHAFT

This shaft has been sunk to a depth of 75 feet on the vein at a point 315 feet to the North of the Rowe shaft.

Here the vein is a strong well defined quartz-filled fissure, having a banded or ribboned structure. It maintains the Northerly strike and dip of about 45 degrees to the east.

At a short distance below the cellar of the shaft, a small tonnage has been stoped by leasees along a distance of about 35 feet.

The ore shows strongly in the Northerly face of the stope, where 3 samples gave average of gold .69 ounces across a width of 29".

Between this shaft and the Enterprise shaft, open cuts clearly indicate the continuity of the vein for a distance of 410 feet.

THE ENTERPRISE SHAFT

This shaft has been sunk on the vein to a depth of 125 feet and shows the average width of ore to be four feet.

Proceeding to the North of the "Enterprise" shaft, not much stripping of importance has been done except at a point 365 feet from the shaft at the "Anchor" cut where a width of 2feet of ore running at $8.00 per ton is exposed.

At a point 400 feet to the North of the "Anchor" cut two opencuts 50 feet apart expose width of 22 to 24 inches of quartz carrying from $2.20 to $2.60 in gold per ton.

Between these cuts and "Ethiopia" workings which lie at a distance of 1000 feet to the North, no stripping of importance has been done.

The "Ethippia" workings lie at a short distance to the North of a strong aplitic dykes which cuts the formation in an Easterly and Westerly direction.

Two narrow veins are exposed in these workings and from which a small quantity of ore has been shipped from the surface. Continuity is not well defined due to dyke intrusions and in the present stage of development no great signifigance can be attached to this occurrence, except that it lies along the strike of the fissure zone.

The bulk of the above information has been quoted from A. G. Langleys report of October 1933 on the mine and from its context may be observed the reflection of the somewhat complex nature of the areal geology. The local igneous dykes and intrusions appear to bear a direct relation to the concentration of the mineralization in a well defined fissure zone and in some places to even cause its entire absence as for its example between the "Rowe" and "White" shafts where Mr. Langley has concluded that incompetency of the wall rock, which appears to be an intrusive sill, has served to destroy the continuity of the fissure zone for this distance but which may continue past this if the extension if of more competent material such as quartzite or granite.

The presence of aplitic dykes favors the possibilities of the region in that it indicates that the intruding magma was in its last stages of differentiation at this point giving rise to segregations of acid differentiates with which are normally associated the common mineralizers and hence deposition of ore bodies.

Apparently the aplite dykes owe their sources to the adjoining grano-diorite mass. However, contrasted with this, the presence of lamprophyres and porphyritic basalt dykes would indicate that they are either complementary dykes to the aplites or there has been a secondary differentiation or another period of magmatic intrusion which gave rise to the more basic dykes accompagnying which little mineralization would be expected and in this case conclude that the ore is related to the first intrusion.

The effect of the more basic members would then be to develop a secondary zone of fissuring and destroy the continuity of the pre-existing fissures.

In any case it is evident that the basic intrusives are secondary to the grano-diorite mass and should they have their origin in a basic mass cutting across or underlying the favorable grano-diorite and quartzites then the depth of this contact will determine the depth of mine and its productive life.

The above is in no way meant to be a definite conclusion but merely a suggestion as the source of the knowledge of the geology of the mine and area is confined entirely to that contained in this above mentioned report, the context of which was quoted earlier in this account.

MEGASCOPIC DESCRIPTION OF THE ORE

The specimens submitted by the mine operators were recieved by the department on Feb. 26, 1934 and consisted of seven tagged samples taken from the points indicated in the accompagnying mine sketch by A. W. Davis Mine Superintendent.

The megascopic description is as follows (see appendix B for correlation)
D 101 AG, D 104 AG, D 105 AG, D 106 AG, D 107 AG------Quartz carrying sulphides, namely, chalcopyrite, Pyrite and Galena and showing abundant content of sericite. There is some indications of oxidation, due to the destruction of pyrite giving a reddish iron stain.

D 108 Quartz carrying the undetermined antimony sulphide associated with chalcopyrite, pyrite and galena.
In general the above samples show a common mineralization and structure

and thus indicate the persistence of the vein along this level for the distance shown in the map with no change in ore character.

MICROSCOPIC DESCRIPTION OF THE ORE

D 104 S

Pyrite being veined by galena with which the chalcopyrite is associated. It is evident that the galena and chalcopyrite is younger than the pyrite.

D 105 SA

In this reproduction the 2 different generations of quartz are represented. The secondary quartz indicated by the blue patched area is carrying galena and chalcopyrite.

D 105 SB

Second generation quartz again is shown veining the primary quartz.

