REPORT ON

THE ANIAK - TULUKSAK MINING DISTRICT

by

J. C. ROEHM

History of Mining Activities 1
Bethel 91 Granite Creek K-91-19. 8
Russ. Mission 81 Dugout Creek 12
91 Slate Creek 13
81 Ophir Creek K-81-4. 15
81 Bogus Creek No. 1 . . . . . K-81-27 . 19
81 Bogus Creeks Nos. 2, 3 and 4 . . . . . K-81-27. . 21
91 Dominion Creek K-91-2, 91-4, 91-10, 91-11, 91-12 22
91 Eagle Creek 26
91 Marvel Creek . . . . . K-91-1 . 27
91 Robin and Eureka Creeks . . . . . K-91-2, 91-4, 91-11 . 33
91 Salmon River . . . . K-91-3, 91-5, K-91-9, K-91-17. . 34

Lode Deposits 39
91 Granite Creek 39
91 Marvel Creek 40
81 Bear Creek 40
91 Fisher Dome 40
81 Tiny Creek 40

91 Fog River 41
91 Fisher Creek . . . . . K-91-16. . . 43
81 Tiny Creek . . . . . K-81-26 . . 46
81 Spruce Creek . . . . . K-81-10, 81-13, 81-14 . . 47
81 Bonanza Creek . . . . . K-81-5, 81-10 . . . 49
81 East Fork 51
81 Myrtle Creek 52

History of Mining Activities

The Aniak-Tuluksak district was of little interest to prospectors during the early stampedes of the gold excitement years. Gold was, however, found in the district prior to 1900, but due to the lack of bonanza deposits, unfrozen and wet ground, and general lack of associating placer gold with granitic intrusives, only a little prospecting was done. The first known stampede was one by dogsled following reports of the discovery of gold on what was then known as Yellow River by Pete McDonald in the lower Kuskokwim valley. The exact location of the Yellow River has not been definitely fixed. However, Ophir Creek on the north side of Mt. Hamilton, which flows into Whitefish Lake, contains abundant yellow granite sands and considerable prospecting was done here in the early days, and it is definitely believed to be the Yellow River of this stampede. Since this stampede did not come up to expectations, it soon ended and only a little prospecting was done in the vicinity.

William Fisher and party ascended the Tuluksak River in 1907 and 1908. They discovered gold on Granite and California creeks. The prospects were small and as a result they proceeded up Bear Creek where they found coarse gold and pay. The following year reports were to the effect that a prospector named Old Man Keeler had discovered gold up the Aniak River. A party of prospectors, H. Buhro, Kid Fisher and Fred Labelle followed Keeler up the Aniak and up Salmon River to the mouth of Dominion Creek. Here they found bar prospects, and built a cabin in which they spent the winter. In August of the following year, 1911, Buhro discovered coarse gold on Marvel Creek, a tributary of Fisher Creek

in the Salmon River basin. Mining immediately started on Marvel Creek, and the creek has had an intermittent production since. Prospecting continued in the vicinity of Bear Creek and gold was found on Tiny, Fox, Bonanza and Spruce creeks. The production from the Bear Creek operations from 1909 to 1914 amounted to $35,000. Marvel Creek produced from 1911 to 1914 over $20,000 and Tiny Gulch the amount of $5,000. The mining was all done by hand methods.

During the season of 1914 most of the claims on Bear Creek were optioned and a gas operated drill was placed on the ground. The presence of thawed gravels and water made the drill necessary to prove further ground. A dredge was proposed for the creek, depending on drill values.

In 1915 the war conditions show their effect, as the proposed dredge did not appear until ten years later. A total of sixteen men mined during the year on Bear, Spruce, Bonanza and Marvel creeks. The following year plans were made for drilling Marvel Creek with a view to installing a dredge. A shortage of water during the season resulted in a low production.

The years following from 1917 to 1920 were years of reduced scale mining with some continued drilling. In the year 1920 hydraulic plants were installed on Spruce and Tiny creeks, and mining continued on Bear Creek. These plants increased the production for a year or two and then fell to a small production. Discoveries of gold were made on Cripple Creek and its tributaries, Dome and Loco. Prospecting was the extent of the operations. Marvel Creek was active until 1925 in which year mining was discontinued. During 1925 a shortage of water suspended most

operations. The New York-Alaska Gold Dredging Company began construction of their No. 1 dredge on Bear Creek. A large tract of ground had been tested by drilling. The dredge, however, was not completed until June, 1926. This year the dredge operated successfully and the production of the district increased. The company acquired considerable of the bench ground between Bonanza and Spruce. A three-mile ditch was dug and a hydraulic plant opposite the dredge was operated.

Marvel Creek began operations in 1927 with hydraulic and a much larger production than heretofore was recovered. On Bear Creek the dredge was operated successfully. Considerable prospecting was done in the vicinity of Marvel Dome.

The following year the New York-Alaska Dredging Company greatly increased their output. Some very favorable ground was encountered off the limits of the drilled tracts. Dahl and Wilson, operators on Marvel Creek, had a good production for the year.

The dredge was inactive throughout the year 1930. The lack of efficient management plus bad dredging conditions have proven since to have been the major causes of this inactivity. Marvel Creek continued with a small production. The following year the dredging was resumed and in 1932 the yearly production for the district was estimated at $153,000, most of which was from the dredge. A new power plant was installed on the dredge and the capacity was increased. In 1933 the dredge and Marvel Creek operated with normal production. With the increased price of gold in 1934 the production in dollars for the district increased two and one-third times. New, efficient management increased

the output of the dredge, which accounts for the increase of gold production. With the success of the New York-Alaska Dredging Company's operation the year before, a new one and one-half cubic foot dredge was constructed in record time and operated the season of 1935 on newly developed ground on the Tuluksak River. This season was a favorable long one, lasting from April 10 to November 9, a period of 214 days. Due to lack of more favorable dredging ground on Bear Creek, and unfavorable bedrock conditions, the No. 1 dredge was dismantled in 1936 and reconstructed with a new hull on the Tuluksak River below the mouth of Bear Creek. During the winter of 1936-37 a new camp, known as Nyac, was built at the mouth of Shovel Creek on the right limit of the Tuluksak River. The Bear Creek holdings were idle with the exception of a lessee who operated with a hydraulic and scraper on Bear Creek above the mouth of Bonanza. The two dredges operated during the season on the Tuluksak with very favorable results. The company's holdings had expanded to a total of 182 claims.

The Bering Alaska Placers, Inc., under the management of Clarence Marsh, operated with bulldozer on Tiny Gulch. Geo. Martin did some mining at the mouth of Dugout Creek. Gus Wilson operated a hydraulic and steam scraper with very successful results on Marvel Creek. During the winter the New York-Alaska Gold Dredging Company optioned Ophir Creek and drilled several lines of holes. Plans were laid for the construction of a 1500 H. P. hydroelectric plant.

During the season of 1938 Gus Wilson had the best production on Marvel Creek which amounted to $75,000. At the end of the season his lease was sold to the newly organized Marvel Creek Mining Company organized by the Awe Brothers and H. DuRand of Flat.

The two dredges on the Tuluksak operated from May 3 to November 5. A new $30,000 bunk house was constructed during the summer. Enlarged bucket lips were used on both dredges, increasing their capacities to a total of over 5,000 yards daily. The company's holdings were expanded to a total of 243 claims. During the late fall months 2100 feet of ditch for the hydroelectric plant was dug and the power house was under construction. The option on Ophir Creek was dropped due to low drill returns. On November 5 the new bunk house burned with the loss of one life. Mining operations terminated due to cold weather and lack of housing facilities.

