

*J. F. W.*  
*+ Topog map?*  
*+ claim map?*  
*+ 5/4/21*

→ *Director's Selection*

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PRELIMINARY REPORT

EXAMINATION OF MINING CLAIMS

NORTH FAIRVIEW

CRYSTAL and ADJOINING GROUPS of CLAIMS

BOHEMIA MINING DISTRICT

FOR

THE OREGON and OHIO MINES COMPANY

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*(9/30/21)*

PRINCIPALS

BY

HUGH M. HENTON

CLEVELAND, OHIO

SEPTEMBER 30, 1921

Lead Crystal Mining Co  
420 Miner Bldg  
Eugene, Oregon

*Oregon Fuel & Oil  
Investment Company  
1921*

*copy of report 1/19*

**NORTH FAIRVIEW**  
**CRYSTAL and ADJOINING GROUPS of CLAIMS**  
**BOHEMIA MINING DISTRICT**

**Location of property** The property of the Oregon and Ohio Mines Company consists of the Crystal Group of five claims and the North Fairview Group of fourteen claims, situated in Sections 2, 11, and 12, Township 23 South, Range 1 East, Bohemia Mining District, Lane County, Oregon. The post-office of the district, Bohemia, is about 40 miles from Cottage Grove, a town of 3,000 situated on the main line of the Southern Pacific, 140 miles from Portland, Oregon. The property is reached by either of two wagon roads, one 14 miles, the other 17 miles in length, the balance of the distance being covered by the Oregon, Pacific and Eastern Railway, a small branch line.

**Names of claims** The Crystal group is located on the <sup>east</sup> north side of Elephant Mountain, on both east and west sides of the ridge. It comprises about 100 acres and includes the claims: Mountain Lion, Elcalado, Knickerbocker, Becky Sharp, and Friar Tuck.

The North Fairview group is located on the southeast side of Elephant Mountain and on the north ridges leading from Fairview Peak; the names of the claims are: Eva, the El Balmont, the Miscellaneous, Bells of Fairview, Dardenelles, Golden Stairs, Teddy, Harris, Fairview, Faber, Mains, Dirigo, Golden Curry, and Albany.  
The general map (#1) given shows the position of

Position  
of  
Claims

the claims relative to each other and to the surrounding groups. Some time was spent in investigating the latter. The Grizzly group was examined carefully, the Champion and Musick groups casually, the Baltimore superficially, and the Helena not at all. The history of the Champion group, especially, has an important bearing on the case.

Relative

The Champion claims lie to the southeast of the North Fairview group. On the former is a 30-stamp mill in a more or less dilapidated state, but still valuable to the Oregon and Ohio Mines Company.

Positions

of

The Grizzly group lies on the east side of Champion Creek, on what is called Grizzly Peak. It is about one mile directly east of the Crystal group. The claims are named the Verdun, the Oversight, and the Keystones. The elevation is much less, probably 3500 above sea level.

Surrounding

Claims

The Baltimore group lies immediately north and northeast of the Crystal. It consists of the separate claims: the Orphan Boy, the Baltimore, and the Oro Plato. In the later stages of development, these claims may be valuable for a tunnel site, and can be easily obtained from the owners.

The LeRoy property lies between the Baltimore and the North Fairview on the west side of Champion Creek, but east of the Crystal. If the Baltimore and Grizzly groups are handled by the Oregon & Ohio Mines Co., it will be well to procure the LeRoy claims, especially if the West Coast Company's property is taken over.

Between the western portion of the North Fairview and the western portion of the Musick lies the Churchill ground, and the Vesuvius group on Sharp's Creek. The Champion is one of the three main groups (47 claims in all)

of claims owned by the West Coast Mines Company, Portland, Oregon. The others are the Helena and Musick groups. The same Company also owns a water-right and power plant (in poor condition) on lower Champion Creek, eight miles below. This power-house and line will be a valuable adjunct to the Crystal plant.

(1921)  
The Champion has produced \$1,700,000.00, the Musick group \$180,000.00, and the Helena \$150,000.00, in spite of a very cumbersome haulage program, and no adequate protection against the massive snows of the Bohemia district. The Amalgamation of the gold and the saving of concentrates was poorly handled, and the property mismanaged in general. All this is mentioned because it applied to the North Fairview and the Crystal properties as well, and because there is still good ore left on the various West Coast Mines Company holdings, which will yield a profit under a modern metallurgical process. All these groups can be secured, it now seems, under a reasonable lease and option agreement.

In the Crystal mill, as well as in the case of the Champion, mismanagement allowed the mill to start before sufficient exploration and development had been completed. Insufficient ore to run a mill continuously had been blocked out. Very little of the total gold and silver value of the ores was "free", and much was not caught on the amalgamation plates.

The concentrates were caught on crude tables, from all appearances, and apparently little chemical control of extraction was attempted. If the samples of the wasted tailings taken at this time are of any value, they show that fully one-half of the values in the ore were

History

Profits

Difficulties

Criticism

thrown away. Concentrates and middlings were evidently not so divided so as to give a product low enough in zinc to be profitably shipped. Further, the concentrates which were made were not profitable because handled in such small quantities.

The criticism of the mining is not so easily possible because many of the workings are caved. The Musick had more than one mile of drifts, cross-cuts, raises and small stopes, on six different levels 50 feet apart. Thus the vertical height thru which extensive development was accomplished only amounted to 300 feet. The Vesuvius, Noonday, Champion, and Helena each had about one-half mile of workings.

When the Champion mill was started on its final campaign, with 30 stamps, to handle ore from the Musick and Helena as well as the Champion proper, it was necessary to install a long haulage system. The management built extensive surface tramways, and the resulting haulage was cumbersome and intermittent due to snows and other weather conditions. The same initial outlay would have paid for driving over a mile of main haulage tunnels and accessory raises, which would have been unaffected by weather and other outside influences.

#### Topography

The altitude of the Crystal and North Fairview groups varies from 4500 to 5000 feet. The topography is very rough and steep. The slopes, while in general heavily wooded with valuable timber, are frequently traversed by slides of heavy snows of the region. The canyons are deeply cut thru the lavas and fragmental volcanic material.

