Department of Mines, Geological Survey Branch, for the calendar year 1907

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CANADA

DEPARTMENT OF MINES

GEOLOGICAL SURVEY BRANCH

HON. W. TEMPLEMAN, MINISTER; A. P. LOW, DEPUTY MINISTER;
R. W. BROCK, ACTING DIRECTOR.

SUMMARY REPORT

OF THE

DEPARTMENT OF MINES

GEOLOGICAL SURVEY BRANCH

FOR THE CALENDAR YEAR

1907

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and the relations of the several series have been carefully studied, their relative stratigraphical position must remain a mere matter of conjecture."

WORK OF THE FIELD OFFICERS.

There were in the field, last season, 20 parties. In addition to the regular officers of the Survey, 3 gentlemen were engaged for the summer on special work, namely:—Messrs. Hunter, Bancroft and Dresser.

The following is a short synopsis of the work performed in the field. It is followed, as usual, by the Summary reports of the field officers themselves.

With the exception of a short period spent in the Rocky mountains, Mr. R. G. McCONNELL was engaged in investigating the geology and economic features of the copper-bearing rocks in the vicinity of Whitehorse, Yukon. In this work he was assisted by Mr. Maclaren, topographer, who obtained data for and is now compiling a contour map of the district. Mr. Haughton acted as geological assistant. A report on the district, illustrated by maps and sections, is now being prepared and will be sent to press shortly.

MR. D. D. CAIRNES continued his explorations in the southern portion of the Yukon, chiefly between Whitehorse and Tantalus, where coal and copper were being largely developed. The serious fall in the price of copper will temporarily, at least, retard mining in this district.

MR. JOSEPH KEELE was commissioned to make an exploratory investigation of a hitherto little known region situated for the most part between lats. 62° and 63°, but which also includes that portion of the Yukon drained by the Upper Pelly and its tributaries, the Hoole, Ross and Kitza rivers.

Mr. Keele, who is wintering in the Upper Pelly, writes that he can find no trace, of the existence of an active volcano that prospectors, returning from this district, have reported among the mountains near the source of the Pelly.

MR. J. AUSTEN BANCROFT was engaged to explore that portion of the coast of British Columbia extending from Powell river to Kingcome inlet, including the adjacent islands. This survey is a continuation of that carried on by Mr. O. E. LeRoy during the summer of 1906. At the time of Mr. Bancroft's visit a considerable amount of copper prospecting was in progress.

MR. W. W. LEACH continued his investigations in the Bulkley valley. He reports that of the comparatively few new mineral locations taken up, the majority are situated on the headwaters of the Zymoetz river or in the Babine mountains.

Work on the coal properties of the Telkwa river has practically been stopped until the route of the Grand Trunk Pacific has been definitely decided on. Several new areas of coal land have been discovered, one in particular on Goldstream giving promise of becoming of importance.

Owing to the wrecking of all the steamers on the Skeena provisions were scarce and expensive, adding much to the difficulties of prospecting.

MR. CHARLES CAMSELL was engaged entirely in work of an economic nature in the gold mining camp of Hedley, B.C. The Nickel Plate mine at Hedley is the most important mine in this part of southern British Columbia, and is at present the largest producer of gold alone in the whole province. Besides preparing a topo-

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REPORT ON THAT PORTION OF THE COAST OF BRITISH COLUMBIA EXTENDING FROM POWELL RIVER TO KINGCOME INLET, INCLUDING THE ADJACENT ISLANDS.

J. Austen Bancroft.

The work outlined in the following report is a continuation of that which was carried on by Mr. O. E. LeRoy during the summer of 1906. A week less than three months was spent this summer in actual field operations on the coast by the writer, who had with him a most efficient assistant in Mr. R. P. D. Graham, Demonstrator in Mineralogy at McGill University. That portion of the coast extending from the mouth of Powell river to the entrance of Kingcome inlet was covered, an examination being also made of the islands, within this stretch, between Vancouver island and the mainland.

The general trend of the coast is here N. 52° W., corresponding to a line drawn between these points, and along such a line the distance traversed was 112 miles. An idea can, however, be gained of the irregular nature of this coast by the statement that 1,540 miles of coast were examined, 680 of this being mainland and the remainder representing the extent of shore line presented by the numerous islands. This is as fine an example as exists in the world of a deeply dissected land area which has been submerged. Vancouver island once was connected with the continent, and in the intermediate lowland there then existed at least one or two river systems, receiving tributaries chiefly from the east. Submergence drowned the river valleys, thus accounting for the salt water straits and inlets of to-day, while the many rugged islands represent former inter-stream areas.

During Triassic, and probably late Palæozoic, times this region formed a portion of the ocean floor, and sedimentation was taking place. The latter part of the Triassic was marked by intense volcanic action, probably subaqueous in origin. This history is expressed in the isolated area of argillites, quartzites, and limestones, and the many varieties of volcanic rocks, such as amygdaloidal diabase, porphyrites, agglomerates, and tufas.

