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EXTRACTS WITH REGARD TO FISHER CREEK FROM GEOLOGICAL REPORT OF THE ANIAK-TULUKSAK DISTRICT BETHEL PRECINCT

MR 91-16

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1939

Intrusive Rocks:

The small area of granite in the vicinity of Fisher Dome is less than 3 square miles in area. It forms a group of small granitic domes and the underlying formation of Mt. Fisher. The latter is partly capped with metamorphosed sediments and represents the highest mountain of the group.

The three prevailing types of granites found were soda granite, hornblende and mica granites. These types do not occur as distinct types with definite periods of occurrences and boundaries, but more as phases of the same magma. In some localities the ferromagnesium minerals are almost lacking, giving the granite a light pinkish to white color, while in others, they are more abundant, giving the granite a dark color and different appearing texture. Microscopical evidence shows the granites, thus far examined in this district, to be genetically related. Field evidence shows them to be very close in age relations. Orthoclase and zoned plagioclase feldspars ranging from albite to andesine, the former prevailing, were noted. Quartz was not found abundant, but interstitial plagioclase feldspars are of the sodic variety and appear to be in greater amounts then orthoclase. The amount of alteration of the ferromagnesium minerals and the amount of interstitial quartz, deposited between the older and larger crystals of the original rock, shows that the granites were subject to the chemical action of hydrothermal solutions long after the first crystallization of the original magma took place. This condition of the chemical alteration within the granites was found most intense in the Tuluksak granite. This granite shows a greater amount of interstitial quartz with more magnetite and less ferromagnesium minerals. This condition is explained mainly by the non-permeability of the surrounding rocks. These hard compact lavas surrounding this Tuluksak granite did not fracture or shear to the same degree as the Cretaceous sediments. The intrusive action of the Tuluksak granite was more of a stopping, with fusing against its outer walls rather than an action of disruption and folding such as occurred in the sediments. As a result, the later hydrothermal solutions, rather than dispersing into the invaded rocks, were confined within the cooling intrusives and penetrated the minute fractures by percolation upward through the intrusive mass. This action was such as to alter and break down the ferromagnesium minerals, to deposit the interstitial quartz, and to cause the repeated zoning of the feldspars. The larger or original quartz crystals have corroded borders, while the younger quartz is in the form of small euhedral clear crystals. Both muscovite and biotite show in various amounts, but with ragged edges and poorly developed crystal forms.

The granite to the north of Mt. Plummer contains a greater amount of mica and hornblende and is darker in color. A small amount of augite was noted and the amount of quartz is less than in the granite of the Tuluksak.

The Marvel Dome granite to the south of Mt. Plummer contains mica and hornblende, but in lesser amounts and these minerals show greater alteration than those of the Plummer granite. The amount of contained interstitial quartz was greater than in the Plummer granite, but less in amounts than in the Tuluksak granite.

The large granitic mass shown at the headwaters of Salmon River, or Salmon River granite, is classified as a mica granite. Both biotite and muscovite are plentiful. These show some degree of alteration and hornblende is present in small amounts. Orthoclase and zone plagioclase feldspars, with albite twinning, appear to be the greater portion of the composition, with some quartz. Interstitial quartz is present, but in lesser amounts than in the other granites. A wide zone of porphyrite surrounds the outer portion of this granite and this zone is in evidence at the head of Dome and Porcupine creeks.

Along Salmon River below Cripple Creek where it is entrenched into the hard argillites, a few greenish fine grained dikes occur. These follow the bedding of the argillites and are to a small extent mineralized. The contained mineralization is mostly pyrite with minor amounts of arsenopyrite and iron oxides. The mineral content is altered beyond recognition of the original constituents. These dikes are held to be genetically related to the underlying intrusive. Dark colored dikes with a diabase texture are said to be cutting the granite on Bear Creek in the vicinity of the placer workings and are reported by Maddren and Smith.* These dikes are apparently later than the main intrusive granite and are held to be Tertiary or later in geological sequence. As a whole, dike rocks are unusual rather than usual in the area. Considerable of the area is covered with tundra and brush, however, where bedrock is exposed the existence of quartz veins appears to be lacking. There are a few small seams and stringers in the immediate vicinity of the granitic contact. This small amount of silicification and accompanying mineralization is so scanty that to assume that all the placer gold originated from these limited areas to make up the placer deposits by erosion is in many respects not logical.

* Maddren, A. G. & Smith, P. S., Mineral Resources of Alaska, 1914, U.S.Geol.Bull. 622, p. 313.

Placer Gold Associated Near Granitic Intrusives:

Gold has been found in erratic amounts on the creeks that lead from the Plummer and Marvel granites. This is especially true of Robin, Eureka and Dominion Creeks on the east. Economic placer deposits have not been found on these creeks, but this condition is attributed to the disrupting action of the alpine glaciation. Marvel Creek, on the south end of the Marvel and Plummer granite mass, contains rich placers. This creek cuts along the contact in its upper course and due to its position on the south slope was free from intensive ice action. Placer deposits are now being mined on Cripple Creek which flows off the Salmon River granite. Dome and Loco, two of its westerly tributaries, extend from the border phases of this granite and have placer gold. Cripple and Loco and parts of Dome are glaciated, but reconcentration since has made workable deposits.

