

MR 27.1

Territory of Alaska
DEPARTMENT of MINESREPORT ON THE PLACER DEPOSITS
OF THE SQUIRREL RIVER GOLD FIELD
1932by Irving Reed,
Associate Mining EngineerINTRODUCTION

The gold placer area herein considered lies north of the Kobuk River in the southern foothills, known to the miners as the Kallarichuk Hills, of the Baird Mountains, between longitudes 160° W. and 161° W., and latitudes $66^{\circ} 58'$ N. and $67^{\circ} 22'$ N. The area covers about 480 square miles and comprises all the drainage to the lower Squirrel River below and including Timber Creek.

The general characteristics of the country are a broad, flat valley or lowland through which Squirrel River meanders, surrounded by steep-sided, though not very high, mountains. These mountains have rather rounded summits, and do not display particularly rugged features. The creeks cut into the mountains in narrow, steep-graded valleys, then meander across the Squirrel River lowland in wide, flat flooded-plains. All the

drainage seems to have a tendency to an east-west direction.

The geology of this area was examined and a sketch map made by Philip S. Smith of the U. S. Geological Survey in 1910. The results were published in Bulletin 536.

On the present examination the writer was alone. He left Kiana on September 16, 1931, going as far as the end of the "slough" in a small motorboat. Thence he backpacked his outfit overland, arriving at Westlake's camp on Klery Creek that same evening. From this place as a base Klery, Baldwin, and Bear creeks were examined. On September 20 the outfit was backpacked over to Central Creek and an examination made of the dredging possibilities of that creek. On September 22 a return was made by trail to Kiana.

Every assistance possible was rendered by the miners and prospectors in the district. If it had not been for this help, not nearly so much territory would have been examined in the short time available.

G E O G R A P H Y

Drainage

All the drainage of the area flows into Squirrel River, which is itself a right limit or northern tributary of Kobuk River. Squirrel River is a large stream with a

rather sluggish current, hugging the right limit or southern side of its valley. The tributaries from the Kiana Hills to the south, though not visited, seem to be short with steep gradients. The streams flowing from the Kallerichuk Hills to the north are much larger. They flow in comparatively narrow valleys until reaching the Squirrel River lowland where their current is checked and they flow in a meandering course, generally in a south-west direction to Squirrel River.

Relief

Squirrel River flows in a comparatively flat-floored valley about five miles wide, the Squirrel River lowland. This lowland appears to widen and be less rolling upstream from the south of Central Creek. Below the south of Central Creek, the lowland rapidly narrows to about two miles wide near the south of the river. The lowland is characterised by flat gravel benches stepped back from the river on its left limit, and from 50 to 400 feet in elevation above the river level.

The highlands, known as Kiana Hills, bordering the Squirrel River lowland on the south, culminate in Deviation Peak, about 2200 feet high. From the north these hills appear to be rounded and well-worn. The northern sides are steep on the lower slopes, which

show an even front roughly parallel to the long axis of the lowland.

The highlands, known as the Kallarichuk Hills, to the north of the lowland, rise to a probable height of 2500 feet. They are more rugged than the Kiana Hills, but show in general the same steep slopes facing Squirrel River lowland. However, the frontage bordering the lowland is broken by the many large streams and morainal deposits and does not show the same even line as that of the Kiana Hills.

Glaciation

At present, so far as known, there are no glaciers in the Squirrel River watershed. However, during Pleistocene times, a large valley glacier occupied the Squirrel River valley.

E C O N O M I C S

Population

The Squirrel River gold fields at one time, for a short while supported approximately 200 men. At the present time about 8 white men and five natives are mining or prospecting in the area. At Kiana there is a general store and possibly a population of 8 more white men and about fifty natives. At Okok about four miles down the Kobuk River from Kiana, there is a trading post and one white man.

Travel and Transportation

A diesel-engined freight scow makes several trips a season from Kotzebue at the mouth of Hotham Inlet to Long Beach on the Kobuk River. Several other small gasoline boats owned by trading companies, miners, or natives, make irregular freighting trips in the summer season from Kotzebue to Kiana or Long Beach. The average charge for freight in large lots from Kotzebue to Kiana, as nearly as can be ascertained, is \$10 a ton. Passage-way can be arranged on any of these boats, fares being a matter of individual negotiation. The first airplane made a flight from Kotzebue to Kiana in the summer of 1931, landing on a bar across Kobuk River from the town. Airplane rates from Kiana to Kotzebue are \$50 a passenger.

