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REPORT

ON THE

ALBERNI MINING DISTRICT

BY

WILLIAM A. CARLYLE,

PROVINCIAL MINERALOGIST.

BULLETIN No. 1.

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By Authority.

JAMES BAKER,

Minister of Mines.

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REPORT.

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To the Hon. Col. James Baker,
Minister of Mines, British Columbia.

SIR,—Herewith I have the honour to transmit Official Bulletin No. 1, a report on the mineral deposits and the progress of mining operations in Alberni and on Barclay Sound, Island of Vancouver, B. C., compiled from notes recently taken by me, May 28th to June 10th, on a short visit to the various points in this district where mining and prospecting are being done. I was accompanied by Mr. Herbert Carmichael, Provincial Assayer, who rendered me signal service by his knowledge of the country and assistance in many ways.

On this short tour of inspection no attempt was made to study the general geology of the country as time forbade, and I confined my investigations to those places where ore was reported as found, or where work had been or was being carried on; and as my office calls for no expression of opinion as to the probable value of any property, I will limit my report to a description of what I saw and learned. Since Mr. Wm. J. Sutton made his much more lengthy examination last year very little more work has been done except on two properties, and but little that is new can now be said; however, I was able to inspect most of the leading points of interest and to acquaint myself with many of the conditions that obtain in this district, although I was unable to reach some claims lying further back, on which, as I learned, but little work save prospecting has been done, and at which no men were then at work.

All mining or prospecting except on the placers on China Creek, as seen by me, was in igneous rock, in most cases I believe in diorite or rock closely allied, rock nearly everywhere carrying more or less iron pyrites, that led some prospectors to report exposures of such rock as ledges of great width and in many cases to call this fine grained or aphanitic rock, quartz, when in fact but little quartz was seen apart from the regular quartz veins to be described, although the feldspar that mostly constitutes this rock is very acidic or high in the percentage of silica. Prospectors find this country very difficult to explore on account of its being densely covered with heavy timber and thick underbrush, especially near the coast, so that it is only by pushing up along the streams that they have picked up the clues that have led to many of the locations now made. Where so little development work has been done and so little of the ore really tested it is next to impossible for any one to reach a safe conclusion as to the value and extent of the ore now exposed, and all interested in Alberni are awaiting the results to be determined by more underground work, the milling tests soon to be possible on the erection by Mr. James Dunsmuir of the prospecting stamp mill at the foot of Mineral Creek and the first clean-up on the placers where hydraulicizing is being inaugurated.

In reference to fire assays of nearly all kinds of free-gold ores I would like to express my belief that such—as it is almost impossible to get average samples—are practically of but little value except in indicating whether gold is present or not, and of none at all in determining the probable *yield* value of an ore unless very careful average samples be taken from a large amount of ore, which is seldom done except by thoroughly experienced men. It is also utter folly by picking out a piece of rock, probably one looking very promising, to attempt to arrive at the value of an ore by the assay value of this particular bit, or further still by the common but pernicious and erroneous method of *averaging* up a number of such assays.

One must not forget that there is often a big gap between the *assay* value and the *yield* value of a gold ore, and that every caution must be taken to determine the milling qualities of such an ore, hence in nearly all gold camps of note where free gold occurs in the ore fire assays are seldom made and mill runs are imperative, and here again the lots of ore chosen must not be picked but systematically sampled out so as to give an average, representative as far as possible of the general run of the mine, keeping always in mind that ore near or at the surface, enriched by decomposition of the vein matter, is often of high value and easier to treat than ore from a lower horizon in the lode or below the natural drainage level.

The drift of these few remarks is to the effect that in this yet untried mining district there are needed much more work to ascertain the size and character of the ore bodies, and

also many careful mill tests, prosecuted with intelligence and experience, to decide not only the value of the ore but its treatment qualities, and much can be done along these lines without an excessive outlay of capital, thorough experience indeed being almost more requisite than money.