A91-19 During August of this same year Clarence Marsh discovered gold in paying quantities on Granite Creek. A total of 38 claims were staked. Mining with hydraulic and bulldozer immediately began and two months of profitable operation resulted.

Jim Davidson and associates, owners of several claims on Cripple, Dome and Loco creeks, optioned to Peck and Rice of Bethel. An airplane drill was flown to the property and several holes were drilled during the winter.

1939 marks a year of considerable increase in mining operations and interest in the district. A production of over $400,000 makes the greatest yearly production from the district since mining began. The

total mining operations consisted of two dredges, three draglines, and one small hydraulic with drag scraper. The three dragline operations were new this year, and two operated only part of a season. The drilling results by Peck and Rice on Cripple Creek were encouraging and machinery, either a dragline or drag scraper, is to be transported to the property during the coming winter. Gus Wilson reports pay in pits on Eagle Creek, and expects to continue his exploratory work. Extensive placer holdings by Anchorage interests have been taken up on Salmon River below the mouth of Cripple and on Fisher Creek, a tributary of Salmon River. These holdings have been leased and testing by means of a drill is expected for next year. New discoveries of gold were reported to have been made by natives on Kopechuck and Quicksilver creeks south of this district. Drilling was in progress on Dominion Creek during the summer. The New York-Alaska Gold Dredging Company operated both dredges during the season. The first unit of the hydroelectric plant, 500 H. P., was put into operation on July 14 and the dredges were transferred to electric power. Considerable difficulty was experienced with the power ditch, which was dug through spots of frozen ground. The company's dragline was put into operation on June 25 and operated the season. A new camp was constructed at the mouth of Bonanza Creek. Some road building was done between Nyac and Bear Creek. The Garrison Company landed their dragline on Granite Creek on July 2 and were started mining before the end of the month. The Marvel Creek Mining Company began operations at the early date of May 18 with dragline, hydraulic and bulldozers. A production of over $100,000 was reported mined during the season. This

again marks the year of greatest production for Marvel Creek. 1940 promises a season equal or even better than 1939. A new six-cubic foot dredge has been proposed for dredging the deeper ground on the Tuluksak River by the New York-Alaska Gold Dredging Company, but due to the various economic conditions, the construction of this dredge is not assured.

Refer to
Mineral Resources U. S. G. S.

Bethel 9.1

Granite Creek

KT 91-19

Granite Creek is a small tributary of the Tuluksak River, which it joins 8 miles below the junction of Bear Creek. Its drainage area lies in the western portion of the district. The length, counting its longest tributary, is 7 miles. The north and east forks join at a point 5-1/3 miles up from its mouth and form the main portion of the stream. The size of the flow at this point averages 10 feet in width and has an average depth of 6 inches. The east fork has the largest flow of water and, with the north fork, has a greater watershed than the other tributaries; namely, middle fork, Mary Lou Gulch, Willow Creek and two short intermittent streams. The total area drained by this creek and its tributaries comprises approximately 20 square miles. The elevation of the junction of the north and east forks is 880 feet above sea level and the mouth is less than 700 feet, which gives a gradient of nearly 58 feet to the mile. The tributaries above their junctions have steeper gradients, but they, like the main river, are comparatively low. The area drained is a well worn down basin with very gentle slopes and surrounded by gently rising mountains with elevations at their peaks ranging from 1500 to 2000 feet. The central portion of the valley is nearly 3 miles wide, and a noteworthy feature is that it narrows to less than half a mile in width where it leaves the basin and empties into the Tuluksak River. Evidence of glaciation is totally lacking within this basin; however, there exists frozen areas at the present time. The extent of

these areas is not known, but drill holes on the east side of Granite Creek were reported in frozen ground. It is evident from the extremely low flat benches, the shape of the basin, the unsorted lower gravels mixed with considerable granite sands, and the widespread abundance of iron oxides in the lowest pay gravels, that the basin was either a lake or bay of a large body of water prior to the glacial period. The gravels are covered with nearly 3 feet of thin bedded layers of fine silt and sand. Thus the present stream has been superimposed upon the lake bed, and gravels of older deposition. Thus near its mouth it is superimposed upon the coarse gravels of the Tuluksak wash. The sunken benches and stream bed of its former channels should be productive from the contact to the Tuluksak benches.

The geology of this basin is favorable for gold with its wide range of acid and basic rocks. The upper half of the valley occupies the southwest end of the main mass of soda granite. This granite is soft, weathers rapidly, and has produced an abundance of granite sand that occupies the basin. The lower half consists of the various lavas, that range from rhyolites to basalts. Near the contact the lavas are fractured, schisted and mineralized. In the first cut mined, one mile up from the mouth and on the right limit, the bedrock is a fractured rhyolite. This is somewhat weathered, hard with the exception of some soft gouge slips, and the fractures are mainly filled with mineralized quartz. Surrounding the contact of the granite an extensive mineralized zone occurs. The gradual wearing down of this mineralized zone is believed to be the source of the placer gold. The gravels are medium small to fine,

mainly angular, distinctly water laid in distinct bands, and containing abundant granite sands. The larger rocks range up to 4 inches in diameter. They consist of various kinds of lavas and granite contact rocks, that are found outcropping surrounding the basin. In the opencut which is directly below a low flat bench, the gravels are 4 feet thick and are covered with an equal depth of silt, sand and tundra. Generally, the gravels both on the benches and near the creek bed contain considerable granite sand and sufficient iron oxides to color them reddish brown.

The gold is fine, rough, and has a shotty nature. A few small nuggets are occasionally found, but are not common. The first cut mined in 1937 by Clarence Marsh with hydraulic and bulldozer averaged 35 cents to the bedrock foot. How far the pay will extend up the creek remains to be determined. Above the junction of the north and east forks large granite boulders are present in the creek bed. Below this junction values may be encountered. Mary Lou Gulch, flowing across the contact, may contain pay.

Fine colors of gold were discovered on Granite Creek prior to the discovery on Bear Creek. However, due to the fineness of the gold and the granite sands, further prospecting was not attempted. One shaft was sunk below the junction of the east and north forks on the left limit within 200 feet of the present creek. Water was apparently hit in this shaft and whether or not bedrock was reached is not known. The dump is very small and consists of granite sands. Clarence Marsh panned gold from the gravels of the low benches near the site of the hydraulic

shown on sketch No. __ during the summer of 1938. He started mining with bulldozer and hydraulic and mined until freeze-up, a period of two months. The shallow gravels were bulldozed into boxes and the tailings were stacked with a nozzle. A total of 27,000 bedrock feet were mined, however, the bedrock was not well cleaned, and 237 ounces of gold was recovered. The following fall Marsh leased the entire holdings to Vance Garrison. The latter organized the Garrison Company. This company landed a 5/8-yard dragline on the property on July 2, 1939 and started mining one shaft on the 14th of July. Due to lack of labor and oil, the company operated one shift until fall and produced $15,000. Hard bedrock reefs were encountered and gold was found distributed on the benches, which bench off to the deeper Tuluksak valley. The company's prospects for the coming year are better, however, further drilling is recommended.