It would be perfectly feasible to use pontoon planes anywhere on Kobuk River. Pontoon planes could be landed on Airplane Lake near Central Creek.

From Kiana freight is taken in poling boats or small motor boats either up Squirrel River to the mouth of Klery Creek, or up a left limit slough from the head of which it is about four miles to the confluence of Bear Creek and Klery Creek. An old corduroyed wagon road at one time led from the "slough landing" to the old road house near the mouth of Bear Creek. The corduroy on this road

is much decayed but could be put in repair at no great expense. Most of the miners at present freight out their heavy supplies from Kiana by dogteam in winter.

Climate

The climate of the Squirrel River valley is distinctly sub-Arctic. Temperature records have been kept for several years by the Weather Bureau at Noorvik on the Kobuk River below Kiana. A resume of these records is given in U.S.G.S. Bulletin 815, page 54. The mean annual temperature from the data given ranges around 22° F. at this place. The snowfall is comparatively light, reaching a maximum of not over seven feet, or a depth of four and one-half to five feet on the ground. The rainfall is light but heavier than in the interior of Alaska. It is probably higher in a mountainous section such as the Squirrel River valley than farther down Kobuk River at Noorvik. In the winter high winds are prevalent and freighting by dogteam is said to be attended with much hardship. The summer seasons are short, probably averaging from 90 to 110 days for shovelling in.

Vegetation

So far as could be seen, the north slopes of the

Kiana hills, and the main valley of Squirrel River below the mouth of Timber Creeks, are devoid of timber. A narrow fringe of spruce timber lines most of the creeks flowing south from the Kallarichuk Hills. Klery Creek thus has a narrow fringe of timber down to a short distance from its mouth. No timber was noticed on either Central or Canyon creeks below the first gravel bench from the hills. Within the hills the fringe of timber is much wider. The mountain between Klery and Baldwin creeks was, before denudation by miners, timbered up to about 800 feet in elevation. The heaviest stand of timber seen in the Kobuk District, with the exception of one stand on Cosmos Creek, is on Timber Mountain between Central and Bear Creeks. Then again the south side of Central Creek is untimbered. Altogether the distribution of spruce timber in the Squirrel River valley is very erratic and unaccountable as no difference in soil or temperature can be seen where timber does or does not grow.

Birch grows a little farther out on the gravel benches than spruce on the north side of Squirrel River valley but seems in the main to be coextensive with the latter. Cottonwood was not noticed except near the mouth of Squirrel River. All the rest of the lowlands in the

area are covered with a luxuriant growth of moss, reindeer lichens and sedges. The tops of the higher mountains and hills seem from a distance, to be practically bare of vegetation.

Animal Life

Caribou and sheep have been exterminated from the area many years ago. A few black and grizzly bears may still survive on the less frequented creeks. Practically the only perennial game are ptarmigan, and snow-shoe and Arctic hares. These vary periodically in their abundance. At the present time they have almost disappeared. Water fowl are plentiful on the rivers in summer.

Of the furbearers there is a small and diminishing supply of land otter, fox, lynx, mink, and muskrats. Parka squirrels are abundant. The large blue Kobuk whistling marmot known as "siksikpuk" has been exterminated by the natives.

The Kobuk and its tributaries support fish in great numbers and variety. These range from the great white-fish called by the natives "shea", through salmon, salmon trout, char and river herring down to the ever-present pickerel and grayling.

A constant supply of fresh meat may be bought at a very reasonable price from the Eskimos owning the numerous reindeer herds which roam all over the area.

Mosquitoes, flies and gnats are a torment to men and beast alike from early June until the middle of September.

G E O L O G Y

Character of Rocks

As noted by Philip S. Smith in U.S.G.S. Bulletin 546, all the rocks seen in the Squirrel River gold field belong to the so-called undifferentiated Paleozoic metamorphic schists and limestones. The schists, as noted by Smith, range from slaty, graphitic to quartzose and calcareous. On the ridge between Klery and Baldwin creeks, outcrops what megascopically appears to be a greenstone schist. From the upper end of Discovery Fraction to the mouth of Jack Creek, is a belt of "massive, much-fractured, and contorted bluish-white limestone standing at a high angle," and striking about South 75° West.