The winters are not cold, but there is much rain-

Climate  
and  
Vegetation

fall which means heavy snows on the higher part of the region. On the lower portions of the district the snowfall is much lighter, the most of it passing off as soon as it falls. Vegetation is profuse, but wild fruits suffer from the lack of moisture in the latter part of the hot dry summer. The fine tall Douglas fir is the predominant tree. The timber is very dense on several of the North Fairview claims.

The geology of the district has been in general pretty well worked out. J.S. Diller, in the 20th Annual Report of the U.S. Geological Survey, Sec. 3a, gives a splendid outline of great help to the engineer. Notes on the formations of the district, by D.F. McDonald, Bull. 380, Sec. a, U.S. Geological Survey, follow out some features of the same outline.

Geology

The lavas of the region are like those of the major Cascades. They are of Miocene period and form irregular flows varying in thickness from 50 to 100 feet each. As many as seven different flows have been counted on the south side of Bohemia Mountain. The total thickness of andesite and dacite from the lava flows is about 4000 feet, counting in the masses of fragmental material, clay, talc and tuffs. Occasionally the erosion has gone so far as to remove a good deal of the original thickness, but has usually been manifest in the cutting of gulches some 2000 feet deep, thru the volcanic material.

ations

Most of the rocks exposed are andesites, with dikes and altered zones which are porphyritic and quartz bearing. Tuffs, dacite porphyries and basalts are also present in varying amounts. The andesites are much altered, and no doubt the alteration helps to explain the importance of the nearby veins.

The ore occurs in narrow veins of quartz porphyry and crushed rock material. The country rock is impreg-

nated with sulphides for several feet each side of the veins. The latter are fissures with numerous small joints and faults, filled with porphyritic quartz bearing andesite, and many colored clays and talcs. Lime carbonate usually occurs in small crystals, sparsely distributed.

In the oxidized zone, as exposed in the present workings, the high grade ore has occurred only in the fissures which have been much fractured since first mineralized. Secondary enrichment gave rise to exceptionally good "sheets" at juncture points of well fractured fissures.

The low grade ores are the mineralized portions of the veins below the reach of extensive oxidation. The vein itself is narrower, but the wall rock is mineralized also. The ore here is hard and dense, necessitating large scale handling to be profitable. The valuable minerals found are galena, sphalerite, chalcopyrite, pyrite, and bornite. The gold and silver are associated with all these, in varying amounts, depending upon the particular vein, and the particular part of the vein.

The region in general is well shown in map #1, which is a topographical sketch taking in all the properties mentioned in this report. The whole range of mountains is known as the Calapooya, and is a sort of connecting link between the coast range and the Cascades.

The claim map (#2) gives the general location of the individual claims and works. Map #3 shows, on a larger scale, the veins of ore, the separate workings and prospect holes, as well as survey data. Much more of the detail of workings is brought out in map #4, which includes only the Crystal, North Fairview, and those claims which are close.

Topographical  
map

Claim  
map

Map  
Showing  
Veins

The main vein on the Crystal runs thru the center of the Mountain Lion and Elcalado claims, as shown on the map #4. The strike is roughly estimated to be about N.70° W. and the dip is S.W. about 65°. The vein usually has quartz about three feet in thickness, general ledge matter of eight to ten feet and an altered region of about 30 feet on the hanging wall side.

Explanation  
of maps

The chief vein on the North Fairview group outcrops along the center of the El Belmont, the Belle of Fairview, the Miscellaneous and so on east. It is labeled the "Middle Vein" on Map #4. Cutting cornerwise across the Belle of Fairview and Golden Stairs where they corner the Miscellaneous is the "South Vein", a very promising prospect. The "North Vein" is the smaller of the three, and outcrops in places on the Dardanelles, and on the Dirigo, where it takes several irregular bends. The veins are of an oxidized ferruginous quartz, showing varying quantities of sulphides as lower elevations are reached. The Dirigo badly needs more prospecting on the east end line and south side line.

The noted veins on the Champion group are the Champion, the Excelsior, the Grey Eagle, and the Mable. The first two have the same strike and dip practically as and "Middle Vein" and the Crystal veins. Crossing the Champion group is a wide porphyry dike, carrying low grade sulphide of copper, lead and zinc. This dike seems to strike at right angles to the general trend as shown in veins mentioned above. It has not been well prospected.

The Grizzly vein strikes about the same in direction as the others of the district. It shows up much better



at lower elevations than elsewhere. The Baltimore vein has been traced for some distance. The float indicates that the best ore occurs in a higher, later disturbed, oxidized zone, but the immense extent of the mineralization in the general vein filling indicates a possible large body of low grade sulphide ore at some depth.

Laws  
and  
Police  
Protection

The laws regarding annual work on mining claims have been very liberally interpreted since the beginning of the war, and for several years complete exemption was granted by Congress. From now on, however, it will be increasingly important to carefully satisfy the requirements in each case. Water rights in Oregon must be used to be valid. Unused water may be appropriated for urgent use, by the help of the state.

Police protection is given only by an occasional game warden, or forest ranger. In some parts of the district, equipment will be carried off, if left without a guard for several weeks. It is a good precaution to leave a watchman for mill buildings during shut downs. However, very little violence occurs, and a spirit of good fellowship is manifest, in all personal dealings.

Taxes

Taxes will not be heavy as many of the claims are not patented, but only surveyed for patent. There is no tax on unpatented mining claims. The Champion claims are many of them patented, if this property is added.

\* not pat.  
grouping

Interferences

The lumber industry sometimes interferes with the mining. It is said that the Lumber Companies would like to keep mines idle, to discredit the mining and enable the purchase of valuable timber now included within the boundaries of mining claims.

Sampling of the Crystal, North Fairview, and Grizzly

Sampling

from the Baltimore and from surrounding claims. The results from sampling of the #5 and #6 levels of the Champion at the south side line of the claim, by Mr. F.J. Bartels, are shown separately. The assay results from the Champion mill campaign in the summer and fall of 1916 are also shown in a separate table.

Table I gives the results from the Crystal Group, Table II from the North Fairview, and Table III from the Grizzly and Baltimore Groups with some from the Champion. These tables also give an average for each claim, calculated after weighting each assay with the area sampled. Table IV gives the assay value of the mill feed, or "heads", in column parallel with the value of the waste discharge or "tails", daily during several months.