Dugout Creek

Dugout Creek is a small creek 2 miles in length and located 4 miles above Granite Creek on the right limit of the Tuluksak River, 3½ miles below Bear Creek. The elevation at the mouth is less than 900 feet and it starts at an elevation of 1500 feet. The valley is narrow and the walls steep. The upper portion of the valley contains granite sands mixed with rocks and boulders. The central portion shows angular rocks in the stream bed. Both the upper and middle portions lack known placer deposits and working conditions are unfavorable. The lower 500 feet has been worked and contained a small placer concentration. This concentration has been formed from a reconcentration of the bench gravels which are in evidence immediately above the mouth of Dugout on the right limit of the Tuluksak River. This deposit of gravel represents a remnant of old higher bench deposits formed by the Tuluksak River and is 50 feet higher than the present creek bed and ranges up to 30 feet in depth. These gravels were apparently gold-bearing and since the lower portion of this remnant was cut by Dugout Creek, a reconcentration formed.

The Bering Alaska Placers Company mined with bulldozer this section from the bedrock rim up Dugout Creek for a few hundred feet. Some gold was recovered. Prior to this operation, Geo. Martin in 1936 groundsluiced a portion of the high bench and obtained 20 ounces of gold. Apparently, the reconcentrated area in the basin of Dugout was very small and the old bench gravels did not pay. In the Tuluksak valley opposite the mouth of Dugout, good dredgable values were obtained, which included minor amounts of platinum.

The bedrock at the mouth of Dugout shows hydrothermal action across a narrow belt of igneous rock enclosed in hard greenstone lavas. Dugout Creek apparently follows a fault zone formed by the soda granite intrusive near the head. This fault zone near the mouth contains a small intrusive, which is apparently related to the granite, and which has been subject to considerable hydrothermal action and has been distinctly altered. It is greenish gray in color and weathers to a brownish red material similar in color and composition to the weathered products of the soda granite. This small injected mass, which also apparently extends under the Tuluksak valley, may have been one of the later phases of the intrusive and contributed to the placer gold deposition. The origin of the platinum, other than from the basic lavas in the vicinity, is unaccounted for.

Slate Creek

Slate Creek, the next tributary of the Tuluksak River on the south side 5 miles below Bear Creek, has a length of 12 miles. The head consists of several small steep creeks which originate at an elevation of 3200 feet on a high ridge directly west of Mt. Plummer. The creek drains the western slopes or foothills of the larger mountain mass to the east. Its tributaries do not cut into the granite mass and no intrusives were noted along its course.

The formations noted along its course, which it cuts at nearly right angles, consist of slate, graywacke, small areas of pencil slates, sandstone, and in the lower portion, greenstone lavas and tuffs. The lower portion of the creek leaves the sediments and cuts directly across the wide structural valley formed by the contact of the sediments and lavas, with a tributary from each direction. The stream is comparatively young and has been superimposed on top of the older drainage on its lower section.

Gold has been found on lower Slate Creek by drill holes of the New York-Alaska Dredging Company located up from the mouth. The section in which the gold was found is located in the Tuluksak valley, the gold apparently having been reconcentrated from Tuluksak valley gravels. Above, on Slate Creek, geological conditions are not favorable for placer deposits.

Russian Mission 81

Ruby

Ophir Creek Pt 81-4

The history of the activities on Ophir Creek, with a detail description of the creek, is given in U. S. G. S. bulletin 622.* From this description most of the following has been compiled. Ophir Creek originates on the northwest flank of Mt. Hamilton and flows slightly west of north for a distance of 15 miles into Whitefish Lake. The elevation at the head is 2,000 feet and at its mouth 250 feet, which gives a total descent of 1750 feet with the first thousand feet confined to the upper three miles. Below the steep section the creek flows for several miles with a fall of 200 feet to the mile through the foothills and thence meets the Kuskokwim lowlands over which it flows with a very wide valley to Whitefish Lake. Four small tributaries join from the west and two from the east. Pass Creek and Hot Springs Creek are the upper two tributaries from the west and geologically the most important. These tributaries originate within the boundaries of the soda granite intrusive on its northeast end, and have fed Ophir Creek with an abundance of yellow granite sands which show in the creek bed over its length. Pass Creek, the upper tributary, is steep and contains numerous granite boulders. Hot Springs Creek is so named from the presence of hot water springs which occur on the left limit. The two other west side tributaries are reported to be four miles in length and flow into Ophir Creek three and five miles below Hot Springs Creek. These creeks were not examined and since the mountains from which they originate appear to be all greenstone, they were not considered inportant. The east side tributaries were not

*See bibliography.

examined, but were observed from the air. Louis Creek, the lower of the two creeks, has a large drainage area directly to the east of Ophir Creek. Below the mouth of this creek the New York-Alaska Gold Dredging Company obtained the highest values of the five lines of drill holes drilled on the creek. This line averaged 20 cents per yard, as shown by the drill records. Louis Creek has not been prospected. No granite within the basin was observed, however, small local patches may occur and this creek may be one of the feeders of Ophir Creek. The drainage area, mainly in low foothills, was estimated from the air to be seven or eight miles in length. Eight placer claims are held on this creek beginning at the mouth.

Ophir Creek flows in its upper portion in a normal stream valley of moderate relief. The lower portion flows over an extensive wide valley and the flat lowlands. In fact more than half of the creek from the mouth up is superimposed upon the flat silt and gravel deposits formed by the delta building of the Kuskokwim River. One would not expect this lower portion to contain profitable placer deposits due to the mixing of the stream deposits with the abundant delta deposits.

Erratic values have been found on the upper portions of Ophir Creek, since its discovery in the winter of 1901-2. In 1913 the creek was staked for a distance of 10 miles. Both a lower and upper Discovery claim were staked and considerable prospecting was done during the following winter. Several holes were sunk, some of which were in frozen gravels and reached bedrock at depths ranging from 23 to 38 feet on the

lower Discovery section. Several other holes were sunk, but did not reach bedrock due to water. Holes were sunk on the upper portion with depths to bedrock ranging from 12 to 15 feet. The five drill lines by the New York Alaska Gold Dredging Company, which were drilled at one-mile intervals and extended for five miles, show an average depth to bedrock of 18 feet. Assessment work has been done on a large group of claims since 1913 and this work has consisted of further test pitting plus a small amount of drilling. A four-inch drill has been on the property since 1913, but very little drilling was done until 1938-39. This latter drilling was done with the idea of blocking out sufficient ground for a dredge. The lines were therefore a mile apart. The total values from the five holes were far below dredging values. Thus this creek is not considered favorable for dredging. This bears out when the lower section of the creek is considered as the mixing of the stream deposits with the abundance of silt and delta deposits. To consider the upper portion, the amount of ground which could be dredged, considering the grade, is limited.

Apparently, the values have not been of a high enough tenor to sustain hand methods of mining, and where spotty values have been found on the upper portions there is not sufficient water for hydraulicking. There is, however, sufficient water for machinery operations other than hydraulic.

Thus the amount of drilling and prospecting taken as a whole does not definitely prove that economic placer deposits do not exist.

First, a good portion of the upper section of the creek is wet ground and has not been pitted or drilled. This is the portion in which the better values would be expected on this type of creek. The scattered pits that were sunk, the most of which did not reach bedrock, do not prove the non-existence of pay. The five lines of drill holes, some of which were on the lower section, are not sufficient lines to accurately test all portions of the creek. The tributaries are unprospected. Again, on this type of creek the values are not distributed evenly over its entire length. Geologically, the upper portion of Ophir Creek is favorable for placer deposits. It has two known tributaries which originate within the borders of the soda granite. The valley contains no glacial features. Bench and bench deposits appear to be lacking. The greatest concentration is to be expected in the present creek bed valley or confined to a zone at right angles to the course of the creek at a point where the steeper grade coalesces with the flat of the lowlands.

