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BRITISH COLUMBIA DEPARTMENT OF MINES

Preliminary Report  
on the  
MINERAL INDUSTRY OF  
BRITISH COLUMBIA

For the Year 1934

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PRELIMINARY REPORT ON THE MINERAL INDUSTRY  
OF BRITISH COLUMBIA  
For the Year, 1934.

The gross value of the mineral production of the Province for 1934 is estimated at \$42,049,013, an increase of \$9,446,341 as compared with the output in 1933, or 29 per cent. This highly satisfactory increase is due in part to increased prices for gold and silver and in part to increased volume output in these metals, and particularly so in lead and zinc.

The table on page 2 shows the estimated output of metals and minerals for 1934 and corresponding figures for 1933.

The value of the metallic mineral production (gold, silver, lead, zinc and copper) is estimated at \$34,418,463, an increase of \$8,848,439 as compared with 1933. Coal shows a slight increase in quantity and value and miscellaneous metals and minerals a large increase in value. Structural materials showed a further decline.

Mineral production in the first half of the year showed an estimated increase of 50.5 per cent over the corresponding period in 1933 but showed a slight decrease as compared with the last six months of 1933. The estimate issued for the last six months of 1934 is \$663,359 over the first six months of the year and slightly over the last six months of 1933. In other words, the value of the mining production of the Province has remained very steady during the past 18 months.

The tonnage of ore mined was approximately 4,732,000 tons as compared with 4,030,778 tons in 1933. The average price at \$6.66 per ton compares with \$5.87 per ton in 1933. This increase is equivalent to the premium on gold and the increase in the price of silver.

Gold production showed an increase of 64,543 ounces over 1933, establishing an all-time high record with a value of \$6,360,960 (gold at \$20.67 per fine ounce). To this figure an additional estimated "premium" of \$4,249,862 must be added to arrive at the total return in Canadian funds of \$10,610,822. The average price of gold in Canada for the year is estimated at \$34.48 as compared with \$28.60 in 1933.

The following table shows the standard statistics and approximate actual returns in Canadian funds for gold production in British Columbia in the last four years:-

<u>Years.</u>	<u>Standard Statistics.</u>	<u>Approx. value in Canadian funds.</u>
1931	\$ 3,310,886	\$ 3,351,000
1932	4,100,061	4,656,000
1933	4,857,780	6,702,890
1934 (estimated)	6,360,960	10,610,890

The benefits to the mining industry in British Columbia from the increased price of gold is clearly indicated.

Lode-gold production has increased chiefly because of larger tonnages from the Pioneer, Bralorne, the old Rossland camp, and a number of small operations.

Placer output is apparently the same as in 1933 but it is worthy of note that two larger-scale operations in the Cariboo are under way and an increase may reasonably be expected in 1935.

Revised Dec. 29, 1934.

## ESTIMATED MINERAL PRODUCTION FOR THE YEAR 1934 COMPARED WITH 1933

PRODUCT	QUANTITY		VALUE		1934		1934 Percentage Increase (+) or Decrease (-)
	1933	1934	1933	1934	Increase	Decrease	
Gold, placer, oz.	25,928	24,000	\$ 406,776	\$ 408,000	\$ 1,224		+ 00.3
Gold, lode, oz.	223,529	288,000	4,620,754	5,952,960	1,332,206		+ 28.8
Silver, oz.	7,006,406	8,907,000	2,650,720	4,197,869	1,547,149		+ 58.4
Copper, lb.	42,608,002	49,400,000	3,176,341	3,566,680	390,339		+ 12.3
Lead, lb.	271,606,071	340,700,000	6,495,731	8,313,080	1,817,349		+ 28.0
Zinc, lb.	195,963,751	252,780,000	6,291,416	7,730,012	1,438,596		+ 22.8
Coal (2240 lb.) tons.	1,264,746	1,337,000	5,375,171	5,682,250	307,079		+ 5.7
Structural materials.	-	-	1,024,045	906,800		\$117,245	- 11.5
Miscellaneous metals and minerals.	-	-	633,532	1,041,500	407,968		+ 64.3
Totals	-	-	30,674,486	37,799,151	7,124,665		+ 23.2
Exchange equalization on gold			1,928,186	4,249,862	2,321,676		+ 120.4
TOTAL VALUE IN CANADIAN FUNDS	-	-	32,602,672	42,049,013	9,446,341		+ 29.0

Silver production is estimated at 8,907,000 ounces, an increase of 1,900,594 ounces over 1933 and an increase in value of \$1,547,149.

Copper production for the year is estimated at 49,000,000 lbs., valued at \$3,566,680, an increase over 1933 of \$390,339, or 12.3 per cent.

Lead production established an all-time high volume record of 340,700,000 lbs. valued at \$8,313,080, an increase of \$1,817,349 over 1933, or 28.0 per cent.

Zinc production also established an all-time high value record of 252,780,000 lbs. valued at \$7,730,012, an increase of \$1,438,596, or 22.8 per cent over 1933.

Coal production increased from 1,264,746 tons to 1,337,000 tons valued at \$5,682,250, an increase of \$307,079, or 5.7 per cent.

Structural materials show a decline of 11.5 per cent from a value of \$1,024,045 in 1933 to \$906,800 in 1934.

Miscellaneous metals and minerals show an estimated increase of 64.3 per cent over 1933, having a value of \$1,041,500.

Average metal prices for the year estimated in Canadian funds are shown in comparison with prices for 1933 in the following table:-

		1933	1934 (estimated)
Gold (Canada)	per oz.	¢ 28.60	¢ 34.48
Silver (New York)	per oz.	37.8328	47.13
Copper (London)	per lb.	7.4548	7.22
Lead (London)	per lb.	2.3916	2.44
Zinc (London)	per lb.	3.2105	3.058

### Metallurgical Developments

During the year the larger operations brought their production back close to capacity, and several operations increased their capacity and a number of new mills were constructed. The following table shows the increase in milling capacity and new mills erected and in course of construction:-

Company	District	Rated Capacity	Producing	Increased from:
Pioneer	Bridge River	400	400	300
Bralorne	do	450	400	225
Minto	do	50 - 75	60	new
Wayside	do	40	25	new
Grange	Lillooet	60	60 ?	25
Dunwell	Stewart	25	25	new
Columario	Omineca	100	?	new
Island Mt.	Cariboo	50	50	new
Cariboo G.Q.	do	100	100	70
Home Gold	Coquihalla	30	30 ?	new
Windpass	N. Thompson	25	25	new
Twin Lakes	Oliver	35	Intermittent	new
Kolowna Expl.	Hedley	50 - 100	Old Hedley mill	reconditioned.
Jennie Long	Kamloops	30		
Kootenay Belle	Sheep Creek	65	35	new
Yankee Girl	Ymir	100		new
Dentonia	Greenwood	100	140	new
Superior Gold	do	50		
Sheep Cr. Gold	Sheep Creek	150	Under construction.	
Ymir Con. Gold	Ymir	50	50	new
C.M. & S. Co.	Tadanac	100	Old Rodmill treating Rossland ores.	
Meridian	Cambrone	100	Under construction.	

During the year 178 mining companies were formed of which 91 were public and 87 private organizations. Of these, 149 companies were formed for the purpose of developing gold properties, with three or four exceptions, within the Province. These figures compare with 153 companies in 1933 of which 145 were gold mining companies.

There was a distinct falling-off in company promotions during the latter part of the year. However, it is estimated that more worth-while work will be done during 1935 than in 1934.

Dividends for the year are estimated at \$6,753,614 as compared with \$3,075,577 in 1933.

During the year the B. C. Electric Company installed a small unit at their Bridge River power project and brought a transmission line into the Bridge River camp. The West Kootenay Power Company extended their transmission line from Ymir into the Sheep Creek camp, making available ample power for the properties located in that camp.

#### GENERAL SITUATION

With the close of 1934 it is evident that the mineral industry of the Province is approaching more stable conditions and that an increase in 1935 comparable to that of 1934 is not to be expected. The fact that mineral production for the past 18 months has been very steady is sufficient reason for such a statement. However, to forecast future production even for the present year is, under existing, rapidly changing world conditions, a matter of considerable speculation. Such a forecast is considered to be of sufficient importance to merit the attempt which may be best accomplished, by treating the major mineral industries of the Province separately.

The history of gold shows that every increase in the price of the metal has been maintained. Therefore, the present price will in all probability hold, and an even higher price may be anticipated. With the bringing into production of a number of old and new properties and increased production in some of the established mines, it is reasonable to anticipate increased volume and a possible increase in price of the metal.

In the case of silver it is interesting to note that the past records in volume and also value production have not been due to extremely high prices for the metal and that production was fairly steady from 1896 to 1921 in spite of wide fluctuations in price. The sudden rise in the volume of silver produced came in 1922 with the sudden rise in the production of lead and zinc, and the future of silver volume production will depend on the markets for the base metals. However, silver camps such as the Slocan respond to the rise and fall in the price for the metal. It is worthy of note that in the peak years of silver production in the Slocan the value of lead produced was not far below that of silver. Under existing conditions, little or nothing can be obtained for the lead content of these ores so that for the immediate future production will have to be estimated on the silver content only. Even under such conditions an appreciable increase in silver production may be anticipated. It also seems probable that a moderate increase in price may be realized.

Copper production in 1935 so far as it can be foreseen is likely to show a decline of about 60%, due to the announcement that the Granby Operation at Anyox is to be closed down late in the spring.

Lead production is likely to remain about the same but it is anticipated that a slight increase in the price for the metal may be realized. The present price is low beyond reason and while the prices of 1926 may never again be reached, a reasonable appreciation in value should be attained within the next few years.

While it is anticipated that the volume of zinc will be maintained due to a demand for electrolytic zinc, and the position which the British Columbia metal has won in world markets in spite of keen competition, it is not anticipated that any appreciable increase in the price of the metal will be realized.

Coal has shown in 1934 an increase of 5.7% over 1933 and if 1935 shows a slight increase, it seems to be a reasonable estimate.

Structural materials should by the end of the year show a marked increase in production.

Miscellaneous metals and materials are not expected to show the marked increase in 1935 over 1934 which has been achieved in 1934 as compared with 1933, and a slight increase is considered reasonable.

Therefore an estimate of \$44,500,000 in even figures is arrived at as the possible value for the mineral production of the Province for the year 1935.

It is hazardous to venture an estimate of the future value of the mineral production of the Province but sound business principles demand a long-sighted view of affairs. To arrive at a possible figure under what, at the moment, may be anticipated as reasonably normal conditions, an estimate is made based on anticipated volume production for 1935 in gold, silver, lead and zinc, and increased production in coal, copper and structural materials. Estimating the value of gold at \$40 an ounce, silver at 60 cents per ounce, copper at 11 cents per lb., lead and zinc at 3.5 cents per lb. in this attempt a figure of \$55,000,000 is obtained.

To increase this figure it seems that gold production will have to be increased and the importance of this metal to the future welfare of the Province is becoming more apparent.

The importance of the mining industry of the Province to the other major industries and in particular to general business conditions has not been fully appreciated by the people of British Columbia. It is gratifying to observe that interest in and realization of the importance of the industry is at last being shown by general business interests.

The Resident Engineers of the Various Mineral Survey Districts report on general conditions in their respective districts as follows:-

No. 1 Northwestern Mineral Survey District. J.T. Mandy.

There has been a decided increase in activity in all branches of the mining industry in this district during 1934. Employment has increased over 1933 and approximately 2,000 men have been employed in about 40 operations of varying size, exclusive of individual prospectors and smaller outfits scattered throughout the district.

Prospecting

Prospecting has been active in the Unuk River area where the aeroplane has been used in transporting men and materials. The Department of Mines has commenced construction of a trail from the head of navigation into this section and the Alaskan authorities have co-operated in the improvement of river navigation through Alaskan territory to the British Columbia boundary.

In the Coastal area prospecting has been carried on at the La Porte group near Port Essington, and the Mastodon group, Hastings Arm, in both of which values in gold are present.

Work has been done on gold showings on the Fairtide claim and Big Chief claim in the Queen Charlotte Islands.

In the Alice Arm area gold showings have been prospected on the Home-stake and Gold Reef groups. Though this area has been comparatively inactive the gold aspects of the west side of the Upper Kitsault Valley area are attracting the attention of examining engineers. The increased price of silver is also attracting attention once again to this area.

In the Portland Canal area, Stewart, new discoveries of interest have been made on the Star Gold group, Marmot river, and the Trcy and Portland groups in the Upper Salmon River section. In the Bear River section new discoveries have also been made on the Palme and El Oro groups. On the L. and L. the discovery of two new veins carrying gold and silver values is reported.

In the Liard area a lode discovery on Quartz creek, tributary to McDames creek, was reported late in the season and resulted in a small stampede and the staking of 170 claims.

Although prospecting for both lode and placer has been very active, no outstanding new discoveries in new areas have been made. However, the features and results during the year of detailed prospecting on many old properties in already known areas can be classed as new discoveries with a favourable bearing on future productivity.

#### Exploration and Development

Exploration and development work has been carried out on many lode properties throughout the district of which only a limited number are mentioned.

In the Skeena division construction and renovation work has been carried out at the old Surf Inlet mine.

In the Portland Canal area a crew of about 60 men has been employed on the Big Missouri and work has been done on the Unicorn, Trcy, Salmon Gold, and Portland groups. In the Salmon River section work has been continued at the United Empire and Glacier creek properties.

Development of the Atlin Pacific Mining Company's property (formerly Norgold) continued throughout the season and it is anticipated that the old Engineer mine will be opened up this year.

#### Production

Production from lode operations has mostly come from the Premier and Dunwell mines, Stewart, Granby Consolidated, Anyox, and Surf Point mine, Porcher Island.

Small shipments have also been made from the Spider, Joker, United Empire and Black Hill at Stewart, Jeannie on Porcher Island, and Princess Royal Gold Mines, Surf Inlet.

Numerous individuals, syndicates and companies have been actively engaged in placer mining. In this connection, it must be stressed that placer prospecting in this district is no easy task and requires not only experience but a grub-stake and funds to see the prospector through the season in the even of failure.

#### No. 2 Northeastern Mineral Survey District, Douglas Lay.

During 1934 mining activity was chiefly confined to the prospecting and development of gold properties, both lode and placer.

Prospecting and development of lode gold properties was carried out at Hudson Bay mountain, near Smithers, Dome mountain near Telkwa, near Babine lake, and in the northern part of the district.

Two new hopeful discoveries were made during the year: that of the Patmore group near Dorreen in the Skeena section, and that of the Timber Line group near McKee lake, in the Horsefly section.

In the Cariboo section, it may be said of lode-gold operations generally that although some have been discontinued, a comparison between the present position and that of two years ago shows clearly that real progress has been made.

The discovery of the markedly-auriferous pyrite replacement deposit in limestone at the property of Island Mountain Mines Company, Ltd., last year and development therein this year has aroused much interest at this property, and at that of the Cariboo Gold Quartz Mining Company, Ltd., at which mineralization of similar type, although less extensive, has been found. This type of deposit adds new interest not only to these two properties, but also to the zone or belt in which they occur.

Stimulated by the improved silver market, work in excess of assessment was carried out at a few silver-lead-zinc properties and a car of ore was shipped from the Golden Eagle group, Topley, by the owners.

For the first time for many years interest has been shown in tungsten properties at one of which, the Hardscrabble mine, near Barkerville, preliminary investigation was commenced.

In placer-mining a marked general increase in activity featured the year. Much additional plant was installed during the year by various operators, including several drag-lines, and two small dredges of new type. Operating control of two well-known mines was secured by different English interests; the property of Consolidated Gold Alluvials of B.C. Ltd. (Wingdam) on the one hand, and that of Bullion Placers Limited (Bullion) on the other.

In the Omineca Mining Division, activity continued in the Manson section where operations are carried on by several companies and individuals.

In McLeod River area operations were carried on by Northern Reef Gold Mines Limited on McDougall river.

In Two Brothers Lake area, in the extreme northwestern portion of this Mineral Survey District, Two Brothers Valley Gold Mines, Ltd., carried on preliminary testing operations at its property on McLair (M-Laron) and Thudegade creeks (Thudegade creek is also known as Two Brothers river). This is the most northerly operation in the district and is served by aeroplanes based at Takla lake.

Calling for special mention are the results gained by the many individual bar-workers on the Fraser and other rivers. It is estimated that the sum total of the value of placer recovered by such during the year will not fall far short of \$50,000.

The output of "Bulkeley Valley" coal from F.M. Deckerill's colliery near Telkwa will be greater than in 1933.

#### Nos. 3 and 4 Mineral Survey Districts, P.B. Freeland.

The greatest activity in mining took place in the Hedley, Cscyoos and Greenwood areas where known deposits of gold occur and where practically all the facilities for mining are at hand. Many old mines have been reconditioned, and extended exploration has produced more ore. Some of this, of course, has been brought into the picture by the higher price of gold and was known of before, but it all points to the fact that one of the best speculations for an exploration company lies in these semi-developed regions where power and transportation exist and where, consequently lower costs at first can be obtained.

The Hedley district for many years was represented by one operation, the Hedley Gold Mining Company. Today this one mine has been rejuvenated by the Kolowna Exploration Company and more ore discovered. In the lower part of the same ore-body, the Hedley Mascot Syndicate is exploring extensions of the known ore-bodies with favourable results.

The key to possible future ore-bodies in the Hedley area appears to lie in the structural association of the gabbro-diorite rocks and the sedimentary beds. In some instances the dykes themselves have been impregnated with arsenopyrite, the gold-bearing mineral of that area. Those prospecting the district will do well to familiarize themselves with the diorite and gabbro.

In the Oliver or Fairview belt, the gold ores occur chiefly in associ-

ation with pyrite, galena and sphalerite in quartz. Some of the veins are found in the schistose rocks; other in granite. There is no doubt about the genetic connection between the veins found in the granite and those in the schist. The fact has been stressed that many of the outcrops are almost entirely barren of values but along the strike where the vein is covered, ore-shoots may occur.

In the Greenwood section, there are many types of quartz veins containing some gold values which are worthy of exploration. With higher prices for silver, the silver-lead-zinc mines at Beavercreek showed increased activity and most of the old claims, upon which some work was done in the past, have been bonded and reconditioned for further development. A large area to the northeast of the operating mines is overlain with the Wallace formation which so far has not produced any commercial ore to speak of. Underlying this and in the direct path of the shear-zones the ore-bearing quartz diorite has been discovered at varying depth between 200 feet and 300 feet. Prospecting beneath the Wallace rocks may result in the extension of the high-grade silver-bearing shear zone being found.

In the Kamloops Mining Division recent discoveries on the Sweet Home claim belonging to the Windpass Mining Company above Kamloops, are most attractive and appear to warrant extensive exploration of the region near Chu Chua.

Taking the district as a whole, developments have been favourable and in the future several mines will come into production. It is not, of course, to be expected that all the explorations will develop mines, but that the only way to discover them is to do some digging.

#### No. 5, Eastern Mineral Survey District, B.T. O'Grady.

In No. 5 district there has been a very marked increase in the production of silver, lead and zinc, chiefly due to the larger output from the Kimberley mine of the Consolidated Mining and Smelting Company. More men were put to work both at this mine and at the Trail smelter, the number of employees at the Sullivan now being 934 with 3,132 at the smelter.

District No. 5 customs shipments to the Trail smelter, chiefly gold ores and concentrates, also show a substantial increase. Shipments were made from 35 properties in the Nelson Mining Division, 11 in the Trail Creek Division, (exclusive of the large output made by lessees on the Consolidated Mining and Smelting Company's mines), 22 in the Slocan Camp (Slocan, Ainsworth and Slocan City Divisions) and 3 in the Lardeau, Arrow Lake, and Fort Steele Divisions (one small shipper in each of these Divisions). The Slocan Camp shipments, with a few exceptions where the ores contained gold, consisted of silver-lead ore and concentrates mostly from leasing operations.

Gold mining has contributed in an important degree to the improvement in the District employment situation, over 1,200 men being at work in the mines (exclusive of the Consolidated Mining and Smelting Company's operations, and seasonal placer-mining undertakings scattered through the District). Production of gold for the current year is better than any year since large-scale production by the Consolidated Company ceased at Rossland. Customs shipments of gold ores and concentrates for the 10-month period contained 20,893 ounces of gold to which must be added the bullion produced by the Reno Gold Mines Ltd., the Relief-Arlington Mines, Ltd. (from which concentrates shipped to the Tacoma Smelter must also be taken into consideration), and the Wilcox Leasing Syndicate. Lessees on the well-known old mines of the Consolidated Mining and Smelting Company at Rossland contributed 20,208 ounces of gold for the first 10 months of the year and their estimated production for the whole year should be close to \$1,000,000 in value. A rough estimate of 1934 total gold production for District No. 5 is 60,000 oz.

The gold-mining industry, based on the enhanced price of this metal, is showing evidence of permanence with increased production when milling operations such as at the Yankee Girl (Ymir-Yankee Girl Gold Mines Ltd.), Kootenay Belle Gold Mines, Ltd., and Queen (Sheep Creek Gold Mines Ltd.), get under way. Shipments have been suspended from the first two mentioned properties and the Goodenough (Ymir Consolidated Gold Mines Ltd.) pending consummation of milling

plans. Expansion to say 60 or 70 tons a day may occur at the Second Relief mill (Relief-Arlington Mines Ltd.), though this is dependent upon the results of exploration under way by the Premier Mining Company organization. A substantially larger annual production from the Reno Gold Mines Ltd., no longer handicapped for power shortage, is assured. Increased output can also be expected from some of the properties entering the production stage such as the Gold Belt Mining Company, and Ymir-Dundee Gold Mining Company, while new developments and discoveries such as, for instance, at the Centre Star property of the Wesco Exploration and Development Company near Ymir, must be taken into serious consideration.

Lode-gold development and exploration is going on at numerous prospects in the Nelson Mining Division, at points in the Fort Steele Division including the Midway group of the B.C. Cariboo Gold Fields Ltd., near Moyie, and the Quartz Mountain, near Cranbrook, of the Kimberley Goldfields Syndicate, and in the Lardeau Mining Division as at the Teddy Glacier (gold-silver-lead) near Camberne. Long dormant properties in the area south of Nelson are being investigated and exploration resumed at former producers such as at the Porto Rico, which lessees are re-opening, and the Fern, where the Gold Fern Syndicate of Toronto is starting work. Preparations are being made to resume work and initiate production from the Bayonne mine reached from Tye Siding on the western side of Kootenay lake. In the Lardeau Division mill construction is announced by the Meridian Mining Company. Gold ore occurrences are widespread in District No. 5 and with good management and adequate financing, important factors which are beginning to materialize, a substantially increased and permanent gold production can be expected. A satisfactory feature is the provision of adequate and dependable power in the Nelson-Ymir-Salmo-Erie area through the newly constructed transmission lines of the West Kootenay Power and Light Company extending from existing hydro-electric plants on the Kootenay river.

