

TERRITORY OF ALASKA
DEPARTMENT OF MINES
JUNEAU, ALASKA

IR 195-35

SUMMARY REPORT OF MINING INVESTIGATIONS IN THE KETCHIKAN,
WRANGELL, PETERSBURG, AND JUNEAU PRECINCTS,
AND ITINERARY OF J. C. ROEHM, ASSOCIATE
ENGINEER, TO B. D. STEWART, COMMISSIONER OF MINES,
TERRITORIAL DEPARTMENT OF MINES, JUNEAU, ALASKA
May 24 to June 27, 1942.

A total of nineteen prospects were examined by the writer from May 24 to June 27, 1942 in the following mining precincts: Thirteen in the Ketchikan, one in the Wrangell, one in the Petersburg, and four in the Juneau. The presence of considerable snow at elevations of 2,000 feet and above prevented the examination of several other prospects, and complete data on some of those examined could not be obtained due to this condition. This season is one of very little activity within the Ketchikan district, with very little interest in mining or prospecting, as shown by a lack of the usual number of samples for determination and of inquiries received at the Territorial Assay Office at Ketchikan. The writer confined his efforts to the examination of likely areas and old discoveries in an effort to locate projects worthy of further investigation and possible development, rather than visiting the mining operations.

The actual mining within the district is limited to four gold and one copper operations. These are: Kasaaan Gold, the Hope, Valparaiso, and Gold Standard mines, while the Alaska Gold & Metals Company was reported to have resumed small-scale operations after a shut down of three months. The limestone quarry on Dall Island, operated by the Superior Portland Cement Company, was reported as inactive this year, due to lack of transportation. The Nelson and Tift operation at McLean Arm was reported to be inactive. Wendell Dawson was reported operating at the Kasaaan Gold with two men employed. H. Dunton was reported as operating an arrastre at the Valparaiso mine at Dolomi. Two men are employed. John Folswarzny is intermittently operating the Gold Standard with one to two occasional men employed. J. J. Matuska has ceased operations at the Cascade mine and expects to resume in the future. Kelly Adams and Ben Leibrant operated the Hope mine at Hollis this winter and spring. They discovered a small high-grade pocket and mined and milled a few hundred dollars worth of gold. Bert Libe did a little development work on the Blue Jay prospect in Helm Bay, but no milling. The J. H. Scott Company at Hyder was reported under new management, with a Mr. Merrill in charge. Fourteen men are employed. These are engaged in operating the mill and in re-milling the tailing pile. No mining or development was reported being carried on underground. The former report that the Mountain View property was under option to the J. H. Scott Company is false, according to Mr. Gore of Ketchikan.

In general, it may be stated that during the interval since the writer's visit last fall, there has been no new discoveries, and very little prospecting has been reported. The general interest is centered around the iron deposits on Kasaan Peninsula, due to the examinations last spring of various engineers representing potential producers, and the present work being carried on there by the U. S. Geological Survey.

The following is a summary of conditions per itinerary:

May 24-26. En route Juneau to Blashke Islands.

A small stock of differentiated ultrabasic rocks occur within the group of Blashke Islands at the head of Clarence Strait. These are described in U. S. G. S. Bull. 800, "Geology and Mineral Deposits of Southeastern Alaska" by A. F. Buddington and Theodore Chapin at page 190. The writer spent a few hours examining the dunite core of this stock in an effort to determine the presence of chromite and possible chromium deposits for future investigation and development. KX 117-5-

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The dunite core is confined to the central and southern part of the large irregular Blashke Island. In general the mass is oval-shaped and slightly less than a mile in length by three-fourths of a mile in width. It is in contact and surrounded by an ellipsoidal ring of coarse crystalline pyroxenite which blends into dunite on the inside contact and into gabbro, hornblende gabbro and diorite on the outside contact. The entire stockwork is in contact with greenstone and underlying graywacke and slate. These are highly altered by contact metamorphism and contain numerous gabbroic to dioritic dikes. The highest elevations of the island range from 50 to 150 feet. The formation is exposed mainly along the beach, and shore of the inclosed salt lake which is connected by three salt-chuck entrances, confined mainly to the dunite core on the larger Blashke Island. A small amount of glacial moraine is thinly and irregularly distributed on the islands, and this material supports vegetation, which consists of moss, huckleberry, and small species of conifers generally found in Southeastern Alaska. Thus this small dunite area differs from others seen in Alaska due to its covering of vegetation. The rock dunite and its weathered products does not support vegetation within itself due to lack of acid minerals and usually outcrops as barren brownish red masses. Since the shore lines are extensive within the area of dunite, the search for chromite deposits was confined mainly to them.

The dunite appears as a reddish brown to yellowish green on its weathered surfaces, while the unaltered is a dark grayish green. It is very fine grained and the use of a magnifying glass is necessary to make out the individual grains. A few small black crystals were noted in dunite. These were found to be magnetic and are supposedly magnetite, although possibly some of them may be chromite. However, they were not sufficient in quantity to make preliminary tests for chromium. A small amount of magnetite was noted in the pyroxenite.