The creek is easily accessible to transportation in winter only, as machinery and supplies could be freighted from the Kuskokwim River over the frozen lowlands via Whitefish Lake. A few small scattered spruce trees are found in the central portion of the valley. A total of 63 claims are held on Ophir and Louis creeks.

With the fact already known that coarse gold occurs in several spots on the creek, the lack of thorough testing, and with the present methods of operation, a small area of profitable placer ground may be proved with further exploration.

R Stan Mission 81
Loehm

Bogus Creeks KT 81-27

Bogus Creeks Nos. 1 to 4, inclusive, are more or less parallel creeks that flow westward from the foothills across the low tundra flats or undrained delta of the Kuskokwim River between Whitefish Lake and the Tuluksak River. The heads of these creeks are small tributaries with small drainage basins occupying small valleys on the west slopes of the hard greenstone lavas which comprise the hard outer shell of the Tuluksak granite intrusive. Out from the foothills where the valleys meet the lowlands the creeks take on a meandering course and are not confined to definite valleys. They are creeks superimposed upon an undrained flood plain consisting of silts overlying gravels deposited in part by the Kuskokwim River and in part by shallow sea waters. Placer gold deposits would only be expected in the upper portions of the creeks, where they are confined to their channels between the foothills. And again only on those creeks which have cut through the greenstone lava to the soda granite intrusive. This latter condition was found on only Bogus Creeks Nos. 1 and 2.

Bogus Creek No. 1: KT 81-27

The entire length of Bogus No. 1 Creek is not known, but from its head to where it meets the flat lowlands at the foot of the foothills its length is eight miles. Over this distance the creek has three short tributaries, one on the north side and two on the east side. The head starts one and a half miles in the granite mass, flows southwesterly, thence turns at the contact and flows through a narrow high walled valley

for a mile and a half in which it is joined by its north tributary. It then enters a wide structural valley and flows southwest for five miles, where it leaves the valley and starts a general westerly course over the lowlands. The head is at an elevation of 1200 feet, and at a point where the stream leaves the structural valley, the elevation is less than 500 feet. This gives an average fall of 87 feet to the mile. The greatest amount of this fall is found in the upper two miles.

Placer gold has been reported to have been found in Bogus Creek valley, as mentioned in U. S. G. S. bulletin No. 622.* The location of the shaft mentioned was not found. Reports by prospectors mention six holes that were sunk by Tony Sami to bedrock on the right limit of Bogus No. 1 below the granite contact in the steep walled valley. He is reported to have obtained coarse gold. The depth to bedrock was not learned. George Wickard reports sinking one hole on Bogus Creek where he obtained pay. The location of this hole is not known.

During the spring of 1939 Clarence Marsh panned gold on upper Bogus No. 1 Creek above the contact. Several claims were staked. The upper mile and one-half contains granite rocks and boulders and would not be workable unless high values were recovered. The bedrock below the granite contact is apparently the various lavas and tuffs. The creek over the length explored contains abundant granite sands and the under gravels were not observed. The depths to bedrock are not known. Due to the presence of the granite sands, and the few varied discoveries that have been made, further exploration on the creek is warranted.

*Refer to bibliography.

Bogus Creek No. 2: 81-97

Bogus No. 2 Creek lies north of Bogus No. 1 Creek and its south tributary nearly connects with the north tributary of Bogus No. 1. The length from its head to the point where it joins with the lowlands is nearly two miles. Over this distance the creek drops 300 feet. The upper half mile accounts for most of the fall. A small tongue of the large granite mass to the east has broken through the hard lava shell between the upper two forks of this creek. There has been considerable granite erosion into the valley of this creek. These upper two branches each have a length of three-fourths of a mile.

Reports from prospectors state that gold has been panned from this creek, but no test holes were reported. Considerable granite sands show in the creek bed. The upper two miles of this creek warrant further testing.

Bogus Creeks Nos. 3 & 4: 81-97

Bogus Nos. 3 and 4 creeks are located north of Bogus No. 2 and flow from minor depressions wholly in the greenstone lavas onto the lowlands. Neither creek cuts back to the granite contact. As a result neither are favorable for gold placers.

During the winter of 1938-39 Geo. McDaniels and Tom Seckinoff sank a few pits on the upper forks of Bogus No. 4 Creek and found only traces of gold.

Bethel 91

Dominion Creek K+91-2 K+91-11
91-4 91-12
91-10

Dominion Creek occupies a large drainage basin on the eastern slopes and foothills of the high range extending north from Marvel Dome and Mt. Plummer. Its headwaters are directly opposite the headwaters of Myrtle and East Fork creeks which drain into Bear Creek from the east. The length of Dominion Creek is slightly over ten miles. Its two largest tributaries are Eureka and Robin creeks, each described separately. The upper head tributaries of Dominion have wide U-shaped deep valleys, showing the existence of small alpine glaciers. These were undoubtedly a portion of the small ice cap that formerly existed around the higher portions of this ridge. The tributaries join in a large valley and flow southeasterly into the Salmon River. Seasonal moraines are very evident in the upper portion of the valley. The lower section is occupied by level outwash plain deposits which fill the lower portion of the valley and through which the creek has become entrenched. The glaciers, which existed at the heads of Robin and Eureka creeks, have pushed out abundant material into the Dominion Creek valley, which in turn has been partly leveled off by outwash waters. So abundant has been this glacial material that Dominion Creek below Robin has been pushed onto its left bank, which it has been cutting since glacial times. It has, however, become entrenched in the outwash gravels and across the width of the entrenchment a minor concentration of glacial gravel has occurred.

From the various values of gold that have been found mainly in scattered localities, it appears very evident that placer concentration existed prior to glacial times. Both Robin and Eureka head directly off the Marvel Dome granite which fed Marvel Creek. Evidence of ice in the

upper portions of the valleys shows that the ice disrupted these deposits, mixing the gold with the glacial debris and pushing it down the valleys. Other than a few drill holes, a cross-section of the gravels below the outwash top gravels has not been observed. In other words, there may have been prior to the last glacial evidence a former and more extensive glaciation further down the valley, which disrupted the lower gravels, and which in turn has been obliterated by the later. Should this condition be true, one would not expect to find the former concentrations intact. The other condition would be the opposite--that there was no extensive glaciation prior to the last, and that the last moraines of the present ice mark the terminal moraines below which the original concentrations have been buried by the overflow of the outwash gravels. The following drill results show evidence of both conditions, however, there has not been sufficient exploration for an accurate determination.

Gold was found on Dominion Creek in 1910 by Fred Labelle, Bud Fisher and H. Buhro. The creek and its tributaries have been intermittently prospected since. Several claims have been held and due to the wet gravels, only prospecting by drill has revealed definite information. The New York-Alaska Gold Dredging Company drilled a line of eleven holes at one hundred feet intervals, three-fourths of a mile above the mouth of Eureka Creek. Very small amounts of gold were reported to have been obtained.