TABLE I  
Crystal Group

Sam- ple #	Date	Sq. ft. Sam- pled	Description	Per ton of 2000#	
				\$ Gold	Silver Oz.
				2067	
1921					
Aug. 6					
(Surface Samples)					
1		1	Elcalado #1 Drift, Sulphides on Dump	.80	1.2
2		1	Elcalado #1 Drift, Oxidized Dump Ore	.40	1.8
3	"	59	" Cut near Lake	7.20	1.5
29	"	224	" " " E. end of claim	2.00	1.5
30	"	48	" Surface samples	1.60	1.1
31	"	12	Mountain Lion 500' from W. end	1.90	1.3
32	"	48	" " 550' " " "	.40	1.3
		<u>143</u>	Average	<u>1.54</u>	<u>1.28</u>
(Underground)					
4	" 6	36	Mountain Lion #3 Drift, Face	.90	1.4
5	"	30	" " " 15' back from Face	.80	1.4
6	"	3	" " " Tale Streak	.50	1.1
7	"	56	" " " g' past last set of tim <sup>ber</sup>	1.00	1.4
8	"	3	" " " Galena Blend Pockets	5.20	2.8
11	"	24	" " " 180' from Mouth	.80	1.2
12	"	20	" " " X Cut on Rt. 60' E of		
			Raise	3.29	1.1
13	"	8	" " " Corner, Start of Raise,		
			Rt.	3.25	.9
		<u>180</u>	Average	<u>1.01</u>	<u>1.32</u>
(Raise)					
14		4	Mountain Lion Raise from #3 to #2 Drifts		
			27' to 34' Slope Dist.	.80	1.

Sample No.	Date	Sq. Ft. Sampled	Description	Per ton of 2000	
				Gold	Silver Oz.
1921					
15		8	Mountain Lion Raise from #3 to #2 Drifts, 45' to 50' slope dist.	1.00	1.5
16		8	Mountain Lion Raise from 35' to 39', Slope Dist.	2.00	.8
17		$\frac{4}{24}$	" " " " " 81' from Hill	$\frac{1.20}{1.33}$	$\frac{1.4}{1.17}$
(Upper Drift)					
19	Aug. 9	70	Mt. Lion, #2 Drift, 15'-25' W. of Raise	.80	1.5
20		60	" " " " " 35'-45' W. of Raise, Rt.	.40	1.4
22		.75	" " " " " 40' from Raise, Galena	trace	2.5
25		4	" " " " " 90' W. of Raise, Foot, Soft	"	.8
26		10	" " " " " 1100' W. of Raise, Foot, Copper	.80	1.2
28		1	" " " " " 90' W. of Raise, Left of X Cut	trace	1.1
34		1.5	" " " " " 170' W. of Raise, Rt. Rack	trace	2.2
35		.34	" " " " " 170' W. of Raise, Left Rack	.30	1.8
37		1.25	" " " " " 100' from Mouth, X Cut	trace	1.1
38		9	" " " " " 210' W. of Raise, X Cut	.60	1.8
42		40	" " " " " Under Old Stope, Bottom	2.40	1.8
40		6	" " " " " 210' W. of Raise, X Cut	trace	1.
43		16	" " " " " Old Stope, W. End, Rack	.80	2.6
45		16	" " " " " Old Stope, W. End, Bottom	2.80	2.6
46		2	" " " " " Old Stope, W. End, Timbered	2.80	5.3
47		20	" " " " " 1st 10' W. of Old Stope	.80	2.
48		20	" " " " " 1st 10' W. of Old Stope Rt. Side	.40	1.1
50		20	" " " " " 10' to 20' W. of Old Stope, Rack	.80	1.6
53		20	" " " " " 20' to 30' W. of Old Stope, Rack	.40	1.4
21	Aug. 11	60	" " " " " 50' to 60' W. of Raises, Rt.	.40	1.2
23		15	" " " " " 75' W. of Raises, Tale on Foot	.40	1.2
24		10	" " " " " 90' W. of Raises, X Cut on Left	.20	Trace
27		28	" " " " " 150' W. of Raises, Rt., Copper	trace	1.7
33		50	" " " " " 160' W. of Raises, Foot Copper	trace	1.7
36		15	" " " " " 100' W. of Mouth, X Cut	trace	1.

## CRYSTAL GROUP CONTINUED

TABLE I

Per ton of 2000#

Sample	Date	Sq. Ft. Sampled	Description	Gold	Silver
1921					
39		4	Mt. Lion #2 Drift 210' W. of Raise, X Wup. Face to 6'	.00	1.7 <sup>oz</sup>
41		12	" " " " 210' W. of Raise, X Cut, 12' to 8'	trace	1.6
44		6	" " " " Old Stoppe, W. End Erenst	2.00	2.3
49		30	" " " " 10' to 20' W. of Old Stoppe, Rt.	.40	4.4
51		6	" " " " Streak, Highup, Rt. Close to #47	1.00	4.4
52		30	" " " " 20' to 30' W. of Old Stoppe, Rt.	1.20	1.2
54		20	" " " " 30' to 40' W. of Old Stoppe, Rt.	Back/trace	1.8
55		30	" " " " 40' to 50' W. of Old Stoppe, Rt. Back	.80	1.6
56		25	" " " " 50' to 60' W. of Old Stoppe, Rt. Back	.40	1.4
57		20	" " " " 60' to 70' W. of Old Stoppe, Rt. Back	.60	1.5
58		40	" " " " 80' to 80' W. of Old Stoppe, Back & Rt.	trace	1.2
59		40	" " " " 70' to 80' W. of Old Stoppe, Back & Rt.	"	.9
60		30	" " " " 80' to 90' W. of Old Stoppe, Back	.40	.9
61		12	" " " " 60' to 70' W. of Old Stoppe, Galena	1.00	2.1
62		4	" " " " Black, Burnt, Pocket, Center #56	.90	1.25
63		10	" " " " 70' to 80' from Old Stoppe, Brown	1.25	1.3
64		10	" " " " 70' to 80' W. from Old Stoppe, White	4.00	1.2
65		5	" " " " 80' to 90' W. from Old Stoppe, Pyritel	1.00	2.
66		10	" " " " 90' to 100' from Old Stoppe, Left	3.20	3.5
67		20	" " " " 90' to 100' from Old Stoppe, side & bot.	1.60	1.6
68		30	" " " " 90' to 100' from Old Stoppe, K. of Timbers	.80	1.5
69		6	" " " " Face, Light Colored, Hang Wall	1.25	1.5
70		12	" " " " Face, Center Talc Streak	.60	1.3
71	Aug. 13	9	" " " " Face, Footwall, Rt. Below Talc	.40	1.6
72		8	" " " " 100' K. from Old Stoppe	.90	2.12
		924,84	Average	.68	1.49





