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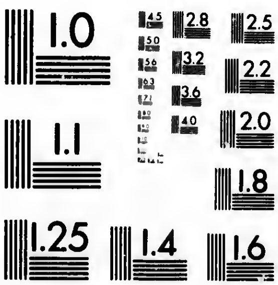

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Engineering Mag.
Sept 97

THE GOLD FIELDS OF KLONDIKE AND THE YUKON VALLEY.

By Harold B. Goodrich.

A YEAR ago it would have been difficult to find many to whom Alaska meant more than the northwest corner of the map of North America. A reminiscence of the events of thirty years ago might come with the mention of the word. "Alaska,—O yes, that worthless frozen country which we bought from Russia for two cents an acre." The Yukon then was only a name. But within the last two months has come an entire revolution in the attitude of our people toward the great northwestern territory. Who has not heard of the Chilkoot pass, St. Michael's, and, greatest watchword of all, Klondike with its treasures, the uncovering of which caused such an excitement in the middle of July? At that time we entered upon a gold madness which has not been equalled since the days of the Cariboo stampede in 1859. It is true that the latest discoveries are situated within British territory, but so near to our frontier that we are greatly affected, and even consider them our own. The public began to realize what some had known for a long time,—that there are great possibilities in that territory of which Uncle Sam has taken so little care. Immediately upon the announcement of the newly-discovered Eldorado, parties were fitted out all over the United States, east as well as west, and these parties attempted to enter the country by all the different routes, even when the approach of winter made such entrance dangerous, and, in the opinion of "old-timers," well-nigh impossible.

Some of these parties, unsuccessful in their efforts, turned back; others, having crossed the Chilkoot pass or ascended the Yukon, are well on their way to the diggings, whence news of their doings may transpire at long intervals during the next few months. In this mad rush are hundreds who have never had any experience in Alaska life; some are "tenderfeet," who think that gold is to be picked up everywhere, and will be much surprised to find that they are obliged to work even harder for a living than "on the outside." There will also be an influx of the blackleg element, those non-producers who live on the production of others, and are justly despised by the better class of Yukon miners.

Before this time the population was a little more than 1,700, but with this sudden increase the character of the interior must utterly change, and it is probable that even now the civilization which the writer had occasion to observe last summer has become historic. Here these people have lived and worked,—a cosmopolitan community made up of representatives of almost all races and walks in life. They are mostly Americans; they are practically beyond the jurisdiction of the courts, but they are not for that reason lawless. It was early appreciated that society must have some sort of protection. To this end the "miner's meeting" was established as the law-making body. This meeting consists of all the men who inhabit a certain district, or, as the population increased, all who work in a certain gulch. In this meeting every man has an equal vote. A chairman is chosen by the assembly, but his power is slight, and in all cases the majority rules. By this legislative assembly, which, by the way, has no regular time of meeting, but may be called at any time by public notice, all the laws governing morals and mining are passed.

It was by this assembly that Chinamen were excluded from the privilege of mining in the Yukon, and that murder was made a crime punishable by death. But the miner's meeting is not wholly legislative; it is the final court in all criminal or civil suits. Here the majority act as judge and jury, there are none but volunteer lawyers, the weightiest questions are decided, and the decision is generally carried into effect without delay.

At first these hardy pioneers rendered decisions of the most puritanical strictness, and there was little or no crime. In a measure this immunity has been due to the obstacles in the way of entering the country and the extreme difficulty of living when once there; for nowhere is seen a clearer illustration of the principle of the survival of the fittest. The dangers to be encountered upon the "trail" to the diggings, and the hardships to be endured, have weeded out all those unfitted to a pioneer life, and the result is an entire community of sturdy men, capable of almost unlimited physical endurance.

Of late years, however, as might have been foretold, the establishment of precedents has led the miners into several mistakes; at times, perhaps, there has been a personal bias which has made the decisions actually bad. At any rate, among the more conservative miners the "miner's meeting" is not now revered as formerly.