No. 6, Western Mineral Survey District, A.M. Richmond.

Gold mining continues to hold first place in the mining activity of the No. 6 District and in 1934 for the first time the two leading gold producers in the Province, Pioneer, with an estimated production of 102,000 oz., and Bralorne, with an estimated production of 52,000 oz., are found in the Bridge River camp. Steady gold production has also come from the Vidette property located on the shore of Vidette lake, north of Kamloops lake. Here a 35-ton milling plant has been operating steadily on ore averaging about  $\frac{3}{4}$  of an ounce of gold per ton. Gold production has also come from the Grange property near Clinton where a 25-ton mill, more recently stepped up to 60 tons capacity, has been in operation for some months. Recent developments at this property are encouraging.

A small production has also come from the Taylor-Windfall mill in the Taseko Lake country. This plant, operating at about 3 tons per day capacity, produced about 250 ounces of gold. More recently, the Wayside property has been equipped with a 35-to 50-ton milling plant of the amalgamation type and it is now reported to be operating successfully at an average capacity of about 20 to 25 tons per day. Minto Gold Mines have recently completed the installation of their 50-ton milling plant and this it is expected will be in continuous operation during the present month.

At the two leading producers, Pioneer and Bralorne, the former has been milling at a rate of about 400 tons per day while the Bralorne is gradually stepping up production to the anticipated 450 tons per day, present milling being slightly more than 300 tons per day.

The Hone Gold property near Hope have recently installed machinery in their mill building and expect to get into production late this year. In all parts of the district prospecting and development work is very much featured in the year's activity.

On Vancouver Island in the Alberni district a mild boom occurred early in the season and many claims were staked in the area contiguous to the Port

Alberni Canal. Further up the West coast of Vancouver Island in the vicinity of Zeballos river and north, many claims were staked by prospectors investigating the possibilities outlined by Dr. H.C. Gunning of the Geological Survey. In the Shoal Bay-Phillips Arm section several hundred claims were staked early in 1934 after the Alexandria property was re-opened by the Premier Gold Mining Company. At the present time in that area much of the prospecting and development work has stopped, the only activity there at present being confined to the operation of the Hercules Consolidated Mining, Smelting and Power Corporation, and the Shoal Bay Syndicate, under the direction of Seymour Campbell.

In the area north of Harrison lake, particularly in the area surrounding Fire lake and Fire mountain, there has been considerable prospecting activity during 1934 and one or two promising finds are reported to have been made in the Lillooet Lake area. In the Hope-Yale area many claims were staked around the property of the B.C. Nickel Company, Ltd., and some exploration work has resulted further up the Fraser river. In the vicinity of Lytton and Ashcroft, activity has been commenced by several gold mining syndicates and companies and in the area surrounding the Vidette mine several groups claims have been staked and a considerable amount of development work, much of it of a negative nature, has been accomplished.

Further north in the area about Clinton many prospectors have been in the hills and they report encouraging results in their year's work, although so far the Resident Engineer has not been able to examine all these properties in detail and cannot give any definite information.

In the Tatlayoc Lake area considerable interest resulted in the possibilities of the country when the old Morris mine was acquired by Vancouver interests. Several exploration parties were in the field in this area and several encouraging finds are reported.

Along the P.G.E. railroad from Squamish to the Bridge River there has been a continuation of the prospecting activity started in 1933 and several new companies were formed during the year for the purpose of obtaining funds with which to develop showings in the Blackwater-Birkenhead and McGillivray Creek sections. In the Brandywine area prospecting activity continues as in past years.

In the main Bridge River camp several developments which were commenced in 1933 have been somewhat curtailed in 1934 due primarily to lack of funds and in many instances due to the failure to locate promising mineralization. The two main producers, Pioneer and Bralorne, have both increased their ore reserves substantially and when recently visited both mines gave the appearance of showing a very substantial ore reserve ahead. Particularly interesting have been the developments on the lowest level of the Pioneer mine and the present programme of shaft-sinking which is to go down to the 3100-foot level (No. 26 level), should result in very interesting development when the lateral work from the shaft is commenced. This, it is understood, will not be undertaken until the shaft has been completed to the 3100-foot level.

In the Bralorne mine interesting and very promising sections have been opened up on the 6th, 7th, 8th, 9th and 11th levels. The "C" vein, or "C" block, as it is called, lying along the No. 2 fault, has responded well to development. More recently the development on what is believed to be the shaft vein on the 8th level has been of a promising nature and a length of more than 300 feet of commercial ore has been opened up on the 8th level development of this vein. At the Bralorne mine the new milling plant has been operating for some time and tonnage is gradually being stepped up to a production rate of approximately 450 tons per day. This tonnage should be reached in the very near future as the new underground shaft serving the levels below No. 8 has been in operation for some weeks.

In the Bridge River camp, outside of the two producing mines and a few other properties, it may well be considered that most of the work being done is primarily of a prospecting nature. Much of this prospecting is being done under the well-directed supervision of the engineers in charge and is rapidly eliminating unfavourable ground, so that efforts may be better directed to any possible prospecting chances which might exist on the individual properties.

COAL MINING - James Dickson, Chief Inspector of Mines:-

The total production of coal in British Columbia during 1934 was 1,380,920 tons, an increase of 9.18% as compared with 1933 when the production was 1,264,746 tons.

The mines of the East Kootenay district were responsible for the increase as both Vancouver Island and the Nicola-Princeton districts showed decreases as compared with 1933. Increased business in railroad coal and intensive marketing, assisted in Manitoba by a Dominion subvention, is largely responsible for this increase in coal production in East Kootenay mines.

The mines of the East Kootenay district produced 651,829 tons in 1934 as compared with 477,677 tons in 1933, an increase of 36.4%.

The mines on Vancouver Island produced 581,695 tons in 1934 as compared with 613,203 tons in 1933 a decrease of 5.1%.

The mines in the Nicola Princeton district produced 144,602 tons in 1934 as compared with 170,643 tons in 1933, a decrease of 15.2%.

The coal mines in the Telkwa area, Northern district, produced 2,800 in 1934 as compared with 3,403 tons in 1933 a decrease of 17.8%.

The official returns for 1934 are not available to date and the above figures are subject to slight revision.

# BRITISH COLUMBIA DEPARTMENT OF MINES

Hon. G. S. PEARSON, Minister.

ROBT. DUNN, Deputy Minister.

(Position vacant) Provincial Mineralogist.

J. DICKSON, Chief Inspector of Mines.

D. E. WHITTAKER, Provincial Assayer.

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BULLETIN No. 1

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## SUMMARY AND REVIEW

OF THE

# MINERAL INDUSTRY OF BRITISH COLUMBIA

FOR THE SIX MONTHS ENDED JUNE 30TH

1934

COMPILED BY

A. M. RICHMOND, Resident Mining Engineer.



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1934.

# Summary and Review of the Mineral Industry of British Columbia for the Six Months ended June 30th, 1934.

OFFICE OF THE PROVINCIAL MINERALOGIST,  
PARLIAMENT BUILDINGS,  
VICTORIA, B.C., July 24th, 1934.

To the Honourable George S. Pearson,  
Minister of Mines,  
Parliament Buildings, Victoria, B.C.

SIR,—I beg to submit herewith Bulletin No. 1, "Summary and Review of the Mineral Industry of British Columbia for the Six Months ended June 30th, 1934." The bulletin summarizes briefly conditions in the industry and gives approximately the value of the mineral production for the period under review.

Included in this bulletin are reports on each of the Mineral Survey Districts of the Province by the Resident Mining Engineers and details of coal production by the Chief Inspector of Mines.

## STATISTICAL REVIEW.

The gross value of the mineral production of British Columbia for the six months ended June 30th, 1934, is estimated at \$18,667,691, an increase of \$6,259,707, or 50.5 per cent., over \$12,407,984, the estimated value of the production in the corresponding six-month period of 1933. The following table shows in detail the estimated output of metals and minerals for the first half of 1934, in comparison with corresponding figures for the similar period in 1933:—

ESTIMATED MINERAL PRODUCTION FOR SIX MONTHS ENDED JUNE 30TH, 1933,  
AND JUNE 30TH, 1934.

Product.	QUANTITY.		VALUE.		1934.		1934.
	1933.	1934.	1933.	1934.	Increase.	Decrease.	Percent- age Increase or Decrease.
			\$	\$	\$	\$	
Gold, placer,* oz.....	6,470	6,600	110,000	112,200	2,200	.....	+ 2.0
Gold, lode,† oz.....	105,600	139,600	2,182,946	2,885,788	702,842	.....	+ 32.2
Silver, oz.....	3,365,000	4,150,000	1,169,338	1,867,708	698,370	.....	+ 59.7
Copper, lb.....	17,000,000	25,050,000	1,137,300	2,030,753	893,453	.....	+ 78.6
Lead, lb.....	128,000,000	161,560,000	2,752,000	4,162,917	1,410,917	.....	+ 51.2
Zinc, lb.....	64,000,000	117,780,000	1,830,400	3,928,905	2,098,505	.....	+114.6
Coal (2,240 lb.), tons...	592,000	653,000	2,516,000	2,775,250	259,250	.....	+ 10.3
Structural materials.....	.....	.....	450,000	425,000	.....	25,000	- 5.6
Miscellaneous metals and minerals.....	.....	.....	260,000	479,170	219,170	.....	+ 84.3
Totals.....	.....	.....	12,407,984	18,667,691	6,259,707	.....	+ 50.5
Exchange equalization on gold.....	.....	.....	480,000	2,030,136	.....	.....	+322.9
Total value, Cana- dian funds.....	.....	.....	12,887,984	20,697,827	8,209,843	.....	+ 63.7

\* Placer gold valued at \$17 per ounce.      † Lode gold valued at \$20.67 per ounce.

The total value of the metallic production (lode and placer gold, copper, silver, lead- and zinc-mining output) for the six-month period was \$14,988,271, an increase of \$5,806,287 (63.2 per cent.) over \$9,181,984, the figure for the corresponding period in 1933. This substantial and

Company, Limited, at Wells, during the present season. During the early part of 1934 activity in the Cariboo has been somewhat less than during 1933. Steady production has been maintained at the *Cariboo Gold* property.

Throughout the Province a very keen interest is being shown by prospectors and scouting engineers who are re-examining old properties and new discoveries in the light of recent price developments for gold, and in many parts of the Province new developments are under way.

The outlook for the last half of 1934 is for substantially increased mineral production of nearly all metals and minerals, expanding employment, and a general all-round improvement in the industry. Development-work this season in many of the company properties under exploration will conclusively prove the advisability of either abandoning or proceeding with an enlarged scale of development operations.

I am, Sir,

Yours faithfully,

A. M. RICHMOND,

*Resident Mining Engineer.*

*Bureau of Mines,*

*Victoria, B.C., July 24th, 1934.*

# REPORTS OF RESIDENT MINING ENGINEERS.

## NORTH-WESTERN MINERAL SURVEY DISTRICT (No. 1).

REPORT BY JOSEPH T. MANDY, RESIDENT MINING ENGINEER (HEADQUARTERS, PRINCE RUPERT).

The increased activity prevailing generally in the various phases of the mining industry in this district during 1933 has been well sustained during the first six months of 1934 and promises to continue and possibly increase during the remainder of the year. Activity is mainly centred in gold. No definite revival of interest in silver and base metals is yet evident.

Although climatic conditions prevailing in many sections of the northern and high-altitude areas of this district preclude the commencement of active prospecting and exploratory operations much before the middle or end of June, the period under review has been featured by an exceptionally early start on preliminary preparations for work in these areas. In anticipation of the increasing activity, many individuals and well-equipped outfits ventured early into the northern areas either by aeroplane or on foot over the snow. Prospecting is exceptionally active and a very busy and constructive season in this respect is forecast. Promising new gold discoveries have already been made in several sections of the coastal area where absence of snow has permitted an early start in prospecting.

The growing interest of outside capital in this district is evinced by the increased and exceptionally early appearance of examining engineers on the lookout for likely properties. In this connection deals on several properties have culminated or are pending.

On the already active properties, operations have continued energetically; on others new operations have already commenced or are about to start. Steady production from the operations of Premier Gold Mines at Stewart and Granby Consolidated at Anyox has been maintained; the *Surf Point* mine on Porcher island has also produced steadily, and small steady production from the *Dumcell* mine at Stewart has been started. New production from several other properties is indicated and these are being energetically developed with this objective.

### PROSPECTING.

Activity and enthusiasm in prospecting has been a feature of the period under review and many outfits and individuals made an early start into the field. The movement of prospectors into the extreme north-western segment of the district embracing the Squaw Creek and Tatshenshini River areas has been especially noticeable and many well-equipped outfits have gone into this area.

Activity in the coastal area has also materially increased, and warranted attention is being given to the gold possibilities of granitic areas of the Coast range, and some new discoveries that warrant further exploration have been made on Porcher island. New discoveries of gold-bearing veins have also been made in the Mitchell Inlet, Atli Inlet, and Cumshewa Inlet areas on Moresby island of the Queen Charlotte islands. An important new discovery of a gold-bearing vein is also reported from the Hastings Arm area of the Nass River Mining Division.

A revival of prospecting is also evident in the Kitsumgallum Lake section of the Skeena Mining Division and some likely gold areas of that section will be investigated during the season.

Interest in gold possibilities of the Unuk River area of the Portland Canal Division has also increased and several outfits will undertake exploration in this section. The potential importance of this section of the eastern contact belt has been concretely recognized by the British Columbia Department of Mines and also by the Alaskan Government. To make the area more easily accessible to prospectors the Alaskan authorities have undertaken the cleaning-out of the river to the boundary. This will provide comparatively safe navigation for small outboard-powered river-boats for this distance. In British Columbia territory from the boundary on, the Department of Mines has commenced construction of a trail to the confluence of Sulphurets creek, which is at about the centre of the mineral-belt.

A marked degree of soundness and efficiency generally features the view-point of prospectors venturing into the field this season. To the training, encouragement, assistance, and advice rendered by the Department of Mines can be ascribed much of the improvement in this respect.

Lectures and classes conducted by the Resident Engineer throughout the winter months were enthusiastically received and well attended, and instructive pamphlets dealing with the various phases of prospecting, compiled by A. M. Richmond, Resident Mining Engineer, were of very constructive assistance in this respect.

#### LODE-MINING.

##### QUEEN CHARLOTTE MINING DIVISION.

On the *Big Chief* group at Atli inlet a quartz vein 4 to 10 feet wide has been discovered by J. Mollitor, of Queen Charlotte. As it may possibly contain free gold, the owners have been advised to open-cut and bulk-sample. On the *Bucktide* at Cumshewa inlet, owned by R. Scharffe, of Skidegate, a new discovery of a quartz vein 10 inches wide has been stripped for 100 feet. A sample of this showing assayed: Gold, 0.4 oz. per ton; silver, 8.4 oz. per ton; copper, *nil*; lead, 2.1 per cent.; zinc, 5.6 per cent. A sample of the wall-rock assayed: Gold, 0.04 oz. per ton; silver, 0.4 oz. per ton; copper, trace; lead, 0.2 per cent.; zinc, 3 per cent.

**Gold Harbour Mines, Ltd.** Operations on this property have not been resumed since their cessation in December, 1933. The operations so far carried out have been mainly concerned with the ill-advised objective of immediate profitable production.

No information has consequently been shed on the indicated possibilities outlined in the 1932 Annual Report. At the time of examination, May 20th, 1934, the winze from the main tunnel was filled with water and, consequently, these workings could not be examined. Between the main tunnel and the old open-cut a stope about 30 feet long and 20 feet high had been excavated towards the north-east. In the back of the stope the vein varies from 10 to 20 inches of quartz stringers, with  $\frac{1}{2}$ - to 1-inch stringers in the face. A sample of this face assayed: Gold, *nil*; silver, *nil*.

To ascertain information regarding mill recovery at the time this property was in operation, a small amount of tailings still remaining above high-tide mark was sampled. This assayed: Gold, 1 oz. per ton; silver, 0.2 oz. per ton. An examination of this material under the magnifying-glass revealed many specks of floured mercury which doubtless must have originated from the amalgamating-plates.

At altitude 250 feet and near the north-easterly corner of the *Big Nugget* claim a new vein has been discovered. This has been stripped for 50 feet and exposes a subdued quartzose shear 69 inches wide, striking N. 30° E. (mag.) and dipping 60° west. A sample of the unoxidized material of this outcrop assayed: Gold, *nil*; silver, *nil*. A new discovery of a series of quartz-outcrops from 1 to 12 inches wide traced up Carmichael creek from the beach has also been made. A chip-sample from the lower end of these exposures assayed: Gold, *nil*; silver, *nil*.

**Haida Gold Mines, Ltd.** Efficient work has been continued on this property at Kootenay harbour, west coast of Moresby island. Work has been centred on the driving of the crosscut to intersect the "C" vein at 288 feet below the upper tunnel. During the course of this work five narrow veins or combinations of narrow stringers were intersected, and in the latter part of May the "C" vein was reported intersected at 387 feet from the portal, showing at this intersection a width of 30 inches of solid quartz plus about 60 inches of small quartz veins and stringers. Only low gold values are reported to occur in the vein at this point and it will require further exploration by drifting in both directions.

##### SKEENA MINING DIVISION.

On Porcher island some very efficient exploration was carried out by Frank Patterson on the *Edye Pass* group. On the *Nabob* claim the vein was stripped for 170 feet and an open-cut 120 feet long excavated, yielding about 40 tons of fair grade gold-bearing pyrite ore. The vein exposed in this work varies from about 6 to 41 inches in width and occupies a well-defined shear-structure and is continuous under the overburden at both ends of the present stripping. The Timmins option on the *Jeannie* claim has not been exercised and Frank Patterson will continue the extraction of ore for treatment in the *Surf Point* mill.

On the *Redbird*, owned by J. H. Jones, of Porcher island, a quartz vein 2 to 3 feet wide mineralized with gold-bearing pyrite has been discovered and stripped for about 300 feet. Several other likely veins have also been discovered on this property.

This property on Porcher island, operated by the Noah Timmins interests, **Surf Point.** has been continuously operated, with the exception of a short shut-down caused by water-shortage during the cold weather in the early spring. Additional Diesel power has been installed and the flotation-mill is treating about 25 tons per day. On account of the erratic lenticular character of the veins, difficulty is experienced in building up ore reserves. Mill-heads have averaged about 0.8 oz. gold per ton and 0.3 oz. silver per ton. In March 85.41 tons of concentrates assaying 8.65 oz. gold per ton and 3.52 oz. silver per ton, and in April 82.81 tons assaying 8.76 oz. gold per ton and 5.84 oz. silver per ton, was shipped. Another shipment of about 80 tons of concentrates of about the same grade will be made shortly.

(See 1933 and former Annual Reports.) The property embraces the old **Princess Royal Gold Mines, Ltd.** holdings of the Belmont-Surf Inlet Mines, Limited, which company ceased operations in 1926. Preparatory work has been continued on this property on Princess Royal island with a crew of thirty-six men under the supervision of Ed. Kinder and the direction of J. B. Woodworth, of Vancouver. This work has entailed preparatory work, including repairs to the wharf, buildings, railway, etc., installation of power and telephone line, laying of track, construction of ore-bunkers, transportation and installation of machinery. Approximately 10 tons of high-grade ore selected from pockets of sulphide in several parts of the old *Pugsley* mine-workings has been shipped. Beyond this no mining or underground preparatory work has been undertaken. The Resident Engineer is informed that mining operations in the old *Pugsley* workings are expected to commence about the end of August, and that for the time being operations will be concentrated on this part of the company holdings. Plans include the initial extraction of ore for shipments and the subsequent installation of a mill.

An examination of this property by the Resident Engineer was undertaken during the middle of June, 1934. For purposes of efficient examination the old *Surf Inlet* mine main workings were deemed inaccessible. Attention was consequently concentrated on the *Pugsley* property in conformity to the initial plans of the operating company.

The *Pugsley* property was originally opened up by four levels, the main or track level being the so-called 900-foot level, with a shaft from this level to the 1,000-foot level and raises to the 800- and 700-foot levels above this to and towards surface. The shaft and 1,000-foot level were flooded and inaccessible and no criterion could be formed regarding the amount of old mining or aspect of veins on this level. It is claimed that on this level drifting and stoping was carried out on the "Big" (or east) vein, but that no mining exploration or development was done on the "Small" (or west) vein.

The ore occurrence consists of two parallel main shear-veins, about 90 feet apart, in gneissic quartz diorite. Mineralization consists of pyrite and chalcopyrite erratically distributed in a quartz gangue in blebs, streaks, and patches, favouring generally the hanging or foot walls of the veins and sometimes being sufficiently condensed to form minable lenses and shoots. Gold values are confined entirely to the sulphides, the quartz itself being barren of values.

The east vein varies from about 5 to 15 feet in width on the 900-foot level. On this level in the drift south on the east vein to the stope, along a distance of about 350 feet, some short lengths of quartz with some sulphide mineralization can be seen and would be worth further exploration for mill-grade ore possibilities. Beyond this the level has been stoped out for a length of about 120 feet, the stope extending probably about 100 feet in the back and also below the level probably to the 1,000-foot level. The workings on the east vein in and beyond this stope are not accessible with any degree of safety. It is understood that further mining by the old company in the back of this stope towards surface was limited by the encroaching boundary of the *Homestake* claim, which claim is reported to be now under option to the Princess Royal Gold Mines, Limited. It is also understood that surface continuity of the "Big" (or east) vein has not been definitely located. Any further possibilities in the upward extension of this stope can consequently only be ascertained by accessibility and examination of the stope back and further exploration in this direction. Possible continuity of this ore-shoot in the east vein below the stoped area on the 1,000-foot level can likewise only be ascertained by examination

after dewatering the 1,000-foot level and the prosecution of further exploration if deemed warranted. In the drift north on the east vein good widths of quartz are exposed in places, with some scattered blebs and streaks of sulphides and the shear decreasing in intensity to the face, which shows a structure 6 feet wide containing crushed diorite and a few quartz-streaks.