D 109S

Pyrite being veined by quartz which is younger than both the pyrite and chalcopyrite which it is enclosing. This appears to be secondary quartz.

D 110S

Galena is younger than the quartz which it is veining and enclosing small particles of. It is also younger, than the pyrite, chalcopyrite and the unknown antimony mineral.

D 107 S

Crystal of Quartz almost enclosed by galena.

PARAGENESIS

From the above descriptions we may conclude that there has been two generations of quartz and that the mineralization is related to the second generation with the following probable paragenesis of the minerals.

Pyrite

Primary Quartz

Chalcopyrite

Unknown Mineral

Galena

Secondary Quartz

The Paragenesis between chalcopyrite, the Unknown and Galena is not very distinct and it is quite probable that they are all of the same generation.

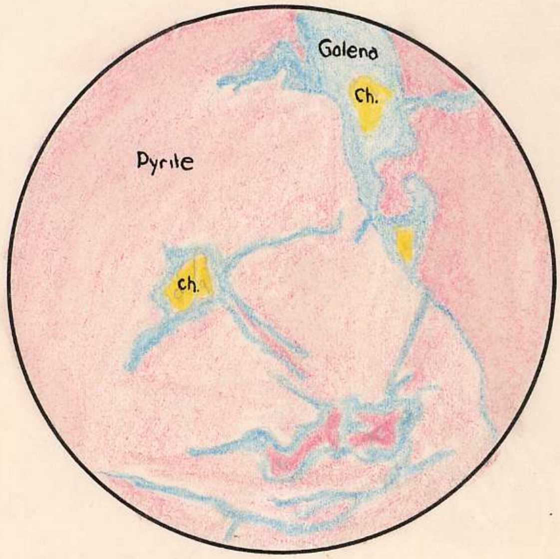
RELATION OF THE GOLD TO THE SULPHIDES

An attempt was made to separate sufficient of the sulphides in order to obtain the gold values in each but due to the finely desseminated nature of the minerals it was possible to obtain only small amount of pyrite which would be sufficiently pure to give a reasonably conclusive comparison. This sample was obtained from specimen D 104 A G from which section D 104S, Plate B was made. As shown this carries a certain percentage of galena and chalcopyrite, which could not be removed except by very fine crushing which would then be prohibitive to separation under the binoculars. The returns from this sample were 4.48 ozs to the ton (assayed by H. Edwards), showing that the gold is at least linked with one of the sulphides.

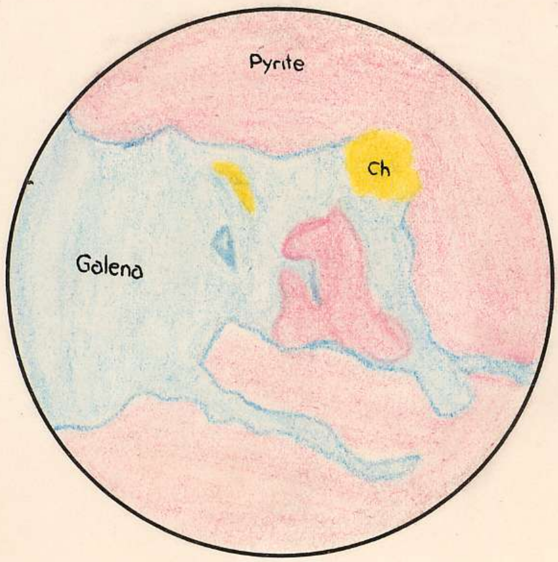
Although it is reported that the free gold is found in the ore none was seen in the specimens submitted, after careful investigation under a magnification of 40 either in the sections or in the rough hand specimens.

CONCLUSIONS

From the results of this investigation the fifth level of the Dentonia Mine is carrying ore with the following minerals Galena, Pyrite, Chalcopyrite, and an Antimony Sulphide in a gangue of quartz with minor amounts of sericite. The association of these minerals normally indicates the primary zone and we may then say that the ore is of primary character. The sulphides are intimately related and complete separation of one from the other by crushing is almost impossible. The gold is linked with the sulphides,alarge proportion with the pyrite and very little if any, found in the free state.

