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SUMMARY REPORT  
OF  
MINING INVESTIGATIONS  
in the  
KVICHAK PRECINCT  
ALASKA  
June 13 to July 6, 1941.

By

J. C. ROEHM

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IN THE KVICHAK PRECINCT, ALASKA  
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June 13. Naknek to Nonvianuk Lake area via plane.

June 14. During the year of 1918 Alex Grant found placer gold on American Creek of the Naknek Lake watershed. This creek heads high up on the north slopes of the Alaska Peninsula, flows in a westerly direction, and empties into Coville Lake, which is one of the larger lakes of the Naknek Lake group. The creek has a length of 30 miles, with its source in a glacial valley. It follows in the path of a preexisting glacier which terminated, forming a small lake at the base of the foothills of the range. From this un-named lake it has become entrenched in a monzonitic porphyry and outwash glacial gravels. Alex Grant made several attempts to work the gravels in this creek, but failed, due to many adverse conditions, among which were wet ground, steep gradient and numerous boulders.

Wm. Hammersly made additional placer gold discoveries on American Creek during 1938 and has been actively engaged during the summers in prospecting and testing. Two important geologic features have been revealed through his efforts that warrant further prospecting in this area. "First, is the discovery of a monzonite-porphry, which extends for a known distance of 10 miles in an east-west direction, paralleling and south of Nonvianuk Lake. The western end and contact of this porphyry mass shows on American Creek on the placer claims held by Hammersly. On this contact, which is with green lavas, some hot spring deposition is in evidence. The lavas are extensively mineralized along the contact, but away from the creek canyon, this contact is extensively covered with morainal gravels."

The second important geologic feature is the occurrence of numerous old channel rocks and boulders with associated well worn, but highly scattered, nugget gold. These rocks and boulders consist mainly of greenstone, quartzite and granite which are scattered and mixed with the later glacial gravels of American Creek. This old channel material, with worn coarse gold, is evidence of an older placer deposit, which to date has not been found. Portions of this deposit may still remain intact, and it is possible it may have been entirely removed by glacial action. On the other hand these remnants may be from a channel or beach line. However, the boulders strongly favor channel deposition, and it is within reason to suspect the existence of economic placer deposits.

*Mt. Katmai 126*

*Kx126-11*

At the west porphyry and lava contact on American Creek, 10 miles up from its mouth at Coville Lake and thence for a distance of 10 miles upstream to the un-named glacial lake, this creek has become intrenched in the porphyry, ranging from 300 to 500 feet in depth. In this section three bench levels have formed. The lower or first bench ranges from 5 to 10 feet above the present creek bed. The second bench is situated 25 to 30 feet above the creek bed. The third or highest bench is situated 95 to 110 feet above the river bed. These benches end as the river approaches the Coville lake flat 2 miles below the porphyry-lava contact.

The Coville flats are an extensive level area with an elevation of 200 feet, with lake at a slightly lower elevation. This area appears to have been an extensive lake, with Coville Lake remaining as a small remnant. As American Creek approaches these flats, a wide extensive delta deposit has been formed, over which the present creek meanders, changing from a swift cutting stream above in the porphyry, and taking on the appearance of an old-age topography as it crosses the Coville flats.

American Creek is the largest stream that empties into Coville Lake, and it is called Coville River by many of the inhabitants. Coville Lake connects by a short strait with Grosvenor Lake, the latter draining into the Savonoski River which empties into Little Naknek Lake.

A careful examination was made by the writer, accompanied by Wm. Hammersly, along American Creek from the section where it fans out on the Coville flats, upstream for 10 miles. This section includes all the prospect workings of Hammersly and Grant. The grade in this section is steep, averaging 100 feet to the mile. The stream is actively engaged in cutting into bedrock and for the most part in this section runs on or very close to bedrock. Large boulders are numerous in the creek bed (note photo slide No. ). These boulders are a mixture of old channel boulders, glacial boulders, and angular pieces of bedrock recently dislodged from the bedrock. This monzonite-porphyry is comparatively soft and disintegrates rapidly into a greenish yellow sand. This sand makes up the greater portion of the finer materials of the gravels.