The "Small" (or west) vein varies in width from 10 to about 14 inches of quartz, with sulphide mineralization in places, containing in a sheared structure up to about 5 feet in width in some sections. Ore is mainly confined to the quartz gangue, which would average about 24 inches in width. Ore is erratically and lenticularly distributed in the shoots, which have a stope-length varying from a few feet to a maximum of about 200 feet. This characteristic necessitated careful selective mining in the old workings, with a resultant erratic stope outline. Considerable stoping has been completed on this vein by the former Belmont-Surf Inlet operation between the 900-foot level and surface. Many sections of these old stopes are inaccessible. Before any definitely accurate criterion can be gathered regarding possible remaining ore-tonnage in the worked area above the 900-foot level, these old workings should be accurately surveyed, mapped, and sampled. Along the 900-foot, 800-foot, and accessible parts of the 700-foot drift-levels short lengths of vein that may possibly grade to ore can be observed in the back and floor. It is possible that between these levels and above the 700-foot level in the old workings a limited tonnage of ore may be revealed, by mapping and sampling, as available to carefully selective mining of some backs, stope-sills, and pillars. In one of the stopes between the 900-foot and 800-foot levels a vein-split or branch occurs, and the workings on the 800-foot and accessible part of the 700-foot levels appear to be on the foot-wall branch of the vein. Unless these branches have again unconspicuously junctioned, the hanging-wall country would be worth exploring for continuation of the hanging-wall branch, and the foot-wall country between the stope and the 800-foot level should be explored for the continuation of the foot-wall section in this block. About 90 feet south of the portal, on the 700-foot level, there is a drift east for 54 feet on a branch vein 24 to 33 inches wide. Small pockets and streaks of sulphides can be seen in this, and it would be worth exploration for ore possibilities in the limited back to surface and also below the tunnel-level.

No stoping on the west vein was evident below the 900-foot level, but the structure and characteristic sulphide distribution along erratic and generally short lengths was observed to extend into the floor of this level. Thorough and methodically-spaced sampling along the floor of this level may reveal some lengths and widths of ore in tonnage conformity to the narrow average width of this vein and to what may be indicated by examination and further exploration, if warranted, of the 1,000-foot level after dewatering.

No definite tonnage or grade of ore in the *Pugsley* vein system can be soundly estimated until methodical surveying and sampling, coupled with further exploration and development, is carried out. Exposed vein-widths, structure, and sulphide-distribution indicate, however, the possibility for a small-tonnage selective-mining operation on the *Pugsley* if economically conducted. The same principles of preliminary investigation and accessibility of workings to enable this to be efficiently conducted apply to any possible sound estimate regarding further possibilities in and beyond the old *Surf Inlet* main workings.

An examination of the old camp-site and mill shows most buildings in fair condition, but necessitating some repair and addition of doors, windows, etc. The bulk of the old mill machinery has been removed, and the main material of possible utility remaining is a good concrete foundation, bins, four tube-mills, Dorr classifiers, two ball-mills, and four Wilfley tables, all requiring reconditioning and addition of removed parts.

#### NASS RIVER MINING DIVISION.

Operations of the Granby Company at Anyox have continued normal, with a percentage restoration of former wage-cuts. The Silver Crest option on the *Saddle* claim, Hastings arm, has been relinquished, but it is understood that this claim has been reoptioned by Vancouver interests, which plan further development this season. An encouraging discovery of a large gold-bearing vein on the east side of Hastings arm is reported by J. Flynn and associates, of Alice Arm, and Anyox parties have been interested in financing further exploration. Activities are subdued in the Alice Arm area, but temporary repairs on the Dolly Varden Railway have been inaugurated by the Department of Public Works. This will materially assist prospecting in this area when snow conditions on the higher altitudes permit.

## PORTLAND CANAL DIVISION.

The Premier Gold Mining Company has continued in normal operation with a slight increase in working crew. Exploratory operations have also continued on the *Big Missouri* and have been resumed at the *Unicorn*. On the *United Empire*, crosscutting, as outlined in the 1933 Annual Report, has continued and construction has been started on the aerial tramway. On the *Dunwell* mining has continued actively and the mill has been brought into operation on an initial 25-ton daily capacity. An initial shipment of concentrates has been made. On several other properties preparations for energetic exploration are under way, and it is expected that much activity will prevail in the Stewart area during this season. Further exploration of the *Unuk* group in the upper Unuk River area is planned when snow conditions permit. A start has been made on the construction of the trail up the Unuk river from the boundary. This will greatly aid the prospecting of this favourable area.

## ATLIN MINING DIVISION.

Further exploration of the *Whitewater* group in the Taku River area is planned by the Alaska Juneau Gold Mining Company. Interest in lode-prospecting in the Atlin Division is increasing and several parties have gone into the Tatshenshini River area with this objective.

The writer recently completed an examination of this property and, while he has not yet received returns on his samples and cannot therefore pass judgment regarding the values, it is considered from structural aspects that the property is a likely prospect, certainly warranting extensive exploration under efficient management and guidance. The property has been opened up by three tunnels: (1.) The Peters tunnel, at 3,320 feet elevation, where a tunnel is in 87 feet with a 12-foot crosscut to the vein. The inside end of the tunnel gives a back of about 150 feet. (2.) The Blacksmith tunnel, at 3,540 feet elevation, where a drift has been made on the vein for 81 feet. The back or ground above the drift-face is about 100 feet at the most. (3.) The Incline tunnel, at 4,100 feet elevation, where a drift on the vein has been driven in 67 feet, giving a back at the face of about 80 feet. The surface vein tracing is very indefinite and a fault is indicated between the Incline and Blacksmith tunnels. This fault has a probable horizontal displacement of about 250 feet. The total underground development done to date by the Norgold Mines, Limited, is consequently in two tunnels for 81 and 67 feet horizontally, with backs of about 100 and 80 feet respectively, and one 12-foot crosscut intersection giving a back of 150 feet. Eight men, using hand-mining methods, were working at the property.

## PLACER-MINING.

During the early spring several men were making expenses or small wages on the beach placers of the east coast of Graham island, Queen Charlotte islands, but later shortage of water for sluicing necessitated cessation of most of these operations. On Shuttle Island beach about 14 oz. of gold was extracted from the pumping of the wet sands until boulder troubles necessitated a shut-down. On this beach J. C. Edwards makes small wages from panning.

On Douglas creek, Kitsumgallum lake, Skeena Division, several individuals have been repairing the damage done by the high-water flood and are preparing for sluicing when freshets subside.

In the Stikine Division operations on the Barrington river by the Barrington Company will be continued with the drag-line scraper installed last season.

In the Liard Division a new discovery is reported in the headwaters area of the Turnagain (Little Muddy) river and further prospecting will be carried out in the section described in the 1933 Annual Report.

In the Atlin Division the movement of prospectors into the Squaw Creek and Tatshenshini River areas has been especially heavy and several well-equipped outfits have penetrated this section, many going in early in the season over the snow or by aeroplane from Carcross. It is reported that extensive staking has been carried out on the several creeks of the Tatshenshini headwaters area described in former reports and also in the upper area of Squaw creek. Further increase of activity is also materializing in the Atlin Lake section and some new operations are being started as a result of preliminary exploration carried out during the 1933 season.

## NORTH-EASTERN MINERAL SURVEY DISTRICT (No. 2).

REPORT BY DOUGLAS LAY, RESIDENT MINING ENGINEER (HEADQUARTERS, HAZELTON).

## GENERAL SUMMARY.

During the period under review activity has focused almost entirely on gold properties, both lode and placer, and it is gratifying to report that in both these branches of the mining industry the results obtained augur well for the future. Whereas last year the investigation of lode-gold properties was largely confined to the Cariboo district, a growing realization that lode-gold promise offers at many other points has been productive of more widespread activity.

In the Omineca Mining Division, at the property of Columario Consolidated Gold Mines, Limited, near Usk, at the time of inspection in April, the management anticipated that installation of milling plant would be completed by the fall, and it therefore seems a reasonable expectation that this property will reach the production stage during the present year.

At the *Free Gold* group of Babine Gold Mines, Limited, on Dome mountain, near Telkwa, the promising results secured in a preliminary crosscut tunnel justify energetic development. Such is contemplated by the management, but material improvements must be made to the road serving the property before machinery can be installed.

The lode-gold possibilities of Hudson Bay mountain near Smithers, to which attention has been drawn in the reports and bulletins issued by this Department, engage the attention of several different operators.

The lode-gold and placer possibilities of the new field, the McLeod River area, are being investigated by Northern Reef Gold Mines, Limited, under the direction of F. B. Chettleburgh, at the property of this company on the McDougall river (formerly the Little McLeod river).

In the northern portion of the Omineca Mining Division the Consolidated Mining and Smelting Company of Canada, Limited, is continuing development of its *Polaris* group on Aiken lake. At several other points of the Omineca Mining Division prospecting is taking place in areas where quartz veins are known to exist.

In the Cariboo district (embracing both the Cariboo and Quesnel Mining Divisions) the property of the Cariboo Gold Quartz Mining Company, Limited, continues to present every indication of sustained productive life, and at other properties—namely, those of Island Mountain Mines Company, Limited; Proserpine Gold Mines, Limited; and at the *Midas* group on Yanks peak (originally optioned by Britannia Mining and Smelting Company, Limited, but now operated by Saddle Mines, Limited)—encouraging results have been obtained.

While popular interest in the lode-gold possibilities of the Cariboo district would not seem to be as keen as last year, a comparison between the position to-day and the position two years ago must render evident that real progress has been accomplished by well-directed development. The results to date seem to entirely justify the anticipation that additional well-directed development will be attended by further success.

In the Horsefly section a new discovery of quartz veins showing free gold is reported by the discoverers, C. P. Goetjen and G. Hoelhne, of Horsefly. The location of the new discovery, which has not yet been inspected by the Resident Engineer, is near McGee lake, between Elbow and Crooked lakes.

In placer-mining a marked increase in activity is apparent throughout the Cariboo and Quesnel Mining Divisions and the Manson section of the Omineca Mining Division. Many new operations have been inaugurated and there is promise of more such, giving every present indication of an increase in placer production.

Of much importance is the fact that this year, owing to early abnormally high water, the bars on the Fraser river have been enriched. This fact, coupled with the present price of gold, holds out to many the prospect of, at any rate, being able to earn a "grub-stake." The skilled bar-workers should do well this year. The unskilled, who are willing to learn from the skilled and to work hard, face better prospects than formerly.

It is germane to the subject-matter of this report to record active developments at the new townsite of Wells, situated close to Jack of Clubs lake at the base of Island mountain.

Full accounts have appeared in the press of the expedition of C. E. Bedaux, who is endeavouring to cross the northern portion of this Mineral Survey District with "caterpillar"

vehicles supplemented by special equipment. The route selected between the starting-point, Fort St. John, and the objective, Telegraph Creek, unfortunately does not follow any of the usual routes to the mineral paths in this region.

The Resident Engineer desires to express his thanks for the many courtesies extended by operators and prospectors, but directs the earnest attention of correspondents to the fact that no office staff is retained in the Department's office in this district; consequently during the field season it is *quite* impossible to deal either promptly or at length with inquiries.

#### LODE-MINING.

##### OMINECA MINING DIVISION.

**Columario Consolidated Gold Mines, Ltd.** As the result of development of the property of this company near Usk, during the winter, material expansion was decided upon by the management. At the time of inspection in April active operations were in progress in connection with the installation of 12-bucket aerial tram, compressed-air plant (Ingersoll-Rand compressor of 500 cubic feet of free air per minute capacity, driven by 112-114-horse-power Vickers-Petter Diesel engine), and the clearing of the mill-site by the lower terminal of the aerial tram situated on the right bank of Noble Five creek. This site permits of construction of an auxiliary aerial tram from this point to one on the Canadian National Railway on the west side of the Skeena river opposite. The exact nature of the milling plant had not been determined at the time of inspection, but its capacity was to be from 90 to 100 tons daily, and it was anticipated by the management that the mill would be in operation by the fall. During construction an active programme of underground development was being pushed forward. This property occupies a happy position geographically, permitting a high degree of economy in operating costs. The consulting engineer is H. L. Batten and the resident manager John Willman.

**Lucky Luke.** Descriptions of this property will be found in previous reports of this Department. It is now under option to R. W. Seelye, who commenced small-scale operations early in the year. At the end of April a winze had been sunk from No. 2 tunnel to a depth of 80 feet immediately below the point at which good ore was struck on and above this tunnel. The ore continued to a depth of 40 feet, then pinched, but again improved, and in the bottom of the winze a width of about 2½ feet of quartz well mineralized with bornite and chalcocite, and showing some free gold, was struck.

**Free Gold.** This property, situated on the eastern flanks of Dome mountain, distant about 28 miles from Telkwa, is under operation by Babine Gold Mines, Limited. Preliminary surface investigation disclosed a number of closely-spaced, although in main small well-mineralized quartz veins, showing high gold values. A preliminary crosscut tunnel was driven to penetrate these at a maximum depth of about 100 feet. This crosscut shows a marked tendency of veins to widen in depth while maintaining good gold values. Further development of this property is warranted, and such is the intention of the management, but unfortunately the necessary machinery cannot be installed until material improvements have been made to the existing road.

On Hudson Bay mountain, near Smithers, an option was secured early in the year by R. W. Wilson on the *Glacier Gulch* group, and camp buildings were erected and preliminary development commenced. On the same mountain, Skeena Gold and Silver Mines, Limited, has been incorporated for the purpose of operating the property formerly held by Mount Evelyn Mines, Limited (*see* previous Annual Reports). The Rio Grande Syndicate has been formed to operate the *Rio Grande* group, which has not been inspected by the Resident Engineer.

*McLeod River Area.*—Detailed accounts of this area appear in the 1933 Annual Report. Investigation of quartz veins on the property of Northern Reef Gold Mines, Limited, situated on the McDougall river, is being carried out under the direction of F. B. Chettleburgh.

##### CARIBOO MINING DIVISION.

**Cariboo Gold Quartz Mining Co., Ltd.** During the year additional Diesel-engine power has been installed and air-compressor capacity increased to permit of an extensive development programme. Development has proceeded at the rate of over 2,000 feet per month, as the result of which many additional veins have been discovered. Mill-feed at times has been derived wholly from development, and in main largely from

this source. A cursory inspection only was possible owing to the limited time available. Indeed, anything approaching a detailed examination of this property as it now stands must occupy several days, if not weeks. It is, however, apparent that this property now presents every indication of a long productive life. It is the announced intention of the management to continue active development, increasing meantime the rate of milling to 100 tons daily in order to put the property on a dividend-paying basis.

The services of well-known consulting engineers have recently been retained to report on the property. The report of Ira B. Joralemon has already in part appeared in the public press (*The Financial News* of Vancouver, issue of June 8th). Mr. J. Norman Wynne, of the firm of McCarthy & Binns, London, accompanied by C. T. Dart, spent several weeks at the property recently for the purpose mentioned.

This company has been incorporated for the purpose of operating the **Aurum Island Mountain Mines Co., Ltd.** group and neighbouring claims on Island mountain, the resident manager being W. V. Smitheringale. Encouraging results have been obtained during the year, more especially in connection with an interesting replacement deposit of pyrite in limestone carrying good gold values. Camp accommodation has been enlarged, and air-compressor capacity considerably increased by the installation of a 500-cubic-foot capacity Bellis-Morcom air-compressor driven by a 117-horse-power vertical Rushton & Hornsby Diesel engine.

This company was incorporated during 1934 for the purpose of operating the **Proserpine Gold Mines, Ltd.** *Independence* group and adjoining claims on Proserpine mountain under option to Proserpine Syndicate last year. During the winter underground development was undertaken with encouraging results, more especially in connection with the continuation of the Newberry adit under No. 1 shaft, where well-mineralized quartz veins are in evidence. At this point a width of 31 feet is stated to constitute commercial ore. It is understood that the driving of a crosscut tunnel to penetrate the zone of veins in depth is contemplated from the eastern slopes of the mountain.

This company is organized to operate the property of the **Cariboo Coronado Gold Mines, Ltd.** Mining Syndicate on Cornish mountain. Operations focus on driving a crosscut tunnel on a bearing approximately N. 32° W. (mag.) from a point above Williams Creek meadows about 85 feet above the level of Jack of Clubs lake. The objective of this crosscut is the interception of the downward continuation of veins outcropping on Cornish mountain and described in the 1933 Annual Report. To date, May 25th, 1934, the tunnel had been advanced about 600 feet. Camp buildings have been erected and a 50-horse-power Rushton & Hornsby vertical Diesel engine and air-compressor installed.

This company holds a number of mineral claims on Cornish mountain in the vicinity of Martin creek, and a crosscut tunnel had been advanced by hand a distance of 400 feet (on May 26th) on a bearing approximately N. 36° W. (mag.) to penetrate veins exposed on the summit of the mountain. At points 70 and 105 feet from the portal veins 6 and 8 feet in width respectively were penetrated, and at 150 feet from the portal a number of closely-spaced quartz veins occur within a width of about 60 feet. Pyrite is present in these veins and a sample of the more heavily mineralized portions showed upon assay low gold values.

This company during the winter drove an adit in the right bank of the creek **Quesnelle Quartz Mining Co., Ltd.** immediately below the point at which rich stringers of quartz were discovered in 1932 and mention of which was made in the 1932 Annual Report. A raise put through from this adit, connecting with one of the pits sunk from the surface in 1932, exposed near the surface a quartz vein between 3 and 4 feet in width and some stringers of quartz. Reference to the 1932 Annual Report in this connection is invited. It is understood that a considerable amount of free gold was noted in some of these veins when they were first struck. The Koch shaft has been unwatered and the workings therefrom cleared out to facilitate examination, this being in accord with the lines of investigation mentioned in the 1933 Annual Report.

This property, owned by A. McClarty and G. B. Williams, of Prince George, is situated on the East fork of Evans creek, tributary of Dome creek, in the eastern portion of the Cariboo Mining Division, and is distant about 14½ miles by trail from Dome Creek Station on the Canadian National Railway. Attention is directed to this property by reason of the large mineralized widths. The width exposed is 200 feet and

the actual width quite possibly greater than this. The mineralization is pyrite and chalcopyrite. Copper would seem to constitute the main values, as samples showed upon assay only traces of gold and silver, but it remains for investigation to show if copper is present to a commercial extent. The mode of mineral occurrence would seem to be that of a large acidic sill some 600 feet in width, which after injection in the enclosing sedimentaries has been fractured and mineralized. The sill is extensively carbonated. Conditions for economic investigation or mining are exceptionally good so far as the topography is concerned.

#### QUESNEL MINING DIVISION.

On Yanks peak, near Keithley, a considerable amount of development has taken place during the winter. It is understood that the *Midas* group, optioned last year by the Britannia Mining and Smelting Company, Limited, has been taken over by the latter, and that a company called the Saddle Mines, Limited, has been incorporated for the purpose of operating this property, on which there are a large number of vein-exposures. During the winter a shaft was sunk in the vein, to which a crosscut was originally run, and connection was made with the crosscut. It is not known what operations are planned in the immediate future, but it is understood that the adjoining *Jane* group has been optioned.

On the property of the Cariboo Yankee Belle Mining Company, Limited, the crosscut started in 1933 has been advanced a distance of about 850 feet. At 790 feet from the portal the tunnel was deflected somewhat from its original course owing to heavy faulted ground being encountered at this point, where a large body of quartz was cut, or a number of closely-spaced individual veins. Up to this point a total of twenty-two veins was counted in the tunnel, the widths of which varied from stringers up to a maximum of 6 feet. It is not known what values exist in these veins. Some samples were taken by the Resident Engineer, but results of assays are not to hand at the time of writing. A portable air-compressor has been installed at this property.

This company is engaged in the preliminary development of mineral claims **Gold Recoveries** situated on Bluenose creek, flowing south-easterly into Cariboo lake about **(Cariboo), Ltd.** 4 miles east of Keithley. About half a mile above the mouth of the creek on the left bank there is exposed what is either a wide quartz vein, or a number of closely-spaced individual veins, which strikes with the enclosing schisted sedimentaries, so far as could be determined from exposures, in a north-westerly direction. The total width of quartz is probably between 30 and 40 feet. There is much oxidation in the schisted sediments on the foot-wall, and sulphides show in the vein at this point. Further surface-stripping in this region is being carried out to give a better exposure. No assays of samples are to hand at the time of writing.

On the *Sylvain* group, owned by E. Levasseur and associates, of Keithley, at an elevation of about 2,000 feet above Cariboo lake, about 1 mile east of Pine (Nigger) creek, a large quartz vein from 15 to 20 feet in width is well exposed by surface-trenching over a length of about 150 feet. The vein shows considerable oxidation and a small amount of pyrite, and appears to conform in strike and dip with the enclosing schisted sediments. Some samples were taken, but results are not to hand at the time of writing.

#### PLACER-MINING.

##### OMINECA MINING DIVISION.

In the Manson section, of which a full account will be found in the 1933 Annual Report, but which has not been visited this year, it is understood that much activity is taking place.

In the McLeod River area a force of men under F. B. Chettleburgh is engaged in testing operations at the property of Northern Reef Gold Mines, Limited, on the McDougall river.

##### CARIBOO AND QUESNEL MINING DIVISIONS.

Widespread activity is manifested at all points of these Mining Divisions. Among new operations may be mentioned: Those of Hixon Creek (Cariboo) Gold, Limited, on Hixon creek; those of Sovereign Creek Gold Mines, Limited, on Gagen creek; those of H. F. Eastman on Red gulch; those of Beaver Channels, Limited, in Beaver pass; and those of Antler Syndicate on lower Antler creek where it is proposed to install a power-shovel.

A considerable amount of Keystone-drilling was carried out by Consolidated Mining and Smelting Company of Canada, Limited, on the *Coldspring* group, owned by W. C. Slade and associates.

Of much interest is the acquisition of the shares of Bullion Placers, Limited, by London capital. The intention is to gradually improve the various water systems, so that ultimately all existing water rights may be utilized. Much has already been done in this direction and two monitors are now operating in the *Bullion* pit. R. F. Sharpe continues as manager, and Chas. H. Stewart, of the London firm of Alexander, Hill & Stewart, is retained as consulting engineer.

On Cedar creek much interest was aroused by the discovery of gold at a new point on the *Platt* lease, owned by E. T. Fitzsimmons. An option on this ground has been secured by Otto Baer. The ground formerly operated by B. Boe has been acquired by A. W. Alliot and associates, who are considering the question of bringing in a supply of water from Boswell lake, with a view to rework the accumulated tailings as well as testing any unworked ground, at some points of which it is stated that encouraging values were recently found.

In the Horsefly section R. W. Tarp has secured an option on the leases of George Kuchan and associates, and intends to install a new type of suction-dredge on the Horsefly river on this ground.

## SOUTHERN AND CENTRAL MINERAL SURVEY DISTRICTS (Nos. 3 AND 4).

REPORT BY PHILIP B. FREELAND, RESIDENT MINING ENGINEER (HEADQUARTERS, PENTICTON).

### INTRODUCTION.

Owing to the tremendous activity in mining and prospecting and consequent calls upon the time of the Resident Engineer, the Clinton, Ashcroft, and Yale Mining Divisions were removed from District No. 3 and placed in District No. 6 (headquarters, Vancouver). For the same reason many properties still remain to be examined.

The chief centres of activity were at Greenwood, Oliver, Penticton, Hedley, Kamloops, and Vernon. The town of Greenwood took on a new lease of life and houses are at a premium.