Frank McDougal and associates hold a total of 26 claims extending from Discovery, one mile below the mouth of Eureka, 4 claims above and 9 below, with several bench claims. This association has drilled a total of 50 holes and dug several cuts. This drilling represents seven crosscut lines, 1,000 feet apart extending from claim No. 1 above to No. 4 below. The average depth to bedrock was reported as 14 feet. The bedrock varied from tuff and sandstone to shale. The highest values were obtained from the No. 1 line of holes across 600 feet on the upper end of claim No. 1 above. Values were reported ranging from 25 to 90 cents per cubic yard. The next best line of holes was the one below. The lines revealed a narrow belt through three drill lines that contained dredgable values. One frozen area was encountered. Clay was found extending to bedrock mixed with the gravels. The values have a spotty tendency. From the 50 drill holes a total of 20 gave values above 35 cents per yard and 12 holes gave only traces. The coarse gold was found on the northeast end of the drill lines. Generally, the gold recovered from the holes was flat and rather flaky with a few coarse pieces. Some holes contained considerable black sands and other holes only small amounts. Two runs of gold were reported, a light yellow gold at a depth of 5 feet and reddish gold on bedrock.

H. N. Hansen was operating a five-inch drill on bench claims opposite McDougal's ground on the right limit below the mouth of Eureka Creek. From a total of 17 drill holes, in which the bedrock ranged from 14 to 20 feet, only three in one small area contained pay. On Discovery

bench claim, opposite Discovery claim on the right limit of Dominion Creek, one long cut had been groundsluiced. This cut, 80 feet in length, had a depth ranging from 20 to 40 feet. Glacial gravels with numerous rocks were exposed to near the bottom, where a stratified gravel of finer nature was found. A small amount of gold was recovered from the glacial gravels and the lower stratified gravels were reported as containing only traces. Bedrock was not encountered in the cut.

Eagle Creek

Eagle Creek is a creek 12 miles in length, which originates on the south side of Mt. Plummer and flows southeasterly for a distance of 7 miles thence turns east and flows into the Salmon River. Over its entire length it has a drop of 800 feet. Its largest tributary is Marvel Creek, which flows into Eagle from the north 2 miles up from the mouth. Its next largest tributary is Wilhemina Creek, a tributary from the southwest, which originates near the vicinity of Fisher Dome. This creek joins with Eagle 1½ miles above Marvel Creek. The upper portion of Eagle Creek is confined to a normal large structural valley located between two high mountain ridges. It has several short tributaries. Evidence of direct glaciation is lacking in the valley, and is accounted for by the fact that the valley is on a southern slope and the sun's action thawed the yearly snows.

Marvel Creek, its longest tributary, has been the only producing creek which is accounted for by its position directly off from Marvel Dome. The easterly tributaries of Eagle Creek have cut only slightly into the hardened shell that surrounds Marvel Dome. These have cut numerous porphyry dikes which extend through this shell and as a result some gold has found its way down Eagle Creek. While several test pits have been sunk on Eagle Creek over its course, it was not until last year that pay was reported. This was from a few pits sank by Gus Wilson on the left limit below the main upper tributary from the east. The lower section below the mouth of Marvel Creek no doubt contains an overflow of fine gold from Marvel Creek. Since this section has not been tested, its values are unknown.

Bethel 91

Marvel Creek

K491-1

Marvel Creek, the largest tributary of Eagle Creek, has a total length of nearly six miles. It heads on the south side of Marvel Dome at an elevation over 3,200 feet, and flows south off Marvel Dome, turning east and following the contact of Marvel Dome granite and thence turns nearly south, joining Eagle Creek at an elevation of 2,100 feet. The Marvel Dome granite, as discussed prior in this report,* appears to be the source of the placer gold. The history of mining operations has been discussed under history of operations.** The upper mile and one half of the creek is steep and flows through Wild Horse Canyon which is partly filled with granite and hardened sedimentary rocks and boulders. As the creek turns southerly and leaves the contact, the grade becomes considerably less, approximately 100 feet to the mile. This course cuts across the strike of the sediments and due to the hardened effect of the intrusive on the sediments, they gradually change from hard quartzites and slate to sandstones, argillites and shale in the lower portion. The result of Marvel Creek cutting across the strike of these hardened sediments has been that the major portion of the gold has been held on bedrock with the hardened argillite and shale bands acting as riffles. The sediments are considerably contorted, close folded, and slightly mineralized. Small quartz stringers were noted in the sediments in the cuts. These were only slightly mineralized and low values in gold were reported obtained by assay.

*Op. cit. page __

**Op. cit. page __

Marvel Creek has four short feeders, three on the right limit and one on the left below Wild Horse Canyon. These tributaries have at their mouths good pay. This pay has not been the result of the tributaries acting as feeders, but as low indented basins which held some of the gold and which were in turn, due to their location, not disrupted by the mud glaciation. The valley at the head of Marvel Creek is rather larger, but lacks evidence of direct glaciation, as compared to Robin or Eureka creeks. The valley below Wild Horse Canyon also lacks evidence of direct ice action. There is, however, considerable evidence that shows that an ice cap formed around Marvel Dome and the surrounding high mountains. The southern slope occupied by Marvel Creek caught sufficient of the sun's rays to retard an active glacier from moving down the valley. This effect produced considerable water, which agency again contributed to further concentration of the gold. During the melting stage of this ice cap, which was possibly brought on by extreme weather conditions, a mud glacier formed and moved rapidly down Marvel Creek. This mud glacier consisted of a general mixture of mud, boulders, various sized rocks and boulders, and it was saturated with water to the extent that it started a flow. This flow, which appears to have been over a considerable portion of the valley, had great force. It acted, as does a swollen river, cutting the insides of the bends, and was most intense in the central portions of the valley. In fact the action sluiced out most of the intact pay gravels, leaving only narrow sections or widths of them intact, mainly on the outside of the bends and on the low benches. A portion of

the gold was apparently held by the rough fractured bedrock. The action by the glacier scattered the gold contained in the original pay gravels and mixed it with greater amounts of gravel and rocks. Normally, where the best pay would be expected, it has been found to be the lowest. However, places in the main valley floor as low basin indentures were overridden and sections of the original pay were left intact. (Note Picture No. __ showing upper gravels unstratified and lower gravels stratified). Since the action of the mud glacier, the present creek has reconcentrated a portion of the upper gravels.

The upper and greater portion of the gravels are unstratified, mainly coarse, and contain large rocks and a few scattered boulders. This strata is overlain with 1 to 2 feet of tundra, 1 to 2 feet of sand, and in itself varies from 8 to 12 feet in thickness. Below this strata 3 to 5 feet of a well stratified well sorted medium to fine gravel is found on the right limit benches of the Camp Robber and Pioneer claims. This lower strata contains the highest pay and is lacking in the sections cut by the mud glaciation with some exceptions.

Only within the last three years has this condition been realized by the former operator. The result has been a greater increase of production, however, it was also realized that these higher pay gravels are limited. Thus with a condition of scattered pay ranging from high to low, the method of mining has through a process of evolution, starting with hand methods in small localities, developed to the present method

of a combination of dragline, hydraulic and bulldozer. This latter method, made possible by the increase of gold price, plus a greater increase in capacity, and lower operating costs, has resulted in plans for a reworking of all the gravels, including the high and low pay with a reworking of the tailings of former operations. Thus, the reworking of the numerous tailing piles will result in the recovery of additional gold that was not recovered in the former methods due to the presence of considerable clay in the gravels.