Structure

This structure of the rocks in the Squirrel River area seems to be a series of closely appressed folds superimposed on the broad anticlinal uplift of the Brooks or Arctic Range. These folds may be considered the latest of a long series of deformations of the schists and limestones of the region. The general strike of these

folds seems to be about S. 70°-80° W. The drainage lines where not changed by glaciation, are controlled by the structure and either follow a general east-west direction or cut directly north and south across the formation.

Unconsolidated Deposits

The valley of Squirrel River has been filled to an unknown depth with glacial outwash and marginal material. Though no actual boulder trains nor distinct moraines were seen, yet it may be possible that the low hills in the lower Squirrel valley near Kiana are real moraines rather than remnants of the outwash deposit farther upstream. This outwash deposit formerly filled the Squirrel River valley to a much higher level. The river and creeks since the time of glaciation have removed much of the deposit cutting it back to low, flat-topped hills and benches with steep bluffs facing the river. It is also thought that some of the bench deposits on Klery and Baldwin may be glacio-fluvial in origin.

Quaternary and Recent History

During the Pleistocene, the Squirrel River area underwent widespread glaciation. A more detailed history of this glaciation in the Kobuk River valley

will be given in a subsequent report on the gold bearing areas of the upper Kobuk. In the Squirrel River valley it is thought that the glaciation may be divided into two phases--first a phase of regional or piedmont glaciation when the region stood at a much higher relative elevation than the present, and a second phase of valley glaciation, at the close of which the elevation of the region was from 300 to 800 feet lower than now. Whether these two phases were continuous (as is likely) and represent the North American Wisconsin glacial period, or represent two distinct periods of glaciation separated by a period of non-glaciation, is not known. All evidence of previous glacial periods seem to have been destroyed in the two last glacial phases.

So far as seen, there is no evidence of the invasion of the sea into the Squirrel River valley. It is thought that, during most of the time of maximum subsidence, the Squirrel River glacier discharged directly into the sea above Kiana, and that the sea only occupied Squirrel River basin during a very short time if at all.

On the gradual disappearance of the Squirrel River glacier the valley of Squirrel River was filled with glacio-fluviatile or outwash material to an unknown depth.

with gradual lowering of the base level (which is probably continuing during the present time) since the end of glaciation, Squirrel River and its tributaries have been removing this accumulation of outwash material.

E C O N O M I C G E O L O G Y

History of Mining and Discoveries

Gold was discovered on Klery Creek sometime in 1909 by John Lesamis. Later in the same year Andrew Garbina^{27-1, 2} discovered gold on Central Creek. The subsequent striking of these and neighboring creeks for speculative purposes, held up the whole country for so long that most of the miners and prospectors became discouraged and left before the area was thoroughly prospected. Mining thereafter was almost exclusively confined to Klery Creek which went through the usual history of bonanza activity down to the few present day one to three men outfits.

Description of Various Creeks and Mining Thereon

Klery Creek

*Klery 27-1
27-2
27-3
27-4
27-5
27-6*

This creek is a large left limit tributary of Squirrel River just below Timber Creek. Klery Creek is at present the only productive area in the Squirrel River gold field. It is staked and held from below the mouth of Bear Creek to above the mouth of Canyon Creek. The creek occupies a rather narrow rock-cut gorge. This

gorge is cut in a wider valley, remnant, probably, of some earlier drainage system. On the upper end of the Madison Association Claim the gorge ends in a low bluff, the bedrock pitches down at a steep angle, and the creek continues to Squirrel River in a bed of outwash material. From where it ends to the upper end of claim No. 9 Above Discovery, the gorge lies towards the right limit of the original valley. Above claim No. 9 Above Discovery, the gorge, so far as seen, lies towards the left limit of the original valley.

The creek itself is a large stream. Just below the mouth of Bear Creek, in the driest season, it carries approximately 5000 miners inches of water. Above the mouth of Gold Run Creek, the amount of water is probably 1500 miners inches. Large banks of "glacier" or aufeis as a rule persist on the upper creek from year to year and insure a permanent flow of water.