Several gold discoveries were made and prospecting in and around the old mining centres uncovered new ore-bodies, so that future production figures may be considerably increased. Many permits were taken on the Indian reserves and near Hedley and Vernon potential mineral-zones were uncovered and are being prospected.

One of the outstanding features was the bringing into production (April 20th) of the Dentonia Mines (*Jewel*) near Greenwood in a comparatively short space of time. The 100-ton mill is working smoothly and is nearing the 90-per-cent. extraction mark. Other milling operations are taking place at the *Windpass*, Nicola Mines and Metals, *Twin Lakes*, *Union*, and Pre-Cambrian Mines, with a prospect of renewed production from the Kelowna Exploration Company's (Hedley Gold Mining Company) plant at Hedley.

The finding of new or extended ore-bodies in the *Windpass*, the *Dentonia*, *Nickel Plate*, *Grandoro*, *Morning Star*, Fairview Amalgamated, *Dividend* group, *Stemwinder* (Phoenix), and Hedley Amalgamated Gold Mines is significant and bears out the theory that some of the old mining areas are worthy of intensive exploration, especially in consideration of higher gold prices.

Although comparatively little is heard regarding silver, the mines at Beavercreek have been steadily producing and an increased output is expected. The finding of silver-bearing shear-zones in the quartz diorite about 200 feet under the Wallace or overlying formation in the *Beaver* mine is worthy of note and a larger field for operation is suggested.

Practically all the Mining Recorders advise that there are more miners' licences and more recordings of claims than ever this year, and there is no doubt that the distribution of money from mining ventures through various channels has materially assisted in alleviating unemployed distress as well as promoting the welfare of district business as a whole.

### GRAND FORKS MINING DIVISION.

This syndicate, with headquarters at 328A Eighth Avenue West, Calgary, have installed an Ingersoll-Rand 38-horse-power semi-Diesel engine and a 9 by 9 compressor, and constructed living-quarters near McRae creek, about 1½ miles below Coryell Station on the Canadian Pacific Railway. It is the intention of the management, G. F. Crowe, to drive a crosscut to intersect some out-cropping mineralization about 1,600 feet below the surface. The group of claims to be explored adjoin the *Molly Gibson* group to the south-west.

**White Swan Syndicate (Coryell Mines, Ltd.)** This group of claims, being worked by a syndicate with headquarters at Mack & McLellan, 317 Alberta Corner, Calgary, is located on Moody creek, about 2 miles north-west of Cascade. A small compressor has been installed and a crosscut commenced to intersect a shear-zone in the granite which has been developed by an open-cut 6 feet deep and about 100 feet higher in elevation. Some pyritic mineralization was noticed in a gangue of feldspar, biotite, and quartz. The owner of the claims is J. K. Sutherland, of Cascade.

**Boas-Creek-Jakin-Moody** These groups of claims, situated between the old Granby smelter and a point several miles in a south-easterly direction, were recently staked following spectacular assays from samples taken by Wm. Puritch and McLeod from an old 200-foot tunnel on the McLeod claim. The area covered by the claims consists chiefly of schistose rocks containing many parallel well-defined and often banded quartz

veins which have been intruded and in places replaced by comparatively recent quartz and granite porphyries. In a few localities practically pure crystalline limestone pods were observed impregnated with pyrite and minute segregations of galena along the contacts. In other areas the quartz veins contained pyrite and sphalerite. Samples taken by individual owners from other outcrops portrayed the presence of gold and silver in paying quantities, so that further intense prospecting along the strike of the veins appears to be warranted. Due to the fact that the schistose beds have been tilted and split in many directions, a full cross-section of veins at depth can be found in many of the ravines. A careful study of these, coupled with sampling across the vein every 5 feet, may save a considerable amount of useless work.

#### FRANKLIN CAMP.

**Union.** The *Union* tailing-dump is being treated by cyanide at the rate of 150 tons per twenty-four hours. No definite decision has been arrived at regarding further mine-development. The cyanide plant flow-sheet is as follows: Three 2-inch pumps in series to a 35- by 10-foot thickener. Underflow to three 12- by 16-foot agitators in series to 35- by 10-foot thickener, with underflow to 12- by 10-foot drum filter—sands to waste and solution back to original pump series, overflow to ditto. Overflow from first 35- by 10-foot thickener to clarifying-tank to zinc-press to gold-silver precipitate.

A deal is reported to have been consummated on the *Yankee Boy* group on Hardy mountain near Grand Forks. (See Annual Reports, 1919, 1920, 1923, 1924, 1925, 1930, and 1931.)

#### GREENWOOD MINING DIVISION.

##### JEWEL LAKE SECTION.

**Dentonia Mines, Ltd.** Since the operation of this property at Jewel lake commenced a total of 1,170 feet of drifting and 175 feet of upraising has been done. This development was carried out with power generated by a 60-horse-power Diesel engine driving a 312-cubic-foot-per-minute 2-stage compressor. Recently a new 625-foot compressor has been installed. The West Kootenay Power Company built an electric power-line from Greenwood to the mine, a distance of  $6\frac{3}{4}$  miles, and motors have been installed in the mill. The mill flow-sheet is as follows: Dumping-platform; grizzly, 10-inch openings; 50-ton bin with gate feeder; belt-conveyor, 30 inches wide; grizzly, 3-inch openings; Baxter jaw-crusher, 9 by 20 inches, belt-driven from 25-horse-power motor; belt-conveyor, 14 inches, with magnetic head-pulley; grizzly,  $\frac{1}{2}$ -inch openings; Traylor gyratory crusher-type 2-foot T. 2 belt-drive from 25-horse-power motor; 14-inch belt-conveyor; mill-feed bin, 120-ton, with adjustable gate feeder; belt-conveyor, 18-inch chain-drive by 5-horse-power motor; Denver feeders; Hardinge ball-mill, 6 feet by 48 inches, driven by a 100-horse-power motor; Simplex Dorr classifier, 3 by 18 feet, with 10-horse-power motor; 6-cell Denver sub-A flotation-machine and 3-horse-power motor; two settling-tanks, 50-ton capacity; overflow settling-tank; sacking-platform.

The ore mined is being taken from the vicinity of the *White* and *Enterprise* shafts and is entirely separate from the old *Jewel* shaft-workings. In this new ore-shoot average values across 5 feet for 460 feet length are: Gold, 0.34 oz. per ton; silver, 2 oz. per ton. Up to June 5th, or in a total of forty-seven days, 4,130 tons of ore was milled, averaging: Gold, 0.32 oz.; silver, 2 oz. per ton. A total of 132 tons of concentrates were recovered having a gross value of \$38,053.04.

A new crosscut is being driven 1,300 feet long which, it is estimated, will intersect the downward extension of the present ore-shoot at a depth of 340 feet. This tunnel has been driven 175 feet to date. In the meantime 95 tons of ore is being hauled to the mill daily by truck, a distance of 3,600 feet, at a cost of 9 cents per ton.

The vein-width varies from  $3\frac{1}{2}$  to 8 feet and consists of pyrite, galena, sphalerite, and possibly some free gold or telluride in a gangue of quartz. The country-rocks are quartzites, schists, and granite.

Future developments include an extension of the present level north, the unwatering of the old *Jewel* shaft (now down to No. 2 level), and completion of the crosscut. The assay-maps of the old shaft-workings show some attractive values over minable widths, especially adjoining the *Denoro Grande* claim to the south (the latter property was not owned by the former operators). The mill tailings are being stored and possibly may be treated with cyanide later.

By replacing the present classifier with a larger machine the capacity of the mill can be raised from 100 to 135 tons a day. Major Angus Davis is operating the mine.

(See Annual Reports, 1931 and 1932.) This group, optioned by J. W. Morris and associates, of Victoria, is situated near the south and west end of Jewel lake. This year a 2,000-foot road was built and a camp-site cleared. The shaft-vein was traced for 1,200 feet to the north-east, where a 30-foot open-cut and 6-foot tunnel exposed the vein containing 4 feet of quartz in granite impregnated with pyrite. A new tunnel will probably be started on the vein close to the camp.

(*North Star* group. See Annual Reports, 1896, 1897, 1898, 1899, 1901, 1931, 1932, and 1933.) This company, with headquarters at 6 Cameron Building, Calgary, Alberta, and reported as owning a controlling interest in the Askalta Oil Company, has bonded the *North Star* and adjoining groups of seventeen claims. A new camp has been built on the *Old Bird* claim and a site cleared for a crosscut tunnel as well as new roads to camp. Development-work consisted of driving a short tunnel on a cross-vein from the old workings. Twelve men are employed and a car-load of ore from the old stope was shipped recently. The quartz vein in the tunnel varies from 2 inches to 3 feet in width and is mineralized with pyrite, galena, and gold telluride.

(See Annual Reports, 1905, 1906, 1913, and 1922.) This old claim, owned by **Bay.** R. Forshaw, of Greenwood, was optioned to W. E. McArthur and associates and all the old workings cleaned out and sampled. The results of this work brought to light the probability of another vein 22 inches wide, part of which was formerly mined, underlying and in places contacting with the main lead. In the old west shaft several tons of oxidized quartz carrying free gold were found and a shipment made to the smelter. The main lead, stripped for 600 feet, is well mineralized with pyrite and galena and, although lower grade, may make mill-feed. High-grade ore shipments were made in the past from this mine.

(See Annual Reports, 1903, 1905, 1906, 1921, 1922, and 1925.) This old mine, situated at Greenwood and owned by Ola Lofstad, has been optioned by **Helen.** I. B. Flater interests; present address, Greenwood. A Jenks 10 by 10 compressor, driven by electric power, a Gardner Denver steel-sharpener, and a 5-ton 2-drum hoist have been installed near the old shafts. A new engine-house, blacksmith-shop, and office have been built. Also a 5-ton truck was purchased.

The old west inclined shaft sunk on the ore, with crosscuts where the vein faulted, and the more recent inclined shaft to the east connecting with it have been unwatered and the drifts from the shafts cleaned out. At the bottom of the east shaft drifts were formerly run 115 feet to the south-east and 140 feet to the north-west, mostly on a quartz vein varying from 2 to 12 inches in width and mineralized with pyrite, sphalerite, and galena. At a point 60 feet from the shaft south-east a fault has displaced the vein to the north-east. The vein strikes approximately N. 25° W., with a 62° dip to the south-east, and varies from 2 to 24 inches in width. Samples generally assay low in gold, and where galena is present, from 0.08 to 15.8 oz. in silver per ton and from 0.40 to 30 per cent. lead is obtained. Three samples: (1) 12-inch sample across the vein 20 feet south of shaft in the bottom level assayed a trace in gold and silver; (2) 8-inch sample across the vein 6 feet from face of north drift in bottom level assayed: Gold, 0.04 oz. per ton; silver, 14 oz. per ton. A sample from a 6-foot shaft uphill from main working assayed: Gold, trace; silver, 0.40 oz. per ton.

It is understood that the shaft will be sunk deeper in hopes that better values and widths may be obtained.

The **Dynamo.** Dynamo Mining and Milling Company, Limited, recently formed, with headquarters at 1024 Marine Building, Vancouver, has bonded seven claims lying to the north-east of the *Helen* group, and this year several trenches and open-cuts were excavated on four quartz veins. A crosscut tunnel was commenced on the *Starve Out Fraction* and is being driven south-east to intersect three of the above veins at about 200 feet in depth. A portable gasoline compressor is being used for this work. About 29 tons of mixed ore from the different veins was shipped to the smelter. No returns from this shipment are to hand. The quartz veins vary from 8 inches to 8 feet wide and contain pyrite, galena, and chalcopyrite. Ore assaying 1 oz. in gold per ton was mined from the old workings in past years. Fred L. Foster is consulting engineer. Ten men are working.

**Republic.** (See Annual Reports, 1896, 1897, 1898, 1904, 1922, and 1933.) This group, situated between Greenwood and Boundary Falls on the west side of the valley, has been optioned by J. E. Taylor and associates, of 1390 Granville Street, Vancouver, from Ola Lofstad, Greenwood, and two men have been employed clearing out the old tunnels as well as driving new drifts and open-cuts on the lead. The vein, which varies from 18 inches to 3 feet in width, has been traced from the lowest workings for over 1,000 feet in a north-westerly direction to the upper shaft on the *Last Chance*. Mineralization is made up of galena, pyrite, and sphalerite in a gangue of quartz. A picked sample from an 8-inch vein in a short tunnel north and above the lowest workings assayed: Gold, 0.40 oz. per ton; silver, 32 oz. per ton. A 3-foot sample across the vein north-west of the *Last Chance* shaft assayed: Gold, trace; silver, trace; and 2.7 per cent. lead to the ton.

**Winner.** (See Annual Reports, 1932 and 1933.) This group, owned by George Walters and associates, of Greenwood, has been developed by stripping, open-cutting, and an inclined shaft 55 feet deep, along a distance of 1,000 feet, on a quartz vein varying from 6 inches to 3 feet in width. A vein varying from 2 to 10 inches in width and containing native gold is found in conjunction with the main lead in the shaft. It seems possible that the full width of this shaft lead may develop sufficiently high values at depth to permit a small milling operation.

**Brooklyn-Stemwinder Gold Mines, Ltd.** (See Annual Reports, 1926, 1927, 1928, 1929, 1930, 1932, and 1933; Geological Survey Report, 1908.) This company, with headquarters at 574 Howe Street, Vancouver, and an authorized capital of \$1,000,000, has optioned the old *Brooklyn*, *Stemwinder*, and adjacent claims at Phoenix. A. Knox Paton is managing director and H. T. Curtis is in charge of exploration. New work consists of cleaning out some of the old surface cuts and shafts, stripping and open-cutting other likely mineralized zones, as well as reconditioning some of the old dwelling-houses for domestic purposes. The results of this work are that a narrow vein about 10 inches wide has been uncovered for about 500 feet in length, striking from the old *Stemwinder* "glory-hole" towards the *Brooklyn* workings. A sample from this assayed: Gold, 1 oz. per ton; silver, 1.5 oz. per ton; copper, 14 per cent. The 250-foot level in the *Brooklyn* (under water) is said to have been driven on this vein for 250 feet. About 250 feet to the north-west, or uphill from this vein, another similar parallel one has been stripped for 360 feet. Widths vary from 4 to 50 inches, and samples assayed from 0.36 to 1.30 oz. per ton in gold; from 1.7 to 3.5 oz. per ton in silver, and from 2 to 12 per cent. copper. Prospecting under a heavy mantle of overburden a short distance to the east of the *Brooklyn* "glory-hole" has resulted in the discovery of two leads: one striking north-south heavily impregnated with copper carbonates and hæmatite, and the other, east-west, containing leached quartz. Insufficient work has been done to prove the extent of these finds. Another discovery has been made downhill closer to the wagon-road between the *Brooklyn* and *Stemwinder* "glory-holes," about 44 inches wide, that assays, according to the management: Gold, 0.10 oz. per ton; copper, 7.5 per cent. The water in the *Brooklyn* shaft-workings has not been pumped out to date. When this is done crosscuts from the 250-foot level will determine the value of these new finds.

#### CAMP MCKINNEY.

A resurveying of the entire camp in the vicinity of the old *Cariboo-Amelia* workings has been made since the fire destroyed the corner posts. To the east and south-east, including the *Dayton* camp, the owners have cleaned out many cuts and resampled the vein systems preparatory to further exploration. The Camp McKinney Gold Hill Mining Company is driving its tunnel ahead towards the shaft where free gold was found in quartz.

#### LIGHTNING PEAK SECTION.

**Waterloo Gold Mines.** (See Annual Reports, 1925, 1927, 1929, 1930, 1931, 1932, and 1933; Geological Survey Report, 1930, Part A.) No. 4 tunnel has been driven about 1,520 feet in an easterly direction, and the tunnel has recently been turned north-east to intersect one of the north-south series of quartz veins which the management expects to encounter within about 200 feet. Other work contemplated consists of cross-cutting from No. 2 tunnel north and dewatering the Gold shaft. Numerous shear-zones cut the main east-west shear-zone in a south-easterly direction, and the management believes that

prospecting to the north of No. 4 tunnel may be productive. Eighteen men are employed under the superintendency of H. C. Hughes.

(See Annual Report, 1933.) This company, with an authorized capital of **Dictator** 2,500,000 shares of no par value and headquarters at Penticton, has acquired **Gold Mines, Ltd.** twenty-six claims situated  $2\frac{1}{4}$  miles north of the Waterloo Gold Mines. Due to snow conditions and the necessity for building 3 miles of road into the property, work on the property has only just commenced. A considerable amount of exploratory work will probably be done before a permanent camp is established. A 50-horse-power Diesel caterpillar tractor has been purchased, which will be used temporarily to drive the compressor when purchased. This, in conjunction with a 15-ton "bummer," will also be used for freight-hauling. Sixteen men are working under the directorship of George A. Clothier.

#### BEAVERDELL.

The *Bell*, *Highland Lass*, *Beaver*, *Wellington*, and *Sally* mines on Wallace mountain continued development and production in the usual way. Diamond-drilling on the *Beaver* and *Sally* assisted in locating the faulted segments of ore. On the *Beaver* the shear-zone was found to the north-east under about 200 feet of overlying Wallace formation.

*Carmi Gold Mines, Ltd.*—Development and production continued on the *Carmi-Butcher Boy* group at Carmi, under the superintendency of J. E. Miller. Most of the work has been done in the region of the *Butcher Boy* shaft.

#### PLACER-MINING.

##### *Boundary Creek.*

The Boundary Creek Mining Company, Limited, a private company, continued operations on the Dr. Lang leases on Boundary creek a few miles up-stream from Midway. A 1-cubic-yard Marian shovel, moving between 200 and 250 cubic yards of gravel per eight hours, is being used and the gravel hauled a quarter of a mile to the sluice-boxes by two  $2\frac{1}{2}$ -ton Federal trucks. A cut has been dug about 30 feet wide and 200 feet long, and according to the owners good "pay" has been recovered. A high rib of porphyry over 150 feet wide cut through bed-rock at the north end of the cut. Coarse gold was found in a shaft a short distance beyond the porphyry. About twenty men are employed under the superintendency of Thomas E. McElroy.

##### *Rock Creek.*

This company's holdings on Jolly creek were acquired by Porter Bros., of **Rock Creek Con-** Spokane, and a  $1\frac{1}{4}$ -yard drag-line shovel installed near the road crossing. **solidated Placers.** A ditch was dug up-stream about 1,800 feet long by 20 feet wide by 26 feet deep. Near the top end of the ditch a high rib of bed-rock was encountered 30 feet wide. This was excavated. At the present time a Star churn-drill is being used to determine the depth of bed-rock ahead of the shovel. Up to the middle of June bed-rock was not found in the ditch, and it seems likely that this section has been "pot-holed" either by stream or glacial action. High bars formerly mined in the creek up-stream lend strength to the belief that the bottom of the present channel should contain a considerable amount of "pay."

*McKinney Creek.*—Several promising small operations are being carried on on this branch of Rock creek and some good gold values recovered.

#### OSOYOOS MINING DIVISION.

(See Annual Reports, 1927, 1928, 1930, 1931, 1932, and 1933.) These and adjoining claims, situated near Osoyoos Customs-house and bonded by the **Dividend-** Osoyoos Mines, Limited, of Calgary, are being prospected at the present time. **Lakeview.** Attractive values in gold have been obtained in the *Little Manx* tunnel, the *Lakeview* and *Dividend* workings. A sample taken recently across 5 feet in the east drift of the *Dividend* assayed: Gold, 3 oz. per ton. Machinery will probably be installed.

This group, owned by A. Carmichael and W. Dalrymple, of Oliver, is situated **Challenger.** about  $4\frac{1}{2}$  miles south of Oliver, close to Stashtavalentha (Testalinda) creek, about 1 mile west of the Osoyoos highway. Considerable excitement was created by the discovery of native gold in a quartz vein on the south side of the gulch. An examination of the property was made, and in two 8-foot open-cuts, 25 feet apart (the only

work done), a highly fractured and faulted quartz vein about 2 feet wide, containing pyrite, galena, and native gold on the hanging-wall, had been uncovered. An extensive bed of quartzite was observed to underlie the vein. Some of this is said to contain values. It is impossible to determine the proper strike and dip of the vein or whether there is any continuity of the values until more work is done. It seems likely, as in other mines in this section, that the faulting is pre-mineral, and more high-grade gold ore may be found in the neighbourhood of those faults. The country-rocks are generally schistose.

This group, optioned to Vancouver interests and owned by Roy Jardine and **Sunrise-Swan** associates, of Oliver, is situated about 8 miles south of Oliver on the west side and close to the Osoyoos highway. A quartz vein in schist, about 3½ feet wide, has been traced up the bluff to the west of the original discovery. In an open-cut about 10 feet long at the foot of the bluff the owners obtained an assay of gold, 0.30 oz. per ton, across 3½ feet. The mineralization is chiefly pyrite.

(See Annual Reports, 1920, 1923, 1924, 1927, 1928, 1930, 1932, and 1933.)

**Morning Star** In the spring of the year R. L. Clothier, former managing director, was replaced by John D. Galloway, former Provincial Mineralogist, with Norman **(Fairview)** **Gold Mines, Ltd.** Brookes superintendent at the mine. All outside work was stopped and development confined to the underground workings. No. 1 level south has been driven 350 feet from the shaft and No. 1 level north 550 feet. On No. 2 level the drifts have been driven 250 feet south and 550 feet north from the shaft. A crosscut has been driven 230 feet east from No. 1 level, which intersected the east vein. Drifts have also been driven 120 feet north and 80 feet south on the east vein from this crosscut, with an upraise of 145 feet long which connected with a 57-foot shaft, formerly sunk.

Besides the ore-body found and partly mined last year a short distance north of the shaft, an entirely new one has been discovered in the No. 1 drift south. This zone commences 74 feet from the shaft and extends for 180 feet in a southerly direction, and channel samples give, gold, 0.566 oz. per ton, over a 4-foot width for this distance. No upraises have been put in, but should the ore extend to the surface there will be about 100 feet of backs. On the 200-foot level south beneath this ore-body there are values that indicate that the shoot may extend down to a short distance above this level. The quartz encountered in other parts of this mine is generally low grade, but should more ore-shoots similar to the one found on the No. 1 level south be found, possibly the entire vein may make low-grade mill-feed. At present there are four known ore-shoots on the property, including the one on the *Stemwinder*, recently acquired, with several thousand feet of potential ground still to be explored. Nothing much is known regarding the east parallel vein lying roughly 216 feet away, except that one diamond-drill hole cut 6 feet of slightly mineralized quartz. The new claims purchased are called the *Stemwinder*, *Brown Bear*, *Wynne M.*, *Stemset*, *Gunsite*, *Peter*, and *Peter No. 1*, formerly owned by the Federal Mining Company. The present directorate are Dr. G. F. Strong, Reg Tupper, Eugene Coste, and St. E. de Wolfe. A considerable amount of ore is known to exist in the *Stemwinder* shaft, but the workings have not been unwatered up to the present.