The Marvel Creek Mining Company (Awe and Durand operation) leased the original claims, consisting of the Ready Money, Wild Horse, Hornet, Yellow Jacket, Camp Robber and Pioneer, plus other bench claims, in the fall of 1938. The owner of these original claims is Luther Hess of Fairbanks, Alaska. On May 18, 1939 this company began mining on the right limit of Marvel Creek on the Camp Robber claim with a combination of hydraulic, bulldozer and dragline. The procedure followed consists of hydraulicking and bulldozing off the tundra and an upper portion of the gravels. Below the central portion of the cut a bedrock drain is dug, in which 40 or 50 feet of boxes are set to grade and below which the sluice water migrates back into the stream through a bedrock drain. This is dug with dragline. Thus mining begins with bulldozer pushing material up to the boxes, where a hydraulic nozzle pushes the material mixed with water through the boxes. The dragline continually dips at the end of the boxes and elevates the coarse material onto a tailing pile. Larger rocks which are not moved by hydraulic through the boxes are also picked

up by dragline and dumped onto the sides. This method, where hydraulic water is available without pumping, has been found advantageous in mining greater amounts of gravel with less cost than the use of elevated boxes. Cuts with dimensions of 250 by 300 feet have been found the most economical to work with this method. On these lower claims, where the shale-argillite bedrock has not been hardened, the bedrock drain is easily dug with dragline. Above, where the bedrock is harder, the drain will apparently have to be drilled and blasted.

The company has as equipment a yard and a half dragline, two caterpillars with bulldozers, a 15-ton trailer, several thousand feet of hydraulic pipe and several giants, several feet of steel boxes with both rail and hungarian rubber riffles, and necessary camp equipment consisting of welding outfit, machine shop, light plant, radio transmitter, etc. The cost of machinery and equipment plus freight and the cost of obtaining the lease, makes an investment of over one hundred thousand dollars. All heavy freight and the greater part of the supplies are hauled by tractor and sled during the winter season via winter road from Aniak on the Kuskokwim River. Summer transportation is dependent on airplane at a cost of 8 cents per pound from Bethel.

Since this is the first season of operation, and in a new section, the cost of mining is not known. The company has not developed ground ahead to determine the average values. The cuts thus far mined have been very erratic--some exceptionally good, others not paying expenses. The total production for the year was reported to be over a hundred thousand dollars.

The character of the gold, like its distribution, varies in certain localities on the creek. In some cuts where older gravels are intact coarse heavy gold is obtained with nuggets up to ten dollars. In cuts where the older gravels are lacking light flat gold, having much the appearance of bran flakes, is obtained. This latter gold is rather disappointing when it is weighed. The fineness of the gold of both types ranges around 850. The two types of gold and their positions also point to the localities that have been subject to mud glaciation. The flat light flaky gold has no doubt been subject to glaciation.

Black sands consisting of magnetite, hematite, and other forms of iron oxides are present in medium amounts. Pyrite, associated with the mineralized sediments which form the bedrock, is common.

Thus the future mining on Marvel Creek will depend upon the amount of older pay gravels which are intact. The amounts of these gravels are not known, due to the fact that drilling or test pitting on a systematic scale has not been done. Only the present and past operations can be taken as indications of values as a whole.

Bethel 91

Robin and Eureka Creeks

12-91-7
91-4
91-11

Robin and Eureka Creeks head from Marvel Dome in glacial cirques, with Robin Creek situated on the north side and Eureka Creek on the east. Glacial moraines and boulders are very evident in the upper sections of the valleys, while the lower sections contain a leveled outwash topography. Both creeks, at their junctions with Dominion, have formed a large delta shaped alluvial fan formed by the large amounts of glacial material thrust out into the Dominion Creek valley. Robin Creek has a length of 5 miles and Eureka a length of 6 miles. Considerable prospecting was done on these creeks in the early days of the district, since they both have their origin off Marvel Dome, as does Marvel Creek. The glacial condition, wet ground and boulders made prospecting difficult. Only the lower portions of both creeks have been leveled off with outwash plain waters and offer favorable mining conditions providing pay is found. A few pits have been sunk on lower Robin Creek with low erratic results. Three drill lines were put down on Eureka Creek above the mouth at 1,000-foot intervals by McDougal and associates during the winters of 1937-38 and 39. The bedrock consisted of tuff, slate and sandstone with depths ranging from 17 to 18 feet. Gold was reported found, but not in paying quantities. Due to the extensive glacial action and the covering of glacial debris on these creeks, a very unfavorable condition exists for the occurrence of placer deposits. The exceptions to this would be a former channel in the lower sections, which may have possibly escaped direct ice action and have been covered with glacial debris. To date no known conditions of this type have been discovered.

BETHEL 91

Salmon River K+91-3, K+91-4, 91-5, 91-17

Salmon River is the second largest river in the district with a total length of 60 miles. Its drainage basin with its numerous tributaries drains the southeastern portion of the district. On the accompanying sketch map a length of 12 miles is shown which represents a portion of its middle section. The upper tributaries which form the head rise in a high plateau of which the central core is an extensive granite mass. The tributaries begin at 3,500 feet and fall fast to the wide extensive low valley which it occupies to below the mouth of Cripple, its largest upper eastern tributary. Below the mouth of Cripple the valley narrows to 2,000 feet in which it is intrenched from 20 to 30 feet in bedrock. This intrenchment gradually becomes less to below the mouth of Dominion where Salmon turns more northeast and leaves the low foothills and flows forth upon the low extensive valley of the Aniak River which it joins at an elevation of 250 feet. The tributaries of Salmon River above the mouth of Cripple are not named. Below Cripple only the larger ones have names, and they are in order proceeding downstream--Bell, Fisher, Eagle, and Dominion creeks. Generally, the river flows in a northeasterly direction. It is a clear water stream, is navigable with small poling boats, and is subject to considerable increase in volume during the spring months.

Several of the upper tributaries of Salmon and Cripple, which originate from the high granite plateau, have their heads in small glacial valleys. The glaciers were of alpine type and terminated on the lower

valley floors. However, the amounts of material which these small glaciers contributed to the valleys were great. This material during the run off of the melting stage moved further down the valleys and were deposited as outwash. Into these outwash gravels the present streams have intrenched, cutting through the gravels and into bedrock. Cripple Creek and its tributaries drained a greater portion of the northern side of the plateau and received the greater portion of the glacial action. Above the mouth of Cripple in the Salmon River valley, known discoveries of gold are lacking. The valley is wide and comparatively flat with a few low long benches. Whether these have been prospected is not known. Evidence of glaciation in the main valley is lacking, however, the main valley floor at the mouth of Cripple shows outwash material.

K+91-9 Gold has been known on Cripple Creek and two of its tributaries, Dome and Loco, since the early days of the region.* Considerable of the gold found on the benches of Salmon River below the mouth of Cripple is believed to have been transported, mainly with the outwash gravels, from the Cripple drainage basin. A description of Cripple Creek and its tributaries is contained in U. S. G. S. bulletin 622, pp. 347-351.** Since the activities mentioned in the above report, very little prospecting has been done.

Following the increased price of gold in 1934 the old locations were restaked by Jim Davidson and associates. The group of claims held is extensive, extending from the mouth of Cripple to above the mouth of Loco and up Dome and Loco. The entire group has been optioned to Peck and Rice of Bethel. Several pits were sunk and two seasons of drilling

*Op. cit. page __.
**See bibliography.

has been done with encouraging results. A machinery operation is to start during the coming season.