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The dunite* mass has apparently been subject to considerable stress following its intrusion, as shown by its platy or fissure structure. The regular cracked weathering effect of dunite appears to be lacking. Some areas of the dunite show more of the platy or fissure structure than others, however, no major structure or condition which would possibly indicate the existence of chromite ore bodies was noted. The existence of the central salt lake and the three narrow entrances may indicate structure of a larger scale, and this is worth further examination. The present surface indications are not favorable for the finding of chromite deposits. This lack of chromite may be explained in many possible ways. First, the magma may have been nearly void of the chromium element; second, the stock may not be eroded sufficiently to expose any quantity of chromium; and third, there may be structure not revealed by the present outcrops on which is contained chromite deposits. In view of the small amount of indications noted and the general conditions regarding these ultrabasic rocks as a whole on these islands, it is not believed worthy of further investigation at this time.

May 27. En route Ketchikan.

May 28. En route to Duke and Percy islands.

Flake graphite was reported by Olaf Holtan on Revilla Island at a point on the beach one mile southeast of Cone Point and one and a half miles north of Lucky Cove, 14 miles southeast of Ketchikan. This showing was discovered by Mr. Holtan in 1936 and samples presented by him at the Territorial Assay Office at Ketchikan were identified as flake graphite. The showing has not been staked. The writer stopped a few minutes with the above and observed the following conditions:

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An inclusion of graphitic slate 80 feet in width and of an undetermined length was found inclosed in a fine grained granite. The slate has been subject to considerable metamorphism and a highly crystalline texture has been developed; also, small shears parallel to the cleavage were noted. The shear zones parallel the bedding of the slates which strike N. 85° W. and dip 53° N. Graphite associated with considerable talc, quartz, iron pyrite and crushed slate pieces was noted in these small shears. The largest noted has a width of 4 feet. A small amount of flake graphite was noted thinly distributed on the cleavage planes of the slates, however, the greatest amount of graphite was in amorphous form. This graphite occurrence is not considered as of commercial importance.

*Slide 445 - Fresh dunite from near center of dunite mass.
Slide 446 - Pyroxenite near dunite contact.

Olaf Holtan has spent nine winters in Ryus Bay on the northern end of Duke Island and reported a considerable amount of brown to reddish rock contained in the central portion of the island. He further reported finding heavy black metal in this rock, but he never had it identified.

Since the central portion of Duke Island is mapped as ultrabasic rocks in Plate No. 1 contained in U. S. G. S. bulletin 800, the writer assumed the possibility of the existence of dunite areas with the possible presence of chromite. Examination in the vicinity of Ryus Bay revealed that quartz diorite is in contact with gabbro, the latter grading into hornblendite. Inland one and a half miles, the hornblendite changes to pyroxenite, which weathers a very dark brownish red due to the oxidation of the ferrous iron contained. This latter formation makes several low elongated ridges which strike in a southeast-northwest direction across the island. Magnetite in small disseminations and blebs was noted widely scattered in the pyroxenite. The greater portion of Duke Island is low and covered with vegetation. A trip on foot was made nearly across the island, which revealed no exposed areas of dunite, nor was any dunite float noted. However, the pyroxenite shows dunite phases in small localities. Dunite areas may be in existence under the extensive vegetal covering.

May 28. A group of small low islands named the Percy Islands lie 4 miles due west of the northwestern portion of Duke Island. These are also mapped as ultrabasic rocks on Plate 1 of U. S. G. S. bulletin 800. The islands are irregular in shape with several small deep channels between them and a very rough beach line. These islands were found to be mostly hornblendite containing various phases that approached pyroxenite and gabbro. The only metallic minerals noted were magnetite and pyrite which are scattered and disseminated in the hornblendite. The unusual feature of this hornblendite is the large crystals of hornblende contained, some of which have lengths up to 12 inches. This is prevalent over the entire group of islands. Due to this large order of crystallization, there may exist accessory minerals other than magnetite that may be of value if further inspection is carried out.

May 29-31 - June 1. A mass of outcropping dunite was noted on Annette Island, one and a half miles south of Metlakatla, on what is locally termed Yellow Hill. The area of outcropping dunite consists of approximately 500 acres comprising Yellow Hill, which rises to an elevation of 525 feet, and there is probably another 200 or 300 acres extending south from Yellow Hill at a lower elevation, on which is situated various military fortifications. A large rock quarry from which over one million yards of ultrabasic rock has been quarried, crushed and used for road building and other military purposes, is situated on this southern extension. Due to the extensive military

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fortifications the southern extension of this dunite mass was not examined, but appeared to extend southeasterly toward Tamgas Harbor. This extension strikes in the general direction of the ultrabasic mass which crosses Duke Island to the south, and may be genetically connected with it. This entire ultrabasic area warrants further investigation, especially on its continuation southeasterly from Yellow Hill and along the shore of Tamgas Harbor, since disseminated chromite was found contained in the dunite of Yellow Hill. However, the fact that Annette Island is in its entirety a military reserve, and that Yellow Hill, and particularly the area south of Yellow Hill, does contain fortifications, makes a condition whereas a survey and detailed examination of the entire area would be very objectionable to the military authorities. Again, with cooperation of the authorities and if commercial bodies of chromite were located, this location with the present military roads, equipment, and transportation facilities make an ideal condition for mining.

The writer during his preliminary reconnoiter for portions of three days, and with the aid of two members of the U. S. Geological Survey for portions of two days, did not encounter any commercial bodies of chromite, or any structural conditions which were considered as likely. Small specimens of chromite were turned over to military authorities at headquarters, and the importance of this mineral stressed, with the request that this department be notified in case any deposits are noted during their activities in the vicinity.