It is to be hoped that the tests soon to be begun will be carried out with experience and understanding, and that the results will be so encouraging as to lead to vigorous mining operations. I believe that with careful, systematic prospecting and exploratory work, work honestly intended to prove and develop the true value of a claim but *not* intended for purely speculative purposes, the work of an intelligent miner not of a projector of mining schemes, this district may become the centre of mining activity; but what is to be most deprecated is the issuing of extravagant reports that, on the face of them, are absurd, for such invariably redound to the hurt, discredit and retarding of what may be a most promising region. A few may make some small gains by such practices, but everybody interested in the opening up and advancement of a new locality should strive to suppress such ultra-highly coloured statements as most injurious to their own real interests, and endeavour by actual development work to prove up their property, as one really promising claim thus developed will be of more substantial value to a district than a vast deal of puffing that cannot bear out investigation.

I will give a short description of properties and localities in the order I visited them. All altitudes were measured from sea level by a pocket aneroid and bearings are magnetic.

BARCLAY SOUND.

SARITA RIVER.

About a mile up this river on the left bank is a steep bluff of diorite, heavily covered with timber and under-brush, showing a considerable amount of rock more or less permeated with magnetite, iron and copper pyrites and pyrrhotite, which in places where a few shots had been put in showed in solid masses of basic sulphides. As to the extent of this deposit no definite idea can yet be formed until some work is done, and the men engaged building a house were to begin driving a tunnel above high water mark to exploit this large surface exposure.

This claim, called the "Sarita," is said to be located in the Indian Reserve, the foreman being John Gray.

Through inability to find the trails I had to abandon a visit to a deposit of magnetite near here, and the marble reported as near Poett Nook.

SANTA MARIA ISLAND.

Near the south end, just at high water mark, is a shaft filled with water, whence many years ago iron ore was extracted, the shaft having been sunk on a small exposure of magnetite containing sulphides, running across this end of the island.

COPPER ISLAND.

"Rainbow" claim. On a small neck of land on east side of this island, near a good sheltered anchorage, a shaft has been sunk 50 or 60 feet on a ledge of magnetite that carries more or less sulphides. This ledge out-crops irregularly along the shore, some parts very red or reddish brown proving on fracture to be solid pyrites. There is a good house near the shaft, but all the men had been removed to the Sarita River property.

Along the north end of the island, and along the shores of the adjacent mainland and islands, is seen much limestone of a dark colour and hard fine grain, traversed by many dykes of eruptive rock, by which all bedding planes have been nearly obliterated. No fossils were found.

SECHART.

On this peninsula much prospecting has been done by Mr. Anderson, who has built good trails to different points, and has disclosed by stripping several large exposures of iron ore. The first claim visited was the "Lord of the Isles," altitude about 950 feet, where three men were engaged uncovering a small exposure of magnetite that lies in what appears to be diorite and next to a very extensive area of limestone, that at the point of contact with the eruptive rock is completely crystallized into large, coarse crystals. On the "Crown Prince," 800 to 900 feet altitude, two miles from the wharf, or about $\frac{3}{4}$ of a mile from the nearest salt water, a large, steep face on the mountain side has been stripped, disclosing much magnetite iron ore, in

places in large masses separated by country rock, but no new faces exposed by blasting were seen. Mr. Anderson allowed me to copy the following analyses made on samples of ore:—

(a.) By E. H. Cook, Cleveland Iron Works, Middlesborough, England: Iron, 66.0 per cent.; manganese, .44 per cent.; lime, 4.00 per cent.; sulphur, .02 per cent.; phosphorus, .01 per cent.; silica, 2.00 per cent.

(b.) By Dr. O. Wurth, Pittsburg, Pa., U. S., October 19th, 1893: Iron, 64.01 to 66.32 per cent.; sulphur, traces to .09 per cent.; phosphorus, .007 to .009 per cent.