TABLE III

## ASSAYS FROM OUTSIDE GROUPS OF CLAIMS CONTINUED

Sample No.	Date	Sq. Ft. Sampled	Description	Per ton of 2000#	
				\$Gold	Silver Oz
1921					
157		2	Oversight, Drift, Rt. X-Cut, 75' in. Tale Rt. Side	trace	.85 <sup>oz.</sup>
141		20	" Along Left Side, past 2 X Cuts	"	.65 <sup>oz.</sup>
153		8	" Center of Claim, 20' from Drift mouth, Galena	3.00	7.6
149		2	" East End, small out	.40	.55
155		2	" " " , small streak outside Rt.	.60	2.15
152		16	Keystone, 5' wide, Croppings in Creek	trace	1.
154		12	" , Face is 5' wide, Grab from Dump, Creek	.40	.9
159		6	" . 500' E. of W. End Face	.20	1.1
		<u>134</u>	Average	<u>.64</u>	<u>1.93</u>

Baltimore Group

1915					
73	Aug.	54	Baltimore Claim, 500' from W. End	trace	1.00
74		12	Orphan Boy, W. End Drift,	.40	1.1
75		9	Baltimore, Surface Streak	.80	2.4
76		8	" , 500' from W. End Hang	.40	1.2
77		25	" , Small Drift, W. End	trace	.7
78		16	Fraction, 30' from face, Roof	.80	3.
79		12	" , In Drift, across 4' Face	trace	1.
106		8	Ore Plate, Creek below Falls, ledge crosses	.80	.6
103		16	" " , Drift in on Baltimore, Face	.60	1.1
		<u>160</u>	Average	<u>.28</u>	<u>1.23</u>

Champion Samples, by F.J. Bartels

1.	1921	10	75' from Surface	92.80
2.		7	80' " "	19.40
3.		15	90' " "	11.40
4.		18.25	92' " "	12.80
4.		22.75	100' " "	73.80
5.		24	105' " "	12.00
6.		22	110' " "	5.00
7.		22	110' " "	4.00
7.		22.5	116' " "	9.40
8.		13	121' " "	7.40
		19.5	122' " "	14.00
9.		24	129' " "	12.00
10.		45.5	137' " "	13.40
11.		40.25	155' " "	10.00
12.		22.75	160' " "	11.40
13.		65	168' " "	17.20
14.		117	Face of #5 Level	4.40
15.		104	44' Below #5 Level	14.80

CHAMPION SAMPLES CONTINUED

16.	104	45' Below \$5 level	7.60
17.	65	52' " " "	36.80
18.	81	70' " " "	13.80
19.	144	Face of \$6 level	7.60
	<u>1008.5</u>	Average	<u>14.35</u>

*See p. 18  
Ch. 18*

(continued on page 15 b.)

CHAMPION MILL CAMPAIGN                      TABLE IV

Date		Concentrates	Heads.	Gold Only	%
1916					
Aug.	1.	\$22.00	\$4.80	\$4.80	
	2.	22.00	4.80	4.80	
	3.	18.00	5.20	1.60	
	4.	59.20	6.80	10.00	
	5.	26.80	10.80	2.40	
	6.	53.60	11.20	2.40	
	7.	37.60	12.40	1.60	.14 Pb
	8.	65.60	8.00	1.60	
	9.	23.80	6.00	2.00	
	10.		8.40	2.40	
	11.		8.40	1.60	
	12.		8.80	2.40	
	13.		6.80	2.40	
	15.		24.00	3.00	
	16.		8.40	3.20	
	17.	36.40	14.40	2.40	
	18.		6.00	2.40	
	19.		12.00	2.80	
	20.		1.60	1.00	
	22.		4.00	.60	
	24.			2.40	
	25.		52.00	1.60	
	26.		4.80	2.00	
	27.		3.20	.80	
	28.		6.80	.80	
	29.		6.40	1.00	
	30.		<u>5.60</u>	<u>1.60</u>	
			9.84	2.43	
	Monthly Average	<u>39.16</u>			
Sep.	2.		6.00	2.40	
	3.		7.20	2.60	
	4.		5.60	4.00	
	5.		9.60	1.60	
	6.		12.00	3.00	
	7.		5.60	3.00	
	8.		5.40	1.60	
	9.		7.20	2.40	
	10.		6.80	2.80	
	11.		6.20	1.60	
	12.	37.50	6.00	2.80	4.9 Cu.
	13.		6.00	2.40	
	14.		8.00	2.40	



TABLE III CONTINUED

ASSAYS FROM OUTSIDE GROUPS OF CLAIMS

Sample No.	Date	Description	Per ton of 2000# \$ in Gold Silver O.	
<u>Miscellaneous Claims in District</u>				
1921				
143	Aug. 18	Champion Tailings, Quartz & Porphyry Gangue	4.00	.75
144		" Concentrates, Iron Pyrite, Etc.	16.40	5.4
145		Musick, " , Scrappy and much leached	trace	.5
158		Frank Williams, Glenwood	140	1.
165		Excelsior Open Cut, E. of Knot Shaft	trace	.6
166		" Tunnel, 10' from Face	"	.65
161.5		Gilbertson, Long Tunnel	"	2.5
162		Lilly, High Grade Manganese	20.00	0.3
163		Cochran, High Grade, Free Gold	126.40	11.6
167		Champion Ore, Oxidized	19.20	3.8
168		" " , Lead Sulphides etc.	11.25	13.8
161		General Sample, Pieces around Poole Cabin Bartels Lease	16.00	5.2
148		Concentrates, (2 tons), <u>Bin at Crystal Mill</u>	72.83	34.2
1916				
	Aug.	Helena Concentrates	17.60	10.00
1916				
	Jan.	Champion " "	10.40	8.60
		C 2174		
		1000 Dwt. Concentrates	41.20	7.00
		575 " " " 100 Mesh*	48.00	9.60
		120 " " " 30 "	25.60	5.50
		58 " " " 60 "	28.80	5.20
		164 " " " 40 "	37.60	4.75
		83 " " " 40 "	22.40	4.60