The dunite mass comprising Yellow Hill is approximately one and one-fourth miles in length and three-fourths of a mile in width. Small lakes occupy basins along the east side and northeast portions of Yellow Hill enclosed within the dunite area. The contact at the bottom of the hill is covered, with the exception of the northwest portion where pyroxenite was found in contact by the gradual increase of pyroxene and decrease of olivine with the dunite. The width of the pyroxenite band could not be determined, however, both gabbroic to dioritic rocks were encountered along the beach to the north and west at the north end of Smuggler Cove and north of Point Cedar. The area north of Yellow Hill shows greenstone volcanics, which are classified by Buddington* as of Jurassic or Cretaceous. The contact is covered, however, the writer is of the opinion that the volcanics overly the ultrabasics and are of later age, due to lack of metamorphic evidence in the greenstone. On the east the dunite is separated from the Annette granite by a low filled and covered valley. However, along the extreme east border pyroxene crystals were noted to be increasing in the dunite, and from this evidence, pyroxenite is believed to be in contact with the dunite and lies between it and the granite. The condition of this granite and its relationship with the dunite and possible pyroxenite were not

*U. S. G. S. Bull. 800, Plate 1.

observed. To the southeast and south the dunite appears to continue toward Tamgass Harbor and its relationship with other formations was not observed. At the quarry on the southwestern extension of Yellow Hill a complex of ultrabasic formations was observed consisting of fine grained dense dark formations ranging from dunite, serpentine, possibly fine grained hornblendite, etc. Chromite appears to be lacking in the contact complex as seen in the quarry. The massive dunite, as it appears on its weathered surface, is a light buff to brown in color, which from a distance has a pinkish-yellow hue. The unaltered dunite is fine grained and has a dark greenish gray color with occasional lustrous black spinels, mainly magnetite and chromite.

Slide T. D. M. 447 represents fresh dunite from the southern portion of Yellow Hill with considerable disseminated chromite.

Slide T. D. M. 448 is dunite showing some weathering from the north end of Yellow Hill with sparse disseminations of chromite.

Pyroxene crystals with associated serpentine seams and veinlets and small irregular bunches and disseminations of chromite are contained more or less generally throughout the entire dunite mass. The chromite is to a large extent associated near and with the small serpentine veinlets and seams and the scattered small bunches of pyroxene. There appear to be no areas of serpentine or pyroxenite within the dunite mass of any extent other than the minor veinlets and seams. However, numerous pyroxenite float are evident in the thin glacial moraine which is irregularly scattered about the hill and along the inclosed lake shores. This scattered moraine supports a small amount of vegetation and some portions of the area are sparsely covered. Such is the condition on the southern and southeastern portions.

A major structure was not encountered within the dunite mass. Minor structures such as east-west trending seams and irregular fractures are evident and along these small seams a slight movement is evident. These seams and fractures contain thin films of serpentine. The usual small weathering cracks and fractures, which causes the dunite to break into nearly square blocks, are in evidence.

The dunite appears megascopically to be mainly olivine, with scattered pyroxene, chromite, magnetite, serpentine minerals, some altered to asbestos form, and white stained coatings thought to be magnesium.

A sketch of the area and pictures were not made or taken due to military regulations.

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In conclusion it may be stated that the writer cannot make definite statements as to whether or not commercial chromite deposits exist within the ultrabasic area. The factors to be taken into consideration are that the original magma which consolidated into dunite contained chromium and this may exist within the mass in commercial amounts. None was noted that could be considered as commercial at the present date, however, further investigations with close prospecting and possible further development may reveal commercial deposits. The most concentrated area of disseminated chromite was found to occur in the southeastern portion of Yellow Hill, where the elevations lower to a hundred to two hundred feet above sea level and increasing vegetation obscures it from view. This area, and continued investigation to the south, is warranted in the future at such time as permission can be obtained from military authorities.

Another small area of ultrabasic rocks occurs along the beach and for one mile inland at the southeast entrance to Smuggler Cove, one and a half miles southwest of Yellow Hill, on Annette Island. These consist mainly of hornblendite, gabbro and various basic lavas and lava dikes. Dunite appears to be absent in this complex and no indications of chromite was detected. The entire area is at a very low elevation and other than the outcrops along the beach, it is mainly covered.

June 3-4. Trip into George Inlet.

KX-120-b

The Mahoney Prospect is located on the west shore of George Inlet, 4 miles north of the Cannery on the north side of Mahoney Creek at its mouth. A trail leads from the north shore of a small lagoon at the mouth of Mahoney Creek to the adit, 250 feet from the beach at an elevation of 50 feet.

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This prospect was originally known as the Ashe group and is described by Wright, F. E. & C. W. in bulletin 347, "The Ketchikan and Wrangell Mining Districts," pp. 150-151.

This showing consists of a bedded vein ranging from 12 inches to 3 feet in width, averaging over 2 feet, and is exposed in twelve surface cuts and one adit. The strike is in a general east-west direction and it is exposed on the surface for 400 feet.

The geology and structure surrounding this showing is of interest, however, a complete survey of conditions could not be made due to extensive cover. This compound bedded vein is inclosed in black slates which, due to their overlying positions relative to a small protruding tongue of quartz diorite to the south, have been folded in gentle plunging anticlines and synclines and along which a schistose structure has been developed. The footwall of the vein is a small porphyry dike along which the vein has been formed. The alternating anticlinal and synclinal folds have a width of nearly 150 feet measured from crest to crest, and they were apparently formed by the pressure and thrusting of the intruding quartz diorite. Associated with this folding

was the injection of three different types of dikes into the sediments (alternating sandstones and slates) paralleling the bedding and occupying the crests and limbs of the developed folds. The small dike associated with the vein maintains a width of from 3 to 5 feet. It is of a light gray color with inclosed greenish porphyritic crystals of unidentified nature. It has a fine grained highly crystalline texture, and appears to have a high silica content. In some localities it is slightly mineralized.