Fisher Creek, which drains the greatest portion of the Fisher Dome granite, contains placer gold and its deposits are under investigation at the present time.

GOLD PLACER DEPOSITS

Salmon River and Upper Tributaries:

J. Cook and associates have nine 160-acre association claims staked on Salmon River starting below the mouth of Cripple. Below the mouth of Fisher Creek several holes to bedrock have been sunk with encouraging results. There has not been sufficient testing to determine whether the gold is equally distributed on the valley floor. Panning tests along the rim rock for a mile above and below Fisher Creek on Salmon show good pans. Thus it is possible that certain sections of this main valley floor may contain workable pay, however, it will require careful testing. Several problems present themselves: First, the problem of recovering a light flat gold with a small amount of clayey material. Second, the rough hard bedrock offers a difficult problem of cleaning. Third, the problem of mining, as to methods of operation, has to be given serious consideration, assuming an abundance of low pay is encountered. The operation of a dredge is not feasible due to elevated position of the gravels. Hydraulic operation cannot be considered, due to lack of natural fall, without reverting to very extensive ditch building. Due to the low pay, a form of machinery operation is essential. A dragline operation may be the solution. A comparatively cheap method recommended, assuming pay is obtained in what appears to be extensive areas, is the use of bulldozers. This would involve using the present river as a bedrock drain and bulldozing the rim gravels into boxes set in bedrock or along the edges of the nearly vertical rims. Bulldozing parallel to the strike of the argillites offers a

more satisfactory method of cleaning bedrock than at right angles. A water supply sufficient for nozzles and by-water for sluices could be pumped from the present river.

As noted in several localities along the course of Salmon River in the section below Cripple Creek, there were segments of older channels partly entrenched and gravel filled. In prospecting this wide valley floor particular attention should be paid to these older channels. As far as noted no frozen areas were observed and the gravels are comparatively loose and free from boulders.

Fisher Creek: Fisher Creek is one of the shorter tributaries of Salmon River which it joins 2½ miles below the mouth of Cripple. The length is 9 miles, with the upper 5 miles flowing in a southeasterly direction, thence turns nearly at right angles and flows northeasterly into Salmon River. Four small creeks namely, J, Jill, Pass and upper Fisher, join together at the southern base of three mountains with granite cores at an elevation of 1780 feet and form the main Fisher Creek. The elevation at its mouth is 1200 feet, which gives a fall of 600 feet in 8 miles. The valley floor ranges from 400 to 600 feet in width with the creek meandering considerably on the valley floor. A few low benches were observed along its middle section.

Granite dome at the head of Fisher Creek.

Glacial action is lacking within the valley and its upper tributaries. There is some evidence of glaciation on the northern slopes of Fisher Dome, located on the western side of the mountain group. This creek valley, which in many respects is similar to Marvel Creek in its direction of flow, in cutting the same series of sedimentary rocks, and in heading against granite intrusives, has been in part filled with some silt and black muck. The volume of run-off waters during the end of the glacial period was not as great as on Marvel, and evidence of mud glaciation is lacking. In the bend, 4 miles above its mouth, six holes were sunk to bedrock during the winter of 1913-14, as reported by Maddren.* These holes were reported ranging from 15 to 30 feet in depth and penetrated frozen

* Maddren, A. G., U.S.Geol.Survey Bull. 622, p. 346.

deposits of silt and gravel. Further reports from prospectors were to the effect that some coarse gold was found on the low benches above the bend. Wet ground prevented the sinking of holes on the main valley floow of this section.

Since the three mountains with granite cores at the head, the westerly one named Fisher Dome, are of a variety of granite similar** to Marvel Dome, gold would naturally be assumed to be associated. The position of the major amount of the concentration of the gold would be on the upper portion of the creek above the bend. This will require test pitting with the aid of a pump or by drilling. Another factor which would tend to hold the gold in the upper portion is the shaly argillite bedrock which the creek cuts at nearly right angles. Thus the bedrock would act as natural riffles for the gold, and the upper hardened portion near the intrusive should hold the greater amount.

The gold found at the mouth of Fisher Creek on the benches is believed to be mostly deposited from Cripple Creek above. Good pans were obtained on Fisher Creek 2 miles up from the mouth in the creek bed. Fisher Creek is entrenched in the argillite and shale bedrock for a distance of one mile up from the mouth. Several dikes of diabase and larger ones of augite trachyte were noted inclosed parallel to the strike of the sediments. These dikes contain a slight mineralization. The sediments are close folded, highly contorted and contain shear zones. It is generally believed their thickness is not great and that they are underlain by the intrusive magma which shows in dike form. It is very possible that the mineralization accompanying the dikes and in the shears of the contorted sediments is to a minor extent a source of the gold.

J. Cook of Anchorage has four 160-acre association claims and seventeen 20-acre claims staked on the creek from the mouth up.

Further prospecting on this creek is warranted, and until then values or extent of pay is not known.

** Op. cit., p. 18.