TABLE IV

CHAMPION MILL CAMPAIGN

Date	Concentrates	Heads.	Gold Only	
			Tails	%
1918				
15.		\$4.80	\$1.60	
16.		29.20	1.00	
17.		6.00	1.60	
18.		5.20	2.00	
19.		8.80	3.20	
20.		9.20	2.80	
21.		6.40	2.40	
22.		9.20	2.00	
27.		6.80	1.60	
28.		5.60	1.60	
29.		12.80	3.00	
30.		<u>8.08</u>	<u>2.39</u>	
Monthly Averages	<u>42.30</u>			
Oct.				
2.		12.00	2.40	
6.		9.60	2.60	
7.		5.20	2.00	
24.		4.80	1.60	
25.		8.80	2.20	
26.		6.00	2.00	
28.	38.00	5.60	1.60	Ag. 2.00
29.		6.00	2.40	
Monthly Averages	<u>38.00</u>	<u>7.25</u>	<u>2.10</u>	
Nov.				
1.		9.20	3.00	
2.		6.00	2.00	
3.		7.60	2.40	
4.		7.60	2.50	
5.		7.20	2.40	1.8 oz. Ag.
7.		7.60	2.50	
8.		7.60	3.00	
11.		11.00	4.20	
12.	47.60	10.40	2.60	10% Pb. ↙
15.		6.40		11.3% Zn.
16.		5.20	2.00	
17.		6.40	1.60	
18.		6.40	2.00	
19.		12.00	1.80	
21.		6.40	1.60	
22.		4.40	1.30	
23.		4.00	1.20	
24.		4.00	1.40	
26.		7.00	2.00	
28.		4.40	1.20	
Monthly Average	<u>47.60</u>	<u>7.05</u>	<u>2.14</u>	

TABLE IV CONTINUED

CHAMPION MILL CAMPAIGN

Date	Concentrates	Heads	Gold only		%
			Tails		
Dec. 2,		4.80	1.60		
3,		2.40	1.00		
4,		2.00	.80		
5,		2.40	1.00		
6,		2.40	1.20		
7,	18.40	2.40	1.00		9.8 oz. Ag.
8,	61.60	2.00	.80		
9,	73.60	1.60	.80		
10,	11.20	4.00	.80		
11,	8.00	4.80	1.20		
12,	17.60	2.80	1.00		
13,	14.40	2.80	1.00		
14,	19.20	2.80	1.20		
15,	22.40	3.60	1.60		
16,	20.00	1.60	.90		
17,	16.80	3.20	1.60		
18,	41.20	2.80	1.60		7 oz. Ag.
19,	36.00	4.00	2.40		
23,		6.40	3.20		
Monthly Average	27.70	3.09	1.30		

Discussion  
of

Assay  
Tables

The sampling was checked at intervals by the introduction of pieces of known waste and an occasional known ore. The assays are not accurate to closer than twenty cents per ton in most cases, on account of the limits of sensibility in the balance used.

Table I<sub>4</sub> gives an average value of \$2.82 for the surface samples, including the silver at the present price of \$1.00 per ounce. In the #3 drift, the figure drops to \$2.33, and in the #2 drift, to \$2.17, though the raise gives \$2.50. In the upper drift the sampling was continuous along the vein, but in the raise the timbers prevented anything but scattering samples. In the #3 drift the work has not proceeded far enough to well open the vein, so the

samples obtainable were few.

From Table II, it will be seen that on only four claims were many samples taken. The average values were \$6.38 for the long tunnel, \$1.92 for the general samples on the Miscellaneous claim, \$3.68 for the Main, and \$2.79 for the Belle of Fairview, surface samples. Good sampling is not possible on the other claims of the North Fairview Group until more prospecting is done.

In Table III, the Grizzly Group makes a good showing, with an average of \$2.57. In reality, it represents the group better than the Bartels average represents the Champion. The latter average of \$14.36 applies to samples taken on the Champion vein, where the vein leaves the south side line and enters the Evening Star claim, now owned by the Bartels interests.

The ores which may be expected on the claims will probably not have assay values greater than those shown in Table IV, in the "Heads" column. The "Tails" values shown indicate very poor extraction, only 60% some months, and often less for periods of several days. Improved methods, including concentration into a middlings product, as well as a heavy concentrate, will effect at least a 90% extraction.

In an attempt to verify the high tailings indicated in Table IV, samples were taken at a dozen places on the remains of the tailings dump. The average of these gave \$4.00 in gold (Assay #143 Table III), so it is probable that all the tailings below the mill pay to run again if they can be collected readily. Thousands of tons have probably been swept down the gulch out of reach although

Champion  
Mill  
Run

Extractable  
Values

most have been stopped by the heavy undergrowth. The character of the tailings renders probably a very high extraction, in case they are retreated.

The ore for the most part, will contain a complex sulphide of copper, lead, and zinc, and the associated gold and silver. A small amount of free gold will be present also. The gangue material will be quartz and porphyry. Where vein filling is highly oxidized, the free gold will be present in slightly greater proportions.

**TABLE V**  
**CHARACTER OF PRODUCTS**

Date	Description	Per ton of 2000#				
		Gold \$	Silver Oz.	Lead %	Zinc %	Copper %
<i>(No samples except #91, 1000 mostly)</i>	(a) Composite Assay	3.80	2	5.2	3.2	.5
	(b) " Average	3.61	2.1	5.13	3.3	.5
	(c) Concentrates (20-1)	42.40	11.45	58.95	6.	1.38
	(d) Middlings (8-1)	9.78	3.93	10.65	15.01	2.17
		<i>(4-1) = 16.18</i>	<i>5.43</i>	<i>20.31</i>	<i>13.21</i>	<i>2.01</i>
1915						
June 24	Musick Base Ore	23.60	12.00			
Aug. 22	#105	1.60		3.5		
	1055	4.00		2.1		
	1056	1.20		5.7		
	1057	.80		1.		
" 23	#1	5.20		.25		
	4	3.20		.3		
	8	4.40		2.6		
	10	2.00		.2		
" 30	#418			5.6	7.2	2.
	419			2.6	4.27	1.2
	422			9.8	7.57	1.2
	423			15.6	8.14	2.3
	429		3.00		4.9	2.5
Dec. 29	# E3	6.40	9.8	34.45	31.46	1.12
	51	4.80	6.6	5.52	1.47	.18
	53	2.40	2.8	3.9	1.28	.16
	Moonstope	5.60	4.6	13.8	9.75	.24
1916						
Jan. 2	#3 Concentrates			12.1	13.87	
	E 55			5.95	12.5	
	57		7.6	2.6	22.4	
	67		414	4.6	8.7	
	68		4.7	1.95	3.65	
	73	4.80	6.2			