At the end of the gorge on the upper part of the Madison Association claim, the creek-bed or floor of the gorge is about 1800 feet wide from rim to rim. This distance gradually narrows to about 500 feet from rim to rim on the upper end of the Victor Association claim. Above this the gorge floor widens to about 1000 feet on

claim No. 6 Below Discovery, then narrows to 400 feet on the lower end of the Missing Link Association claim. On the upper end of the Missing Link Association it widens to 500 feet, again narrowing to 300 feet on the upper end of the Columbia Association claim. On the middle of Discovery claim the gorge floor widens to 800 feet, then narrows to 500 feet on the lower end of Discovery Fraction claim. On the upper end of Discovery Fraction claim, the gorge narrows abruptly to a 200 foot-wide limestone canyon about 1000 feet long. About 500 feet above the canyon, the gorge floor widens to 500 feet. Above this point the creek bed remains about 500 feet wide, to claim No. 1 Above Discovery where it widens to 700 feet. On the lower end of claim No. 2 Above Discovery the gorge floor narrows to 500 feet. On the upper end of claim No. 4 Above Discovery the gorge floor narrows to a canyon about 50 feet wide at the mouth of Rocky Creek. On claim No. 5 Above Discovery it widens to 200 feet, to narrow again to 100 feet from the lower end of claim No. 7 Above Discovery to lower end of claim No. 9 Above Discovery. From claim No. 9 Above Discovery to claim No. 16 Above Discovery the gorge floor varies from about 100 to 150 feet wide. From claim No. 16 Above Discovery to claim No. 25 Above Discovery, the gorge floor is about 150 feet wide.

On claim No. 4 Below Discovery the depth to bedrock is about 4 feet. This bedrock is false and consists of coarse schist slabs and clay. Below this false bedrock is gravel, then sand to an unknown depth. On the upper end of the Madison Association claim the depth to bedrock is said to be 10 feet. On the lower end of the same claim bedrock could not be found. About 500 feet southeast of the mouth of Bear Creek a shaft was sunk in frozen ground 135 feet deep with no bedrock. From Discovery claim up the creek to claim No. 9 Above Discovery, the depth to bedrock in the creek is from 4 to 6 feet, all gravel. Away from the creekbed there is from 1 to 3 feet of silt and soil over the gravel. From claim No. 9 Above Discovery to claim No. 16 Above Discovery, the average depth to bedrock is 7 feet. On claim No. 23 Above Discovery the depth to bedrock is 2 feet.

Below the Madison Association claim, boulders are very few, the gravel consisting of fine outwash material. On the Madison Association many limestone, greenstone and schist boulders appear, growing more numerous until at the limestone canyon on the upper end of Discovery Fraction, the surface of the gravel in the creek appears covered with boulders. Above the mouth of Jack Creek the boulders become fewer as far as claim No. 11 Above

Discovery. Above this point the gravel appears covered with boulders. On claim No. 23 Above Discovery, the coarse, angular wash is mostly composed of boulders up to 3 feet in diameter.

From the mouth of Bear Creek to the upper end of the Madison Association claim the rise of the creek bed is 10 feet or on about 0.25% grade. From the upper end of the Madison Association claim to the middle of claim No. 6 Below Discovery, the rise of the creekbed is 20 feet or on about 0.44% grade. From the middle of claim No. 6 Below Discovery to the middle of the Missing Link Association claim, the rise of the creekbed is 22 feet or on about 0.84% grade. From the middle of the Missing Link Association to the mouth of Jack Creek the rise of the creek bed is 54 feet or on about 0.53% grade. From the mouth of Jack Creek to the middle of claim No. 1 Above Discovery the rise of the creek bed is 20 feet or on about 0.61% grade. From the middle of claim No. 1 Above Discovery to the mouth of Rocky Creek the rise of the creek bed is 47 feet or on about 1.01% grade. From the mouth of Rocky Creek to upper end of claim No. 9 Above Discovery the rise of the creekbed is 57 feet or on about 0.87% grade. From the upper end of claim No. 9

Above Discovery to the upper end of claim No. 11 Above Discovery the rise of the creekbed is 54 feet or on about 2.05% grade. From the upper end of claim No. 11 Above Discovery to the mouth of Gold Run Creek the rise of the creekbed is 162 feet or on about 1.53% grade. From the mouth of Gold Run Creek to the middle of claim No. 23 Above Discovery the rise of the creekbed is 25 feet or on about 0.54% grade.

On the Star Association claim on the left limit of the creek is a beach about 400 feet wide whose bedrock apparently lies about 4 feet above the present creek level. On the Gopher Bench claim there seems to be an old channel on the right limit about 20 feet above the creek level. This old channel is outlined behind a rock bluff to the west of the right limit rim of the creek, by several shafts sunk into the gravel. The elevation of the old channel opposite claim No. 8 Above Discovery is approximately about 52 feet above the level of the creek.