(See Annual Reports, 1933; under *Flora*, 1899, 1900, and 1901.) Since this company was incorporated to acquire the *Flora* group of claims lying to the west of the *Stemwinder*, a camp has been built, including a double-decked bunk-house 77 by 24 feet, an office 30 by 25 feet, blacksmith-shop 20 by 24 feet, and an engine-room 15 by 30 feet. A 240-foot portable Sullivan compressor has been used temporarily, which will be replaced by a 790-foot Gardner Denver machine, electrically driven. A Sullivan steel-sharpener and oil-forge are used in the blacksmith-shop. A new power-line has been built 11,685 feet long from Oliver to the mine by the West Kootenay Power Company. The cost of this line is temporarily paid for by the mining company. In the mine a 10-inch blower vent-pipe has been installed for ventilation.

New development constitutes a 60-foot crosscut from the end of the old *Flora* lowest level north, which intersected the main vein, with a drift on the vein 40 feet long. In the face of this drift the vein measures about 20 feet in width, and on the foot-wall there is 4½ feet of ore well mineralized with pyrite, sphalerite, and galena that assays, according to the management: Gold, 0.95 oz. per ton. The rest of the vein appears to be low grade in this face. The main *Flora* tunnel has been extended for about 100 feet north-west and the main vein drifted on for about 40 feet. Near the face the vein was faulted into the foot-wall, but

appeared to be swinging back into line at the face. Insufficient work has been done to prove the extent of this ore-shoot, but a rough estimate of 100 feet long is suggested, with ore still in the east face. The vein to the west contains segregations of pyrite and galena and is probably not as high grade as the east end. When the new compressor is installed the levels will be pushed both ways. Major T. Fraser is managing director and R. B. Kirk mine superintendent. About eighteen men are working, with two shifts in the mine.

**Viking Gold Mines, Ltd.** This company, with headquarters in 716 Hall Building, Vancouver, acquired the *Viking* group of fourteen claims located approximately 15 miles in a direct line south-west of Penticton, and the *Torres* group of twenty-one claims located approximately 7 miles north-east of Cawston. A considerable amount of surface-stripping has been done on the *Viking* group and numerous open-cuts and shallow shafts excavated on the *Torres*, with the result that the company has decided to concentrate its efforts for the present on the latter, where two strong well-mineralized quartz veins have been uncovered in the granite. These veins vary from 4 inches to 6 feet in width and strike generally magnetic east. Several vertical and horizontal faults have thrown the veins close together at the east end and it appears possible that they may unite along the strike. Numerous open-cuts and shallow shafts have proved the vein continuance for about 500 feet. Beyond this a heavy overburden has obscured the outcrops. Mineralization is chiefly pyrite and galena. A compressor, engine, and complete camp outfit will be installed. O. C. Thompson is consulting engineer and H. Haakinson foreman.

(See Annual Reports.) This company, operating a group of claims on Manery creek on the Similkameen River slope, continued development under the management of A. T. Miller. A trial shipment of 2 tons of sulphide ore from the top of the winze in the *Buller* tunnel gave returns of: Gold, 1.83 oz. per ton; silver, 1 oz. per ton. A 6-foot road  $1\frac{3}{4}$  miles long has been built from the highway to the boundary of the *Kitchener* and *Buller* claims and a new log camp constructed to accommodate twenty men. An Ingersoll-Rand 8 by 6 portable compressor has been installed at the mouth of the *Kitchener* tunnel. A new level, elevation 3,800 feet, has been driven 155 feet, which is intended to explore the downward extension of the high-grade ore-shoot found on the *Buller* 4,100-foot level. A shaft is at present being sunk in a gulch near camp in order to obtain water. Eleven men are employed.

(See Annual Reports, 1930, 1931, 1932, and 1933.) The Grandoro Mining and Milling Company, Limited, a private company, developed the mine near Twin lakes until early this year, when a public stock company was formed. Development consists of driving No. 1 tunnel 524 feet from the *Independence* workings to the *Oro Fino*. An upraise was put in which cut the *Oro Fino* vein at 27 feet and followed it for a distance of 80 feet into the old workings. No. 2 shaft was commenced where the upraise intersected the vein and has been sunk for 150 feet and is still in ore. The main winze on the *Independence* was sunk 215 feet and followed an irregular fault-plane in ore for 190 feet from the collar. At this point there is evidence of very intensive and complex post-mineral faulting. A second winze was commenced at 190 feet and sunk in an easterly direction along another fault-plane in ore for approximately 100 feet. A 75-foot upraise was driven on the south side of the fault in an endeavour to locate the ore extension above. About 330 tons of ore was shipped in April and May. New machinery includes one 72-B.H.P. Petter Diesel engine and one 350-cubic-foot Holman vertical compressor. About thirty men are employed, some of whom have been prospecting the company's ground with encouraging results. Approximately 3,500 feet of new road has been built between the Twin Lakes camp and the mine.

(See Annual Reports under: *Juniper* and *Huntsman* group, 1924 and 1933; **Twin Lakes Gold Mining Co., Ltd.** Summit section, 1928; B.E. Mining Company, Limited, 1929, 1930, and 1931; Parvenue Mines, Limited, 1932.) This company, under the management of J. D. Shannon, continued operation. The "mill" tunnel has been driven a total distance of 900 feet. Some diamond-drilling will be done from this adit later. From this elevation the ore found above can probably be mined by gravity very cheaply. The *Summit* shaft has a total length of 250 feet; the lower half is only on a 6-per-cent. grade. The vein has been badly faulted both up and down and is consequently difficult to follow. Most of the ore has been mined from the south side of the shaft. The 40-ton mill flow-sheet, now treating 35 tons daily, is as follows: 100-ton coarse-ore bin; 9 by 6 Blake-type jaw-crusher; 50-ton fine-ore bin;

Bryan-type high-speed Chile mill; 5-foot-diameter amalgamation-plates having a total area of 64 feet; blankets of an area of 80 feet; two Wilfley tables; blankets and a thickener. The underflow from the thickener is tailings; the overflow returns to the Bryan mill. Power equipment consists of a 90-horse-power semi-Diesel engine driving a single-stage 420-cubic-foot compressor, a 50-horse-power semi-Diesel that drives a 35-k.v.a. generator, and a 25-horse-power Diesel driving the mill. The mine-hoist is a motor-driven winch, capacity 15 horse-power. No crude ore has been shipped this year. Total weight of concentrates shipped, 60 tons; total tonnage milled, 2,800; total production, 800 oz. gold. About forty-eight men are employed.

(Old Hedley Gold Mining Company.) Since the beginning of 1934 this company has carried on development in the *Nickel Plate* mine, and since the commencement of operations a total of 4,500 feet of drifting and crosscutting has been done, as well as 3,000 feet of diamond-drilling. At Hedley the mill is being repaired preparatory to operation in the near future. Damage done to the spillway at the dam has been repaired, but a considerable amount of work remains to be done both to the Similkameen and 20-Mile Creek plants before sufficient power is available for full load requirements. The development crew at the mine may be increased after July 1st and timber replacements and overhauling of underground machinery undertaken. Later the gravity-tramway will be repaired. Wallace Knowles is superintendent.

*Mascot Fraction, Nick of Time, and Copper Chief.*—It is understood that these claims have been bonded by Vancouver interests and exploration will commence in the near future. The *Mascot Fraction* lies in the path of the *Nickel Plate* ore-bodies and the old Hedley Mining Company mined ore from each side of it. The exact amount of ore in this fraction is unknown, but it appears likely that a considerable tonnage exists, especially in view of the higher value for gold.

(See Annual Reports under *Whirlwind-Peggy* group, 1921, 1923, 1926, 1928, 1929, 1930, 1931, 1932, and 1933.) This company was formed to take over the Stenwinder Mountain Mines, mentioned in the 1933 Annual Report, and has an authorized capitalization of 3,000,000 shares, par value 50 cents. The directors are Alfred Thompson, M.D., J. Y. McCarter, J. E. Buerk, Frank Parsons, A. J. Smith, J. A. Robinson, and R. E. Barker, all of Vancouver. Dr. V. Dolmage is consulting engineer. Address of company, 736 Granville Street, Vancouver. Recent developments consist of extending the "red tunnel" ahead, now driven a total of 155 feet, as well as a lateral tunnel 60 feet and a winze 32 feet on the ore. On the 20-Mile Creek slope a crosscut tunnel has been started 75 feet downhill to tap a new vein which assays \$17 to the ton in gold, according to the management. Dan McKinnon is in charge.

#### GENERAL.

Many miles of the Hedley area have been staked and a considerable amount of surface exploration done, with the result that much hitherto undiscovered mineralization, chiefly arsenopyrite, has been uncovered. These finds have been made mostly on Paul creek and near the mouth of the Ashnola river, and are embraced within the *Shamrock*, *Speculator*, *Lost Horse*, *Arrawana*, and *Confederation* groups of claims. The ore occurs generally in siliceous limestone and is associated with porphyry dykes which are probably genetically connected with the underlying granite batholith. No thorough sampling has been done, but intermittent samples show the presence of gold. On the *Apex* group, *Nelson* group, *Star of Hope* group, *Yuniman* group, and *Golden Zone*, attractive samples of gold are have been found. The possibilities of these areas have not been delimited.

#### SIMILKAMEEN MINING DIVISION.

The lowest crosscut on this property on Sterling creek, a few miles west of Hedley, has been driven a total distance of about 370 feet and has intersected three shear-zones—(1) at 85 feet from the portal, (2) at 130 feet, and (3) at 150 feet. Samples from these zones are not to hand, but a considerable amount of banded quartz, chert, pyrite, and arsenopyrite are present. The shear-zones are formed in the cherty volcanics. John D. Galloway is consulting engineer and E. Lovitt superintendent at the mine.

(See Annual Reports under *Pollock*, 1909, 1910, 1913, and 1933.) This property **Gold Mountain Mines, Ltd.** has not been examined as yet this year, but it is understood that the lower crosscut tunnel has been driven 330 feet, with an ultimate objective of 600 feet. This is intended to tap the downward extension of the ore found in the *Maple Leaf* workings above. About 566 feet of diamond-drilling was done with very encouraging results. About sixteen men are working under the superintendency of Frank Dollemore.

## GENERAL.

None of the developments in the west end of the Similkameen Mining Division have been examined as yet this season. Several reports received state that interesting results are being obtained from prospecting and exploration, especially in the neighbourhood of the *Canuck* group on Boulder creek, and the headwaters of Granite creek.

## PLACER-MINING.

*International Placers, Ltd.*—This company has been operating the old *Swan* and other leases between Granite creek and the Tulameen river near Coalmont. Drifts on bed-rock at both ends established the fact that pay-gravel exists. At the Granite Creek end values are considerably higher and are, according to reliable reports, distributed throughout the gravel above bed-rock. Churn-drilling has been commenced to determine the extent and direction of the old channel. Water rights on Granite creek have been obtained with the idea of hydraulicking later. About 221 oz. gold and 21 oz. platinum have been recovered. The theory that there is an old channel of Granite creek cutting across towards the Tulameen river near Coalmont, and now filled with glacial moraines, has long been held, but the ground has never before been seriously explored. In view of the fact that the pay-gravel was rich in the creek, further work appears to be well worth while.

*Siwash Gold Placers, Ltd.*—(See Annual Reports, 1927 and 1933.) This company, with headquarters in 471 Metropolitan Building, Vancouver, has been formed to develop fourteen leases on Siwash creek, a tributary of 5-Mile creek. Former exploration-work on the benches adjacent to the creek resulted in recovering a considerable quantity of coarse gold. More exploration is necessary and justified before putting in a plant to recover values.

*Ruby Leases, etc.*—In the vicinity of these leases on the Tulameen river, about 4 miles below Coalmont, there is much activity in placer-mining, especially along the benches which were, no doubt, part of the old Tulameen River channel. These leases were worked spasmodically in former years, but there is still much virgin ground that appears to be attractive.

## NICOLA MINING DIVISION.

(See Annual Reports, 1916, 1920, 1927, 1928, 1929, 1930, 1931, 1933.) When **Nicola Mines and Metals.** this mine, situated at Stump lake, about 32 miles south of Kamloops, was examined at the end of April the following were the developments accomplished: *Enterprise* workings unchanged since the end of 1933; *Tubal Cain* north drift, 596 feet long; *Tubal Cain* south drift, 427 feet long; intermediate drift south, 124 feet; crosscut from *Enterprise* to *Joshua* workings, 1,417 feet; *Joshua* 400-foot level south, 723 feet; *Joshua* shaft, 716 feet deep; *Joshua* 700-foot level, 30 feet of crosscut and 70 feet of drifting north; *Joshua* upraise between 300- and 400-foot levels, 80 feet; *Joshua* 550-foot level south, total crosscutting and drifting 144 feet and upraising 42 feet.

The mill capacity is at present about 100 tons a day. The crushing units—i.e., crusher, ball-mill, and rolls—are capable of handling 300 tons a day, so that should the mine develop sufficient ore only the lower section of the mill will require enlargement. It was the intention of the company in April to run the mill with the idea of testing the possibilities of ore reduction. There was insufficient ore blocked out then to permit a steady operation for any length of time.

Ten diamond-drill holes were bored from underground with the idea of obtaining information regarding structure, etc., at depth. One hole 1,000 feet below surface under the *Tubal Cain* shear-zone cut 2 feet 5 inches of quartz mineralized with pyrite and galena. There were no signs in this hole of the intense shearing found above. As far as development had proceeded at the end of April, there was but little ore indicated below the 400-foot level in the *Joshua* shaft, although the fissure was still strongly in evidence. Official reports from the mine state that the first car-load of concentrates was shipped to the Trail smelter on June 18th and that recovery was better than 98 per cent.

(See Annual Report, 1933.) This group, situated about 3 miles south-east of **Jennie Long.** Stump lake, is being developed by E. W. Watson and associates, of Calgary and Vancouver. A camp for twelve men has been constructed at the creek and a Pelton wheel installed to generate power for running the compressor. If the head of water in the creek is found to be insufficient at certain times of the year, a supplementary steam unit will be added. A new head-frame and blacksmith-shop were built at the collar of the shaft and air will be piped from the plant.

When digging pipe-line pits near the shaft, two new well-mineralized quartz veins about 30 feet apart to the north-west, also about 75 feet to the south, the continuation of the shaft-vein  $4\frac{1}{2}$  feet wide, were discovered. The latter vein, although much oxidized, contained pyrite, galena, and possibly grey copper. A chip-sample of this assayed: Gold, 0.20 oz. per ton; silver, 16 oz. per ton. Other samples taken by the management assayed as high as: Gold, 0.70 oz. per ton. Future development consists of deepening the 70-foot shaft and crosscutting to the newly-found veins. E. W. Watson was in charge at the mine.

*Mary Reynolds Mines, Ltd.*—This property, situated a few miles from the *Jennie Long*, has not been examined this year, but it is mentioned in the Annual Reports of the Minister of Mines for 1918, 1919, 1922, 1927, 1928, 1929, 1930, and 1931. It is understood a considerable amount of work has been done this season. Capitalization, 1,500,000 shares. Head office, 716 Hall Building, Vancouver.

*Sheffield Gold and Silver Mines, Ltd.*—This company's property near Nicola has not been examined this season. Their holdings embrace the *Almeda*, *Thelma*, and *Corona* claims, which were reported in the Annual Reports for 1924, 1925, 1926, 1927, 1928, 1929, and 1930. Capitalization is 3,000,000 shares at 50 cents. Headquarters are at the Stock Exchange Building, Vancouver.

#### KAMLOOPS MINING DIVISION.

(See Annual Reports, 1917, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1930, and 1933.) The operation of this company's holdings, about 10 miles from **Windpass Gold Mining Co.** Chu Chua, has continued steadily and 322 feet of new drifting has been done on the No. 3 level and the *Telluride* shaft has been sunk a further 100 feet. Some development has also been done on the *Sweethome* vein. New buildings consist of an assay office, boarding-house at the mine, and miscellaneous buildings at the mine and mill. The 50-ton pilot-mill flow-sheet is as follows: 800-ton ore-bin; 10 by 20 Hadfield crusher; 120-ton crushed-ore bin; ore-feeder; 6-foot by 16-inch Hardinge ball-mill; type F. Dorr classifier; 8-cell Fahrewald flotation-machine; Dorr thickener; vacuum-pump; Dorrco pump; 3- by 4-foot Oliver filter; tailings from flotation over two No. 6 Wilfley tables; concentrates to thickener. One hundred and forty-two tons of sorted ore and 196.95 tons of concentrates have been shipped to the smelters. About sixty-one men are working under the management of Byron Wilson.

#### GENERAL.

Much work has been going on in this Division—i.e., at Scotch creek, Louis creek, and Jamieson creek, where good values in quartz are reported. On the *Ballantyne* claims near Clear-water Station, open-cuts and tunnels have exposed strong quartz veins mineralized with pyrite and galena. Under the Canadian National Railway tracks, what appears to be the top of an ore-shoot has been discovered. On Adams plateau continued exploration has uncovered deposits of silver-lead-zinc that are reported as worthy of further development.

#### VERNON MINING DIVISION.

Tremendous activity prevails in the section along the west side of Okanagan lake, close to Vernon and east to the Monashee mountains. Numerous discoveries have been made and exploration-work is proceeding satisfactorily.

(See Annual Reports, 1921 to 1924 and 1927 to 1933; also Geological Survey of Canada Summary Report, 1931, Part A.) **Pre-Cambrian Gold Mines.** A crew of men worked in the mine all winter and about 100 feet of exploratory work was done on the 200-foot level. The ore-shoot exposed in the "glory-hole" is being opened up to the north by quarrying and the ore put through the mill. An upraise has been made from the 6-foot level to the surface north of the "glory-hole." From this 54 tons of mine-run

ore valued at \$80.80 a ton was shipped. On the 100-foot level the same shoot is being developed. This ore is being milled. The management, P. H. Holdsworth, expects to ship a car-load of concentrates by the end of June.

**Peggy-Evelyn-Edith.** These groups are new stakings on the Okanagan Indian Reserve No. 1 near Goose lake, about 7 miles north-west of Vernon. The owners are George Gartrell, William Brent, and associates, of Summerland and Vernon.

Numerous strong quartz veins, one of them 30 feet wide, have been uncovered and in some instances traced on the strike for 800 feet. Mineralization is pyrite and, in some of the veins, galena. High assays have been obtained when the galena is present. Exploration-work is proceeding.

**Falcon.** (See Annual Reports, 1899, 1921, and 1932; Geological Survey Report, 1931, Part A.) The shaft on this old claim was unwatered by Victoria interests and some stripping done on the surface. The returns from samples taken recently have not been received at present. Values of an ounce in gold have been found near the shaft-collar. There are apparently two veins lying parallel and the shaft has been sunk about 70 feet on the lower one, which appears to be barren of mineral.

**Pacific Gold Mines.** This private company of Vancouver has bonded a group of claims on Brewer creek, 12 miles east of Vernon, from A. Brewer, P. Murphy, and associates, of Vernon, and a crew of men is employed on the property. Several quartz veins from 4 to 30 feet in width, striking in different directions, have been uncovered. In one place free gold was found associated with pyrite. The quartz occurs in the diorite and argillaceous rocks.

**Monashee Mines Syndicate.** (See Annual Reports, 1897, 1900, 1901, 1903, 1904, 1913, 1914, 1915, 1916, 1921, and 1933.) This old group of claims has been bonded by the Vidette Gold Mines and a crew of men employed. A compressor and engine have been installed and the old camp renovated. A diamond-drill will also be used.

**Lakeside Mining Co.** This company, formerly a private one, is being made into a public stock company, with headquarters at 522 Metropolitan Building, Vancouver. The property, bonded from W. Armstrong, of Penticton, lies about a mile north-east of Penticton, on Okanagan lake-shore. The old shaft and tunnels have been cleaned out and retimbered where necessary. A small hoist, portable compressor, 220-foot compressor, and pump have been installed and the shaft and lower workings pumped out. The old top level was driven 160 feet, and at the bottom of the 100-foot shaft another level was driven 200 feet on the quartz vein easterly. At the end of the first level a horizontal fault has displaced the vein. Some ore has been stoped from above the first level, and there is a block of ore about 30 feet long and 4 feet wide in the lower level, from which the management has received returns of about \$8 per ton in gold and silver. Both the upper and lower levels will be driven ahead. C. B. Smith, Incola Hotel, Penticton, is in charge. J. T. Johnston, 914 Standard Bank Building, Vancouver, financed the preliminary work.

#### PLACER-MINING.

Plans are reported to have been made to operate some of the gravels on the Shuswap river east of Vernon in the near future, also on Cherry creek.

On the Woods Lake leases, staked about 800 feet above the valley on what is considered an old high river-channel, work has necessarily proceeded slowly owing to the tightness of the gravel and inability of the owners to finance their own holdings. Most of the work has been done by Hall and Eley, and their lower drift has been driven about 350 feet. Bed-rock, according to the owners, has risen from about 7 feet to 14 inches below the floor of the drift, and it appears likely that this may be the rim or a slip from the main channel. Work done on other leases about a mile north has definitely determined the presence of quartz pebbles, but not that they are in place. On the *McMasters* lease, about three-quarters of a mile east, pebbles have also been discovered in the workings.

## EASTERN MINERAL SURVEY DISTRICT (No. 5).

REPORT BY B. T. O'GRADY, RESIDENT MINING ENGINEER (HEADQUARTERS, NELSON).

## INTRODUCTION.

Conditions have continued to improve since mining progress was described in the Annual Report for 1933. Full production figures are not yet at hand for the six-month period under review. The available information shows increased gold production, with accompanying improvement in employment.

To June 21st, customs shipments, chiefly gold ores and concentrates, received at the smelter aggregated 13,907 dry tons. Increased production from the *Yankee Girl*, with substantial shipments from the *Goodenough*, contributed largely to the total. To the same date the various groups of lessees on mines of the Consolidated Mining and Smelting Company at Rossland shipped 16,562 dry tons. Gold production should show a very marked improvement during the current year, judging from the tonnage being received at the Trail smelter and the increased output to be expected from the *Yankee Girl*, where a 100-ton mill is to be erected; the *Second Relief*, where mill expansion is anticipated following the speeding-up of ore-development by the Premier Mining Company; and the *Kootenay Belle*, where a 50-ton mill is under construction. Mill-construction is also under consideration by the Ymir Gold Mines, Limited, in connection with the *Goodenough* and *Ymir* mines. At the *Granite-Poorman*, H. R. Smith, representing the Livingstone Mining Company, is erecting a mill of a reported daily capacity of 60 tons.

The output of the Reno Gold Mines, Limited, is increasing, the mill having recently been operated on a 100-ton basis as in May, when 3,000 tons were milled with a gross production of over \$53,000.