Specimen T. D. M. 449 represents a fresh portion of this dike taken underground.

Another form of dike intercalated in the folding of the sediments is of a dark gray color and fine crystalline texture. This form weathers black and maintains a larger size than the siliceous dike along the vein. These dikes appear to be closely related to the diorite and represent the first series to have been injected. These dikes are not mineralized and have no associated veins.

Specimen T. D. M. 450 represents a fresh portion of one of these dikes.

The third type of dike found is situated above the vein dike and outcrops along the beach. It ranges from 2 to 3 feet in width and is intercalated with the folded structure of the sediments. This dike has a dull bluish gray color and it is very fine grained with abundant phenocrysts of blue quartz and a light green crystalline mineral. It weathers to a light reddish brown color.

Specimen T. D. M. 451 shows both altered and unaltered portions of this dike.

The sediments as shown in this vicinity on Plate No. 1, U. S. G. S. bulletin 800, are classed as of Triassic age. The quartz diorite, from which the above dikes are believed to have originated, is classified as upper Jurassic or lower Cretaceous. The acid dike, with associated vein, appears to be in a weaker section of the slate stratum. This stratum differs slightly in composition and texture than the other slate strata in that it represents a conglomerate phase and has become more schistose and altered by heat and pressure. It has a speckled appearance.

The vein is a compound bedded vein in that the footwall portion is banded quartz with scattered metallic minerals and the hangwall portion is made up of nearly massive sphalerite, galena, pyrite and chalcopyrite. Both the quartz portion and the massive sulphide portion reach their maximum widths at the crests of the anticlines, and gradually narrow down on the extensions of the limbs.

Two anticlines, and one syncline in between, show along the outcrops as exposed in the cuts. The vein outcrops along a general east-west strike, which is irregular due to folds and it has a variable dip of 10 to 20°, which also represents the plunge of the folds slightly east of north. The eastward extension of the vein in the long cut 120 feet northeast of the adit portal dips along the east limit of the east anticline and goes under cover. It has not been exposed on the beach 400 feet east. The westward extension was lost past St. 12 (Note sketch map) by change in strike of downward plunging limit of west anticline. This west end could, no doubt, be further extended by calculating changes in strike and dip.

A crosscut adit, elevation 50 feet, was driven and intersected the vein at a point 65 feet from the portal. Thence the vein was followed by a drift to the west for 80 feet, ^{at which point} where the drift overran the vein and was later exposed in the bottom of a 6-foot winze. At a point 20 feet west of the small winze a raise nearly vertical was extended upward 30 or 40 feet. Lack of timber prohibited the inspection of this raise. The vein as shown in the small winze plunges downward on the limb of the fold and is under the drift as it continues westward. At a point 60 feet west of the winze the vein again shows in the bottom of the drift for 30 feet. Thence again the vein dips under and the remaining drift, plus two crosscuts, one north and one south, failed to intersect the vein. (Note sketch) The total underground workings consist of 172 feet of crosscut, 270 feet of drift, 30-40 feet of raise and a 6-foot winze.

The ore minerals noted in the vein consist of sphalerite (dark variety), galena, pyrite, chalcopyrite, hydrozincite, hematite, limonite and secondary lead minerals. Gold and silver are apparently contained in the ore. The gangue minerals consist of crushed and altered slate pieces, quartz, calcite, dolomite and a green variety of mica. A total of 18 channel samples were taken in the tunnel and various cuts which, with the results, will later be shown on a sketch of the adit and surface workings.

The use of a fluorescent light underground was an advantage due to the alteration of the sphalerite to a thin coating of hydrozincite on the exposed surfaces. This latter mineral gives off a bluish white glow under the ultra violet light, which in itself is almost identical in color and intensity of the illumination of the tungsten mineral scheelite. This enabled the writer to immediately determine the limits of the ore underground. A total of 18 channel samples, 1002-1019, ^{limited} inclusive, were taken in the adit and surface cuts. RX-126

June 6. An effort was made to examine the showings and workings of the Lon-de-Van group situated on the west side of George Inlet $2\frac{1}{2}$ miles south of the Mahoney prospect and one and a half miles north of the Libby cannery.

The surface workings on this property were snow covered. The 2,000-foot adit, which is located at an elevation of 200 feet and close to the beach, was found caved at the entrance. This was reported as a crosscut adit in which some of the above veins were cut. One vein was reported cut near the face of the adit, which consisted mainly of sphalerite. Evidence gained from the dump shows this adit cut black graphitic slates and argillites. The adit is situated near a contact of quartz diorite to the north and the sediments to the south. Banded milky white quartz pieces with a sparse metallic minerals, mainly pyrite with a little chalcopryite, galena and sphalerite, were abundant on the dump. These probably contain gold and silver values. A few small pieces of massive sphalerite and chalcopryite were found near the portal of the adit. Entrance to this adit would be warranted in order to determine the amount of zinc-copper ore encountered, as well as an examination of surface workings. The portal is badly caved and would require a few days work and possibly three or four sets of timber to reopen. This property was reported as patented and held by Ketchikan interests.