These analyses show a very small percentage of phosphorus, that would rank this ore as a fine Bessimer iron ore.

Other deposits of iron ore have been stripped, but I had not time to inspect them. These iron deposits can be easily mined and the ore brought down to a well sheltered deep-water harbour, but as yet no work has been done underground to test the continuity or extent of these ore masses. Along the trails exposures of syenite and felsite were seen and limestone was abundant.

The "Sechart" quicksilver claim, $\frac{1}{2}$ of a mile up Pot-Hole Creek, which empties into the sea about $\frac{1}{4}$ of a mile from the wharf, has three tunnels and two shafts close to the creek in which it is reported native mercury was first found by hunters. The rock on the dump appears to be a diorite or a diabase, and some good specimens of the ore were found which, on being broken, disclosed the cinnabar disposed along the extremely narrow invisible cracks, while decomposed rock was found carrying the metallic "quick."

The dense under-brush, but little cleared away, precluded further examination to learn in what relations the ore was to be found, but at one place where ore could be got a fault wall was seen to be next to this material. No work is being now done on this property, which is held under a Crown grant.

The "Hundred Islands" consist mostly of syenite, but in one place a bluff about 100 feet high, close to the water ledge, was a hornblende granite, from which had fallen many large blocks.

EFFINGHAM INLET.

About 5 miles up this inlet is a high bluff of reddish brown eruptive rock of close, fine grained texture, but showing no series of regular cleavage planes or indicating whether it would break out in large blocks. Associated with it were intrusions of greenish eruptive rock with more or less amygdaloidal structure, and fresh blocks of agglomerate were to be seen. There is deep water right up to the bluff, on which the cribbing for a wharf has been laid. Along the west side of the inlet at this point is exposed much limestone cut by dykes, but no rock of the true character of marble was seen along the shore, although good marble is claimed to be found inland.

ALBERNI CANAL.

COLEMAN CREEK.

About a $\frac{1}{4}$ of a mile up this stream on a claim located by Mr. McAllister for some Victoria gentlemen, on the surface of a bluff on the left bank is evidence of a shear zone in the diorite or where along a fault plane, 6 to 7 feet of dark, rusty coloured crushed rock matter is seen, into which a tunnel was started and run 60 feet where it branched into two short drifts, one 15 feet the other 22 feet long. In the workings I could see no indications of a vein or of ore, although several smooth fault walls are there, with gouge or talcy matter along them. No work is being done on this property.

GRANITE CREEK.

About $3\frac{1}{4}$ miles by a good trail from the mouth of Hiwatches Creek, on a tributary, or Granite Creek, I visited the "Star of the West" claim, located 1894 by Messrs. McCoy, Poole, *et. al.* Alt. 740 feet. A tunnel then about 50 feet long was being run N. 45° E., following as a hanging wall, a well defined fault wall, dip S. 45° E. 60°, with another such or the foot wall, with 4 to 5 feet of greenish coloured rock between, carrying much calcite but little quartz, and some pyrites. Some of the rock called "blue quartz," tested with hydrochloric acid, proved to be lime. No assays or tests have been made of late, but from the material first taken out and on the dump, I was told assays of \$10 to \$12 had been several times obtained.

Several other claims have been located adjacent to this one, and also 7 or 8 miles up further along the creek, but as no one was at work further up, I did not visit them.

CHINA CREEK.

A road now runs from Alberni to the upper end of the "Duke of York" placer claim, whence $2\frac{1}{2}$ miles more are being constructed to Mineral Creek, near its junction with China Creek where near De Beaux' cabin—Alt. about 1200 feet—the prospecting stamp mill will be erected for treating the test samples of ore from the property of the Alberni Consolidated Mining Co. and other claims up Mineral Creek, up and along which is a good trail, that I took and inspected the "Mountain Rose," "Last Chance," "Missing Link," "Alberni," and the "Chicago" claims.