The intrenched valley in this section averages nearly one-half mile in width with steep banks. The tops of these banks are covered with deep glacial gravels. This valley appears to have been formed both during and after the glacial activity, and it is very doubtful if a valley existed here prior to glacial times. Along the right limit of this entire section, numerous dry valleys extend to the intrenchment from a northeasterly direction. They represent hanging dry valleys, the bottoms of which range from 100 to 150 feet above the present creek

bottom, and were apparently formed during the melting stage of the glacier which formed Nonvianuk Lake to the north. At the present time American Creek lacks flowing tributaries in this section. The presence of these old channel boulders was noted scattered over the 10 miles of intrenchment to the un-named lake. This apparently shows they were removed from their original positions by the glacier which formed this un-named lake. No evidence of old channels was found in the section of American Creek below the lake to Coville flats.

Gold is found in consistent small amounts in the bench gravels and of the present creek bed gravels. It ranges in size from fine and flaky to well worn coarse nuggets. Nuggets and all smaller pieces have a common flatness which is characteristic and contributed by glacial action. There is considerable evidence that the known gold deposited in this section of American Creek is of glacial and post glacial deposition. Further evidence shows, from the test pits and workings of Hammersly, that the amount of gold on the benches, etc. is insufficient for mining under existing conditions of steep gradients, numerous boulders, lack of hydraulic water, and other problems.

*Mt. Kalmia - 126*

Hammersly is holding a group of 18 placer claims beginning one mile above the mouth of the canyon on the Coville flats and extending nine claim lengths upstream. Discovery Claim is located at the contact of the monzonite-porphry and the greenstone lavas two miles upstream from the Coville flats. This contact, which cuts across the canyon, extends in a northerly and southerly direction and has caused the stream to form a large S bend on which the three bench levels show distinctly. The lavas near the contact are folded and to some extent altered by the intrusive porphyry. The monzonite porphyry near the contact is mineralized with pyrite and contains a few mineralized quartz stringers. The entire contact shows as a wide oxidized zone, and possibly a portion of the fine gold below originated along this zone.

The greater portion of the workings are situated on the left limit benches 300 feet below the contact. One series of cuts is located on the 25-foot level or second bench. These cuts average 9 feet to bedrock consisting of 1 foot of moss and volcanic ash, 3 feet of stratified porphyry sand and 5 feet of coarse gravel. The bedrock is fractured and altered lava and is rough and uneven. Several pans were taken from these cuts and they contained from 5 to 20 fine colors. On the first bench level below the above cuts, one large cut into the river bank, 6 feet above the river level, was worked by Hammersly. Sixteen feet of 12-inch boxes were used and the cut was shoveled in. Twelve feet of screen and four feet of Hungarian riffles were used in the boxes. This cut measured 40 feet by 10 feet by 5 feet and was covered by two feet of sand and some ash. The cut produced \$30 in gold. This gives a return of 40 cents per yard for the 5-foot gravel stratum. The total average, including the top sand and one foot of fractured bedrock, averaged 30 cents per yard. Black sands and magnetite pebbles are abundant, making the recovery of the fine gold difficult.

Another series of pits was sunk on the right limit on the first bench, 200 feet above the contact. Depth to bedrock in these pits averages 6 feet, showing 5 feet of a heavy coarse gravel consisting of one-third rock and boulders, and the remainder gravel and sand. Consistent panning of the fine material showed numerous fine gold colors. A small amount of clay sediment was noted in the sand. The camp is located on this bench.

Coarse gold was found on the right limit on the first bench, located  $3\frac{1}{2}$  miles above camp. Here two outs, 30 feet apart were made into the gravel bank near the water's edge. The gravels are stained red with iron oxides, and coarse gold, with some nuggets was found contained in the gravel near bedrock. Upstream from this location on the same limit the river has cut through an extensive deposit of glacial moraine, 60 feet in thickness. The coarse gold below this moraine is believed to have been concentrated from these gravels. (Note slide No. showing glacial moraine). There has not been sufficient concentration, however, for economic mining. Further prospecting is warranted above on American Creek. Remnants of the old channel, from which the channel rocks and boulders originated, may still be intact and contain economic amounts of gold. To date no such remnants have been located.