Character  
of  
Ore

Table V is the result of an effort to ascertain the analysis of a possible future ore. The first four items are the most significant. One ounce from each of one hundred samples, mostly from the Crystal and North Fairview, was made into a composite sample of one hundred ounces for a test. The careful assay of the composite is given in the first item of the Table. The average of the separate assays is shown in the second item.

The composite sample was next panned carefully to a 20 to 1 heavy concentrate. The overflow from this was further panned to a 5 to 1 middling product. The third item shown the analysis of the heavy concentrates (20-1), and the fourth, that of the middlings, (5-1).

Panning  
Test

A careful check of the gold and silver will show more gold in the concentrates and middlings than shown in the original bulk of ore, and less silver. Some free gold was recovered in the pan which the original assay of the ore did not give. Some silver was lost in the overflow from the pan. Much coarse quartz remains with the middlings.

Calculations  
of  
Assured

An amalgamation test will show what proportion of the gold is in the free state. The further items in Table V serve to show the relation between the copper, lead, zinc, gold and silver in a variety of products. By amalgamation and concentration, it is possible to extract practically all the gold and lead and 80% of the silver. Zinc and copper are not marketable at present writing. In fact, the zinc is a detriment. The possibilities of a separation by flotation are being investigated.

Mineral

The claims are all in the prospecting or exploratory stage. No estimates of quantities of ore available are

possible until one at least of the veins is fully explored. Then the ore body can be blocked out so it can be measured.

When the Crystal #3 Drift is driven thru the ore body, it will be possible to measure and assay the block of ore between the #2 Drift and the #3 Drift. With a metallurgical test on the samples, mill extraction can be predicted and returns from the block of ore calculated. In the absence of tonnage records for the Champion Mill, it is impossible to say how many thousands of tons of tailings are lying in the gulch to be retreated. It is possible these tonnage records can be obtained.

**Present  
Equipment**

The equipment now available on Champion includes:

- 1- 30 Stamp Mill (in poor repair)
- 1- Office Building (frame) in fair shape
- 1- Boarding-house for 30 men (good shape)
- 1- Bunk-house for 30 men (fair shape)
- 1- Assay Office Building
- 1- Main Tramway and Track, 3000 Ft. (shed down)
- 1- Helena " " " " "
- 1- Musick " " " 6000 Ft.
- 1- Power-house (in poor repair) and flume
- 5- Miles Transmission Line (in Poor repair)
- 1- Air Compressor (good)
- Motors (badly weathered), Mine Cars.
- Air Pipe Line (badly rusted), Many feet of rails, miscellaneous supplies.

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The Old Noonday Mill

Engine and 2 boilers.

- 1- Good Cabin on Miscellaneous Claim
- 1- Small Tram-shed and Shop

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The Equipment at the Crystal consists of:

Crystal  
Equipment

- 1- 6 Stamp Mill, Engines and Boiler
- 1- Ore-bin and Tramway
- 1- Good Blacksmith Shop
- 1- Boarding-house and Bank-house (20 men)
- 1- Powder Magazine
- 1- Assay Office, partially supplied
- 3- Mine cars, Rails, Steel and Tools

The old mill buildings of all the above mentioned plants are falling down, due to neglect and to the heavy snows of the region. Much of the lumber is in good shape, however, and can be used in the construction of new mills. The tramsheds are most of them down, due to snow slides and poor construction in the first place. The cabins and dwelling-houses on the various properties are more solidly built, better braced and are in much better condition.

Figure 1 shows the location of the Champion Mine, between Grouse Mountain on the left and Fairview Peak on the right. Fig. 2 shows the latter Peak from the opposite side. Fig. 3 shows Grouse Mountain from the south. Fig. 4 gives a view of the side dump tram car and a portion of Champion tramshed.

Photographs

of

District

A portion of the Musick tram-track is shown in Fig. 5, with a partial view of the trussle necessitated by the steep slope. In Fig. 6 the tram-shed at the Musick is



shown in its wrecked condition. Mt. Bohemia, near the Musick Mine, is shown from three positions in Figures 7, 8, and 9. A group of cabins near, occupy Figure 10.

The upper cabin on the North Fairview property is shown in Figure 11. Figure 12 gives a good view of the large waste dump from the Fairview Tunnel. A bit of the shop shows also.

The Crystal bunk-house and boarding house are shown in Figure 13. The creep of the heavy snows against the up-hill side of the buildings, tends to push them down the gulch. They yield unless they are well braced and the foundations well out in the solid rock. Figure 14 shows another building of the group, set with its length in line with the creep of the snow. This plan offers a better resistance to the slides.

The Crystal blacksmith shop and entrance to #3 Drift are shown in Figure 15; the tram-shed and ore-bin in Fig. 16; and the Assay office in Fig. 17. The dense growth of heavy timber is shown in all three views. This timber is used in the mine for lagging, and for fuel. The large Douglas fir, prized for clear lumber, and heavy mill timber, grows in great profusion on the North Fairview eastern claims. Often 300 M per acre is cut by the saw mills.

Figure 18 shows the small hemlock and spruce at one place on the claims. Figure 19 shows some of the Douglas fir at another. The distribution of timber is shown well in Figures 20 and 21, taken near the Musick Mine, high up near the top of Mt. Bohemia. Figure 22 shows the ranger station of the U.S. Forest Service.

The prospecting of the claims was first done by means

Photo's  
of the  
Crystal  
Buildings  
  
Timbers  
and  
Fuel

of trenches and open cuts on the numerous ledges of mineralized quartz and vein matter. Some of these ledges show plainly on the surface. The North Fairview has been prospected by 27 such trenches and cuts, which can be noted along practically the whole length of the group, over one and a half miles. The work was pushed somewhat further by several so-called cross-cuts, which, however, are drifts at times, following the cross veins for short distances.