At the *Wilcox*, lessees are producing some bullion from their 10-stamp mill operation. Other contributory factors include the initiation of production, at first on a shipping basis, by the Gold Belt Mining Company, while development and exploration of gold properties is proceeding at numerous points in District No. 5. New companies are being formed and resumption of work is being undertaken in connection with long-dormant prospects, while the investigation of others, being actively conducted, should lead to new activities. In the Slocan camp revived interest is apparent, as evidenced by the resumption of company activities at the *Silversmith*, *Noble Five*, *Monitor*, and *Utica*.

At the Trail plant some 400 men have been added to the pay-roll since the beginning of 1934. Operations in the lead department are being conducted at capacity, with, at the time of writing, a daily output of from 425 to 430 tons of lead. The zinc plant is being run at over 80 per cent. capacity, or about 340 tons per day. From the *Monarch* mine of the Base Metals Mining Corporation, near Field, substantial shipments of lead and zinc concentrates, sent to Antwerp in Belgium, are being maintained.

In all the eleven Mining Divisions of District No. 5 there is activity of varying extent to report, but only some brief notes are possible herein owing to the restricted space available. Owing to the large number of applications for assistance towards the repair and construction of mining roads and trails, it has not yet been possible to visit all the activities of which mention is made in the body of this report.

## NELSON MINING DIVISION.

At the *Granite-Poorman* mine, west of Nelson, the foundations for the mill at the new site are being constructed; the power-house being completed. H. R. Smith, representing the Livingstone Mining Company, is in charge. At the adjacent property of the Kootenay-Nevada Mines, Limited, a shaft is being sunk under contract by A. H. Green Company, of Nelson, on the *Nevada* vein. At the *Athabasca-Venus-Juno* properties of the Noble Five Mines, Limited, the new low tunnels on the *Athabasca* and *Venus* are being continued and further development of the *Juno* ore-shoot has been done. Lessees made shipments from the *Athabasca* and *Venus* workings. At the adjacent *California* property Charles Udall and associates, of Tacoma, have become interested and will take over the operation from the lessees. At the *Perrier* small-scale work is being continued by T. H. Turner for the Perrier Gold Mines, Limited, and two car-loads

of ore have been shipped. At the *Golden Eagle*, on Sandy creek, work is being continued by B. A. Pickering and associates and small shipments made at intervals. At the *Good Hope*, on Bird creek, W. E. Coles and associates have shipped their first car-load, which assayed about 1.5 oz. gold to the ton.

At the *Euphrates*, 10 miles south of Nelson, the lower *Ell-Tee* tunnel is being driven ahead to explore the ground below the *Lost Cabin* vein. When visited on April 20th this working was in over 1,400 feet and the objective had not then been reached. The vein is well exposed for practically the entire length of this tunnel, in which it averages from 4 to 6 inches in width, with a maximum width of about 2 feet. There are two short stopes, each about 30 feet long and 25 feet high, at points about 300 and 900 feet in from the portal. In the backs of these stopes vein-widths were about 3 inches, of which samples taken in June, 1933, gave assays of 0.36 and 0.15 oz. gold per ton respectively. The vein-filling as exposed throughout the tunnel is either quartz or shattered wall-rock, or both. Quartz occurrences are not very persistent either in length or vertical extent, as may be seen along the adit and in the small stopes. The occurrences may be described as elongated lenses from a few feet to 30 or 40 feet in length and averaging less than 6 inches wide. The quartz is often well mineralized with galena and pyrite, at times oxidized, and the shattered or schisted wall-rock in the vein is highly oxidized. The small ore-body stoped in the upper *Ell-Tee* tunnel does not persist to the lower level, indicating a habit of extreme localization of the ore occurrences, which is further shown by the small amount of quartz and mineral showing in the backs of the two small stopes previously mentioned. This vein as exposed might yield a few tons at a time of good-grade ore, but it is far too small and the good ore of too limited and erratic occurrence to allow of profitable mining by the usual methods. Conditions in general are not appreciably changed since described in the Annual Report for 1929, though some new surface-trenching along the *Lost Cabin* shear-zone was not inspected in April owing to snow covering that portion of the ground. Summarizing previous inspections, the *Lost Cabin* shear strikes and dips with the formation, the average width of the shearing being from 6 to 8 feet. Its intensity tends to diminish rapidly in short distances and the same is true of the mineralization and bands or elongated lenses of quartz. The gold content, as sampled in the old workings, was very erratic, with occasional high assays being obtained, due to heavy concentration through oxidation or possibly the local occurrence of a little free gold.

In the Ymir camp there has been a substantial increase in the scale of shipments from the *Yankee Girl*, which have been at the rate of about 50 tons a day, the estimated production to June 30th being 10,350 tons. Preparations are under way for the erection of a 100-ton mill, which is expected to be in operation by the end of the year. H. W. Seaman is in charge for E. P. Crawford and F. R. Weeks. At the *Goodenough* O. D. Frith, for the Ymir Gold Mines, Limited, has shipped in excess of 2,300 tons of ore from the two upper levels. Crosscutting on the No. 3 level proved the downward continuation of the vein and this will be drifted on to locate the ore-shoots on this horizon. Mill-construction on a basis up to 50 tons capacity is planned in connection with the *Goodenough* and the old *Ymir* property, where sampling operations have shown areas of commercial milling values, at prevailing gold prices, in the old workings. At the *Two Star* good progress is being made in driving the long tunnel by J. L. Parker for the Trites Gold Mining Company, the approximate length of the tunnel now being 2,000 feet. At the *Wilcox* work has been resumed by J. J. Cullinane and associates after the winter lay-off and the 10-stamp mill is again being operated. Supplies are being taken in to the *Excelsior*, beyond the *Wilcox*, by J. Brokenshire for Vancouver interests. At the *Tamarac*, north of Ymir, a few men are employed by the owner, E. W. Widdowson, reconditioning the old workings and on preliminary work.

On Boulder creek work is being continued at the property of the Clubine-Comstock Gold Mines by L. R. Clubine and a new Diesel engine and compressor have been installed for increased drilling capacity.

The Sheep Creek camp is very active with several promising developments. About 125 men are on the pay-roll of the Reno Gold Mines, Limited, including a special crew for sinking the new shaft mentioned in the 1933 Annual Report. The estimated production for the half-year period is 6,730 oz. gold and 3,446 oz. silver. The present rate of production is about 1,700 oz. gold per month on the 100-ton daily milling basis which has been maintained since April. The June, 1934, production amounted to 1,730 oz. gold. The ore has been struck east of the fault on the 600-foot level, the first two rounds assaying 1.18 oz. gold per ton across a width

of 2.4 feet. The drift had been advanced 25 feet, all in ore, up to July 12th, 1934, but assays other than that given above were not available at that date. The shaft is down over 60 feet with the temporary equipment, which is being used, pending the arrival of new high-tension electric cable from the East.

On the property of the Gold Belt Mining Company ore-shoots are being developed along the "C" and "D" veins on the 200-foot level, high-grade sections of ore having been exposed in the "D" vein drifts, from which 46 tons have been shipped, and in the raise to the surface on "C" vein. Drifting is also proceeding on the "D" vein on the 600-foot level and the main crosscut is being advanced to cut the "C" vein.

At the *Queen* property of the Sheep Creek Gold Mines, Limited, good results are being obtained under the direction of H. E. Doelle. Drifting east on the No. 7 level has disclosed good milling-ore, 150 feet long at the time of writing, over the full width of the tunnel. A raise put up from the east stope on the same level to the No. 6 level develops the vein, 8 feet wide or more, containing fair milling values under present conditions. The thorough investigation being conducted, following some diamond-drilling and accompanied by development, is showing up good objectives for exploration in the shaft-workings. Drifting is also being done on the *Alexandria* vein farther up the creek. Thirty-four men are employed.

At the *Kootenay Belle* J. G. MacNiven, of Kimberley, designed and is superintending the erection of a 50-ton mill. The work is being done under contract by A. H. Green Company, of Nelson. Development is proceeding on Nos. 1 and 2 levels and plans call for a new lower tunnel 200 feet below No. 2. The *Yellowstone* vein is also being trenched on the surface.

The *Summit* group was recently examined by A. G. Langley to report on work to be undertaken by the McCuaig Red Lake Gold Mines, Limited (N.P.L.). A small crew is employed by the McClay interests, of Vancouver, driving the No. 3 tunnel on the *Bonanza* on Wolf creek, and good indications are being obtained of the downward continuation of the ore-shoot in the No. 2 tunnel.

In the Pend d'Oreille limestone-belt development has been continued at the *Aspen* and, to a smaller extent, on the *Emerald*. At the *Aspen* the work is under the technical direction of H. C. Boydell, of Toronto, for the Salmo Malartic Mines, Limited. Recent development in the northern workings have disclosed a considerable body of low-grade zinc mineralization.

On the 200 or more claims staked in 1933 for the Wesko Exploration and Development Company, Limited (N.P.L.), covering the ground lying north of the *Reno* to Wild Horse creek, prospecting is being actively continued and a crew of men are working on their *Big Patch* group at the head of Poreupine creek. For the *Howard*, on the South fork of the same creek, a small mill is under consideration by J. F. Duthie, of Seattle.

On Erie creek management of the *Second Relief* mine has been taken over by the Premier Mining Company, following acquisition of control of 51 per cent. of the stock of the Relief-Arlington Mines, Limited. A vigorous development campaign has been initiated. Fifty-six men are now on the pay-roll and a new bunk-house has been built to accommodate twenty-four additional men. A new mess-house, to provide for 100 men, and three residences are under construction, new powder-house and warehouse having already been built. The No. 5 level is being extended into the *Ida D.* claim, in which the outstanding half-interest has been acquired. Of the new drifting done, 200 feet continued all in good ore, somewhat higher in grade than the previous section. Other new work includes a crosscut on the same level, now in 200 feet, to cut the vein system. The No. 3 level on the main vein is being extended into *Ida D.* ground. Preparations are under way to sink a 2-compartment shaft from No. 5 level along the foot-wall of the vein to a depth of 300 feet as the first stage to test the deposits at depth. Excellent progress is being made in all headings. Milling is being continued on the same scale, but additional machinery will probably be installed to bring capacity up to 50 tons a day. S. M. Manning, of the Premier Mining Company organization, is in charge.

The *Arlington* property is being worked by lessees, including the Oscarson Bros., who have been shipping ore, and Godfrey Birtsch, who made a small shipment. Adjoining the *Arlington*, Fred Golightly and associates are working on their lease and shipping ore.

In connection with the *Black Rock* property, compressor equipment has been taken in over the newly-constructed caterpillar-tractor road. Work is being done by the Black Rock Syndicate, of Vancouver.

Many minor activities occurred in the Nelson Division of which mention cannot be made at this time. At the *Sullivan* prospect, Kitchener, a compressor has been installed and development is being started by C. W. Conn and associates, of Vancouver. Work has been resumed after an interval at the *Sanca* property, on the eastern side of Kootenay lake.

SLOCAN, SLOCAN CITY, AINSWORTH, ARROW LAKE, LARDEAU, REVELSTOKE,  
AND TRAIL CREEK MINING DIVISIONS.

In the Slocan camp leasing activities are being continued much as described in the Annual Report for 1933. Company activities are being resumed on a restricted scale in some cases, as at the *Silversmith*, where J. Lancaster has repaired the flood damage to the mill and reconditioned the workings, followed by a thorough investigation and diamond-drilling; and at the property of the Noble Five Mines, Limited, where diamond-drilling has proved the easterly extension of the ore-body on the 1,800-foot level beyond the fault. This vein, previously thought to be the *Deadman*, is now shown to be the *Noble Five* vein. On the 1,600-foot level diamond-drilling proved the upward continuation of the same vein, with fair values where cut. A hole drilled from the end of the main 1,800-foot level crosscut cut a vein, probably the *Last Chance*, in quartzite. At the *Monitor*, Three Forks, eight men are employed by the Slocan-Monitor Silver Mines, Limited, extending the No. 5 tunnel along the vein to get under the ground stoped in the tunnel above. In the adjoining Ainsworth Division work has been resumed by the Utica Mines, Limited.

In the Slocan City Division gold prospects on Lemon creek are being investigated, including the *Kilo*, where resumption of work is expected by Vancouver interests (see Annual Report for 1933).

In the Arrow Lake Division interest centres on Cariboo Creek, Burton, where small crews are at work on the *Promestora* and *Chieftain*; C. S. Lord being in charge for the Reward Mining Company.

In the Lardeau Division an engineer-superintendent, J. MacDonald, has taken over the management of the Meridian Mining Company's properties at Camborne. This area has not yet been visited and no details are available at the time of writing about progress. In connection with the *Gillman* and adjacent properties, the Kootenay-Lardeau Gold and Silver Mines, Limited, has been incorporated. In connection with the *Magnet*, on Canyon creek, Gerrard, a company is being incorporated by S. E. Betts, of Toronto, and a small crew is at work.

In the Revelstoke Division preparatory activity is taking place on Carnes creek, Big Bend area, as at the *J. and L.*, where bulk samples are to be shipped to the Department of Mines at Ottawa for mill tests. Dr. D. C. Hart, of Regina, and associates own the property.

South of Revelstoke, on Isaac creek, N. E. DeMers, of Montreal, is testing his dredging lease, extending 5 miles up Isaac creek from the Columbia river. **DeMers Placers, Ltd.** In this connection the DeMers Placers, Limited, is reported to have been granted a Dominion charter with a capitalization of \$3,000,000. A new camp building has been erected and old buildings have been repaired.

When this undertaking was visited on May 24th last by the writer the only gold "dredging" or gold-recovery equipment on the ground was a home-made contrivance powered by a second-hand 45-horse-power auto-engine. Briefly stated, this equipment consisted of twenty-seven little buckets on an endless chain, mounted on a 35-foot boom. The gravel and sand pass over screens, the coarse material going to the tailings-pile and the fines being washed over cocoanut-matting after passing through the screens. At intervals the mats are removed to extract the black sand "concentrate" which was being saved for shipment to the Trail smelter. According to the management, the capacity of the "dredge" was 2 cubic yards per hour and it was being operated six hours per day. The fine material recovered contained magnetite sand with which is associated very fine colours of gold. An analysis of the black sand showed silica, 7.8 per cent.; lime, 1.3 per cent.; iron, 57.8 per cent. No systematic or thorough testing of the ground controlled by DeMers Placers, Limited, is known to have been done. Any examination of the property at this time can only be very superficial as no test-holes have been put down to bed-rock.

In the matter of recoveries, the proportion of black sand to the original bulk of the material is small. A shipment of 13 tons of "concentrate" was made early in July. This "concentrate" was the accumulated result of at least two months' operation. The assay of this 13-ton shipment

just received (July 23rd) was 0.005 oz. gold per ton. This, of course, is barren for any practical purposes.

No gold was being recovered at the property. The black sand allegedly containing gold values, as stated by the management, is saved for shipment and no attempt is made to separate the gold (such as is present to some extent in a very finely divided condition), which is associated with the magnetite sand. No reports by professionally-recognized engineers are known to have been made on the ground controlled by this company.

East of Revelstoke a good start has been made by the Alco Silver Mines, Limited, and some twenty-six men are employed—sixteen on construction of a road and ten men at the mine.

In the Trail Creek Division conditions are much as described in the Annual Report for 1933, but the lessees on the Rossland properties of the Consolidated Mining and Smelting Company have greatly increased their shipments. At the *Velvet*, under the new management, substantial shipments are being made to the Trail smelter.

East Kootenay placer-mining has, in the aggregate, provided considerable employment in the Cranbrook district, as previously mentioned. At Kimberley the *Sullivan* mine of the Consolidated Mining and Smelting Company is being operated twenty-three days a month, with a daily tonnage of 5,500 tons mined and milled. Work has been resumed at the *Quartz Hill* on Sawmill creek by the owners, and W. S. Hefferman, of Nelson, has acquired an option and intends to install a compressor. Resumption of work is expected at the Midway prospect, near Aldridge Siding, by the Cariboo Gold Fields when new financial arrangements are completed.

At the *Dibble* group, near Fort Steele, a start has been made by Calgary interests and a car-load of ore shipped. New activities are being undertaken in connection with lode-mining, as on Boulder creek, a tributary of Wild Horse creek, and the *Bellevue*, on Fish Lake creek.

## WESTERN MINERAL SURVEY DISTRICT (No. 6).

REPORT BY A. M. RICHMOND, RESIDENT MINING ENGINEER (HEADQUARTERS, WORKMEN'S COMPENSATION BUILDING, VANCOUVER).

## INTRODUCTION.

In April, 1934, the Yale, Ashcroft, and Clinton Mining Divisions, which were formerly part of the Central District (No. 3), administered by Resident Mining Engineer P. B. Freeland at Penticton, were transferred to this, the Western Mineral Survey District (No. 6). The Western District therefore now contains the following eleven Mining Divisions: Alberni, Clayoquot, Quatsino, Victoria, Nanaimo, Vancouver, New Westminster, Yale, Ashcroft, Clinton, and Lillooet, and includes within its boundaries the Vancouver Island, Shoal Bay, Phillips Arm, Texada Island, Howe Sound, Hope, Coquihalla, Vidette, and Bridge River mining areas.

Since the writer took charge of the No. 6 District it has been impossible for him to make any extended field-trips throughout the district, with the result that this summary of mining operations for the first half of the year will of necessity be brief. It should also be remembered that many of the mining properties in the district are situated at high altitudes, and it is only recently that the operators have been able to start their development-work for the year. Consequently, there is not as yet very much to report on in the way of new work at these operations. Arrangements have been completed whereby the Resident Engineer will have an opportunity of examining all the important mineral developments in the district during the balance of the field season.

## GENERAL SUMMARY.

Gold-mining continued to hold first place in the mining activity of the district, and this year for the first time the two leading gold-producers in the Province, *Pioneer* with a six-month production of 46,090 oz., and *Bralorne* with a six-month production of 26,000 oz., are found in the Bridge River camp. Steady gold production has also come from the *Vidette* property, located north of Kamloops lake, following the start of milling operations in the 30-ton milling plant late in 1933. A small production has also been made from the *Grange* property (formerly the *Big Slide*) near Clinton, where a 25-ton mill has been in operation for some months. It is reported in the daily press that milling operations are to be resumed at a remodelled 30-ton mill on the *Dawson* property near Hope, and that milling plants at the *Home Gold*, *Minto*, and *Taylor-Windfall* properties will be constructed during the coming season. These properties have not yet been examined in detail by the writer.

In all parts of the district prospecting and development-work is very much featured in this year's activity, some of the work being under capable, technical direction. On Vancouver island, in the Alberni district, a mild boom occurred early in the season and numerous claims were staked in the area contingent to Port Alberni. Similarly, in the Shoal Bay-Phillips Arm section, where some hundreds of claims were staked following the opening-up of the *Alexandria* property by the Premier Gold Mining Company. Some prospecting activity is also reported from the Fire Mountain area north of Harrison lake, while in the Hope-Yale area several new claims have been staked and old properties reopened. Along the Pacific Great Eastern Railway from Squamish to the Bridge River there has been a continuation of the prospecting activity started last year, and several new company promotions have been made for the purpose of obtaining funds with which to develop showings in the Blackwater-Birkenhead and McGillivray Creek areas. In the main Bridge River camp several developments started last year have been somewhat curtailed this year, due to lack of funds and in several instances due to failure to locate promising mineralization. The two main producers, *Pioneer* and *Bralorne*, have both maintained and increased their ore reserves substantially. New developments at the *Pioneer* on the fourteenth level west and on the fifth level east have opened up very promising sections of this mine, the leading gold-producer of British Columbia. In the *Bralorne* the recent developments on the eleventh level, culminating in the cutting of the King vein between faults 1 and 2 at a depth of approximately 200 feet below the ore-showings on the tenth level, have materially strengthened the picture in this mine. Several other promising developments have also been made in the upper levels of the *Bralorne*. At the present time the enlargement of the milling

facilities at the mine have almost been completed, whereby it will be possible to gradually step-up production to about 450 tons per day. It is expected that this increased capacity will be reached during the latter part of this year, probably by the end of October.

In the Bridge River camp, outside of the two producing mines and a few of the properties spoken of later, it may well be considered that most of the work being done is primarily of a prospecting nature. Much of this prospecting is being done under the well-directed technical supervision of the engineers in charge and is rapidly eliminating unfavourable ground, so that efforts may be better directed to any possible prospecting chances which might exist on the individual properties.

In this connection it should be realized by the general public that, just because a property is located on the augite-diorite or greenstone belt in the Bridge River, it does not thereby ensure the certainty of finding profitable mineralization. In any economic consideration of mining in the Bridge River or in any other camp, it is a prerequisite for profitable operation that the two factors, gross tonnage and grade of ore, must be found complementing one another. Furthermore, the gross value of the recoverable metals in the ore-bodies should be such that there will be left a net profit after deducting all costs of property acquisition, development, mining operation, plant depreciation, interest charges, taxes, etc.

In the light of present operations in the Bridge River camp, it is considered by the writer that from \$7 to \$8 gold values are the minimum that can be profitably worked when the scale of operation is not less than 100 to 150 tons per day. A property having this grade of ore would require not less than 100,000 to 150,000 tons of "blocked out," "probable," and "possible" ore reserves before mill-construction would be warranted. This amount of ore would be sufficient for at least a three-year operation of the milling plant.

Still another thought which is very often overlooked by the general public is the fact that 1,000 tons of gold-quartz ore will occupy approximately 12,500 cubic feet, and this volume is equivalent to a vein 3 feet wide, 100 feet long, and 41 feet deep. Expressing this another way, it would require a vein 3 feet wide, 1,000 feet long, and 152 feet deep to run a 100-ton mill for one year. This, it can be readily appreciated, is a vein of considerable size. Furthermore, this volume of vein material must of necessity be of an *average* grade that will permit of its being handled profitably, and this average value of the ore can only be determined by a thorough, systematic, detailed, and conscientiously honest sampling done under the supervision of capable and reputable men.

Unfortunately, this important and absolutely necessary guide to the exploration of mining properties is not considered essential by many of the company operators, with the inevitable result that when such properties are given a thorough engineering sampling they do not stand up under the test and must of necessity be abandoned, sometimes long after development-work might otherwise have been suspended had the property been properly sampled at the time the exposures were first made. One or two high-grade samples, while in themselves reassuring, nevertheless do not express any true value of a mineral-showing. In any ordinary mining property it is the average of many hundreds of systematically-taken samples which must be used in determining the average grade of the ore.

Another common belief held by many with regard to the Bridge River country is that the quartz veins in the augite diorite, or greenstone, will get richer with depth. This is not necessarily so. When the ore-bodies of this camp were first formed many millions of years ago, they were formed at considerable depths below the then present surface of the ground. In the intervening time this overlying rock has been worn away by erosion, exposing to our view portions of the mineral-bearing veins which at one time were far underground. Therefore, with the knowledge that the present surface ores were at one time underground at depth, there is no good reason to expect any marked change as further depth is gained on the veins unless a geological change in the surrounding rocks takes place.