June 21. Return to Nonvianuk Lake and thence to Naknek by plane.

June 22-24. An investigation was made of reported black gravels on the banks of the Naknek River located 4 miles upstream from its mouth in Bristol Bay. These gravels are located on the south bank of Naknek River one-third mile northwest of the Bureau of Fisheries station. These gravels have a thickness of 12 feet exposed from the river's edge up the bank and along the bank for 150 feet. (Note slide No. ). The blackish gravels are covered with finer gravels of a red color, the latter caused by the abundance of iron oxides. These top fine gravels are covered with 20 feet of fine sandy silt. The black cemented gravels appear as a small fan-shaped deposit formed by a former side creek depositing its contents into the larger river.

The cementing material is a dry black greasy mixture, which has the appearance and luster of dry crude oil. These gravels were apparently subject to a small flow of oil from a small tributary, which saturated and cemented the gravels. This flow or tributary apparently ended or changed its course, and the red gravels and silt were later deposited on top. The gravels are thickest in the center and become lower and thinner on the ends. The depth to bedrock is not known in this vicinity, however, this section on Naknek River is 8 miles northeasterly from Johnson Hill. This is an elongated dome which rises 200 feet above the general terrane or almost level country. This marked monument of topography breaks the general levelness in a distance of 35 miles in any direction. The hill is a mile in length and is located 3 miles inland

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Naknek

from the east shore of Bristol Bay and 5 miles southwest of the mouth of Naknek River. Bedrock shows on the west side of the hill and under the silt bluff along the shore of Bristol Bay. This bedrock is a brownish sandstone. The elongation of the hill is northeasterly and southwesterly, and it has a width of one-fourth of a mile. A cross-section would represent the top of a dome.

Near the location of these black gravels, the only known evidence of underground conditions is a well drilled at the cannery of the Alaska Packers Association. This well reached a depth of 162 feet or a hundred feet below sea level. Solid ice was hit at this depth and the well was abandoned.

The Libby, McNeil and Libby Packing Company drilled a water well at Koggiung, 15 miles north of Naknek River near the shore of Bristol Bay. This well reached a depth of 382 feet, with the lower section in a clam shell bed cemented with beach sand and clay.

June 25-28. En route from Naknek to Grosvenor Lake and on foot to northeast boundary of Katmai National Monument.

An attempt was made to examine cinnabar occurrences reported by Roy Fure along the northeast boundary of Katmai National Monument. These were reported by Fure to be located on Gorge Creek 10 miles due east of Grosvenor Lake and in a very inaccessible section north and east of the northeast boundary of the Monument.

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Mt. Katmai

An attempt was made, accompanied by Fure, to reach the first and most important showing, located in the bottom of a 300-foot vertical walled gorge on Gorge Creek. An ascent was made from the southeastern shore of Grosvenor Lake up what is locally known as Canyon Creek to its head and over a divide at nearly 2,000 feet elevation, down to the head of Gorge Creek. This stream has a very steep gradient and is cut down into nearly flat-lying sediments, forming steep canyon walls ranging from 100 to 300 feet in height. It empties into Hardscrabble Creek, with the latter emptying into the Savonoski River. From the banks to timber line, near elevation 2,000 feet, the area is covered very densely with alders and high grasses.

A seven-foot vein of cinnabar was reported found in 1934 by Roy Fure and Martin Mickelson, both of Naknek, while on a prospecting trip for placer gold, and while traveling up Gorge Creek during the early spring on the ice. The vein was noted by Mickelson, an old-time prospector, who identified the mineral content of the vein as cinnabar. Two hundred pounds of the ore was collected and later retorted in a crude way. Mickelson used this mercury on a small copper plate during his placer testing activities. The discovery was not staked, since Mickelson mentioned to Fure that mercury was not of sufficient value at the time. The following year Mickelson died. Fure later visited the discovery during his trapping ventures, but never did any work or cut any trails to it.

