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Preliminary Report of Investigations in St. James Bay, Lynn Canal, Juneau Precinct, Alaska
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Investigations were made in a limited area surrounding St. James Bay and inland across the first mountain range to the southwest as to the geological possibilities for the occurrence of lode tin (cassiterite) and lead-silver, as a result of information furnished by George Comstock and John Charles of Juneau, Alaska, per attached sheet regarding discoveries.

Summary and Conclusions:

The cassiterite-bearing rock (Sample TDM 459 and micro-slide) was determined to have been transported by ice to its position of discovery on the beach along the south shore of St. James Bay. (Note location on attached sketch). Two types of ice movement have occurred in the area, and either type may have accounted for the rock transportation. One type is valley glaciation within the drainage area of St. James Bay, which shows an ice movement from the northwest with smaller contributing glaciers from the higher mountain ranges to the west and southwest. Due to the fact that the cassiterite-bearing rock was found on the southwest shore, it is logical to assume that one of the southwest valley tributary glaciers from the high range was the contributing agency. The other type of ice movement, and along the shorelines of the bay there is considerable evidence of this, is by rafting on icebergs. In this latter type of ice movement, any of the former glaciers in Lynn Canal could have been the contributing agency.

The metallic tin content of the sample from the rock was estimated to contain 11 percent. The micro-slide shows over 20 percent of cassiterite. Hence the value of the sample is sufficiently high to be of commercial importance with metallic tin at the present price.

The importance of this float discovery is the occurrence of the mineral cassiterite within an area which has been only slightly prospected, and in which even general geology is lacking. The geological assumption that the Paleozoic limestones of Silurian Period are in contact with definitely known Mesozoic intrusives to the west in the higher ranges would make conditions possible for the deposition of tin and other metals along the contacts.

The quartz veins along the shores of St. James Bay in the graywacke and slates of the Paleozoic are considered to be economically unimportant. They contain scattered amounts of galena with associated silver and occur in limestone inclusions and lime filled fractures. The two metals are definitely of supergene origin as contained in these veins, and primary mineralization is lacking. However, their occurrence does indicate a primary source within the area to the west, probably confined to the limestone formations.

The occurrence of gold as fine colors in the valley gravels is not highly significant due to the mixing of alluvial material by glaciation.

Advice to prospectors is to confine their efforts to the inland portion of the area in close proximity to the intrusives and possible lime contacts. Their search may reveal good indications of lead and silver with possibly some gold. They should be on the lookout for high temperature contact zones on the lime contacts and within the intrusives themselves, which may contain cassiterite and from which the float found on the shore of St. James Bay may have originated.

Topography:

St. James Bay is the largest coast line indenture along the west shore of Lynn Canal. The bay extends in a northwest-southeast direction, nearly 5 miles in length and 2 miles at extreme width. The northwest half consists of extensive tide flats with several tidal islands. The southeast half is shallow out to the entrance and contains the Lynn Brother Islands. Fair protection and anchorage is afforded between the larger island and the south shore. One small river drains the main valley to the northwest and one large creek enters at the head from the southwest. Small vertical bluffs, 20 to 30 feet in height that occur along the shoreline, show recent rejuvenation. Low ridges were found inland paralleling the direction of the bay and the general strike of the sedimentary formations. These ridges attain heights up to 500 feet. The first mountain range rises abruptly at a distance of 2 to 3 miles southwest of the bay and generally parallels the bay and ridges. Some of the peaks of the first range reach elevations over 4000 feet. These peaks are sharp and between them are numerous feather type ridges. Timber line ranges from 1500 to 2000 feet in elevation.

Glaciation:

Small hanging glaciers were observed at the very heads of some of the valleys in the first ranges southwest of St. James Bay. Snow fields of considerable extent were observed on the second range inland, and these have in the past apparently fed valley glaciers which extended through and over the first range into St. James Bay valley. Fine worn

gravels now occupy the stream and river valleys at the head of the bay, and are of the outwash plain type. Along the shores of the bay many widely scattered boulders and rocks that have been transported by ice were observed. These are of various kinds, such as quartz diorite gneiss, granite, greenstone lavas and many gneissic metamorphosed schists. Many of the latter are believed to have been rafted by icebergs from the main batholith contact on the east side of Lynn Canal.

The ice movements of the glacier within St. James Bay appear to have been from the northwest or in strike with the valley. Inland, and within the valleys of the mountain ranges, the valley glaciers moved in accord with the direction of the valley. Movement of the raft ice on Lynn Canal could have been from any direction and in accord with wind, tide and ocean currents.

The 100-pound, rounded cassiterite-bearing rock, found in the vicinity of the anchorage in St. James Bay, could have been transported to its position of discovery by the glacier movement southeastward in the bay or rafted from former glaciers extending into the shores of Lynn Canal.