The workings of the old Peterson group, located directly back of the Libby Cannery at an elevation of 300 feet and one mile from the beach, were examined. The two short adits were found caved. One open cut above the upper tunnel exposed a milky white quartz vein, 12 feet in width. This quartz contained a very meager amount of metallic minerals and as a result was not sampled. This property apparently is not held.

June 7. En route to Cholmondeley Sound.

June 8. On a report of considerable zinc ore in an old prospect in Kitkun Bay, Cholmondeley Sound, the reported showing was examined. These old workings are located on the Washington and Oregon claims as described in U. S. G. S. bulletin 347, "Ketchikan and Wrangell Mining Districts, Alaska," pp. 168-169. An old cabin was located on the south shore, from which a trail leads eastward to a point, elevation 200 feet, on the nose of a ridge directly opposite the outlet of Kitkun Bay. Here old open cuts and one short adit were noted. The underlying formations are foliated, eastward dipping greenstone schists with inclusions and limestone remnants contained. In the irregular limestone inclusions, small bunches of sulphides were noted with some quartz. These consisted of pyrite, chalcopryite, pyrrhotite and small amounts of sphalerite and galena. In two of the old cuts nearly massive pyrrhotite was noted which may contain a small amount of chalcopryite and sphalerite. From the small amount of information gained from these old workings, the deposits appear to be scattered and small in extent. The massive pyrrhotite was apparently mistaken for massive sphalerite by the party giving the information.

Magnetite deposits were reported on the top of the ridge between Dora Bay and South Arm of Cholmondeley Sound. These were reported as on a contact of limestone and granite. Snow was noted covering this contact above timberline and the deposits were not examined.

Magnesite was reported as occurring in veins on the north shore of Cholmondeley Sound west of Sunny Cove and opposite the entrance to South Arm. Investigation revealed numerous lenses of blue and white limestone with various degrees of crystallization intercalated in north-westerly striking greenstone schists. The limestone weathers from a pinkish buff color to light gray. Several samples were tested in the Territorial Assay office for magnesite with negative results.

June 9. A trip was made inland from the west side of South Arm, Cholmondeley Sound, to the Moonshine and Hope prospects. The surface workings, which lie above 2100-foot elevation, were covered with snow. The long adit driven by Sawyer-Reynolds and Jenkins in 1920 at an elevation of 1900 feet to intersect the ore at depth was found open. The adit is filled with mud back from the face to a raise which was reported to connect with a shaft to the surface. This raise is located approximately 2,000 feet in from the portal and was ascended 75 feet to a point beyond which it was considered unsafe. At a point 100 feet in from the portal a body of white to blue limestone was cut, which contains a large irregular underground cavern and which has sloughed into the crosscut and broken down the roof for several feet. This area is particularly dangerous and timber is necessary before work can be carried on in this adit. Other than the limestone near the portal the crosscut cuts across green schists. A 4-foot diabase dike was cut and followed for 300 feet. The dike walls contain gouge which has sloughed in various places. No ore bodies were noted in the adit. A few small pieces of massive galena ore were noted on the dump near the portal entrance. The horse trail to this prospect has grown up considerably and the planked portion and bridges have rotted.

Both the Moonshine and Hope prospects were reported as containing lead and zinc and a preliminary examination of the surface workings may be warranted in the future.

June 10. Zinc minerals were reported in the old Roundtree prospect located on the west side of South Arm of Cholmondeley Sound at a point 2 miles down from the mouth.

A 300-foot adit was located on the west side of the East fork of a steep draw one-half mile from the beach at an elevation of 600 feet. This adit bears S. 65° W. and contains one 30-foot cross-cut, and cuts highly foliated and mineralized quartz sericite schists.

These schists have a greenish cast and are closely folded with a steep plunge to the NW. Bands of a fresh bluish quartz carrying pyrite with small scattered amounts of chalcOPYrite were intercalated in the folded schist. Black sphalerite was reported in this extensive mineralized zone. Close examination reveals that considerable of the pyrite, which is possibly marcasite, weathers a brownish black and appears similar to sphalerite. Fresh breaks reveal the absence of sphalerite. A few manganese stains were evident in the adit, and the wide mineralized and silicified zone apparently carries low gold values. No samples for assay were taken. Specimens were obtained for tungsten tests.

June 11. Copper and zinc minerals were reported in a prospect located in Lancaster Bay of Cholmondeley Sound. A trail leads upward from the west side of a small creek that enters Lancaster Bay along the east shore. The trail leads to a small adit 40 feet in length, one-half mile from the beach at an elevation of 300 feet.

The showing consists of a brecciated vein in limestone which is traceable for 200 feet on the surface and along which the adit is driven on the western end. The vein strikes N. 80° W. and has a slight dip off vertical to the south. The limestone ranges from white to a dark blue in color. The limestone strikes N. 53° E. and has a dip 25-30° N. To the northeast the limestone is in contact with greenstone lavas. The brecciated zone or vein ranges from 2 to 3 feet in width and apparently was an open zone into which silica solutions were later injected forming zonal growths around the contained fragments. Associated with the quartz is calcite, dolomite and the metallic sulphides pyrite, chalcOPYrite, tetrahedrite and probably gold and silver. These minerals were unevenly distributed in the zone and as a whole appeared to be in non-commercial amounts. Only specimens were taken. The tetrahedrite and some of the weathered pyrite was possibly taken to be sphalerite which was not detected.