Later, small shafts were sunk in places where good assays were obtained. Five such, from 15' to 30' deep, were sunk on the North Fairview.

The Crystal was prospected by three drifts and nine trenches and cuts, all on the altered dacite porphyry of the vein. A large number of cross-cuts should have been driven, but were not. The cross veins were practically neglected.

The major portion of the exploration was done by driving drifts on the fissure veins. There were revealed, 19 Drifts and tunnels on the Fairview claims, and three on the Crystal. #1 drift on the latter was found caved in near the entrance. #2 Drift is 546' in length, and passes beneath the small stops from which the ore for the five stamp mill was taken. #3 Drift measures 835' to the face. There is an 80' raise between the drifts.

The longest drift on the Fairview starts on the Miscellaneous claim and runs west into the Belle of Fairview some 570 feet. It is sort of a cross-cut, as it is aimed to cross the south vein of the Fairview Group near its junction with a rich branch vein which nearly centers the high ridge between Fairview and Elephant

Peaks. There are four or five drifts scattered along the outcrop of the main vein. These vary in length from 100' to 200'. The rest of the nineteen drifts mentioned are short ones.

There was much duplication of work, evidenced by the driving of workings one under the other on steep mountain sides. This great waste of work was caused by the attempt to develop the vein for milling purposes before the ore body was found or explored sufficiently. The old mistake of "Mill before Mine" was made, for the stope in #2 Drift of the Crystal shows that only 300 tons from it were broken down and put thru the five stamp Crystal Mill.

In the Champion-Musick program there was an excuse for extensive development and haulage drifts, because the ore-bodies had been fairly well explored. Strange to say, this property shows the absence of good haulage drifts, and the substitution of expensive outside trams. With development proceeding on six different levels above, a haulage drift on the level of the mill ore-bins would have been a logical solution of the Champion Mine troubles. The development of the higher levels as they were, benefited an adjoining property, the Evening Star Group.

Labor is plentiful at the large cities along the coast, but it is often hard to get good miners. Wages vary from \$3.00 to \$4.00 per day.

The water supply is plentiful. Champion creek, North Fairview, creek, and Crystal creek will supply all the water necessary for later milling purposes. The streams are much higher in spring when the snow is

melting, as will be noted in Figures 23 and 24.

## Power

Water-power is available at the junction of Brice Creek and Champion Creek, about eight miles distant. Under present methods of restraining, the water is high in the winter and spring, and low in the summer; the power available dropping as low as 25 horsepower in a dry season. With a large dam and efficient methods, as much as 250 HP could be utilized the year round.

The power plant is in poor condition, and the line is down in many places. The 100 HP generator is an old style machine, but is in fair condition, as are the four transformers of 75 HP each. Most of the wire in the line can be used again, although a great deal has been taken away since the abandonment of the old plant.

Supplies must be hauled in by truck about 14 miles from Dixton, up Champion Creek, until a narrow gauge railway is built. The wagon road is on a very good grade, but needs ballast badly in places. A second road, 17 miles to Wildwood, by way of Sharpe's Creek, passes thru the west end of Fairview claims but is not easily accessible to the cabins and buildings, except by pack train.

## Products

There will be three products at first, as near as can be foreseen, viz., (a) Gold bullion in brick form from retorted amalgam, to the amount of about \$48.00 per 20 tons treated in mill; (b) Lead-silver concentrate, one ton per 20 tons milled, worth about \$40.00; and (c) A Middlings, four tons per 20 tons milled, worth about \$40.00. The product (a) can be sold to the mint at San Francisco. (b) can be shipped to Skolby, Calif. (c) will have to be handled by a roasting and leaching

process, or by flotation, either on the ground, or at some central point for Oregon ores.

**Scale of  
Operation**

As the property has so far shown indications of large bodies of low grade ore, exploration and development must be on a large scale and thorough before a concentrating plant or mill can be planned. If the ore continues low grade, it is probable that nothing short of a 400 ton mill (about 60 stamps) will pay. If high grade bodies are opened up, smaller units situated close to the mines may be the solution.

**Equipment**

For the present, mine equipment should include: one power driven air-compressor (six 2" drills), to serve the Crystal group and west end of the Fairview; one power driven compressor (3" drills) for the east end of Fairview; receivers, pipe lines, six machines, drill steel, and all supplies necessary to drive and timber four full sized drifts. Drain and ventilate the same.

**Development**

**Necessary**

To explore the Crystal, the #3 Drift should be driven 760 feet to the end of the Mt. Lion claim, a raise driven to surface, then the drift continued thru the Elcalado 1500 feet to the further end, with frequent cross-cuts and occasional small raises.

**Operating**

**Conditions**

**Future**

To develop the west end of the North Fairview, the present tunnel on the Miscellaneous should be completed thru the ridge until it comes out on the Belle of Fairview. From a point in this tunnel directly under the center of the high ridge, a cross-cut should be run both ways, up and down the ridge (about 900' each way), to intersect possible rich branch veins.

Also, a cross-cut should be started from the present face of the #3 Drift on the Mt. Lion, southwesterly,

toward the southwest corner of the Golden Stairs. This will cross at depth the Dardanelles, the Miscellaneous, and the South Vein of the Golden Stairs.

From a point on the El Belmont, which has about the same elevation as the Crystal mill (about 4500 above sea level), a drift should be run on the vein disclosed, toward the southwest corner of the Golden Stairs.

To explore the east end of the North Fairview Group; first, a drift should be driven on the South Vein, thru the ridge between the Favor and the Fairview, or vice versa, at an elevation about 500 feet above the Crystal Mill; second, a cross-cut should be started on the Teddy at about the elevation of the Crystal Mill, but on the opposite side of the gulch. This cross-cut should be run toward the southeast corner of the Faber, and on a very slight grade, just enough to drain water. Work should be started at the same time from the proper point on the Faber to connect with the Teddy end.