"Mountain Rose."—Alt. 1500 feet. Owner, Wm. Campbell, *et. al.*, Alberni.

Two men were working stripping a well defined vein very irregular in width, of 5 to 30 inches of quartz, carrying a small amount of iron and copper pyrites, strike east and west, dip 80° N. into the mountain; country rock a greenish schistose rock, laminae at right angles to course of vein, which is exposed for a short distance along the hillside but near the workings is faulted, the direction and amount of throw not having yet been determined.

"Last Chance."—Alt. 2125 feet.

The Quadra Mining Co. comprises three claims, the "Ophir," "Quadra," and "Last Chance," at the last of which two men were at work sinking a shaft, then about 30 feet deep. On the surface the shaft had been started in an exposure of very rusty iron-stained rock with a small stringer of white quartz, but the bottom of the shaft was all in country rock, a hard fine grained diorite of a slightly schistose character.

Foreman, John Merrifield, Alberni.

"Alberni."—Alt. 2800 feet.

The Alberni Consolidated Mining Co. own four claims in a block, the "Alberni," "Waspit," "Victoria," and "Chicago," the dispute as to ownership having been satisfactorily terminated admitting the commencement of progressive exploratory work, upon the results of which the further development of this locality now greatly depends. At the "Alberni" claim the last work was begun on the steep hillside on a clearly defined vein of quartz about $1\frac{1}{2}$ feet wide, and an open cut nearly 20 feet deep was made before a shaft was sunk 40 feet down on the pitch of the hanging wall, but at the time of my visit this shaft was full to the collar with water which, being too great to handle with a bucket, has necessitated the driving, 60 feet down the hill, of a tunnel to be about 100 feet long, to tap the vein about underneath the shaft. At the top of the shaft the quartz vein was two feet wide but following it along the surface a short distance it narrowed materially, while down in the shaft, a miner stated that at its widest part it (*i. e.*, the quartz vein) was $3\frac{1}{2}$ feet. The country rock on either side, eruptive rock evidently dioritic, is heavily impregnated with iron pyrites, and is reported to give good assays in gold, although this must be conclusively determined by the mill tests.

The dump, where most of the material from the shaft has been piled to be milled, consists mostly as far as could be seen of this pyritic wall rock with little typical quartz rock in evidence, hence increasing the importance that will be attached to the mill runs, proving this rock to be good pay ore or not as there is a large quantity of it; from a smaller quartz vein higher up the mountain on this claim, two tons of ore were selected and sent last year to an American smelter from which most favourable returns in gold were obtained. A good cabin is near by the shaft. Strike of the vein being N. and S., dip 80° E.

Foreman, Capt. Ross.

The "Chicago" is the claim south of the "Alberni," and is about a line with the direction of the strike of the vein at the shaft just described, and about $\frac{1}{8}$ of a mile distant. In an open cut about 30 feet long is a quartz vein 8 to 30 inches wide, strike N. 15° W. and S. 15° E., dip into mountain of 75° to 80° easterly.

The "Missing Link"—Alt. 3050 feet—immediately north of the "Alberni," shows in a small open work on the side of a small creek, a quartz vein 1 to 2 feet wide, strike N., 30° W. and S. 30° E., dip about 80° easterly, with pyritic country rock.

From De Beaux to the "Alberni" shaft is about $1\frac{1}{2}$ miles along the good pack trail, with a difference in elevation of 1600 to 1700 feet, and for testing purposes it will be easy to pack down ore to the stamp mill soon to be erected near De Beaux, and run by water taken from Mineral Creek, which will afford an ample supply for this purpose. It is strongly urged that this mill may be in charge of a man thoroughly experienced in gold-milling, capable of making fair sample lots of the ore at the mine and then of determining by use of the mill the probable average yield-value of the ore and the character of mill that may be best suited for this ore if such prove persistent in quantity and rich enough in gold to promise a good margin of profit, or otherwise these tests, so important in determining to a great extent the advisability of further expenditure, may be very unsatisfactory or worse than useless.