During Upper Jurassic times these stratified rocks, which once covered the region, were intruded in a widespread manner by granite and allied rocks. This vast intrusion, known as the Coast Range batholith, is largely composed of granite, but over wide areas it passes into basic facies which are most interesting. Diorites and gabbros are very common, while in Bute and Knight inlets it exists over quite large areas as almost pure hornblende. On a few small islands to the west of Midsummer, and north of Fire island, there is a beautiful development of an orbicular or kugel diorite.

The stratified rocks, then, formed the roof of this batholith. During the intrusion of the latter, portions of the roof were stoped off and engulfed within the magma; others, partially attached to the roof, draped themselves into it as 'roof pendants,' while, in other places, the stratified rocks may have been actually folded into the

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magma. Especially up the deeper inlets, that is, towards the axis of the Coast range, the granite is locally gneissoid, and the schistose structure has been developed in some of the areas of stratified rocks. The strike of such gneissoid and schistose structures corresponds in general with the axial direction of the range. Two sets of dark dikes have cut the region since the cooling down of the batholith.

To-day, erosion has removed the roof, with the exception of a few isolated patches, and has truncated the included stratified masses. It is exceedingly important that these scattered areas of stratified rocks be located and mapped, for it is within them, and especially along their contact with the intrusive batholith, that the prospector should look for minerals of economic value. Within the region examined about fifty areas of such rocks were located.

Though only one fossil specimen had hitherto been found within the whole of this area, we were fortunate enough to discover five localities that contained among them at least four species.

About thirty-five prospects were visited during the course of the summer. South Valdez island was the only locality where mining operations were being carried on in the district at the time of visitation. From Kelly point to Quathiasca cove this island is underlaid by volcanic rocks. These represent a portion of one of the roof remnants of the batholith. Once floating on the plastic magma, during the adjustment upon cooling down, small faults formed in these volcanics. Heated waters and vapours passing up the fault and joint-planes deposited copper minerals along these cracks, and where the adjacent rock was very porous, because of its amygdaloidal character, it became impregnated, chiefly with chalcocite, and with less quantities of bornite and native copper. This acounts for the stringers of chalcocite along a zone of shearing in the Ajax claim, situated on the north of Deepwater bay (at an altitude of 950 feet above sea-level and about one mile from the shore), and for the irregular vein on 'The Ingersoll,' situated about two miles from Copper Cliff. On 'The Ingersoll' a very irregular vein of chalcocite with a gangue of calcite and quartz may be traced for 350 feet with a maximum width of fifteen inches, the country rock being unevenly impregnated for a width of thirty-four feet. The Copper Cliff, Commodore, and Steep Island mining properties are situated on highly amydaloidal beds through which are disseminated over wide areas, chalcocite, a little native copper, and, on the Commodore, some bornite.

From Open bay, an the east of South Valdez island, to within a mile and a half of Granite bay on the west side, there extends a series of limestones and interbedded greenstones having a maximum width of a little over a mile. In this area, which deserves the most careful prospecting, a number of claims have been located. On the 'Lucky Jim,' along a contact between the limestone and a greenstone layer, chalcopyrite, pyrrhotite, pyrite, and some magnetite have been deposited. On 'The Geiler,' a shaft twenty feet deep sunk on a similar contact, displays a very good showing of chalcopyrite. A speck of free gold was noticed in a specimen taken from 'The Geiler.' This area is, of course, not yet sufficiently examined to properly determine its possibilities, for at no point has it been opened up to a greater depth than twenty-five feet.

On the north of Rodonda island the Elsie claim is staked on a deposit of magnetite that occurs at a contact between the granite and a patch of marble. At an

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altitude of 500 feet, one open cut has exposed fifty-four feet of magnetite, with a width of thirty-five feet, and at two other points smaller amounts have been uncovered. This property should be tested in depth, for the ore is high grade and shipping facilities, although the ascent from the water is deep, could be quite easily arranged.

The Shoal Bay area, which is now deserted, is associated with contact phenomena between the granite and stratified series.

On Mars island, to the southwest of Baker island, small quantities of bornite and galena were found in a limited area of argillites and limestone. On one of the joint planes of a quartzite layer flecks of leaf gold were seen.

On the northwest of Village island, in another area of argillites, a small amount of chalcopyrite and bornite was noticed.

Granite suitable for building stone may be found at a number of different localities with excellent opportunity for immediate shipment by water. At Squirrel cove, Walsh cove, towards the head of Pendrell sound, and at Kwatsi bay, the granite affords such commercial possibilities. The area of orbicular diorite above mentioned would furnish a unique and very beautiful ornamental stone.

In certain depressions on South Valdez island, Manrelle island, and especially Reade island, the finer grained glacial clays should make excellent material for the manufacture of bricks.

An examination was also made of a hematite deposit, owned by Mr. Stuart Henderson, M.P., of Ashcroft, a detailed report of which will be rendered shortly.