The trip via Canyon Creek became almost impassable for packing due to the dense growth of alders and a camp was established part way up Canyon Creek. Thence a light trip was made over the divide and down Gorge Creek. Heavy alders again slowed going and the vicinity was reached by night-fall. The water was exceptionally high in the creek and it was found impossible to descend or ascend along the creek bed due to canyon walls, waterfalls and swift current. The following day two descents were made into the canyon from the top, but it was impossible to reach the locality of the vein.

Fure gave the following description of the showing: Granite forms the bedrock of the creek and this is overlain by a sandstone stratum 30 feet thick. Overlying the sandstone is nearly 300 feet of a green conglomerate. These formations were confirmed by the writer. The cinnabar vein, according to Fure, is in the sandstone stratum and extends down into the granite, but ends on the conglomerate stratum above. The vein has a northwesterly strike and crosses the stream at a low angle, and it is nearly vertical in dip. It has distinct walls both in the granite and sandstone and is represented in the conglomerate as an open fissure. Its width was reported to be 7 feet, and it could be traced in length only a few feet from the west bank east in the river bed to the east bank in which it is covered.

Hot spring deposition was noted in the fractures of the granite and sandstone 600 feet above the location of the vein. However, no cinnabar was noted in the fractures in this vicinity. The elevation of this discovery is 600 feet. The sandstone and granite contact has a slight dip to the north. The sandstone has been laid down unconformably upon the granite and contact minerals are absent. The fracturing in the granite, sandstone and conglomerate appears to be recent. The evidence of the hot solution deposition in these fractures makes a very favorable environment for cinnabar deposition.

A descent was made to the river bed below the location of the reported showing to search for float pieces of cinnabar. These were not found due to the smooth bedrock and high water stage of the river. After two days of effort, it was found next to impossible to reach this showing or to cross the river and continue east to examine further reported cinnabar outcroppings. These other discoveries were reported in sandstone north of the Savonoski River. They were located by Fure during his various trapping expeditions. These locations would be north of the Monument boundary line, however, the showing on Gorge Creek is exactly on the north boundary line.

Mt. Katmai  
June 29-30. An attempt was made to reach the above mentioned locations via the Savonoski River. The river, however, was found to be extremely high and to have changed its course near the mouth and was flowing through the timbered portions of the valley. As a result it was found impossible to ascend by boat or to pack up the flooded valley. Since these cinnabar showings can easily be reached during the winter season when the rivers are frozen, Roy Fure has promised to collect samples from each occurrence and send them to this office next winter.

The major geology of this section, from what little was noted, appears to be very favorable for these types of low temperature deposits. It contains a central core of vulcanism, which has been very active in the past. This is in contact with an elevated anticlinal structure of sandstone, conglomerate and tuffs which extends across the Peninsula from the northwest to the southeast, or more definitely from Grosvenor Lake to Hallo Bay. Slides show some of the tributary canyons and the type of topography in this section.

July 1 to 3. <sup>Kodochrome pictures that</sup> A trip was made up the Ikeh River to the valley of Ten Thousand Smokes. The valley was traversed to within 5 miles of Nova Rupta Volcano. Slides Nos. were taken, which show the valley in general and include close-ups of pumice colorations and weathering effects and silica sand deposits. Several samples of pumice and sand were collected. One of the most noticeable recent changes within the valley is the abundant new growth of young vegetation which is gradually creeping up the edges of the valley and starting upon the cooled lava beds. The high winds, which occur in the valley have, through the transportation of sands, dust and seeds, been the main agency in this respect. They have whipped the loose disintegrated particles of pumice into sand dunes on which various grasses, alders, and even small spruce trees, have started growing. The most abundant vegetation, other than the grasses, are various flowers, which grow with remarkable vigor. The vegetation along the mountain sides, which was formerly killed by the gases and heat expelled from the cooling lava, has made a remarkable new regrowth. Wonderful shades of light green colors are in direct contrast to the light pink hues of the lavas. This remarkable spectacle will soon be ended with the new growth that is springing up on the surface of the lava.