At both of the producing properties, *Pioneer* and *Bratorne*, very rich gold ores were found at the surface, and it is also true that in these mines there are barren and low-grade zones at considerable depths, as well as enrichments, underground. As a matter of fact, where the quartz-exposures containing gold mineralization have been extensively altered by surface oxidation, they should be materially richer than the unaltered ore at some depth below. This is due to the fact that much of the barren sulphides are often removed by surface agencies and to the fact that gold is not readily removed by surface-alteration processes.

## QUATSINO, CLAYOQUOT, ALBERNI, AND VICTORIA MINING DIVISIONS.

In these Mining Divisions, which comprise the western half of Vancouver island, there has been a fair share of mining activity, particularly in the nature of prospecting and individual developments during the period under review. In the northern section of the island, in the Quatsino Mining Division, only a very limited amount of individual prospecting is reported. This area is primarily a copper-bearing section and due to the depressed state of the copper market there has been no incentive to further exploration.

In the Clayoquot Mining Division activity in the Herbert Arm and Zeballos River sections has continued. W. W. Gibson, of San Francisco, has not operated the *Lcora* group during the present year, although it is planned to resume work there should water-power conditions improve. It is reported by the management in a letter to the Resident Engineer that operations at the King Midas Gold Mining Company's property on Zeballos river (the Marks property) have been continued on a small scale since the first of the year, and it is reported that a vein of considerable size, but low-grade value, was encountered in an open-cut near the "glory-hole" workings. The property was recently examined by Professor J. M. Turnbull and it is understood that a programme of diamond-drilling will be started in the near future.

At Nootka sound, the Nootka Gold Syndicate has taken up property on the south side of Tlupana arm, following an examination of the ground by Messrs. Langley and Warren, consulting engineers, of Vancouver.

On the Alberni canal, work has been resumed at the W.W.W. group and extensive repairs to the trail and camp have been made preparatory to resuming underground operations and the installation of a small milling plant.

At Toquart harbour, the Hillier Bros. have continued prospecting on the *Toquart* group.

Early in the year the Vancouver Island Gold Mines, Limited, was formed to take over the old *Warspite*, *Victoria*, *Chicago*, and *Alberni* claims near the head of China creek, some 10 miles south-west of Port Alberni. A 2-mile road was constructed from the Alberni Pacific Logging Company's railway to the camp, and, following the installation of a Diesel-driven compressor plant, drill-sharpener, etc., a tunnel was started to intersect the *Golden Belcher* vein. At the time the writer visited the area late in May, no underground work was in progress. H. W. Herman is the engineer in charge; he is assisted by P. Hurley, geologist.

At the property of the Taylor River Gold Mines, Limited, located some 4 miles up Taylor river from Sproat lake, a small crew has been engaged in stripping and cleaning out various surface showings under the supervision of V. P. Johnstone.

In the Victoria Mining Division a further 50 feet of tunnelling is reported to have been done at the *El Capitan* group near Cowichan lake by Messrs. Lomas and Powell, who have an option on the property.

In the Wolfe Creek section near Victoria some placer-mining and considerable prospecting has been carried on by individuals.

## NANAIMO MINING DIVISION.

There has been considerable prospecting and development activity in the Nanaimo Mining Division, which includes the western portion of Vancouver island and that part of the mainland from Jarvis inlet north to Seymour inlet and back to the headwaters of the rivers flowing into the Toba, Butte, and Knight inlets.

## SHOAL BAY SECTION.

At this property, in which the Premier Gold Mining Company started development early in 1934, a crew of about twenty-seven men has been working steadily in sampling and exploring the shear-zone found here in a band of altered sediments between two granite sills. The shear-zone, which strikes approximately N. 45° W., is almost vertical. During the first part of the year the Premier Company unwatered the shaft and did some development on the 100- and 200-foot levels, and thoroughly sampled the mineralization in these underground workings. Due to the expense of keeping the underground workings pumped out with the limited equipment available, it was decided by the management to continue the No. 2 level (50 feet above sea-level) along the shear-zone past the main fault, in the hopes that ore-bodies of similar size and gold content to that found between the zero level and the minus 200 level would be encountered. When the

property was visited late in May the No. 2 tunnel was being advanced approximately 12 feet per day and a crosscut to the south-west on this level was being advanced approximately 4 feet per day.

**Enid Julie  
Mines, Ltd.**

This company's property, which is situated on the west side of Phillips arm between the *Alexandria* and *Doratha Morton* properties, has been further developed in the period under review by a crew of eleven men. At the time the writer visited the property late in May the 780-foot level tunnel had been advanced a total distance of 284 feet along the quartz-filled shear in the altered sediments. A channel sample taken across two places in the 18-inch quartz vein showing at the face of the tunnel assayed a trace in gold per ton. An independent and reliable channel-sampling of this tunnel every 10 feet for the first 250 feet showed gold values between a trace and 0.11 oz. per ton over widths varying from 2 to 4.8 feet. The average gold content of this section of the workings was approximately 0.02 oz. gold per ton over an average width of 3.3 feet. At the upper or shaft showing, which is some 800 feet higher than the 780-foot level tunnel, the writer took three channel samples across the vein over widths of 3.5, 3.5, and 3 feet. These three samples returned an average gold content of 0.1 oz. per ton. This sampling checks very closely with an independent sampling.

At the *Empress* workings, which are located approximately half a mile east of the shaft-workings and at 2,500 feet elevation, nine channel samples over comparatively narrow widths in narrow stringers assayed between trace and 0.13 oz. gold per ton. Subsequent to the writer's visit the company engaged J. D. Galloway, M.E., to make a thorough examination of this property.

**Hercules  
C.M.S. & P. Co.  
(Doratha  
Morton).**

At this property a crew of about thirty-five men has been employed under the supervision of L. R. Leslie in rehabilitating the camp, constructing the road from the beach camp to the *Doratha Morton* workings, clearing the right-of-way for a tram to the *Doratha Morton*, and driving a tunnel on the *Marble* claim of the company holdings. The most important exposures on this company's property seen by the Resident Engineer on the occasion of his visit on June 1st were the old *Doratha Morton* workings, from which it is recorded 10,000 tons of ore was mined many years ago. From this 10,000 tons of ore it is also officially recorded that 4,434 oz. gold and 10,000 oz. silver were recovered in the now destroyed cyanide plant which was operated in 1898-99 at this property. The old workings, which are described in the 1933 Annual Report, have developed a wide quartz vein in altered sediments and volcanic rocks along a granitic contact. The Resident Engineer took nine channel samples across widths varying from 2.8 to 7 feet in the No. 1 and No. 3 levels of the property, the assays varying from *nil* to 0.2 oz. gold per ton. These results, while somewhat disappointing, should not be taken as conclusive, as good values have been found in the old workings, but the sampling does suggest that extensive and detailed sampling should be done in the underground workings of the property at the earliest possible time in order that a true idea of the average value of the mineralization exposed can be arrived at. This would enable future development-work to be properly planned. It is understood that G. A. Clothier, M.E., who is acting as consulting engineer for the company, has planned to make a detailed and systematic assay-map of the underground workings in the very near future. Comfortable camps have been erected at the beach and upper workings.

Operations at the *Thurtlow* mine by Federal Gold Mines, Limited, under the direction of C. P. Riel, were curtailed after sinking the winze in the 100-foot tunnel but a few feet. This property is idle at the present time. There is no activity at the *Sonora Gold Mines* at present. This also was under option to the Federal Gold Mines, Limited, during the early part of the year.

At the *Douglas Pine* group of claims, which has been optioned by the Pine Gold Mines, Limited, clearing and road-reconstruction has been done by a small crew of men under the direction of D. B. Burton, preparatory to the construction of a small milling plant to treat material from the various workings and exposures on this property.

At the *White Pine* group of claims, situated about 2 miles west of Shoal bay, Seymour Campbell with the crew of four men has been developing strong pyrrhotite, pyrite, quartz gold-bearing showings which were discovered outcropping in the granite formation of this area. This operation is being financed by a Vancouver syndicate headed by C. H. Dickie, M.P., J. H. Hemsworth, and J. M. Turnbull. A tunnel is being driven on the west side of the property in a massive showing of pyrite, pyrrhotite, and quartz.

## TEXADA ISLAND SECTION.

**Gem Gold Mines, Ltd.** R. Logan, in charge of a small crew of men, has continued underground development at this property, situated south-west of Vananda on Texada island, with reported encouraging results. G. A. Clothier, M.E., is acting in a consulting capacity for the company. Additional equipment has recently been installed and present plans call for an aggressive underground development programme in deepening the shaft and drifting to the south-east on the 100-foot level.

Hugh McMillan, of Nanaimo, and associates have had a small crew of men employed under the supervision of Wm. Lee making trail and road repairs and surface prospecting on the *Nancy Bell*, *Silvertip*, *Surprise*, *Copper King*, and *Retriever* group of claims south of Vananda.

## TATLAYOKO LAKE SECTION.

This section, at the headwaters of the Homathko river, emptying into the head of Bute inlet, has been further prospected during the present year, according to reports received by the Resident Engineer. Recently the Tatlayoko Gold Mining Company, Limited, owning the *Morris* property on Tatlayoko lake, has been amalgamated with the Bridge-Island Gold Mines, Limited. This property has been reported on by both the late W. Fleet Robertson and J. D. Galloway in past Annual Reports of the Department. It is understood development operations are to be resumed at once under the supervision of C. B. Hume. A. G. Langley, M.E., is consulting engineer for the company.

## VANCOUVER AND NEW WESTMINSTER MINING DIVISIONS.

In the Howe Sound section of the Vancouver Mining Division the Britannia Mining and Smelting Company, Limited, operating the *Britannia* copper-mines, has maintained production at the rate of 60,000 to 70,000 tons of ore mined and milled per month. This tonnage of ore is being drawn from the ore-bodies containing a higher than average zinc and gold content. About 540 men are employed and every effort has been made by the management to keep the organization together as far as possible. Since the beginning of the year a considerable increase has been made in the number of men employed.

## NEW WESTMINSTER MINING DIVISION.

In this Division attention has recently been attracted to the gravels of the Fraser river by the advertisements of Fraser River Golds, Limited. This company, of which Dr. G. H. Worthington is president; O. B. Allan, secretary; and Roy McIntosh, C. T. McAttie, E. H. Adams, L. M. Diether, G. B. Johnson, Dr. D. F. Carswell, Dr. Kirkpatrick, and Dr. Calbich are directors, have recently completed the construction of a large suction dredging plant with which it is proposed to dredge the gravels of the Fraser river between Hope and Chilliwack. At the present time the dredge has been floated up to a point a few miles above Chilliwack and dredging operations are to be commenced at Laidlaw, about 12 miles west of Hope, as soon as the necessary power development on Jones creek has been installed.

In the company prospectus it is pointed out that the average value of the gravel obtained in ten test-holes varied between 19 and 71 cents per cubic yard, gold calculated at \$20.67 per oz. It is further stressed in the advertisements that the average of sixty-five pan-samples taken by the company engineer along some 35 miles of the Fraser river in an examination extending over three days last fall was approximately 40 cents per cubic yard. It has been further stated in newspaper advertisements that J. Hume Robertson, after tests, estimates the average value at 40 cents per cubic yard, basing his values on gold at \$20.67 per fine ounce.

It should be realized that sixty-five tests along a length of 35 miles of a river of the dimensions of the Fraser are quite insufficient to determine the average values of the gravels therein. In order to properly estimate the average gold content of the Fraser River bars between Hope and Chilliwack, a distance of some 35 miles, will take the expenditure of many months of time and many thousands of dollars, and therefore any average figures based on the incomplete testing which has been done to date must be used with the utmost caution, and the enterprise above mentioned must in the absence of more detailed testing information be regarded as speculative.

There has been a renewal of activity in the Fire Mountain area north of Harrison lake and good prospects are reported by the owners of the various claims in this district. The Resident Engineer has not yet visited this area.

#### YALE MINING DIVISION.

At this property, situated a few miles north-west of Hope, a crew of 130 men **B.C. Nickel Co.** under the supervision of C. B. North, the engineer in charge, have accomplished a very substantial amount of development-work in the six-month period under review. The No. 1 tunnel at 3,530 feet elevation had been extended to 2,670 feet from the portal at the end of June. In this tunnel, between 1,300 feet and 1,430 feet from the portal, a mineralized zone of pyrrhotite and nickel was encountered. This 130-foot section of mineralization assayed 0.6 per cent. nickel. At 1,600 feet from the portal of this No. 1 (or main) tunnel diamond-drill holes drilled to the north in a horizontal direction encountered encouraging mineralization, and in hole No. 36, 120 feet of nickel-pyrrhotite mineralization averaging 1.13 per cent. nickel was encountered, and of this 120 feet, 30 feet of what is presumably the hanging-wall section of the mineralization assayed 2.59 per cent. nickel. In hole No. 37 from the same set-up, drilled horizontally in a direction 30° to the east of hole No. 36, 30 feet of nickel-pyrrhotite mineralization averaging 1.08 per cent. nickel was encountered.

In the No. 2 (or "Chinaman") tunnel at 3,275 feet elevation progress has not been as rapid, and at the end of June, 1934, the face had been advanced to a point 932 feet from the portal. The No. 1 tunnel, which is 8½ by 9 feet in section, is being advanced approximately 650 to 700 feet per month, an excellent rate of progress. The No. 2 tunnel is being advanced 225 feet per month. It is 5 by 7 feet in section.

Two diamond-drills are being used for underground and surface exploration, the drills working in all five shifts each day. The present rate of progress in the No. 1 tunnel should bring the face of the tunnel about opposite one of the main objectives by the end of July. Then it is planned to crosscut to the north and diamond-drill for the downward continuation of the large outcrops of pyrrhotite-nickel mineralization which were drilled some years ago by the old company.

A magnetometer survey of the surface workings was recently completed under the supervision of E. Bergman, while more recently a new tunnel-site 900 feet lower in elevation than the No. 1 tunnel was selected on the line of the proposed tramway between the upper tunnel and the mill-site on the Fraser river near Choate. The next six months' developments at this property should be sufficient to clearly indicate the possibilities and the results will be awaited with much interest.

Some surface and underground prospecting in the vicinity of the B.C. Nickel Company's holdings has been done by the Chrome Nickel Syndicate and by the Ideal Gold and Nickel Mines, Limited.

In the vicinity of Jessica, on the main line of the Kettle River Valley Railway, a crew of men under the supervision of D. H. Rae has been engaged in reconstruction-work at the property of the Dawson Consolidated Gold Mines, Limited. It is reported in the press that this property will go into production late in the fall of the present year, when it is planned to have a 30-ton mill in operation. The mill was constructed some years ago, but the present company plans to alter the flow-sheet and slightly increase the capacity.

At the *Home Gold* property, where encouraging results were reported by Resident Engineer Freeland in his 1933 Annual Report, it is reported that plans are being completed for the installation of machinery in the mill buildings constructed last year, and it is expected by the company that they will be into production some time during 1934.

Surface and underground prospecting has been continued in the Pierre River section near Jessica and up Siwash creek from Yale. Operations are also planned for the old *Queen* mine near Yale by W. N. Bailey and associates, of Vancouver. The usual number of river-bar placer-miners are working along the Fraser river in the Yale Mining Division.

#### ASHCROFT AND CLINTON MINING DIVISIONS.

In the Ashcroft Mining Division the property of the Vidette Gold Mines, Limited, has been in continuous operation since the first of the year. Milling was started last December at the rate of 14 tons per day on a one-shift basis and has been continued throughout 1934 with a steadily increasing capacity. At the present time the mill is being operated on a full-time basis

at the rate of 35 tons per day. Mill-heads are reported to average 0.75 oz. gold per ton. Underground developments are stated by the management to be very satisfactory, the No. 2 level drift to the north having been extended for 314 feet north of the winze in ore of average value and average widths. The face is reported to be still in ore. This year a new crosscut tunnel east of the *Tenfold* workings was driven to intersect the Bluff vein. This vein, which is somewhat narrower than the main vein developed at the *Vidette* property, is reported to have values somewhat greater than average. A new Diesel engine has recently been installed and several additions have been made to the milling plant. At the present time the company is constructing approximately 18 miles of new road from Tobacco flats to the mine. They are making approximately one-third of a mile of road per day. The Resident Engineer has not yet visited this particular operation.

It is understood that the *Last Chance-Sylvanite* group of claims has recently been taken over by a newly-formed company and that development-work on an increased scale will be undertaken immediately.

Due to the success at the *Vidette* and *Sylvanite* properties, there has been an increasing interest taken in the area and many new recordings of mineral stakings have been made during the present year. Placer-mining by the unemployed has been continued along the lower parts of the Deadman river.

In the Clinton Mining Division the Grange Mines, Limited (formerly the *Big Slide*), has operated its 25-ton mill at less than capacity rate since it was started on December 31st, 1933. For part of the period under review mill-heads averaged about 0.6 oz. gold per ton, but more recently, due to the fact that much of the ore has been coming from development-work and from stopes in which rather heavy waste dilution occurs, the mill-heads have been considerably lower and some days have run as low as 0.1 oz. gold per ton. The winze from No. 3 to No. 5 levels has been sunk an additional 100 feet to No. 6 level and drifting at this level has progressed a total distance of 90 feet. It is reported by the management that the vein on No. 6 level is 3 feet wide with better than average values. The milling equipment at the Grange property is being remodelled so that a somewhat increased tonnage may be handled.

In May of this year the E. J. (Whitewater) Taylor properties on Iron creek, near Taseko lake, were taken over by the Taylor-Windfall Gold Mines, Limited, and it is reported that favourable values have been discovered by diamond-drilling. This operation is of interest from the fact that aeroplane transportation is used almost exclusively to transport men and supplies from either Seton or Williams lakes into the property, which is situated about 12 miles by trail from Taseko lake. The Resident Engineer has not yet been able to examine this property, descriptions of which have appeared in past Annual Reports of the Department.

Placer-mining activity in the Ashcroft and Clinton Mining Divisions during the period under review has been much as in past seasons, with the usual number of operators working on the Thompson River bars, the Fraser River bars, Watson Bar creek, and Poison Mountain creek.

#### LILLOOET MINING DIVISION.

In the McGillivray Creek area development-work of an exploratory nature has been continued beyond the fault in the No. 3 level of the National Gold Mines, Limited, property. The vein continuation had not been located as at June 30th, but as a result of the thorough geological surveying and mapping of the property by C. M. Campbell and R. R. Wilson (the latter recently appointed managing director of the company), it is expected that further light will be thrown on the solution of this important problem. The underground and surface workings were also sampled in detail by the above-mentioned engineers.

It is reported that development-work has been continued at the properties of the Del-Mar Gold Mining Syndicate, in the Birkenhead area, and at the north end of Lillooet lake. Work has also been continued at the *Gold Hill* and *Diorite* properties in the McGillivray Creek area. At the property of the Richstrike Gold Mines, Limited, on Whitecap creek, it is reported that the main crosscut tunnel had been advanced over 450 feet from the portal.

On Cayoosh creek, at the south-west end of Seton lake near Lillooet, the *Bonanza* and *Cache* properties of the Bonanza-Cache Gold Mines, Limited, have been under development. At the *Bonanza* group the main tunnel is being advanced, while at the *Golden Cache* group, following an examination of the property by Dr. S. J. Schofield, diamond-drilling from the surface is being done to determine the underground extent of the *Golden Cache* vein.

## CADWALLADER CREEK SECTION.

In the producing area of the Bridge River district good progress and developments of major importance have occurred at the *Pioneer* and *Bralorne* properties. These two mines, with a six-month total production estimated at 72,090 fine ounces of gold, produced 52 per cent. of the gold mined in British Columbia during the half-year period under review, and with increased milling facilities recently completed at the *Bralorne* it is anticipated that this rate of production will be expanded during the remainder of 1934.

**Pioneer.** Underground developments on the fourteenth level west, where over 270 feet of high-grade ore has been developed, with a 78-foot length of the ore having a reported average value of 7 oz. gold per ton over an average width of 2.5 to 3 feet; and on 5 level east, where it is reported by the managing director, D. Sloan, that over 550 feet of ore averaging 3 feet wide and 3.9 oz. gold per ton had been opened up, are of decided importance. At the present time the No. 4 level drift is being extended to the east to get into a possible upward extension of the No. 5 level ore. Lateral development-work is also being continued on the levels below the tenth level, east and west. The work of retimbering the No. 2 shaft to the fourteenth level and installing a new hoist similar to that on the No. 1 shaft is rapidly progressing. Early in June the work of sinking the No. 2 shaft to the 3,150-foot level commenced and at the end of the month had been advanced approximately 75 feet. It is planned to cut level stations at 125-foot intervals down to the 3,150-foot level, but it is not presently expected that the first lateral work on the *Pioneer* vein will be done before the seventeenth level is reached at 375 feet below the fourteenth level. Milling has continued at an average rate of somewhat over 360 tons per day, with production on some days averaging more than 400 tons. The management plans minor alterations in the milling equipment which will bring the daily tonnage of ore treated up to 400 tons per day. Physically, the mine is in excellent shape and reflects the able local management of Dr. H. T. James and his assistants.

**Bralorne Mines, Ltd.** During the period under review underground developments at the *Bralorne* mine have kept pace with the underground developments of last year. Recently the King vein section between the No. 1 and No. 2 faults was encountered in the 11-A crosscut on the eleventh level. This work gives an additional 200 feet of backs to this section of the King vein. At present no data are available as to the average grade of the vein where encountered and it will be some months' time before accurate figures can be worked out. These are only obtainable as lateral development progresses. The King vein has also been opened up west of the No. 2 fault on the Nos. 6, 7, and 8 levels and good widths of mine average grade ore were opened up. More recently the 805 drift on the eighth (or main) adit-level opened up a section of what is believed to be the shaft-vein. Better than average mine values over drift-widths were encountered in this work. At the present time the tenth level is being extended to intersect the King vein to the west of the No. 2 fault. Drifting is being continued on the eleventh level in the first section of the King vein and the ninth level is being extended to intersect the King vein between the first and second faults.

Early in the year it was announced by the management that the milling plant would be stepped up to treat 265 tons per day. Later, as a result of excellent underground development, the management announced that the mill would be increased by the addition of another unit, making a total capacity of 400 tons per day. This unit of the mill was recently completed and put into service, and after the old section of the mill has been thoroughly overhauled the daily output from the mine will be gradually stepped up to 400 tons per day.

At the property of the Standard Gold Mines, Limited, at the head of Cadwallader creek, underground development-work with a crew of eight to ten men has been continued during the period under review. The main tunnel was in approximately 640 feet at the end of June. Several wide but very low-grade sections of mineralization have been reported by the management. The Resident Engineer has not yet been able to sample these showings.