The "Golden Eagle," five or six miles above De Beaux by a trail along China Creek, is a kind of box canyon, in a steep mountain side scoured in places by annual snow-slides, up which, along a ridge, a well defined quartz vein in the same kind of country rock or diorite, as described above, has been traced and explored by four short tunnels. The lowest tunnel, No. 1, was covered by the snow which never entirely leaves this basin, but Mr. Sutton reports its length to be 44 feet, with 7 feet of solid vein matter at the mouth and $3\frac{1}{2}$ at the face. About 100 feet above is tunnel No. 2—alt. 2960 feet - which I was able to enter and find to be about 60 feet long and run in on a true fissure vein of quartz and iron pyrites, mispickel, etc., more or less banded in a direction parallel with the walls $2\frac{1}{2}$ feet wide at the mouth and 15 inches at the face. Strike West of South, dip nearly vertical.

Tunnel No. 3, altitude 3075 feet, direction as No. 2, and nearly immediately above it. Vein, the same as below, but $3\frac{1}{2}$ feet wide at entrance, but beginning to narrow at 35 feet in until at the face or 45 feet only 4 inches wide; however, there is no reason to doubt but that the vein on continuing along its course may widen out again as is characteristic of nearly every vein or ore deposit where such irregularities are to be expected. Tunnel No. 4 was inaccessible and the approach for this examination to this property was attended with some difficulty on account of the snow banks. No data as to the average value of the ore taken are available to me, but as I understand this claim has just been sold for a good price, we may expect that much more work will soon be undertaken and this vein thoroughly exploited.

PLACERS.

The properties of two companies were visited, where the work is being energetically pushed forward and will now be described. On the "Constance" claim I was informed that much water was giving trouble in the exploratory shaft being sunk to bed-rock.

The "Duke of York" claim, Superintendent, M. W. Leveridge, Albemarle, P. O.

The property consists of (a) the "Duke of York" and the "Queen" claims, 2 miles long, and (b) the "Prince of Wales" claim below the Cataract Co.'s ground. On the "Duke of York" claim excellent work is being rapidly accomplished in thoroughly and properly equipping it for work, all the requisite details to be completed before the water is turned on in the early part of July, after which the climatic conditions are such that hydraulicing may be carried on throughout the whole year, the cold winter spells being in most years very short and not at all severe.

Flume.—Near the upper end of the "Duke of York" claim is a dam across China Creek, whence water is led into a flume 6 feet wide, 3 feet deep, California pattern, for $1\frac{1}{4}$ miles to the pressure box, whence the pipe, 22 inches in diameter of No. 14 steel plates, imported rolled and punched, but rivetted on the claim, will carry it 1100 feet to the pit, and then divide, with gates, into two 15-inch pipes leading to two 7-inch monitors. The grade of the flume is $\frac{8}{100}$ per 16 feet, and in one place is carried along a trestle work 60 feet high and then, passing under an over-hanging bluff, is suspended by chains of $\frac{5}{8}$ inch iron fastened to the outer end of sill while the inner end is bolted to a short piece resting on two bolts driven into the rock. Capacity of flume, 6000 inches.

Head.—At the lower end of the claim, 240 feet head will be available and for one mile up the stream nearly 200 feet, and with the two monitors it is expected 2500 to 3500 cubic yards of dirt will be handled daily with 5000 inches of water.

Sluice Boxes.—At first in working the lower gravel sluices 6 feet by 40 inches, grade 6 to 8 inches per 16 feet will be put in and lined with 9-inch fir blocks, but when working the upper benches and more dirt is available the sluices will be 8 feet by 40 inches. There will be excellent facilities for an under-current 20 feet wide, grade 1 inch per foot.