The valley of Salmon River below the mouth of Cripple, as shown in the southeastern corner of Plate No. __, has a width of 2,000 feet within which the river is intrenched. Within the intrenchment a width ranging from 100 to 150 feet of shallow gravels and short shallow bars are common. The river itself runs close to bedrock. Due to the grade and swiftness of the water, and unequal volumes of water, concentration of gold would not be expected within the intrenchment. The river cuts the closely folded argillites at nearly a right angle. These sediments are locally mineralized and contain small diabase dikes parallel to the strike. A coarse wash gravel has been deposited over the main valley floor, which ranges from 6 to 9 feet in depth. The bedrock on the rims pans considerable fine flaky gold. This fine gold, with occasional coarse heavy pieces, was found to extend from the mouth of Cripple for a distance of nearly 5 miles. The valley in this section appears not to have been actively glaciated, however, the heavy coarse gravels are outwash glacial material. The greater portions of these gravels appear to have been deposited during the melting stage and run off periods of the glaciers from Cripple Creek. The rough hard argillite bedrock with its strike nearly at right angles to the stream, acted as natural riffles for the gold. A greater portion of the gold is contained in the bedrock associated with black sands and pyrite and is held intact with a clayish silt.

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 shows 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 one nozzle 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 intrenched 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.

Russian Mission 81

Rochm

Lode Deposits

There are neither developed lode prospects within the district covered by Plate No. __, nor are there any lode claims held at the present time. Formerly a few lode claims were staked on the divide between Bonanza and Bear creeks near their junction. On this point at an elevation of 1700 to 1800 feet a mineralized zone 300 feet wide is exposed striking nearly east-west for two claim lengths. Monuments of former stakings, along with several partly filled cuts, which represent the total amount of work, are still in evidence. This zone contains a disseminated mineralization contained in fractured and highly altered lavas. The metallic minerals noted were pyrite and arsenopyrite which were reported as carrying low gold values. Considerable ~~silver~~ silica is present in minor segregations scattered as irregular masses and disseminations within the zone, however, definite veins or stringers are lacking. The lavas have been considerably altered and fractured, and are in close proximity to the granite which underlies, and which is exposed in the creek beds of both Bonanza and Bear. Since the cuts all show only disseminated and mineralized material of a low grade, and in the absence of promising float, no samples were taken.

In the hydraulic cuts on Granite Creek, as mentioned under Granite Creek,* small irregular quartz veinlets were noted in a fractured rhyolite. These are mineralized and believed to be gold bearing. Small quartz pieces with free gold attached have been found during the panning of concentrates on this creek.

*Op. cit., page __.

Small quartz stringers and veinlets were noted in the cuts on Marvel Creek. These were slightly mineralized and were reported to have contained low assay values.

The mineralization accompanying the various dikes consisting of pyrite and arsenopyrite does not contain sufficient gold values to mine. The hardened sandstone bands, altered to graywacke in the vicinity of Fisher Dome, contain numerous quartz filled fractures mineralized with pyrite and arsenopyrite with traces of copper. The only other metals present in the district are small amounts of silver associated with the gold, platinum in small amounts that has been recovered associated with the placer gold, and small amounts of cinnabar that is recovered in the concentrates on Bear Creek. These have not been found in place. Indications of malachite and chalcopyrite were found in greenstone lavas at the head of Tiny Creek, but not in sufficient quantities to warrant prospecting.

Gold lode deposits may, however, exist and may be found in the future. Outcrops and indications are lacking throughout the district. Quartz float rocks are not common among the gravels. Due to the great extent of erosion to which this district has been subject, it has no doubt worn away many veins that may have existed in the upper portions of the granite stocks. The sediments, due to their folded and contorted structure, are not favorable for continuous veins. The lavas and interbanded tuffs lack on the whole favorable structure. Thus the search for lode deposits within the district is not likely to bring favorable results.

Bethel 7/

Fog River

Fog River has a length of nearly 40 miles, and it is the longest tributary of the Tuluksak River which it joins 10 miles above the latter's mouth. This river drains a considerable area consisting mainly of foothills in the southwestern portion of the district (Note Plate No.__). Two large tributaries called the northeast and southeast tributaries join to form the main river 20 miles above the mouth. The southeast tributary heads in the same vicinity as Salmon River and flows northwestward. The northeast tributary heads on the southwestern slopes of Mt. Plummer and the divide between Eagle and the head of Slate Creek. This tributary has a short tributary 15 miles in length that flows southwestward out of the large structural valley which represents the major contact between the sediments and the ancient lavas.* This tributary joins the northeast tributary a few miles above its junction with the southeast fork.

Since the river flows mainly on the flat lowlands and the tributaries flow through low rolling foothills, in which known granite intrusives are lacking, only the headwaters of the northeast tributary were investigated. Evidence of any tributaries cutting granite intrusives was found lacking, and placer deposits and gold discoveries have not been reported.

During the early years of mining activity on Bear and Marvel on the north, and Canyon and Eek River to the south, several prospectors

*Note Plate No. __.

crossed the upper tributaries of Fog River. They were attracted by the series of elongated red hills which extend across the Fog River valley below the junction of the two main tributaries. This is a more or less continuous band of acidic lavas which extend from south of Fog River up the tributary of the northeast tributary across Slate and Cale, and continues northeasterly through onto Sawpit Creek. This band consists mainly of rhyolites and trachytes of later age than the more basic varieties, and along which the recent sinter deposits are distributed. These hills in the Fog River valley show very red with the high percentage of iron oxides which they contain. These hills were prospected from time to time with unfavorable results. The wide valley of Fog River below the tributaries appears to be deep and possibly frozen.

Unless granitic plugs or stocks, which may exist and have been worn down, are found within the valley, the chances of economic gold placer deposits are few.

Bethel 91

Fisher Creek

K+91-16

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.

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 west. 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 fine glacial material. 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 in bulletin 622,* p. 346. These holes were reported ranging from 15 to 30 feet in depth

*See bibliography.

and penetrated frozen 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 floor of this section.

Since the three mountains with granite cores at the head, the westerly one named Fisher Dome, are of a variety similar* to Marvel Dome, gold would naturally be assumed to be associated. The position of the major amount of the concentration 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 intrenched 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

*Op. cit., page ___.

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.

Russian Mission 81

TINY CREEK

K 81-28 Koehler

A small gulch creek named Tiny Creek joins Bear Creek on the left limit one-half mile above the junction of the latter with the Tuluksak River. It has a length of three-fourts of a mile, and contains a very small amount of water. The upper half-mile is contained in a small V-shaped valley with the surrounding rocks composed of greenstone lavas. The lower one-fourth mile of its course flows across an old bench formed by Bear Creek. The creek has entrenched itself into the gravels and into bedrock at its mouth. The bench gravels consist of angular glacial gravels mixed with some well worn rocks and worn gravels. A small section beginning at the mouth has produced pay for 500 feet upstream. Coarse heavy gold with a few nuggets is associated with fine gold, black sand and traces of cinnabar. This creek is the only tributary of Bear Creek below Spruce Creek on which gold has been found. The origin of the gold has been the subject of considerable discussion locally. The writer found a small stock of soda granite outcropping one-half mile east. (Note plate) This granite appears very similar to the granite on Bear Creek at the mouth of Bonanza. The gold in its present location is a concentration formed by Bear Creek and reconcentrated by Tiny Creek, with its origin associated with the small granitic stock.

In the early days of mining on Bear Creek some mining was done on Tiny Creek and a small production was made. The last attempt at mining was made by the Bering Alaska Placers, Inc. in the year 1937 with bulldozer. The pay gravel was found limited and after a small production the activity ceased.