When the above drifts and cross-cuts have proceeded far enough to show the location of the principal bodies of ore, and it is found that these ore bodies go still deeper, another program for main haulage drifts and tunnels may be laid out. It will be seen, however, that the above tentative program is flexible in that it will allow for haulage to a mill on the present Crystal site, one on the Alcalado side of the Elephant Peak, one on the El Belmont side of the Fairview, and one on the slope toward the present Champán Mill.

Later, a drift and main haulage tunnel can be driven from a point on the Albany at 500' below the elevation of the Crystal Mill, westward toward the Belle of Fairview

claim. This would serve a mill on the present Champion site. A much shorter tunnel could be driven from the Vesuvian side of the ridge, if the main ore body develops deep beneath the Belle of Fairview, and would serve a mill on that side.

At an elevation 1000' below the Crystal Mill, a tunnel can be run westerly toward the Crystal Group from a point opposite the Grizzly Group. This main haulage and development tunnel would serve a mill at the mouth of Crystal Creek. This mill could handle ore from the Grizzly in case a good body was found there. The above tunnel would be located on the Baltimore Group and would explore any veins of ore on the latter. With the mill in this location, an auxiliary tunnel will have to be driven south across the BeRoy property underneath the Albany and Golden Curry to mine the Deep ores in the latter and the deep ores in any possible Champion acquisitions.

A system of trenches and cuts should be used to uncover a possible high grade shoot of ore along the south side line and east end line of the Dirigo.

In the following estimate of probable costs, the entire program is outlined:

Probable	\$ 10,000.00	Housing and care of mill machinery, rust prevention, snow protection, roads.
First	40,000.00	Leasing, repair and extension of Champion power lines, to Crystal.
Costs	50,000.00	Compressors, pipe lines, machines, drill steel ventilation, etc.
	150,000.00	13,000' long drifts & cross-cuts, 2000' short drifts, cuts etc.
	100,000.00	Examination, Surveying, lease and purchase of adjoining ground, assaying.
	<u>\$350,000.00</u>	1st stage (prospecting and exploration) 1922-23'

If the first stage shows up the expected bodies of ore, the next stage will be:

\$150,000.00	400 Ton Mill, at one of the four preliminary sites, say the Crystal.
50,000.00	Supplementary steam plant at Warehouse, now dam and aqueduct, roads.
<hr/>	
200,000.00	2nd stage (1923-24) Erection of small mill, operation commenced.

If the 1st stage has shown that the ore still continues at lower depth stage 3 will cost:

Later  Costs	\$ 50,000.00	5000' Drift from lower end Albany to Belle of Fairview.
	50,000.00	5000' Drift Cross-cut, & haulage tunnel on Champion ground, on same level as Albany drift.
	50,000.00	Development work on Musick group, same level.
	50,000.00	Development work on Helena, same level, copper bearing porphyry dike.
	<hr/>	
	200,000.00	3rd stage (1924-25) Larger development stage.

While stage 3 is proceeding, stage 4 will probably be planned.

\$150,000.00	Selection and purchase water power sites, erection of larger power plants.
250,000.00	1000 Ton Mill at present Champion site, City Creek, or Sharpes Creek.
150,000.00	15 miles narrow gauge railway from Diss-ton. (Standard gauge railway may prove more practical)
<hr/>	
	4th stage, Larger Mill building stage.
550,000.00	

If stage 3 has demonstrated that the ore bodies continue still deeper, a mammoth development stage should be inaugurated, preceded by obtaining options on Grouse Mountain property, City Creek, Mt. Bohemia, Vesuvius and Fairview Peak properties. The lower level, 1000' below the present Crystal Mill, would then be the elevation to work from. The cost cannot be approximated very closely, but would



probably be in the neighborhood of:

\$ 50,000.00	Lease and develop the Grizzly and adjoining claims, 5000' of drifts, cross-cuts.
50,000.00	Lease and develop the Baltimore, main haulage tunnel to Crystal, 5000'.
50,000.00	Develop the Champion, same level as above, from Oro Plate (Baltimore group).
<u>200,000.00</u>	Looking toward building of a 2000 Ton Mill on the lower end of Oro Plate.
\$ 50,000.00	From the lower level elevation 3500', develop Helena from Horscheaven side.
50,000.00	Lease and develop Kauffman ground from Horscheaven side.
50,000.00	Lease and develop North Grouse Peak properties from Horscheaven side.
50,000.00	Lease and develop South Grouse Peak properties from Horscheaven side.
<u>200,000.00</u>	Looking toward building a 2000 Ton Mill. The above mill might in certain events, be placed on lower City Creek, in which case

it would serve some of the ground mentioned in the next paragraph.

Future	\$ 50,000.00	Develop the Musick from the same level (above).
Expansion	50,000.00	Lease and develop Vesuvius from Sharpe's Creek side, same level.
	50,000.00	Develop west end of Fairview, from Sharpe's Creek side, same level.
	50,000.00	Lease and develop Churchills, develop west end Crystal, S. Creek side.
	<u>200,000.00</u>	Development necessary to build mill, Sharpe's Creek side.

**Cost Operation**

The preceding program is extensive, but proceeds in separate stages. It is flexible in that it can be stopped or changed at any time after the initial stage is well underway. A practical minimum of expenditure occurs before the mill building stage. After the exploration is successful, the 400 ton mill built, and mill operation well under way, returns will commence.

However, in order to expand and provide ore for the larger later mills, it will be necessary to keep on with the development shown in the 3rd and later stages of the outline. With the development of the mine always pre-

ceding mill expansion, it is thought that mining costs will be finally reduced to \$1.25 per ton, and milling costs to fifty cents.

#### Recommendations

With the foregoing facts all reviewed, the organization of the necessary capital to accomplish the above program is recommended. At first, enough money should be obtained from the sale of stock, to complete the first stage. Work should then begin. Ample provision should be made for further sales of stock in time to take care of the succeeding stages of development.

The obtaining of a lease and option on the Champion, Musick, Helena, and power plant of the West Coast Mines Company makes the project especially attractive. As a mining proposition, the prospect gives a minimum of risk, and the promise of a fair return after the initial stage of two years, with the added possible discovery of the major ore body of the district.

With all the neighboring groups of claims gradually leased, purchased and placed under the same management, and including the North Fairview and Crystal, the Oregon and Ohio Mines Company have a great opportunity. With a safe, constructive program, they should soon develop the best paying proposition in all Oregon.

Respectfully submitted,

Hugh M. Henton.