June 12. The adit workings of the Moth Bay zinc property, owned by the Freeburn Development Company, located 2200 feet inland from the head of Moth Bay, Revilla Island, were mapped and the larger showings sampled. The main adit workings consist of 370 feet of crosscut and 450 feet of drift, the latter paralleling the mineralized zone, and from which short crosscuts cut the zone in various places. A continuous sulphide ore body is exposed in the crosscuts in the east drift for a distance of 240 feet, which maintains a width from 10 to 16 feet. The ore body is contained in mica schists, which are in contact with quartz diorite, and cuts the schist at a low angle both in dip and strike. The schists in the adit strike from N. 40° to 50° W. and maintain a steep dip at the adit portal which gradually becomes less toward the quartz-diorite contact. The ore appears to be of a contact metamorphic origin and ranges from massive sulphides or total replacement to partial replacement as shown by the banded nature and disseminated sulphides in the schists. The sulphides, which make up the ore and carry associated low gold and silver values, are in order of abundance, pyrite, sphalerite and chalcOPYrite. The associated gangue is some quartz, mica, and various alteration products of the schists. Various outcroppings were reported

on the surface and another short adit, which shows the same type and character of ore. This examination was confined to the main adit workings, which were mapped, and a total of six channel samples were taken. These averaged 0.6 per cent in copper, and zinc values varied from 0.25 to 14.2 per cent.

June 13. At Ketchikan.

June 14. En route to Bradfield Canal.

June 15. An examination of the south end of Deer Island, which is located in Ernest Sound opposite Etolin Island, was made to determine the amount of sillimanite. The southern end of Deer Island consists of metamorphic schists ranging from garnet to mica and various other kinds which are thinly bedded. These strike northwesterly across the southern end of the island. These schists are metamorphic equivalents of various sediments and in contact with quartz diorite on the east and with granite on the west. Small strata with widths varying from 6 inches to 2 feet occur along the shore line intercalated with the other types of schists, which contain from 30 to 50 per cent sillimanite crystals. These crystals are fibrous and vary from one-fourth to one-half inch in length and show a distinct bow structure. The matrix consists mainly of fine silica grains with fine mica flakes. The silica grains are iridescent. Slide T. D. M. 452, of unaltered sillimanite and matrix, will reveal the accessory and matrix minerals. These sillimanite bands could be traced for several hundred feet as they cut diagonally across the point of the island, however, they do not extend more than 40 to 50 feet above sea level in elevation. The important factor with regard to this occurrence of sillimanite is the apparent association with silica in the matrix. This would require highly efficient flotation to obtain a product with no silica content, which is detrimental to its use as a refractory. Again the sillimanite crystals may even reveal silica content within themselves. This can easily be determined from the slide mentioned above, which is in preparation.

June 16. A stop was made at Anderson's camp at the mouth of the Harding River in Bradfield Canal. Two years ago Jack Anderson reported finding tin in his attempts at placer mining at the head of Bradfield Canal. The samples submitted as cassiterite lacked the usual weight. Further tests are required, however, of the two hundred specimens submitted to the writer for examination, several were samples of good grade zinc, mainly the dark variety of sphalerite. These were reported to be from a wide zone of small stringers and some veins in granite, inland from the head of the canal. The area on date of visit was snow covered and a return trip may be made to examine these showings this fall.

118
An old zinc property was reported by Anderson one and a half miles inland from the north shore of Bradfield Canal at a point east of Ham Island at the first creek. This was reported to be at an elevation of 600 feet and a short tunnel was said to have been driven. Several old claim posts and lines were encountered, but the adit and cuts were not found.

117
June 17-18. A search for fluorite was made on the southwestern end of Zarembo Island, as reported in U. S. G. S. bulletin 800. The formations as noted along the beach and up several of the creeks, consist mainly of greenish lavas, mainly andesites, dacites, etc., with more recent lava dikes and sills of basalt. Shear zones occur with east-west strikes in the older lavas. Small irregular veins of fluorite and several brecciated quartz veins were found in these shears. Only the larger brecciated quartz veins have a continuous strike. The fluorite veins are associated with small irregular and possibly later, quartz veins within the brecciated zones and near the more recent lava dikes. These veins vary from mere seams up to 6 inches in width. Small limestone remnants were noted in the brecciated zones and small amounts of calcite and dolomite were noted in the fluorite veins. Trips were made inland following up creek beds and only small seams of fluorite were noted. Careful observations for associated minerals such as scheelite, cassiterite, etc. were made, but none was observed. These small veinlets of fluorite appear to be the result of hot spring deposition in the shears and small fractures made in the older andesites and dacites by the younger lava dikes and sills. The fluorite occurs as small seams and irregular small bunches usually on the wall of the quartz veins as a later precipitation. The varieties of silica in the veins range from agate, chalcedony and jasper to fresh quartz, all of which show a near surface deposition.

117-26
June 19-20. A trip was made in Duncan Canal, Kupreanof Island, in an effort to examine the old workings of the Kupreanof Mining Company. U. S. G. S. bulletin 739, "Mineral Resources of Alaska, 1921" gives a description of this property and gives the location at 5-3/4 miles inland from Duncan Canal and mentions a motor truck road to the property. Two days of search along the beaches and inland failed to reveal the road and the old workings.

115
June 21-22. A short adit was reported near the beach in Farragut Bay in the north Arm, in which scheelite was said to have been found. Extensive search along the beach failed to reveal the existence of any adits or other workings.

Several specimens of nearly massive galena and sphalerite were presented by a Mr. Gruening in Farragut Bay, which he stated came from 14 miles up the Farragut River and was snow covered on date of visit.