Russian Mission 81

SPRUCE CREEK

Kt 81-10 81-13 81-14 Roehm

Spruce Creek is a small tributary of Bear Creek, three miles in length, flowing in a bedrock basin toward the northeast in its upper mile, then turns east and southeast emptying into Bear Creek 1½ miles below Bonanza Creek. The lower two miles flow across outwash and morainal gravels into which it is intrenched with a grade of 200 feet to the mile. The upper mile has a descent of 1500 feet. The extensive bench deposit between Spruce Creek and Bonanza Creek, 1½ miles long and 1 mile wide, consists of glacial gravels, partly sorted and partly levelled off by possibly dammed waters during the progress of the Bear Creek glacier. This bench deposit represents a morainal apron from the glacier laid down up the pre-existing valley. Two periods of damming show by the strata of blue clay with an intercalated band of partly sorted gravel. This shows in a cut on the right limit of Bear Creek one mile up from the mouth. These blue clay strata are from one foot to eighteen inches in thickness. These strata have acted as bedrock for the gold which was concentrated by the glacial waters.

Since glacial time Spruce Creek has entrenched and eroded a major portion of the gravels. This caused a greater reconcentration of gold and enriched the glacial deposits. Bulletin 622, page 322, (x) mentioned the total deposition of gravels as 400 feet in thickness. Remnants of these gravels are still in existence on Bear Creek. Bonanza and Bear Creeks have been the major creeks in the erosion of these deep gravels, while Spruce has contributed its share.

From the geological map, Plate ...., it is evident that the gold found on Spruce, Bear and Bonanza Creeks has had its origin from the narrow soda granite finger that extends across from the larger mass to the west to the granite area to the east. The composition of this granite is more acidic than that of the two main masses but is distinctly genitically related. It is generally believed to be somewhat younger, or slightly later injection from the same source carrying more acid solutions and greater amounts of metallic minerals, in which gold was associated. The concentration of gold which existed prior to the Bear Creek glacier no doubt existed on or near bedrock in the existing channels or immediate vicinity. This concentration was disturbed by the Bear Creek glacier. How much the ice disturbed the concentration in Spruce Creek is not known and there is a possibility of undisturbed gravels beneath the glacial material or old channel or low benches, in which the former deposited gold is intact. Thus far no such gravels have been encountered. With this in mind the New York Alaska Gold Dredging Co. in 1939 drilled two holes to bedrock on the Schutler Association claim on Spruce Creek, located 1½ miles up from its mouth. These holes reached bedrock at 46 feet. The core consisted of fine gravels mixed with clay, similar to outwash deposits. At a point 12 feet below the surface fine flaky gold was encountered which was distributed to bedrock. Over four hundred colors were encountered from one hole

(x) op.cit. p....

which due to fineness and flaky nature was light in weight. Values of five cents per yard were obtained from the two holes and drilling was suspended.

A few thousand dollars worth of gold has been mined from cuts by ground sluicing with the gold mainly on the false clay bedrock. Claims are still held on the creek and minor amounts of gold are still being mined. There exists a possibility of buried pay gravel on or near bedrock which was not disturbed by the ice. Thus the overlying glacial gravels must be taken into consideration both in locating the buried placers if they exist, and in mining. The gold in the clay seams appears to occur in spots. This gold associated with the blue clay is difficult to wash and retain in the sluice boxes.

Russian Mission 81

Roehm

Bonanza Creek

Kt 81-5
81-10

Bonanza Creek is one of the larger tributaries of Bear Creek, which it joins from the northwest one fourth of a mile above Fox Creek and a mile and a half above Spruce Creek. Its length is 5 miles, with its head at an elevation of 2700 feet, and less than two miles from the head of Bear Creek in the central northern portion of the district. Its mouth is at an elevation of 1600 feet showing a fall of 1100 feet over its entire length. The greater portion of this fall is in the upper two miles. Four unnamed tributaries join within a distance of one mile and make up the lower two and one half miles. These tributaries are small creeks with exceptionally steep grades that are situated on the eastern slope of the east contact of the Bear Creek granite intrusive. These tributaries do not cut through the hard contact shell into the main mass of granite, but cut porphyry and contact phases and the hard volcanics. Their valleys are mostly filled with hardened contact rocks and boulders. They are not considered as important gold feeders to the main creek below. The lower two and one half miles of Bonanza Creek is situated in a wide valley which cuts along a contact zone of a granite spur which leaves the main Bear Creek granite mass and cuts across Bear Creek, and continues up Fox Creek then turns south joining with the Marvel Creek granites to the south.

At the mouth of Bonanza Creek is Discovery claim on Bear Creek which contained some of the highest pay. Fair values were found for two claim lengths up Bonanza and on the lower claim considerable hand mining

has been done. At the present time the New York Alaska Gold Dredging Corporation holds the first two claims up from the mouth. John Brink holds six claims above.

The right limit of Bonanza Creek for a distance of one and a half miles from the mouth borders the high gravel and silt benches that cover the large basin area south to Spruce Creek. These outwash bench deposits have thrown Bonanza against its left limit, while Spruce Creek has been thrown against its right limit.

The gravels of Bonanza Creek are shallow at the mouth and appear to be shallow in the creek bed above.. They consist of medium to coarse--mainly a mixture of medium stream gravels with outwash and occasional granite boulders occurring on the benches. In the creek bottom the gravels are loosely stratified while the benches are unstratified. The bedrock varies from hard metamorphosed lavas to various intrusive rocks to contact phases of granite. Generally, it is hard and in places highly fractured.

The bench deposits below the mouth of Bonanza Creek on Bear have in the past been productive.* These benches and the middle section of Bonanza Creek warrant further prospecting to determine workable deposits.

*Op. cit., page __.

Bethel Precinct,
Aniak - Tuluksak
Russian Mission 81
Roehm

EAST FORK

East Fork is the longest tributary of Bear Creek and has a length of nine miles with its junction three miles below Myrtle Creek on the left limit. Its head is in a large glacial cirque on the north side of Mt. Plummer. From its head to the mouth its gradient is steep with a difference of 2,000 feet in elevation. The upper six miles has contained an Alpine glacier and the lower three miles is across the extensive morainal apron left by the glacier. This large amount of glacial material acted as a dam across Bear Creek. Since that time Bear Creek has cut into these unsorted gravels and considerable of the material has moved downstream. Thus with the extensive glacial action in the upper six miles, pre-existing placer deposits would beyond doubt be disrupted and highly scattered. Deposits on the lower section would be covered with deep extensive glacial gravels. Since glaciation, the water action has not reconcentrated the gravels to produce economic deposits.

Bedrock Province
Arctic - Subarctic
Russian Mission 81

MYRTLE CREEK

Russian

Myrtle Creek is a small stream five miles in length which joins Bear Creek on the right limit, between Spruce and Bonanza Creeks. It heads at an elevation of 2500 feet, flows northwest to west and empties into Bear Creek at an elevation of 1500 feet. Most of this descent is in the upper two miles which flows from the granite across the contact over highly folded argellites and tuffs. The lower two miles cuts into an argillite tuff bedrock on the right limit, against which it has been crowded since glacial times. The extensive morained apron which extends from Myrtle Creek to below the mouth of the East Fork ~~has been the dumping~~ was dumped by the East Fork glacier. As a result Myrtle Creek in the lower section has been pushed against its right limit, which position it still holds. It has moved a portion of the glacial gravels with a result that large glacial boulders still remain in the creek bed. The upper three miles is steep and contain numerous rocks and boulders and is unfavorable for placer mining. Small prospects of gold have been found, and the only favorable area for prospecting is near its mouth on the low benches of Bear Creek.