It is proposed that in the season of low water the creek will be deflected through the flume and the bed of the creek hydrauliced through the smaller sluice, but with high water, then the benches will be washed into the larger placed higher up.

Gravel.—Between 25 and 30 prospect pits have been sunk to bed-rock, in which the gravel is reported to have always prospected well. On either side of the stream are high benches of gravel and as the claims are 10 chains, or $\frac{1}{3}$ of a mile on each side, there is a large amount of ground to wash in which there is not an excessive number of boulders as might well be expected, and so far but few that will be beyond the capacity of the powerful derrick.

Dump.—Work will begin on bed-rock at the lowest limit of the claim where the creek falls into a fast descending gorge that passes through 800 to 1000 feet of territory not to be located as placer ground, and that should afford a site for a considerable amount of débris.

Derrick.—A very complete derrick, invented by Mr. Leveridge, Sr., will be put in the mine by which stumps and all boulders up to 6 tons in weight will be easily lifted and dumped on the washed bed-rock, the stumps and heavier boulders to be lifted by chains, while smaller rocks will be rolled on to a 6 by 4-foot platform, it being intended to keep as many as possible of such boulders from entering the sluices. The derrick will be operated entirely by water-power through a 7-inch pipe, with gate, from the main pipe, and $1\frac{1}{2}$ inch nozzle on a hurdy-gurdy water-wheel centered horizontally up on the gudgeon of the mast, below a platform. The mast is 86 feet long, 16 inches square at the butt and 14 inches at the top. The boom will be an extensor one capable of handling its load at 40-90 feet, this length to be at once changed at will with full load on so that a stump or big boulder can be easily moved 180 feet in 3 minutes, the derrick being operated by one man. This property will soon be fully and well equipped for the proper working of its gravel, and before long the returns from clean-ups should be on record. The timber was cut at their own mill, and houses, blacksmith-shops, stables, etc., are now erected.

The "Cataract," Superintendent, J. J. Stuart, Alberni, P.O.

The property of this company comprises three claims, (a) the "Cataract," $1\frac{1}{2}$ miles long; (2) "Balley Hooley," $\frac{1}{2}$ mile; (3) the "Pal-Patlicant," $1\frac{1}{2}$ miles, on China Creek. About 1000 feet below the lower end of the "Duke of York" claim is a dam 20 feet high, 48 feet along the crest, cost \$2000, the first dam higher up the stream having been swept away by a freshet. From the dam 5000 feet of flume, 40 by 24 inches, grade not regular, carries the water to the pressure box, whence a 12-inch, No. 12 steel pipe leads the water to a monitor with 4 and 6-inch nozzles with available head of 148 feet. At the time of my visit the monitor was being used to prospect a high gravel bench on the right bank, and a face about 30 feet high was exposed, but so far no holes have been got down to bed-rock. 200 feet of sluice-boxes, 4 feet by 3 feet, grade $\frac{1}{2}$ inch to the foot, were carrying away the dirt, but as the creek has but a small drop along this part of the claim, the sluice could not be put in with a steeper grade or so as to reach bed-rock until run a considerable distance up stream. No mercury is being yet used in the sluice, but if this prospecting gives favourable results it is proposed to run a new and larger flume, by trestling which 40 or 50 feet more head can be got, and to install a complete hydraulic plant, derricks, etc.

There is much gravel in the benches on both sides of the creek, carrying gold, it is claimed, in nearly every part, and in the pit not many boulders have been encountered. On both properties can be seen the places in which, for several years, the Chinamen worked in their primitive way.

Being under orders to proceed without delay to the Kootenay Mining District, I regret that more time was not at my disposal to make a further and more extended examination in this part of the Province, but with more development done and more definite results attained, I hope on my next visit to find much progress to report and successful mining properties in full operation.

I have the honour to be,

Sir,

Your obedient servant,

WILLIAM A. CARLYLE,

Provincial Mineralogist.

*Bureau of Mines,
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