The various small streams which flow from the mountains down onto the lavas have within the few years since the eruption in 1913 of Mt. Katmai, and the lava flows in the valley, cut deep gorges into the easily eroded lavas. In places they have cut through the lava beds and are running on the older original bedrock. These gorges with their domed erosive features of the lava, and with the various shades of pink, make very picturesque scenes. The streams are heavily loaded with silica sands and floating pieces of pumice.

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The pumice deposits consist of various flows conformable on each other and varying in thickness from a few feet up to 100 feet. These strata vary somewhat in the amount of ferric iron content which accounts for the various shades of pink. (Note slides for the different bands). This pumice is extremely light in weight, filled with infinitesimal gas bubble holes, and its composition appears to be nearly pure silica. The impurities noted by eye consist of ash and cinders, black carbon matter, and iron oxides. Several samples of this pumice were collected for specimens. As the pumice disintegrates by the action of weathering agencies, mainly water and wind action, silica sands are formed. These are found along the stream banks deposited by stream action, and by wind as sand dunes and in sedimentary bands in some of the canyons and along the edges of the flows. The purest sands are the wind blown deposits, since the wind deposits only small and light weight particles. The largest and best deposits noted were found on the north side of the valley near the edge of the flows in the canyons formed by the side mountain streams. (Note slides).

Fure reports a great abundance of these sands along the wide flat valley of Katmai River and along the shores of Katmai Bay. Again wind blown deposits are found along the beach of the bay and have been reported as of great purity, between 98 and 99 per cent silica.

The sands are very well located with respect to salt water transportation, the only difficulty being the shallowness of Katmai Bay for docking and loading facilities. With regard to the pumice, the most and purest lies with certain strata of the various lava flows within the valley of Ten Thousand Smokes. Some, however, was reported to occur on the Katmai River drainage. Via Katmai Pass, elevation 2500 feet, there exists a suitable caterpillar route over which this pumice could be hauled to the beach in Katmai Bay.

All steam vents of the valley floor, from which the valley derived its name, and the steam action originating from the outpoured lava, have ceased action. There remain, however, eight active vents, commonly called smokes, located 300 to 400 feet above the floor of the valley on the west and north flank of Baked Mountain and Nova Rupta Volcano. These are in the immediate vicinity, apparently, of the opening for the ejection of the lava which flowed down the valley. They apparently are connected with the still hot magma found below the crater of Nova Rupta Volcano. These smokes are distributed in a nearly straight line along the slope of the mountain and volcano. They appear to be distributed along an apparent fissure, striking nearly north and south. This apparent fissure has a length, according to the distribution of the smokes, of between 3 and 4 miles, and it apparently has sufficient depth to intercept the still hot magma within the core of Nova Rupta

Volcano. Thus it represents a passage-way for hot vapors, gas and solutions which are concentrated in channels, forming escaping vents, which are represented by the hot springs and steam vents. An opportunity to sample these waters and gases, together with a detailed study of this fissure, might reveal interesting data on vein and mineral deposition. The writer was not equipped to undertake further investigations in the valley. However, it may be stated that an abundant supply of the various pumice deposits and silica sands is in evidence. Both, however, are confined within the boundaries of Katmai National Monument.

The valley, with the loss of its numerous smokes, has lost its great picturesque attraction. The eight remaining smokes are not confined to a small area nor do they have great attraction. How long these smokes will remain active is unknown, but they apparently will cease as did the others of the valley. Therefore, with the rapidly advancing vegetation over the valley floor, nature will, within a very short time, have healed its own wound, and have covered from view a wonderful and spectacular sight.