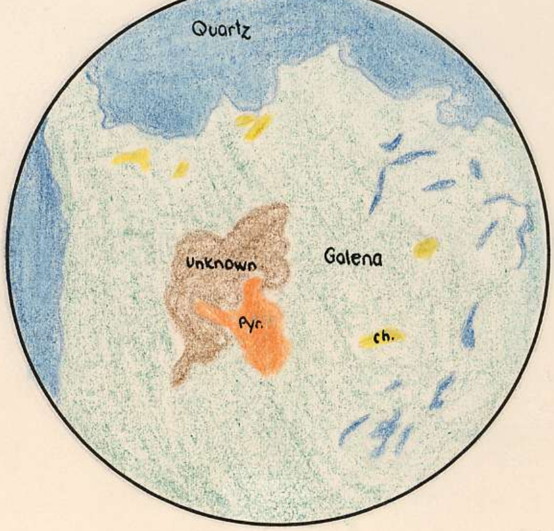


D104S.A

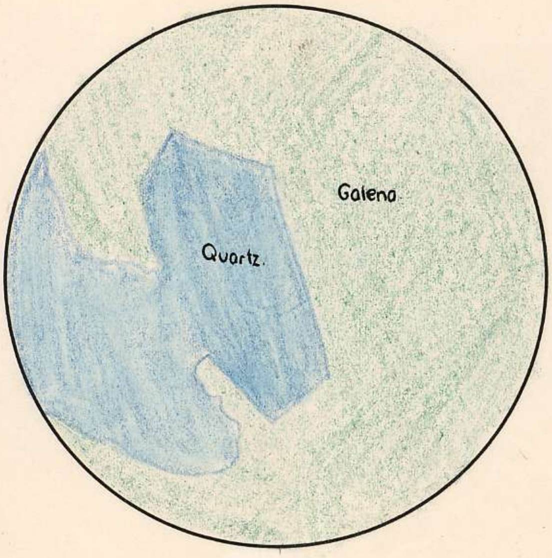


D104S.B

X40



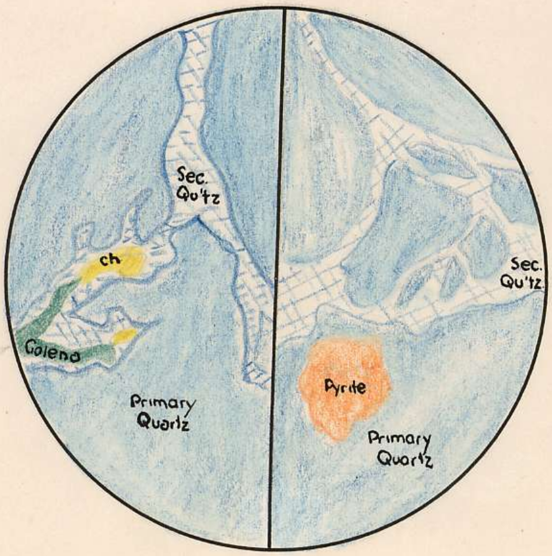
D110S



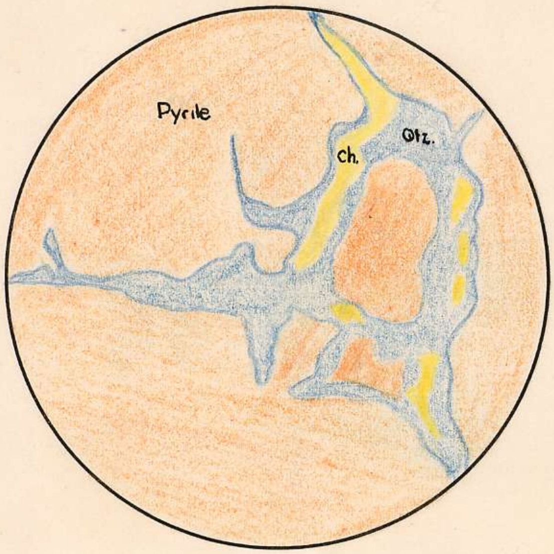
galena carrying primary quartz crystal

D107S

X40



D105 S



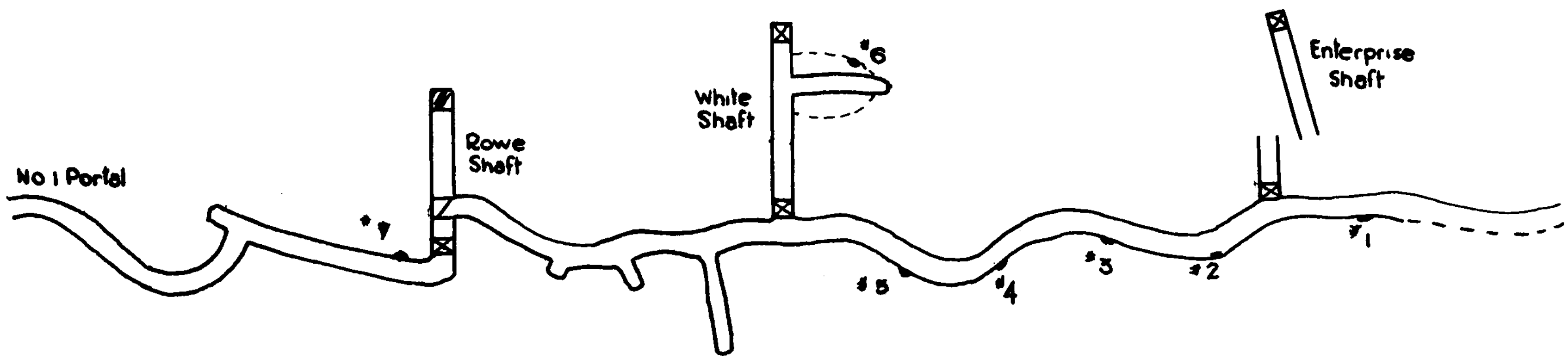
D109 S

X40

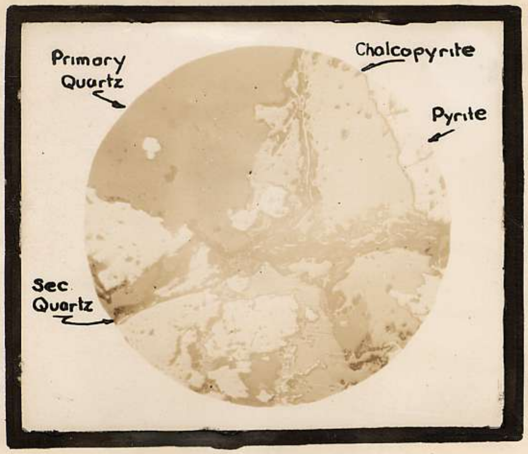
APPENDIX B

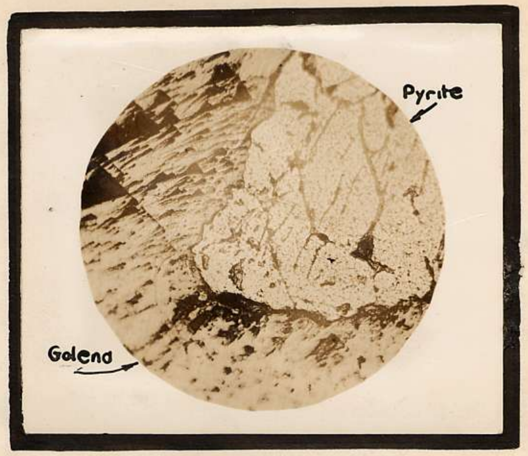
CORRELATION BETWEEN POLISHED SECTIONS PLATE NO'S AND MINE NO'S