The gold on Klery Creek is as a general rule fine and flaky. However, it is coarse and nuggetty in a few curiously distributed places. These places are: on the left limit benches of the Columbia Association claim; On Discovery and Discovery Fraction claims;

on the left limit bench on the Star Association claim; on the right limit lower half of claim No. 1 Above Discovery; on the Gopher Bench claim; on claims No. 5 Above Discovery and No. 6 Above Discovery; on upper end of Claim No. 8 Above Discovery; on claim No. 9 Above Discovery; about 1/2 mile up Joe Gulch from its mouth.

On analyzing the above described probable section of high channel, the false bedrock on claim No. 4 Below Discovery, and the distribution of the coarse gold, it would appear that there is a possible old preglacial (or interglacial) channel on Klery Creek, straighter and on a steeper grade than the present creek channel. This possible old channel carried a much coarser run of gold than the present channel. Wherever it is cut by the present channel a reconcentration and enrichment occurred showing this coarse gold on mining. As far downstream as claim No. 9 or 10 Above Discovery, this old channel may be on the left limit. Below this place it lies on the right limit as far as the Gopher Bench claim. From the Gopher Bench claim down to claim No. 4 Below Discovery, it practically coincides with the present creek. Below claim No. 4 Below Discovery it may swing over to the left limit again. On claim No. 4 Below Discovery, the old channel seems to lie several feet below the present creek channel. On Discovery and Discovery Fraction claims it appears to practically coincide in elevation

with the present creek channel. Opposite claim No. 8 Above Discovery it lies about 50 feet above the present creek channel. These data would then give to the possible old channel an average grade of approximately 1.24%.

The only mining methods used on the creek are ground sluicing and shovelling-in and hydraulicking. On claim No. 4 Below Discovery, Leopold Geffe is shovelling-in, employing one native. He uses four 10-inch by 12-inch sluice boxes set on a grade of 9 inches to 12 feet. The ground is about 4 feet deep down to false bedrock. The gold is fine and flaky and lies entirely in the gravel. It is claimed the ground runs \$1.10 a cubic yard.

On the Star Association claim on the left limit bench a short distance below the mouth of Jack Creek, Manuel Lavendero started in the summer of 1931 to operate a small hydraulic plant. The ground is from 14 to 30 feet deep. It appears to be a deposit partly from Jack Creek and partly from the old channel of Klery Creek. Up to 5 feet of the top is a sandy silt and loam, the rest is a coarse gravel wash with boulders up to 18 inches in diameter. The bedrock is limestone of which 1 to 4 feet is taken up in mining. The gold is coarse and fine mixed and is worth about \$18.50 an ounce.

Lavendero uses five 12 by 14 inch boxes, set on a grade of 10 inches to 12 feet. In the future he intends using 14 by 20 inches boxes. Water is supplied from Jack Creek through a ditch about 1 mile long and 4 feet wide at the bottom. 800 feet of 8 by 18 inch slip-joint pipe is used. The water is delivered under head of about 60 feet through a No. 1 giant with a 2½-inch nozzle. He employs 2 natives paying \$3.50 a day and board. The ground is said to run about 40 cents a cubic yard.

On the Star Association claim on the left limit bench just above Lavendero and below Jack Creek, Andrew Garbine was shovelling in a small pit in the summer of 1931. He used two 10 by 12-inch boxes. Water was supplied through an automatic gate and short ditch from Jack Creek.

On the downstream part of the eastern side of the Gopher Bench claim, Theodore Westlake is shovelling-in. Operations first started in 1917 on claim No. 1 Above Discovery and have continued each summer ever since. The gravel on claim No. 1 Above Discovery is a coarse wash which becomes much finer on the Gopher Bench. The depth to bedrock on claim No. 1 Above Discovery is from 4 to 5 feet. On the Gopher Bench the depth to bedrock so far as worked is from 6 to 20 feet of which a depth up to 2 feet is silt and soil. The bedrock is schist

with cleavage standing at a high angle. From $\frac{1}{2}$ to 2 feet is taken up in mining. The gold is very coarse and nuggetty, and is worth about \$18.50 an ounce. Water is brought from Klery Creek in hydraulic hose. Four 10 by 12-inch boxes are used set on a 9 or 10 inches to a 12-foot grade. One man is employed, wages being \$5.00 a day and board. The ground is said to run about 65 cents a cubic yard.