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One of the justifications for establishing this area as a National monument, besides reserving it as a wonder of nature, was to prohibit natives and others from occupying the area, which, due to the great eruptions and possible repetition of the same, created great fears and tales of death suffered from this activity of nature. Both as a natural wonder, and fear of similar eruptions have passed and these justifications no longer hold. Since the original boundaries were established only on paper, there has been an enlargement, which includes the greater portion of the Naknek Lakes, and an apparently rich mineral area northeast of Mt. Katmai along the south coast to Kamishak Bay. This includes the greater portion of an area believed to be very favorable for mercury deposits and also several reported discoveries of gold. Due to the unfavorable climatic conditions, both in summer and winter, the entire area is unattractive for tourist travel or resort establishments. The restrictions in the monument are such that prohibit any economic acquisition or activity and prohibit settlement by individuals. Thus the extended boundaries prohibit settlers from the Bristol Bay area, who have a three-month working season, from settling in the Naknek Lake area, where natural opportunities are very favorable for a livelihood by trapping, hunting and prospecting. Further, the non-establishment of definite boundary lines is another factor which confuses the average settler and discourages prospecting and acquiring property.

The cabin built by the Geographical Society near the mouth of Iliuk River on Iliuk Arm of Naknek Lake is uninhabited. The trail from the cabin to the valley of Ten Thousand Smokes has grown up with abundant vegetation and cannot be followed with any degree of success. The east end of Iliuk Arm is very shallow and is becoming rapidly filled with pumice and sand, and the great silt content of the waters of Savonoski River, which empties at this point. Transportation to this point from Naknek via the Naknek River is limited to very shallow draft boats due to three miles of rapids below Naknek Lake.

July 4-5. Return to Naknek via boat. A few gold prospects were reported located on the shores of Brooks Lake. These were reported to be small and were not visited.

July 6. Mr. A. R. Davey of Naknek requested that I visit a supposed oil dome with him.

For a number of years several people in Naknek and surrounding area have been interested in what they term an oil dome, located on the Kvichak River flats at the head of Yellow River 15 miles north of its mouth in the Kvichak. Yellow River empties into the Kvichak River from the north at a point 22 miles down from its source at Iliamna Lake. Here, protruding above the level lowland area, is an elongated east-west dome, approximately 3,000 feet long and 800 or 900 feet high. Along the Yellow River, which drains from the south side of this dome, a few oil seepages have been reported by trappers and air pilots. Due to the accumulation of various reports on oil in the vicinity, it has led several to believe this structure to be an oil dome. Investigations as to reaching this structure showed the methods limited to either by canoe up Yellow River from its mouth, a trip requiring a week or ten days, or flying over by air and picking a lake to land on near the structure.

Since the writer was unable to arrange transportation facilities for further investigations on out the Peninsula, with the exception of airplane, which was very indefinite and expensive, a return to Anchorage was planned. Rather than make a special trip to this structure and return, the pilot agreed to circle the dome, and if conditions warranted, to land if possible. A complete circle was made around the dome by plane and a few 35 mm. slide pictures were taken. As the dome is approached from the south, it can be easily seen that there is no gentle rise of the surrounding section to the dome. Instead, the dome protrudes out of a nearly level lowland area surrounded by shallow marsh lakes. One lake on the north side is sufficiently large to land a plane, equipped with pontoons in summer and skis in winter. On the south side, the types or kinds of rock were undeterminable due to fine weathered products. On the central northern side a talus slide showed rather large angular pieces, representing more of an intrusive rock rather than sediments. From this evidence it is believed that the structure is a small stock intrusive, which has pushed up through existing sediments, and the latter worn away exposing the intrusive. This intrusive may have disrupted oil bearing strata and in forming fissures and fractures in the strata may have made the existing small oil flows. A few spots of oil film of minor extent were observed from the plane. However, these may be only vegetable oils of recent origin. The slides taken of this dome may reveal further information. A trapper in the vicinity has promised to send some samples of the black gravels and specimen pieces of rock from the dome. For this reason no stop was made, and further investigation will depend upon samples collected this winter.

Arrive Anchorage 6 p.m.