Geology:

The formations outcropping along the beaches of St. James Bay are made up of interbedded Silurian* graywacke, slates and greenstones. These formations also were found forming the ridges on each side of the bay and extending through the first mountain range to the southwest. Beginning near the tops of the peaks of the first mountain range are inclosed lenses of Silurian* limestones in the slates. These formations show considerable thickness, however, there may be some close folding and bed repetition. The limestone lenses and thin strata becoming evident in the series to the westward is indicative of an approach toward the basal section of the Silurian, which appears to be the sequence in the southern portion of Southeastern Alaska. The wide portion of the Silurian limestone is believed to exist, beginning in the second mountain range back from the beach. Also within this second range the mountains appear to contain intrusives, and are believed to be in close contact with this wide Silurian limestone belt. The second range contains numerous snowfields and many hanging glaciers.

High temperature deposits which may contain such minerals as cassiterite, scheelite and associates may be found to exist within the intrusives or along the contacts. Such a deposit may have been the origin of the cassiterite float found on the shore of the bay.

*Buddington, A. F. & Chapin, T., U. S. Geol. Survey Bull. 800, Plate 2.

Mineral Indications:

The investigation of numerous rocks and boulders of granitic texture, similar to the cassiterite-bearing rock, failed to reveal the presence of this type of ore along the beaches of the bay.

Three shear-breccia type quartz veins were found along the south shore of the bay opposite the larger Lynn Brothers Island. (Note location on attached sketch). These veins are parallel in strike with the formation, N. 35° W. and dip 76 to 78° NE. They were found extending across a small protruding peninsula and traceable for 1000 yards.

No. 1 or west vein is on a contact or bedding plane of graywacke and slate with a portion of the vein confined to a brecciated portion of the graywacke. The black slate forms the hanging wall. Along the footwall is a 10-foot band of schisted graywacke, which contains scattered pyrite crystals and small thin seams of lime carbonate. The width of the vein is 15 feet and is made up of milky white banded quartz containing angular pieces of graywacke, thin schisted slate bands, and grades into parallel quartz stringers on the hanging wall. Lime carbonate pieces and filled openings were found irregularly distributed in the vein, and in these carbonate filled openings and pieces, galena and secondary lead minerals were noted. Small scattered pyrite crystals were noted in the quartz and the incloaed rock pieces. The amount of galena and secondary lead minerals appears to be very low across the veins as a whole. The largest galena bunches were up to 4 inches in diameter, mostly, however, narrow thin seams.

No. 2 vein parallels No. 1 vein with an interval of 50 feet between. This vein is similar, containing banded stringers of white quartz in black slate. Some brecciation and shearing was noted. Lime carbonate was noted forming fillings between the quartz and slate bands. These also contained seams and small bunches of galena and secondary lead minerals. The strike and dip is the same as No. 1 vein, however, the width slightly exceeds 5 feet.

No. 3 vein is situated less than 100 feet northeast of No. 2, and parallel to the outer bluff on the beach. The width is 8 feet and it is wholly in black slate. Shearing to a greater extent was noted in this vein than in the other two, and as a result a greater amount of galena is present. Considerable graphite was also noted, another result of shearing. The galena in the vein occurs within the lime carbonates, as in the other two veins. A caved adit portal was noted 100 yards southeast from the northwest beach outcrop of the vein. This adit is

15 feet above high tide level in a very small indenture of the bluff. The approximate length of the adit could not be determined, since the tide has removed the greater portion of the dump. However, this No. 3 vein was apparently cross-cut, since vein material was noted on the remaining dump. The pieces of vein material show small bunches and seams of galena inclosed in lime carbonate material. Small amounts of pyrite are distributed throughout the pieces on the dump.

Sample No. JCR 1184 was made up of mineralized pieces of the vein material on the dump. Following are the results of assay:

Au. _____ oz. per ton; Ag. _____ oz. per ton; Pb. _____ percent.

Fine gold colors were panned in the valleys of the tributaries of the right limit of the large creek that enters the head of the bay in the southwest corner. Also on the slopes of the mountains at the heads of the valleys of these tributaries, considerable quartz float was observed. It consisted of milky white and vuggy type of quartz, but lacked sulphides except in very minor amounts. A great portion of the quartz contained limy inclusions. The quartz apparently had originated in the black slates in close association with the thin limestone beds.

Prospect No. _____

Recording District: Juneau

Name: Comstock Tin

Location: St. James Bay

Source of Information: George Comstock; Jack Charles

The mineral cassiterite was identified (1943) in a small piece of granitic rock from a 100-lb. boulder which was found in St. James Bay and placed aboard a trolling boat for ballast. This boulder was unloaded at Hoonah and remained on the dock for sometime.

The cassiterite is contained in a quartz feldspar groundmass. The color is light to dark gray and the tin content of 11% (estimate) is noticeable in the weight of the sample.

History:

During the early gold boom days a prospector by the name of Nado made some discoveries in St. James Bay. He is reported to have started an adit and was continually bringing to town rock containing high silver values.

Sandy Goodman of Juneau knew of old workings inland from Lynn Sisters Island up one of the two creeks emptying at this point. Reports were to the effect that lead ore galena was present in quantity and contained 500 to 600 ounces of silver.

Tetrahedrite was contained in samples from St. James Bay or Excursion Inlet that was given to Comstock and M. Kelly.