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STATE OF ALASKA
DIVISION OF MINES AND MINERALS

PROPERTY EXAMINATION REPORT

CAMEL GYPSUM PROPERTY Kx 114-10,126

and

PACIFIC GYPSUM PROPERTY — Kx 114-96, 95

SITKA QUADRANGLE

GORDON HERREID
State Geologist
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PROPERTY EXAMINATION REPORT

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and
PACIFIC GYPSUM PROPERTY

~~CRAIG~~ QUADRANGLE
Sitka

At the request of Mr. Jerry Herdlick, I visited the U.S. Bureau of Mines diamond drilling operation at Iyoukeen Cove on July 30 and 31. The first day was spent visiting the Pacific Coast Gypsum property and the drilling site in Adit #3 on the Camel-Gypsum property in the company of Mssrs. Herdlick, Johnson and Wright of the Bureau and D'Arcy Bannister, the Bureau's engineer on the project. The principal object of my visit was to offer an explanation for the confusing geological relationships that have been encountered in drilling at the Camel-Gypsum property.

PACIFIC GYPSUM PROPERTY

Despite the fact that the Pacific Coast Gypsum property was mined from 1906 until 1923, very little is known concerning the dimensions of the deposit and its relations to the surrounding geology. The gypsum strikes about N 80 E, and dips steeply North at the surface and is said to flatten at depth.[1/] This flattening at depth is corroborated by the reported widths of 500 feet on the 160 foot level and 600 feet on the 300 foot level.[2/] The gypsum is overlain in sharp contact by limestone breccia and is reportedly underlain by cherty limestone, which I

1/ Wright, C. W., Non-metalliferous mineral resources of southeastern Alaska: U.S.G.S. Bulletin 314-C, pp. 73-81.

2/ Stewart, B. D., 1932, The occurrence of gypsum at Iyoukeen Cove, Chichagof Island, Alaska: U.S.G.S. Bulletin 824-E, pp. 173-177.

didn't see on my visit. No veins of calcite, gypsum or quartz or other evidence of hydrothermal origin for the gypsum were seen. Several excellent exposures of buff limestone breccia were examined. This rock is composed of subangular to angular white to buff limestone clasts in a matrix of limestone, which in some places was almost unconsolidated. No thrugoing shear zones were seen, though looked for, and only a few evidences of minor faulting were noted. Most of the clasts were subangular. In addition to limestone, there were scattered greenstone clasts up to 3 inches across. Due to the lack of shear zones, the rock was considered to be a talus breccia at the time. The area around the mine is mostly covered with glacial gravel and vegetation, except along Gypsum Creek and on the borders of subsidence pits over the old mine workings.

CAMEL-GYPSUM PROPERTY

The geological relations at the Camel-Gypsum property are visible in the #3 adit, in which the U.S.B.M. had completed one diamond drill hole and was drilling a second. This area has been mapped on 1" = 400 feet by the U.S.G.S.[3/] This adit is approximately 75 feet from the high tide line and about 15 feet above it. The adit extends for about 220 feet in a N 75 W direction, approximately perpendicular to the coast line. Figure 1 is a map taken from U.S.G.S. Bulletin 989-B and section taken from U.S.B.M. RI 4852 which I have slightly modified.

The adit was driven in on an elevated beach deposit of beach sand which contains a continuous shelly layer, starting from near the floor at the adit and rising into the back and out of sight toward the end of the adit. This beach sand is underlain by a limestone boulder conglomerate (in which I found no granitic clasts) with a sandy matrix which is, in turn, underlain by white gypsum with an undulating upper surface. Fifteen feet from the face sedimentary (?) banding in the gypsum strikes N 80 E and dips 31°S. In places the gypsum occurs as sub-

3/ Flint, G. M., Jr. and Cobb, E. H., 1951, Gypsum deposits near Iyoukeen Cove, Chichagof Island, Southeastern Alaska. U.S.G.S. Bulletin 989-B, pp. 27-37.

horizontal slabs set in a sandy matrix. A plastic gray clay which coats the gypsum surfaces and occurs as seams in the gypsum is probably the clayey residue resulting from solution of gypsum containing argilaceous impurities.

Diamond drill hole No. 1 was drilled under the end of the adit at an angle of 39° encountered gravel throughout its length (120 ft.?) and failed to penetrate any gypsum at all! Only the aidt level was open at the time of my visit. In the lower levels, D'Arcy Bannister reports that scattered gypsum clasts up to large boulders were present in a gravel matrix. Evidently the gypsum is interfingered with gravel and the adit has been driven into one of the fingers.

Along the shore line, particularly at the side of the cove in which the Camel-Gypsum property is located, prominent outcrops of gray limestone occur, which is reported by the U.S.G.S. to be of Carboniferous or Permian age. The limestone appears to be gently folded about a horizontal N 75 E axis. I believe that the steep dips on the U.S.G.S. map (plate 3 in Bulletin 989-B) were taken on joints and not bedding planes. The limestone is fractured by several different directions of sheeting into small blocks, up to a few inches in greatest dimension. Along the shore, 750 feet NE of Adit #3, slickensides on small thrust faults strike N 75 E. Breccia zones which are gradational with the fractured limestone are overlain by unbrecciated layers of similar appearance and therefore could not be talus breccia. Elsewhere tabular breccia zones lie along fault planes. This "crackling" of the limestone is due to faulting and is not of surficial origin. It seems likely that the limestone breccia at the Pacific Coast Gypsum property is of similar origin.

The beach at Iyoukeen Cove is covered with granitic cobbles and much of the upland area is covered by granite-bearing glacial debris.

CONCLUSIONS:

The problem is mainly a structural one and not enough data are available to draw more than very tentative conclusions. The crackling and local brecciation of the limestone without any evidence of important faults may possibly have originated during folding as a result of lack of support by adjacent gypsum, which would flow more readily than the limestone. In any event, a close spatial association of gypsum and brecciated limestone is apparent, along with a lack of convincing evidence for major faulting and hydrothermal action. At the Pacific Coast Gypsum property the rapid flattening of the dip with depth, if true, could indicate a recumbant anticline or drag along a major reverse fault. If the gypsum pinches out down dip it may be that the thickness of the exposed gypsum is due to its being squeezed into the hinge area of a fold whose axis trends about N 75 E. Intersections of the gypsum by a line of drill holes perpendicular to the strike of the outcrop (i.e. a line of holes trending about N 20 W) will give a picture of the profile of the gypsum in case it is located on a fold. It is interesting to note that my mapping at the Camel-Gypsum property indicates a fold axis trending in about the same direction.

At the Camel-Gypsum property the gypsum seems to occur in a synclinal area. The gypsum occurs in large and small blocks in gravel and seems to be part of a land slide from the west. This slide may have been caused by the presence of an incompetent gypsum bed at the surface. It seems very possible that gypsum may be found in place a few hundred feet to the west beyond the "slide area" and that further drilling in the slide gravel will be both expensive and inconclusive. Along the line trending west from adit #3, the topography shown on Plate 3 of Bulletin 989, if it is correct in detail, seems to indicate a steepening of the hill slope above the 260-foot contour. This may represent the upper edge of the slide, and if so, a good place to put down a vertical hole. The drill "core" slide gravel should be checked for granitic pebbles. If none are present, it would allow differentiation of the glacial debris from slide gravel which would aid in interpretation of drill data if holes are drilled west of Adit #3.