On the claim No. 23 Above Discovery, E. G. Wood was shovelling-in. The gravel is very coarse, sub-angular wash with boulders up to 3 feet in diameter. The depth to bedrock is about 2 feet. The bedrock is schist with schistosity lying horizontal. Water is obtained from Klery Creek. One 12 by 12-inch box was used, set on a grade of 11 inches to 12 feet. Work was started August 20, 1931.

The paystreak on Klery Creek seems to occupy the whole width of the floor of the gorge. As said before, the pay seems to have been locally enriched so as to be workable, by the cutting of an old channel.

Running in such a narrow gorge and having quite a large drainage basin, Klery Creek is very subject from late June through August to many high and prolonged freshets.

The ownerships on Klery Creek are as follows:

K27-3

From the lower line of claim No. 5 below Discovery downstream, all claims are held by Klery Creek Mines Company, a copartnership

No. 5 Below Discovery is held by Leopold Gaffe

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Columbia, Liberty, and Missing Link Association are held by Klery Creek Mines Company

Discovery Association is held by H. Greenberg and associates.

Discovery Fraction is held by John Lesamis and Manuel Lavendero

Star Association is held by John Lesamis, Andrew Garbine, and H. Greenberg and associates

Oregon Association and No. 1 Above Discovery are held by Greenberg, Robinson and Magids

No. 2 Above Discovery is held by Theodore Westlake

Kt 27-5
Gopher Bench E. G. Wood
Teddy Bench
Hard Luck Bench
Vera Bench

Kt 27-5
No. 3 Above Discovery to Paul Xavier and
No. 6 Above Discovery (Incl.) J. W. Southward

No. 7 Above Discovery to Klery Creek Mines
No. 17 Above Discovery (Incl.) Company

No. 18 Above Discovery to Paul Xavier and
No. 27 Above Discovery (Incl.) J. J. Quillen

Cross Creek

K+27-8

This creek is a right limit tributary of Klery Creek a short distance above the confluence of the latter with Squirrel River. Prospects are said to have been found on this creek in early days. However the work was dropped and no one is on the creek at the present time. No detailed information could be secured about the creek or the foregoing work. The creek was not visited.

Peluck Creek

K+27-10

This creek is a right limit tributary of Klery Creek above Cross Creek. Jos. Kozak prospected in winter about $\frac{1}{4}$ mile above the first small left limit tributary upstream from the mouth, working in summer at Candle for wages. It is said that coarse gold has been found at this place. The creek was not visited.

Baldwin Creek

K+27-11

This creek is a right limit tributary of Klery Creek above Peluk Creek. The creek is about 7 miles long and carries about 500 miners inches of water. The valley floor in the hills is about 300 feet wide from rim to rim. The grade of the creek in the hills is about $1\frac{1}{4}\%$. The bedrock seems to be mostly schist. It is apparently crossed by the same belt of limestone as Klery Creek. The gravel is a small-sized wash with few boulders. The depth to bedrock is 5 to 6 feet in the creekbed, and 8 to 9 feet away from the creek. The gold found on the

creek is fine and flaky. Only about 4 holes have been sunk in early days on the creek, at the "big bend", by James Armstrong and Thomas Baldwin.

Bear Creek

K+27-13

This creek is a left limit tributary of Klery Creek above Baldwin Creek. The creek is about 5 miles long to the forks and carries about 800 miners inches of water at the mouth. The width of the valley floor where the creek emerges from the hills is about 200 feet from rim to rim. At this place the bedrock is limestone and the grade of the valley is about 1.1 percent. About $\frac{1}{2}$ mile down stream from the forks, E. G. Wood mined intermittantly for several years. Where this mining was done, is said to be schist bedrock.

Jack Creek

K+27-17

This creek is a left limit tributary of Klery Creek above Bear Creek. The creek is about 8 miles long and carries about 500 miners inches of water. The bedrock is limestone. The width of the valley floor is about 100 feet from rim to rim. The grade of the valley floor is about $1\frac{1}{2}\%$. No values have been found on Jack Creek.

Gold Run Creek

K+27-18

This creek is a left limit tributary of Klery Creek about $3\frac{1}{2}$ miles long. The creek carries about 300 miners inches of water and has a grade of about 2%. Only assess-

ment work has ever been done on this creek. 2 or 3 ounces of coarse gold have been recovered. 3 association claims are held on the creek by Paul Xavier and J. J. Quillen.