**Butte I.X.L. Gold Mines, Ltd.** At this property a crew of nineteen men has been engaged in driving a main crosscut tunnel to thoroughly explore the possibilities of this property near its western boundary. A shaft was first sunk to a depth of about 160 feet, but due to water difficulties it became necessary to drive a crosscut to tap the shaft and take care of the heavy water-flow. This crosscut was in approximately 625 feet from the portal on June 22nd. At 355 feet from the portal a 16- to 18-inch quartz vein was encountered in the sedimentary rocks. This vein is said to have shown free gold. Two channel

samples across the 16- and 18-inch widths of the vein assayed but a trace in gold. More recently it is reported that the crosscut tunnel had encountered a 5-foot vein at 777 feet from the portal. This vein is stated by the management to carry only low values in gold and silver. The management intends to further explore the property by diamond-drilling and, later, to sink the shaft another 330 feet and crosscut the veins from this new level to explore them at greater depth.

Work at the *Red Hawk* group of claims, owned by the Red Hawk Gold Mines, Limited, has been suspended for some time on the advice of Colonel H. H. Yuill, the company's consulting engineer. Colonel Yuill considered it wise to await results of further development at the adjoining properties—namely, the *P.E. Gold* and the *Butte I.X.L.*

At the property of the Mix Gold Mines, Limited, situated a short distance up-stream from the Pacific Eastern Gold Mines, which in turn adjoins the *Pioneer* ground, four men have been employed driving a tunnel through overburden in an effort to reach bed-rock, where further underground exploration of the greenstone-belt will be undertaken. A previous attempt to reach bed-rock resulted in a tunnel 360 feet long in overburden and loose slide-rock. The second tunnel is in about the same distance.

At the Pacific Eastern Gold, Limited, property, which is an amalgamation of the P.E. Gold Mines, Limited, the Dan Tucker, Limited, and the Plutus, Limited, properties, a start has recently been made to thoroughly explore that section of the property immediately adjoining the *Pioneer* to the east. After reaching bed-rock under the heavy slide covering this portion of the property it is planned to thoroughly explore the greenstone formation by diamond-drilling. At the *Dan Tucker* operation of this company's properties the 100-foot level tunnel is being continued to get into the solid formation, from where diamond-drilling will be started.

**Bradian Mines,  
Ltd.**

Early in 1934 this company was incorporated to take over the eastern end of the property owned by Bralorne Mines, Limited, comprising in all twenty-one Crown-granted and five un-Crown-granted claims, with a total area of 773 acres. Following the installation of an electric-driven compressor plant, underground development was started at the *Coronation* and *Ida May* sections of the property. The old *Coronation* shaft, down to a depth of approximately 200 feet below the main *Coronation* tunnel-level, is being sunk a further 500 feet. At the *Ida May* property a new shaft called the No. 2 shaft is being sunk to a depth of 460 feet. The *Coronation* and *Ida May* tunnel entries are at elevations differing by 260 feet, and after the *Ida May* No. 2 shaft has been sunk to the above-mentioned depth a connection will be made with the present bottom level of the *Coronation* shaft by a crosscut approximately 2,100 feet long. This crosscut will explore the ground between the two shafts. An excellent camp capable of accommodating fifty men has been built. In the past excellent values from veins up to 4 feet wide have been explored and partially mined on both the *Coronation* and *Ida May* properties, and development in the near future on these very promising prospects should be most interesting. The property is considered to have an excellent chance of developing into another producing mine.

**Taylor-Bridge  
River Gold  
Mines, Ltd.**

The long crosscut tunnel from the eighth level of the *Bralorne* mine entered the Taylor-Bridge River mine early in the year and it has encountered three veins. The first vein, which is really a fault-fissure, was followed for about 100 feet with a drift, but values and widths were disappointing. The second vein, 100 feet to the north, was drifted on for 30 feet. Here again values and widths were below commercial grade. Some 60 feet north of the first vein intersection a crosscut branching 30° to the east of the main crosscut is being extended at the present time. At 75 feet from its portal, or 135 feet north of the first vein encountered, a vein varying in width from 6 feet to 14 inches was struck some weeks ago. This vein, when sampled, was found to contain very low gold values. It is the best looking of the three veins and no doubt the company will do considerable drifting on it to determine the possible location of commercial ore-shoots. A short drift, 16 feet long, to the north-west on this vein indicated that the vein pinched rapidly to a width of about 14 inches. On the right-hand wall of the crosscut the vein shows up 6 feet wide, is well ribboned, and quite attractive-looking structurally, although of very low-grade value. The best values obtained were about 0.08 oz. gold per ton.

The Taylor-Bridge River Gold Mines, Limited, has contracted with the Bralorne Company whereby *Bralorne* will drive 3,700 feet of crosscuts and drifts on the Taylor-Bridge River property. This development-work from the *Bralorne* mine gives a vertical depth of approximately 1,200 feet on any veins encountered on the Taylor-Bridge River ground.

**Gruhl-Wihksne.** Extensive underground tunnelling and diamond-drilling to date on this property has failed to disclose commercial widths or values of gold-bearing quartz veins. At the present time the company is prospecting the diorite formation with diamond-drills in an endeavour to locate quartz veins upon which underground exploration might be started.

**B.R.X.** Early in January a diamond-drill hole from the No. 3 level of the *California* vein-workings encountered a section of core at a depth of 400 feet below the No. 3 level which assayed 0.7 oz. in gold per ton along a core-length of 10 feet. The sludge for the same distance assayed 1.4 oz. gold per ton. This diamond-drill hole, No. 2, which was collared 905 feet from the portal of the No. 3 tunnel, was drilled at a vertical angle of approximately 78°, thereby indicating that the 10-foot core-length would be representative of a vein approximately 7 feet wide. Up to the time that this drill intersection was made, the company had extensively developed the *California* vein on three levels without finding commercial widths and values of ore. Following the intersection of the good gold values in the diamond-drill hole No. 2, diamond-drilling was stopped and, following the purchase and installation of the necessary equipment, an incline shaft from the No. 3 level on the *California* vein was started. This shaft, now down over 450 feet (July 18th), was directed to intersect diamond-drill hole No. 2 at a depth of approximately 400 feet below the No. 3 level in the vicinity of the core intersection mentioned above. Going down the shaft, the vein rolled away from it and recently the hanging-wall section of it has entered the shaft again. An air-receiver station cut at about 350 feet down the shaft encountered the hanging-wall section of the vein in the foot-wall of the winze. Assay values on samples by the management across a width of 4 feet were less than \$1 in gold per ton. To date no lateral development has taken place from this shaft. Very interesting results should be obtained as soon as lateral development-work is started from the winze at either the 450- or 600-foot level.

At the B.R. Consolidated operation under exploration by the Consolidated Mining and Smelting Company of Canada, Limited, extensive diamond-drilling and underground work has so far failed to disclose commercial widths, lengths, and values in the veins known to exist on this property. The recently reported strike encountered on the *Jewess* vein in the *Why Not* tunnel is presumably the extension of the *California* vein into the Bridge River Consolidated ground. The exposure recently made in underground drifting showed 8 inches of quartz in the shear. Two samples were taken across this width, returning an average of 0.01 oz. gold per ton. A crew of from twelve to fifteen men is employed at this property under C. A. D. Seaton.

At the B.R. Mountain Golds, Limited, property, situated to the west of the *Pioneer*, a crew of ten men under the supervision of Malcolm McGregor has been extending the lower tunnel, and it is reported by the management that a 3-foot vein has been encountered at 385 feet in from the portal of the tunnel. The Resident Engineer has not yet visited this operation.

It is also reported that the B.R. Ogden (1934), Limited, has been incorporated to acquire the holdings of the Native Son Mines, Limited, and B.R. Ogden Mines, Limited. They propose diamond-drilling in the near future.

#### BRIDGE RIVER SECTION.

**Wayside.** The following summary of information gives the present situation at the property of the Wayside Consolidated Gold Mines Company: Late in 1933 it was announced by Purves E. Ritchie, managing director of the company, that a milling plant would be constructed at the property. Following this, and in accordance with instructions given by Frank I. Eicheberger, president of the company, Arthur Notman, consulting engineer, of New York, was engaged to make an examination of the property to determine: (1) Whether, in his judgment, there had been sufficient ore developed to justify the erection of a 50-ton mill; and (2) if not, whether, in his judgment, the prospects were sufficiently favourable to justify further exploration.

Mr. Notman reported adversely on the first question, but did recommend a programme of underground exploration and diamond-drilling to thoroughly delimit the possibilities of the property.

After this programme had been followed for a period of three months, Mr. Notman re-examined *Wayside* and as a result of his examination operations at the property were suspended.

Following this announcement, Colonel H. H. Yuill, consulting mining engineer, of Vancouver, was engaged by the directors of the company to thoroughly examine the *Wayside* property and report to the directors.

The writer recently spent parts of three days at the property, and after a study of the company's assay-plans, a trip of inspection through the underground workings, and an analysis of the sampling done by Colonel Yuill and his assistants, it is considered that Colonel Yuill's examination represents a true picture of the situation.

Colonel Yuill's summary of the geology and development, and his conclusions, are given herewith:—

*Geology.*—The area is underlain by sedimentary rocks and volcanic flows which have been intruded by stocks and dykes of diorite.

The largest stock of diorite on the property covers the *Wayside* claim and adjoining claims. It is 2,300 feet wide in north-south direction and has been identified for 3,600 feet in east-west direction.

A wide shear-zone occurs in the central south-east part of the stock trending N. 27° W. and dipping at 57° north-east. The main shear has a number of smaller shears branching off, both from the hanging-wall and the foot-wall. The wall-rocks on each side of the shears are generally shattered and are highly altered, bleached, and in some cases pyritized. This type of shear has not been found favourable for finding valuable ore in this district.

Quartz-lenses occur in the shears at and near intersections with other shears.

*Development.*—The mine-workings are located on this shear-zone and adjacent foot-wall and hanging-wall shears, offshoots of the main shear-zone.

Development has been done by seven adit-levels through a vertical range of 650 feet and diamond-drilling has tested 540 feet deeper than the lowest adit. The shear has been explored along its strike for over 1,200 feet.

The development-work comprises 8,100 feet of drifts, crosscuts, raises, and 5,450 feet of diamond-drilling, which has been well laid out to test the shears effectively and has been carried out in an efficient manner.

A considerable amount of surface prospecting has been done by trenching and test-pits.

*Results of Development.*—The surface prospecting and diamond-drilling have not disclosed any indications that warrant investigation.

The underground development has opened up some small quartz-lenses with payable assays across small widths, but these small ore-bodies are so irregular and scattered that by themselves could not be mined at a profit.

Nos. 2, 3, and 4 levels on the main shear were driven at horizons where parallel flatter-dipping branch shears joined the main shear, and consequently there is a certain amount of quartz; No. 5 level, 120 feet lower, shows practically no quartz-bodies in the main shear. A raise was put through from No. 5 level to No. 2 level, a distance of 370 feet in the hanging-wall of the quartz-lenses.

Two hundred and eighty-two samples were taken to supplement the company's samples; fifty-seven of these were taken to study the values in a narrow irregular seam of black breccia which was found occasionally on the foot-wall of the quartz-lenses near the raise on Nos. 2, 3, and 4 and sub-levels and in the raise below No. 3 level.

The sampling of the black breccia gave very erratic values, ranging as high as 3½ oz. over 2 or 3 inches in width. The values in this material are localized and highly variable, and the volume indicated would not warrant the expense of developing for this material.

Sampling of the quartz-lenses themselves gave a general tenor for the quartz itself of less than \$1 per ton (0.05 oz. gold per ton). During development occasional high assays were obtained which were probably due to inclusion in the sample of fragments of the richer parts of the black breccia.

*Conclusion.*—I consider that the development done on this section of the property has thoroughly explored the possibilities and has not indicated any valuable ore-bodies. Therefore I advise that work in this section be discontinued.

Surface prospecting has not indicated anything of value elsewhere, but it is not conclusive. The north-west end of the diorite stock has an area of approximately 2,000 by 1,500 feet. It is possible that a more favourable type of fracturing may occur in this area for the formation of veins than in the section already explored. Any work done to explore for this condition would

be prospecting of a highly speculative nature. There is also probably a large section of the diorite stock under the flood-plain of the river, covered by silt and gravels having a thickness of at least 175 feet.

"*Résumé.*—The work done on this property has thoroughly tested the shear-zone found in the centre of the diorite stock and, in my opinion, has exhausted its possibilities as regards finding valuable ore-bodies.

"While an examination of the workings and surface outcrops does not disclose any indication of valuable deposits, it cannot be said that all possibilities of the property have been exhausted.

"The main diorite stock is extensive and the hornblende or augite diorite has been intruded by quartz diorite and acid dykes typical of the ore-bearing formations in the Bridge River area. Also it is definitely established that this diorite stock has been subjected to some degree of gold mineralization. Therefore, purely as a prospect, the property has some speculative merit. On this basis I would recommend more detailed geological mapping, which may indicate the advisability of testing the north end of the diorite stock for fractures near the margin that might contain veins.

"(Signed) H. H. YUILL."

The complete assay results as compiled by the company are not yet available; but a résumé of the 282 samples taken by Colonel H. H. Yuill in his recent examination show that the main shear-zone averages less than 0.05 oz. gold per ton. His sampling indicates that the main shear-zone for a length of 215 feet and an average width of 3.3 feet on the No. 1 level averages 0.095 oz. gold per ton, while the foot-wall shear on the same level averages less than 0.05 oz. gold per ton. On the No. 2 level the main shear-zone was sampled for indications only, and the six samples taken averaged 0.08 oz. gold per ton. On the No. 3 level the main shear-zone for a length of 140 feet and an average width of 17 feet assayed less than 0.03 oz. gold per ton. On the No. 4 level the shear-zone as exposed in the main drift for 210 feet from the portal assayed less than 0.04 oz. gold per ton across an average width of 5.1 feet, while thirty-two samples on the shear-zone, which centres about the main development raise in the mine, assayed 0.045 oz. gold per ton along a length of 210 feet and across an average width of 14 feet. On the fifth level the main shear-zone along a length of 520 feet across and an average width of 16½ feet assayed 0.017 oz. gold per ton.

These values indicate quite clearly the low-grade character of the shear-zone filling, which it was expected by the management would be of sufficient grade to justify the installation of a milling plant. At the present time the company is following out the recommendation of Colonel Yuill in geologically examining the rest of its property in detail, with a view to finding if there are any prospects near the margin of the north end of the diorite which outcrops on the property.

At the property of the Minto Gold Mines the underground development has proceeded rapidly during the present year and various estimates of ore-tonnage and ore grade have been prepared by different engineers. The Resident Engineer has not yet had a chance to thoroughly examine this property, and cannot, therefore, say what the tonnage and average values are.

At the present time the underground development is being vigorously proceeded with on the main working-level, which is now in over 900 feet from the portal, and which is reported to be in good ore again after passing through a broken section of the vein. The company is having a series of milling tests made to definitely establish the ratio of concentration which might reasonably be expected if a milling plant were installed. The reports of these tests are not yet to hand. They will have a decided bearing on the possibilities of the *Minto* property, for unless it is economically possible to make a good recovery of the gold values in the ore, and at the same time make a concentrate worth not less than approximately \$100 per ton, it will be difficult to conduct a profitable mining operation.

The mineralization underground presents an attractive picture for a small operation of possibly 50 tons per day capacity, if the average values are as stated by the management and if it is possible to make a concentrate of the above grade without too serious a loss in recovery.

At this property T. C. Botterill with a crew of thirty men has continued underground exploration. In the No. 1 level, after following the narrow vein through the dyke, the mineralization in width and values was improved. The sampling done by the management has shown gold values over minable widths to vary between

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0.04 oz. gold per ton and 0.72 oz. gold per ton. The average value for the vein as exposed in 200 feet on the No. 1 level has not yet been computed. The property is equipped with the compressor plant, steel-sharpening shop, and comfortable camp. Development-work on the No. 2 level, 130 feet below No. 1 level, recently encountered the vein and it is now being developed by drifting.

Other operations in the Main Bridge River section include those at the Federal Gold Mines, Limited, property, 1½ miles east of the *Minto* property, where underground exploration-work and development is being done by the Federal Gold Mines, Limited.

At the Olympic Gold Mines, Limited, property J. E. Leckie and a small crew of men are doing some surface exploration and recently started tunnelling operations.

#### GUN LAKE SECTION.

This company, operating the *Ypres* group on the west side of Gun lake, has considerably expanded the scope of the underground work during the period under review. Three veins in the unaltered augite diorite of this area have been crosscut in the tunnel located 40 feet above the lake-level. The first vein, 90 feet in from the tunnel portal, has been drifted on for a distance of approximately 400 feet, the vein varying in width from a few inches to as much as 4 feet, but averaging possibly 12 to 16 inches. Values have been generally low, ranging from a trace to 0.10 oz. gold per ton. The second vein, striking parallel to the first and with the same dip, was drifted on for 110 feet, with similar results to those obtained in the No. 1 vein. The third vein, encountered at 276 feet from the portal of the crosscut tunnel, was 26 inches wide on the left wall of the crosscut and 14 inches wide on the right wall. Two channel samples taken by the Resident Engineer across the left and right wall exposures assayed 0.02 oz. gold per ton and trace respectively. The main crosscut is being continued to cut several other veins exposed in past surface exploration on this property. An excellent camp capable of accommodating fifty men has been erected. Power equipment driven by a 200-horse-power Pelton water-wheel is used for underground exploration. Ed. Marshall is in charge at the property.

The Frances Gold Mines, Limited, property, situated near Haylmore, is to be developed following an examination of the ground recently made by S. J. Schofield.

#### GUN CREEK SECTION.

Very encouraging developments are reported from the *Jewel* property, under option to the Bralco interests, where a narrow vein containing average values in gold of from 2 to 5 oz. per ton has been uncovered in underground and surface development-work.

This company has had under development the *Simons* property, situated near Fish lake, and the *Taylor* property, situated in Taylor basin. The properties are known respectively as the *South* and *North Goldside* properties. Work at the *South Goldside* property during the period under review consisted of driving a 140-foot tunnel into a wide porphyry dyke which outcrops on the property. In this dyke a small quartz-filled fissure widening at one end to 3½ feet was developed for a short length. Diamond-drilling was also used to explore the underground continuation of this particular vein. The best value obtained across the 3½-foot vein of quartz close to the eastern edge of the dyke was 0.07 oz. gold per ton. Work was subsequently stopped at this property and concentrated on the *North Goldside*, situated in Taylor basin, about 8 miles by trail from the road at Tyaughton lake.

At *North Goldside* property several mineral-showings are being developed by a crew of twelve men under the supervision of S. H. Davis. The lower showing, consisting of a massive gossan-outcropping of iron oxide which overlies a calcite outcrop in serpentine, was being developed by ground-slucing and surface-trenching. A sample of the oxidized gossan over an area approximately 30 by 20 feet assayed but a trace in gold, while another sample of the unaltered calcite and iron pyrite, which was exposed over a length of up to 17 feet by 40 feet in width, assayed but a trace in gold. This exposure is at 6,000 feet elevation and close to the bank of Taylor creek. Several narrow quartz stringers partially oxidized and but a few inches in width, showing arsenopyrite mineralization, have been exposed by a long ground-slucice open-cut at 6,600 feet elevation, a short distance above the camp. These exposures occur in serpentine rocks, with which are interbedded silicified rocks of volcanic origin, possibly an

altered diorite, locally called greenstone. No work is being done on this showing at the present time.

North-east about 500 feet from this No. 1 (or Big) cut, another open-cut has exposed some dark-brown-stained siliceous rocks and pyrite mineralization over a width of about 6 feet. The main showings at the camp, where development is being pushed by diamond-drilling and open-cutting, is situated about half a mile west of the last-mentioned showing and at 7,350 feet elevation. This showing, which consists of several narrow disconnected veins in association with pyrite and porphyry, is being diamond-drilled at the present time. On the surface at this showing a branching vein system has been partially exposed by open-cutting. The most important vein-exposure is along a vein-length of 25 feet, averaging from 6 to 22 inches in width. Two channel samples taken by the Resident Engineer across vein-widths of 12 inches and 22 inches in a shallow shaft sunk on this section assayed 0.64 oz. gold per ton. Mineralization consists of arsenopyrite and pyrite with some associated gold. A diamond-drill hole was being started to intersect this vein at a depth of about 40 to 50 feet below the surface.

The other veins in this branching system are but narrow fissures not more than 2 or 3 inches in width. At a still higher elevation and above the showings just referred to, several open-cuts have been made along mineral-showings in the sedimentary formations. One sample of selected ore from an open-cut at 7,900 feet elevation assayed 0.5 oz. gold and 1.4 oz. silver per ton.

Development-work has also been continued at the *B. and F.* property (Bunting and Ferguson) on Gun creek.

#### PLACER-MINING.

At the property of the Lower Bridge River Placers, situated 12 miles up Bridge river from Lillooet, the company reports that operations during the first half of 1934 have consisted of sinking a 6- by 6-foot shaft in search of bed-rock, which, they regret to say, was not found. All operations are now suspended, pending information as to the results of dredging operations being carried on with a new type of dredger at Frenchman's bar.

The Resident Engineer has no information to hand as to the results of placer operations on Tyaughton creek or Marshall creek.

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## COAL PRODUCTION FOR THE SIX MONTHS ENDED JUNE 30TH, 1934.

COMPILED BY JAMES DICKSON, CHIEF INSPECTOR OF MINES (HEADQUARTERS, VICTORIA).

During the first six months of 1934 coal-mining in the Province showed a considerable increase as compared with the same period of 1933, but is much below the average for past years; the tonnages are given in long tons. The following figures, while approximately correct, are subject to slight revision. The output of coal to the end of June was 653,000 tons, as compared with 592,000 tons for the same period in 1933, an increase of 61,000 tons. The mines on Vancouver island produced 269,000 tons, as compared with 282,000 tons in the first half of 1933, a decrease of 13,000 tons. The mines of the Nicola-Princeton area produced 66,500 tons, as compared with 89,000 tons in the first half of 1933, a decrease of 22,500 tons. The Northern District produced 1,500 tons in the first half of 1934, as compared with 1,750 tons in 1933. The mines of the East Kootenay District produced 316,000 tons in the first half of 1934, as compared with 219,250 tons for the same period in 1933, an increase of 96,750 tons.

The subvention granted by the Dominion Government to assist coal produced in Eastern British Columbia to reach Manitoba and Ontario markets has been of material assistance in permitting some 40,000 tons of British Columbia coal to reach this market. It is hoped that the bonus provided for the mines on Vancouver island in the matter of deep-sea bunkering and export sales (except to the United States) may prove of value to these mines.

None of the coal-mines in the Province worked full time during the first half of the year and the average working-days was about 60 per cent. of the possible working-days.

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VICTORIA, B.C.

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