June 24. An examination was made of the Forty Per Cent property, owned by Herman Kloss and Jack Davis, and located 9 miles southeast of Sundum, on the west side of Endicott Arm. A total of six claims; namely, the Forty Per Cent Nos. 1 to 6, inclusive, comprise the property, four claims located along the strike and two alongside the four on the north end. V
Rt. 115-18

The discovery of this mineralized zone was made by the owners in 1939. The development consists of three groups of open cuts which exposed a mineralized zone for a distance of 900 feet. The cuts aggregate twelve in number and expose a mineralized zone which averages 20 feet in width.

The mineralized zone occurs in gneissic schist formation, which in its relative position between metamorphic slate on the west and a limy metamorphosed sandstone strata on the east, is believed to have been a sediment. The gneissic structure is a general condition, which prevails in a wide zone through various types of formations which border the coast batholith. The zone in which this mineralized zone is located appears to have been subject to greater action and has a more gneissic appearance. This gneissic schist varies in color from a dull green to a light gray and it is thinly laminated. The schists, including the mineralized zone and the altered sandstone strata, are generally calcareous. In general the gneissic schists have a very persistent general strike of N. 35° W. and a dip of 75 to 85° W. The strike, as observed along the mineralized zone in the cuts, varies from N. 25° W. to N. 45° W. This variation in strike is confined mainly to the mineralized zone and it is believed to account for the small parallel openings into which the various sulphides were injected. A ten-degree variation in dip was also noted along the strike in the various cuts. The mineralized zones represent partial replacement, mainly by quartz and accompanying sulphides. These sulphides consist mainly of pyrite, with lesser amounts of sphalerite, chalcopyrite and galena. They occur in small massive stringers veinlets, and seams and conform to the laminated gneissic structure. Of the 20-foot zone of mineralization, the greatest amount of sulphides is confined to a 10-foot width.

Copies of assay reports presented by Mr. Kloss from samples taken, and made up of pieces taken across the full width of the zone, gave lead returns ranging from a trace to 3.2 per cent and zinc from 5.2 to 7.10 per cent, and low gold, silver and copper values.

Four channel samples (J.C.R. 1028-1031, inclusive) were taken across the richer portions of the zone in various open cuts. A sketch of the workings at a scale of 40 feet to the inch was made. In general, the metallic content for the zone as a whole is weak and very low assay results are expected.

June 25. The Marie group of three claims; namely, Marie Nos. 1 to 3, inclusive, is located $2\frac{1}{4}$ miles inland from the west shore of Endicott Arm at a point 9 miles southeast of Sundum. A trail leads from the beach to the adit, the latter at an elevation of 2150 feet. The claims are held by Herman Kloss and Jack Davis.

The showing, which consists of a gold quartz vein, is located on the Marie No. 1 claim. The vein has been exposed on the surface by eight cuts along its strike for a distance of 450 feet between elevations of 2150 and 2250 feet and underground in an adit tunnel 160 feet in length.

The formation in which this vein is inclosed consists of a gneissic schist with a high silica content, as shown by the numerous quartz-filled fractures, small lenticular masses, gash veins and abundance of quartz in the seams of the laminations. It is very hard and dense and seems to comprise the greater portion of the area in the vicinity. The original formation prior to the schistosity and later gneissic alteration was not determined. From the amount of silica and ferromagnesium mineral content of the gneiss, the original formation may have been an intrusive rock of quartz diorite composition. The schistosity of the gneiss strikes N. 30° to 35° W. and the dip is steep to the southwest. The vein strikes N. 5° to 15° W. and dips east 30° to 40° which cuts the schistosity both in strike and dip. The vein is situated on the hanging wall of a shear zone 20 feet in width which strikes and dips with the vein. Another shear zone 15 feet in width parallels the schistosity and intersects the vein shear near the central portion of the exposed vein. In the adit from the face back 50 feet, this intersection of the two shears is in evidence, the vein pinches to a narrow width, and appears to be cut into short narrow banded lenses. A further study of this shear intersection and further development on the tunnel is necessary before definite conclusions can be reached regarding the potentialities of this vein.

The vein varies from a few inches to 4 feet in width. It is banded with thin dark bands which contain graphite. The origin of this graphite is unknown as the gneiss appears to be lacking in minerals which would alter to graphite. It may be a product which has impregnated the shear from slate formation, remnants of which are in evidence at higher altitudes. The gold in the vein appears to be mainly free and is contained mainly in and near these graphite seams in the quartz.

The metallic sulphides in the quartz are few, but are more abundant in the schist walls which show considerable alteration and are free. A few narrow cross fractures in the quartz were noted filled with sulphides. The sulphides noted were arsenopyrite, pyrite, sphalerite, chalcopyrite and galena. The gangue minerals are banded milky white quartz, graphite, altered pieces of wall rock and limonite.

A sketch of the surface and adit workings was made. Three raises in the adit, two of which open to the surface, and a small stope mined on the side of one, with the adit, make up the total underground workings.

Since free gold was noted in all the surface cuts, no samples were taken. Three channel samples, J. C. R. 1032, 1033 and 1034, which represent widths of 31, 20, and 24 inches, respectively, were taken in the adit. (see sketch) A Gibson 2-ton "Prospector" mill and $1\frac{1}{2}$ H. P. Fairbanks-Morse gas engine comprise the equipment on the property. All work was done by hand methods. A cabin, blacksmith shop and mill building are located near the adit.