Caribou Creek

This creek is a small right limit tributary of Klery Creek about 3 miles long. A small amount of coarse gold with much attached quartz was taken from this creek near its mouth. The creek was not visited.

Joe Gulch

This stream is a small left limit tributary of Klery Creek about 2 miles long. For the first $\frac{1}{2}$ mile from the mouth, the gold on Joe Gulch is fine and flakey. Above this point the gold becomes coarse and nuggetty. Only prospecting has been done in the creek. 3 association claims are held on Joe Gulch by Paul Xavier and J. J. Quillen. The creek was not visited.

K+27, 17 Central Creek

This creek is a left limit tributary of Squirrel River about 5 miles below Klery Creek. From the last gravel bluff and drop-off in bedrock, at point No. 1 on the map, to the head, the creek is about 13 miles long. The amount of water in the creek is about 1000 miners inches. As far as the forks the gravel in Central Creek appears to be fine with few boulders. At point No. 1,

the depth to bedrock is said to be 16 feet. At the drill line above point No. 4, the depth to bedrock is from 9 to 14 feet. At point No. 5, the depth to bedrock near the cabin is said to be 9 feet, and in the creekbed from 1 to 5 feet. Above this last point the depth to bedrock has not been determined so far as could be ascertained. From point No. 1 to Point No. 2 the width of the valley floor is about 1000 feet. From point No. 2 to point No. 3 the width of the valley floor is about 600 feet. From No. 1 to No. 3 the ground appears from the vegetation, to be frozen. From point No. 3 to point No. 5, the width of the valley floor is about 400 feet. The ground is unfrozen from point No. 3 on up the creek. The bedrock appears the same schist as on Klery Creek. The grade of the surface is about 1.2%. From point No. 5 to point No. 6, the width of the valley floor is about 300 feet. The bedrock is mostly limestone as indicated on the map. The grade of the surface is about $1\frac{1}{4}$ percent. From point No. 5 to point No. 9 at the forks, the width of the valley floor is about 400 feet. The grade of the surface is about 2.1 percent. The width of the valley floor of North Fork is about 100 feet. The surface has a very steep grade. The width of the valley of East Fork to its forks at point No. 11, is about 200 feet. The grade of the surface is about 2 percent.

Many shallow shafts have been sunk between the cabin and creek above point No. 4. In the creek bed several open cuts were shovelled-in during early days. On the left limit opposite and a little above the same place some winter drift mining has been done. Near the cabin at point No. 5 there are evidences of old shafts and other workings. It is claimed that the early miners took out \$4 or \$5 a day, making the ground run approximately 50 cents a cubic yard. The gold is fine and flaky, and is worth about \$18 an ounce.

A little over $\frac{1}{4}$ mile below the cabin above point No. 4, Arthur M. Hansen has run, in the winter of 1930-1931, a line of drill-holes 50 feet apart across the valley. He claims to have ground running 64 cents a cubic yard. He is continuing his drilling with a Star gasoline drill in the winter of 1931-1932. He employs 2 native helpers. The creek is held in 40 acre association claims for 3 miles below the cabin above point No. 4, and for $3\frac{1}{2}$ miles above said cabin, by Arthur M. Hansen. He also holds one association claim at the forks. In the summer of 1932, W. H. Suksdorf, is planning to thoroughly drill the creek with a Keystone drill.

K+27-9 Timber Creek

This creek is a large left limit tributary of Squirrel River just above Klery Creek. No one is on the creek at present. Although prospects were reported here in early days, no information could be obtained at the present time. The creek was not visited.

K+27-7 Spruce Creek

This creek is a left limit tributary of Timber Creek. No one is on this creek at present, nor could any information be obtained on the prospects found here in early days. The creek was not visited.

K+27-19 Homestake Creek

This creek is a small left limit tributary of Timber Creek above Spruce Creek. The creek is about 1 mile long to the forks. From the forks to the head is about 1 mile. From the head of the main or east fork there is a low pass into a short tributary of Klery Creek.

About 1/2 mile upstream from the mouth, Albert Wise worked for 12 summers. He is said to have taken out several hundred dollars in coarse gold.