Section No.	Plate No.	Mine No.
D 105 S	3	5
D 109 S	3	
D 107 S	2	7
D 110 S	2	
D 109 S	1	4



DENTONIA MINES LTD.
NO. 1 LEVEL
Showing Location of Samples
- Submitted. -



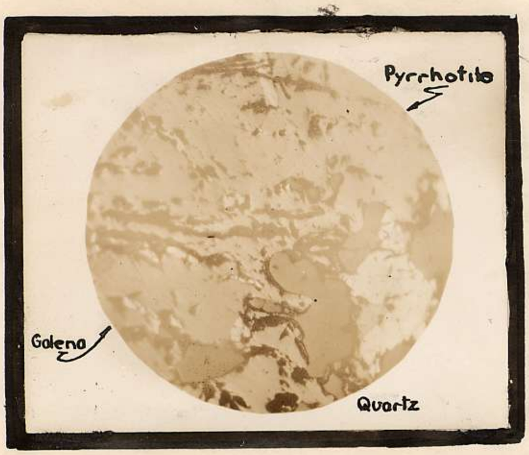


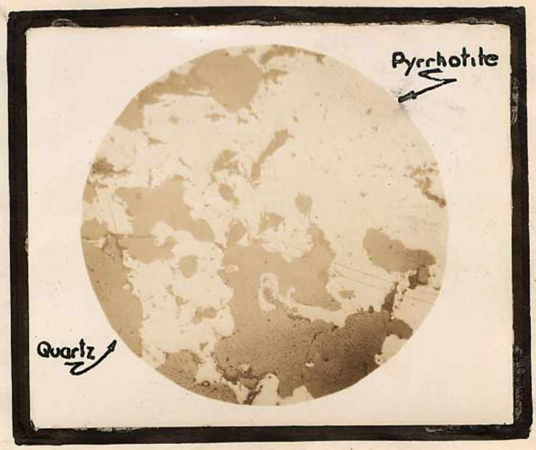
- DENTONIA -
Secondary Quartz veining the primary & carrying Sulphides.

- DENTONIA -
Galena & Pyrite.

- MICROPHOTOGRAPHS -

X30





- RENO -
Showing relation of Galena, Quartz and Pyrrhotite.

- RENO -
Pyrrhotite replacing Quartz