The Gold Fourth group of three claims, numbered from one to three, are located below and adjoining the Marie group on the east. The Gold Fourth vein extends across these claims and can be traced by surface outcroppings for a mile in length. This vein conforms in strike and dip to the gneissic formation which is N. 28° W. and from 80° W. to vertical. The width of the vein varies from 4 to 10 feet of slightly banded quartz. A small amount of movement was noted which alternates from wall to wall, showing a reopening. Mainly the walls are frozen and unaltered, and are composed of a highly siliceous gneiss. The structure of this vein is very strong and well defined. On the western end of the claims an east-west fault cuts the vein with a very small displacement.

The vein consists of a milky white quartz with abundant vugs and crystal faces showing. Sulphides are sparse in the massive white quartz, but are more abundant in the reopened portions which contain graphitic bands. The sulphides are pyrite, arsenopyrite, chalcopyrite, sphalerite and galena. Gold occurs free along the graphitic bands and also can be observed at several places in the quartz along the vein. The gangue minerals consist mainly of white quartz, graphite, sericite, calcite and altered pieces of gneiss.

Samples taken by Kloss while engaged in open-cutting the vein, and representing the width of the vein, were reported as averaging from two to eighteen dollars per ton. No samples were taken by the writer.

This vein appears to be an older vein than the Marie vein, and other than the reopened portions, it appears to be very barren.

June 26. The Point Astley property, mentioned in U. S. G. S. bulletin 773, pp. 131-133, located in the small cove east of Point Astley, was visited. There has been no further development on this property, than that mentioned in the above report. The only information that can be gained from a preliminary visit due to the fact that most of the development is confined to workings off shafts, is the mineralized zone in the vicinity of No. 3 or the south shaft. Here a mineralized zone, lenticular in shape, forms a bluff along the shore. This bluff showing is 40 feet in height.

1
5
/ 5
/ 5
/ 5
A short drift adit on the north side of the bluff showing has a length of 20 feet and was driven along the footwall on the contact of slate and greenstone schist. On the east side a 20-foot crosscut adit, with a 15-foot out approach, cuts through the central portion of the lens to the slate footwall. A shaft on the north end of the outcrop was reported to have been sunk to a depth of 100 feet and a 90-foot crosscut which intersected the vein.

1
5
/ 5
/ 5
/ 5
The mineralized lens has an exposed length of nearly 200 feet and a width of 22 feet in its widest exposed portion. The strike of the lens conforms with the strike of the slate-greenstone contact N. 5°-15° W. and a steep dip of 75°-80° E. The most intensely mineralized section is confined to a 5-foot width occurring along the footwall of the zone. The sulphides contained in this zone consist mainly of pyrite, with sphalerite, chalcopyrite, galena and bornite in varying amounts on the fresh pieces. The alteration products of some of these minerals were noted. The gangue minerals were chlorite, calcite, quartz, mica, and unaltered portions of greenstone. The ore is banded and made up of nearly massive seams and stringers with bands of quartz and altered limy greenstone schist.

A total of six channel samples were taken, Nos. 1035 to 1040, inclusive, five of which represent a cross-section of the zone taken in the crosscut tunnel and one of a high grade sphalerite band on the south end of the outcrop. Generally, the zone as a whole appears to be low grade, which condition will be determined by assays from the channel samples. Should the results indicate commercial grade, further investigation is warranted.

See Collier
05145 122
to 122-2
29377

The property comprises several claims, which are held by H. Ahrenstedt.

June 27. Return to Juneau headquarters.

During the interval covered by this report, May 25 to June 27, the writer carried a portable fluorescent light. Specimens were tested from all the properties examined, all specimens contained in the Territorial assay office, and several hundred for various individuals. The results were negative for any reaction for scheelite, other than the specimens in the assay office from the Riverside mine, Hyder district. The writer intends to follow this procedure in the future as a process of elimination and possible discovery.

Excerpt from Summary Report by J.C. Roehm - 1942

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	Au.	Ag	Pb.	Cu	Zn.
1028	Tr	Tr	0.67	0.08	1.02
1029	Tr.	1.0	0.80	0.27	1.57
1030	Tr	Tr	0.65	0.17	1.57
1031	Tr	Tr	0.51	Tr	0.49

Excerpt from Summary Report by J. C. Hoehn,
Associate Mining Engineer, Territorial Department of Mines
May 24 to June 27, 1942

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The property comprises several claims, which are held by H. Ahrenstedt.

Sample	Au	Ag	Cu	Pb	Zn
1035	Tr.	8.0			22.08
1036	Tr.	1.6	1.10	Tr.	6.43
1037	Nil	Tr.	0.18	Tr.	2.01
1038	Tr.	Tr.	Tr.	Tr.	0.62
1039	Nil	Tr.	0.03	Tr.	4.20
1040	Tr.	Tr.	0.34	Tr.	3.57

- 1035 - 70 feet above beach
100 feet south of tunnel
Cut in bank
Width - 8 inches
- 1036 - Tunnel under bluff showing
Center - alate contact
Width - 5 feet
Footwall
- 1037 - Ditto
5 feet to 10 feet from footwall
North side
Width - 5 feet
- 1038 - Tunnel cut - east of No. 1037
North wall
Width - 5 feet
- 1039 - Tunnel cut - east of No. 1038
North wall - high tide line
Width - 5 feet
- 1040 - Tunnel cut - east of No. 1039
Water's edge
Width - 2 $\frac{1}{2}$ feet

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