K+27-14
27-15 Canyon Creek and Mink Creek

Although prospects were reported from these creeks in early days, at the present time no one is on them, nor could any data be obtained as to what work was done or values found.

PRODUCTION

(Approximate estimate from local records)

<u>Klery Creek</u> <i>kt 27-1 to 6 incl.</i>	Up to and including season of 1930	Season of 1931
No. 4 Below Discovery	about \$ 3,000	
Libery and Missing Link Assns.	unknown	
Columbia Association	about 2,500	
Discovery Association	about 8,000	
Discovery Fraction	unknown	
Star Association	about 200,000	
Oregon Association	about 200,000	
No. 1 Above Discovery	about 175,000	
Gopher Bench	about 2,000	
No. 2 Above Discovery	nothing	
No. 3 Above Discovery	about 3,000	
No. 4 Above Discovery	about 5,000	
No. 5 Above Discovery	about 40,000	
No. 6 Above Discovery	about 3,500	
No. 7 Above Discovery	about 1,500	
No. 8 Above Discovery	about 1,600	
No. 9 Above Discovery	about 1,400	
Approximate known total	\$646,500	\$1,000
<u>Bear Creek</u> <i>kt 27-13</i>	about \$2,000	
<u>Caribou Creek</u>	about 1,000	
<u>Gold Run Creek</u> <i>kt 27-18</i>	about 50	
<u>Central Creek</u> <i>kt 27-12</i>	possibly 3,000	
<u>Homestake Creek</u> <i>kt 27-19</i>	possibly 3,500	
Approximate known total for district		\$657,050

From an estimate of the size of the pits worked on Klery Creek and from information furnished by the miners, a rough estimate of the values per bedrock-foot may be made on some of the claims.

Rough Estimate of Values per Bedrock-foot on Klery Creek

No.4 Below Discovery (from owner's statement)	16¢ b.r.f.
Discovery Association	8¢ b.r.f.
Star Association	151¢ b.r.f.
Oregon Association	151¢ b.r.f.
No. 1 Above Discovery	53¢ b.r.f.
No. 3 Above Discovery	9¢ b.r.f.
No. 4 Above Discovery	8¢ b.r.f.
No. 5 Above Discovery	17¢ b.r.f.
Gopher Bench	14¢ b.r.f.

FUTURE DEVELOPMENTS

Outside of work on possible new discoveries, it is very evident that the old hand methods of mining cannot any longer yield a profit in the Squirrel River gold field. So far as seen, Klery Creek and Central Creek have the only ground on which enough values have been shown to warrant mining on a large scale.

Unless there is sufficient reworking and reconcentration of the outwash material below the "drop-off" in bedrock, (which is very doubtful) Klery Creek has too shallow a gravel deposit and too many boulders to be dredgeable. Plenty of water, however, is available and, with fair ditching ground on either limit, it is possible to hydraulic the creek, provided the aforesaid severe freshets can be controlled. The creek has a comparatively slight gradient. As it is necessary as a rule to set sluice boxes at a six percent grade or more, some form of elevator would have to be used. The ground being so shallow and with natural drainage, the many fairly large boulders, and the necessity of frequent moving, would

all suggest the use of a rubble or grizzly elevator. If means could be devised for firmly anchoring the elevator and other equipment so that the danger of being washed away by the freshets could be overcome, it is thought that no other flood control would be needed.

So far as prospected, Central Creek appears to be suited for dredging by a small flume dredge. As said before, the lower part of the creek appears frozen. It is doubtful whether sufficiently high values would extend down much farther than $\frac{1}{2}$ mile below the present drill-line. It is also doubtful if any values will be found in the limestone farther up the creek, judging from Jack Creek whose valley lies altogether in the limestone, apparently without values. Above the limestone the dredgeable part of the creek is very small. In the writer's opinion, Central Creek is a doubtful dredging proposition of small area. It will need careful and extensive drilling before it can be proven to be large enough to put a dredge on.

The Kallarichuk Hills on both sides of the Kallarichuk River, have never, according to all local information, been prospected since the time of the first newcomers in 1898. As these hills, though severely glaciated, are of the same formations that of the Squirrel River gold

fields, they would certainly be worth while prospecting. Also the upper Squirrel River beyond Timber Creek is apparently, from such data as can be ascertained, unprospected. Although the formation is unknown at this last place, yet it is a very good assumption that it is the same as at Klery Creek.

/s/ IRVING REED
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Engineer.