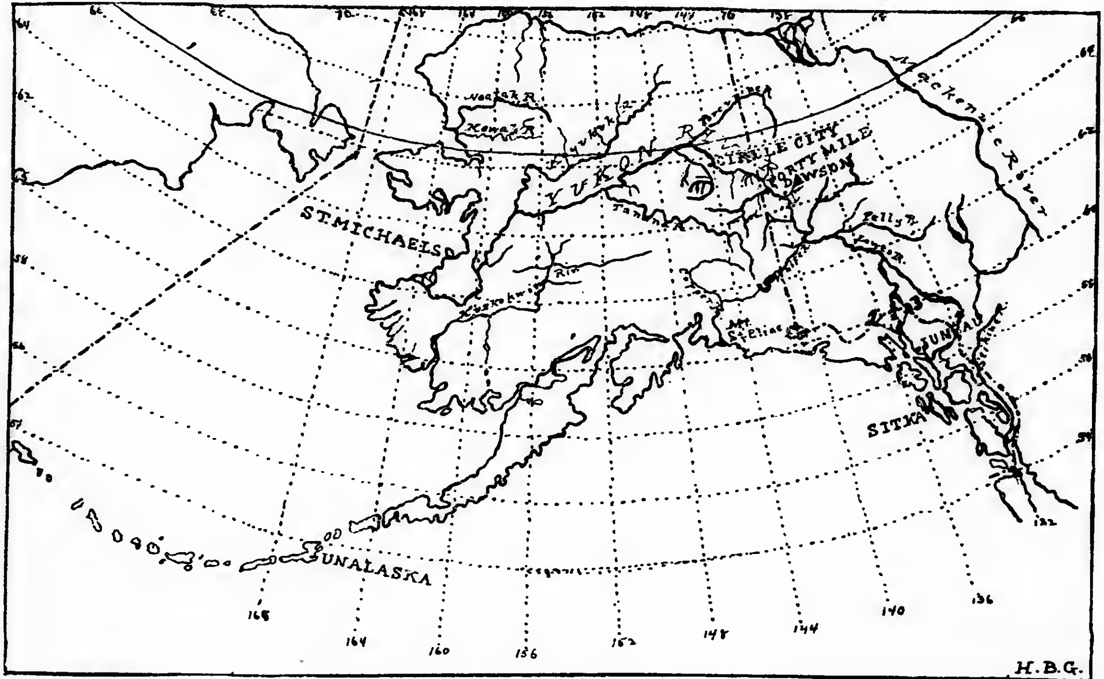
Last summer, in one of the British creeks in the Forty Mile district, there was a clash between the self-appointed government and the Canadian mounted police stationed at Fort Cudahy to preserve order. A claim owner had not paid the men employed by him, and the miner's meeting voted to sell his claim to satisfy this demand; but the soldiers were sent to the gulch, and this decision was rendered void. On the American side of the boundary line there have been no officers corresponding to the mounted police, the only representatives of the government being two custom-house officers sent to Circle City last summer, and the authority of the miner's meeting has never been questioned. Under its rulings, mining has been carried on, and all have lived harmoniously. If, as has infrequently happened, a man has been convicted of stealing,—the crime next to murder in heinousness, —he is whipped at the post and sent out of the country.

Placer mining is the only kind practised, and it is carried on in the most primitive manner. Bar and gulch diggings are the two types of occurrence. The former consist of gravel deposits in the quiet portions of running water, and are found in points of land, or islands in the stream. In earlier days these placers, which contain generally fine and far-carried gold, were the only ones worked. At present, however, although a certain amount of "bar-rocking," as it is called, is carried on along the main stream of Forty Mile creek and others, this form of digging is not nearly so important as that of the gulches.

In the bar the "rocker" or cradle of the Californian days is generally employed. More complicated machinery, however, is used in some localities. Flumes have been built which convey a head of water sometimes a half a mile, and the necessary force for sluicing is also obtained by raising the water from the main stream by a water-wheel. Two of these have been erected, one on Forty Mile and one on Birch creek. They are fifteen feet in diameter, float in mid-channel, and are supplied with cup-paddles. But even with these appliances very few bar-diggings produce more than ten dollars a day per man, which, under existing conditions, is the lowest yield that can be made profitable.

Gulch diggings are deposits of gold-bearing gravels which have been made in the valleys of the smaller creeks. The gold in them is generally coarse, bearing the character of nuggets, and has not been carried to any great distance from its place of origin. Geologically speaking, the gravels are recent, and have invariably been deposited in running water—not by glaciers, as is sometimes thought, for there has been no glaciation in the gold region. They occupy the lowest part of the trenches which have been excavated in the surface by the running water. The present stream often takes a slightly different course from that which it pursued at the time of deposit, the result being that the gravels are cut and exposed at one portion, while at another the water flows over bare bed-rock.

The thickness of the gravel varies from head to mouth of the same creek and between different creeks, and so there is a distinction between shallow diggings, in which the deposit is thin, and deep diggings, where it is from fifteen to twenty-five feet thick. The Klon



Drawn by the Author.

MAP OF ALASKA, AND PART OF BRITISH AMERICA.

1, Chilkat Pass; 2, Chilkoot Pass; 3, White Pass; 4, Taku Pass; 5, Scoloi, or Nicolai Pass.

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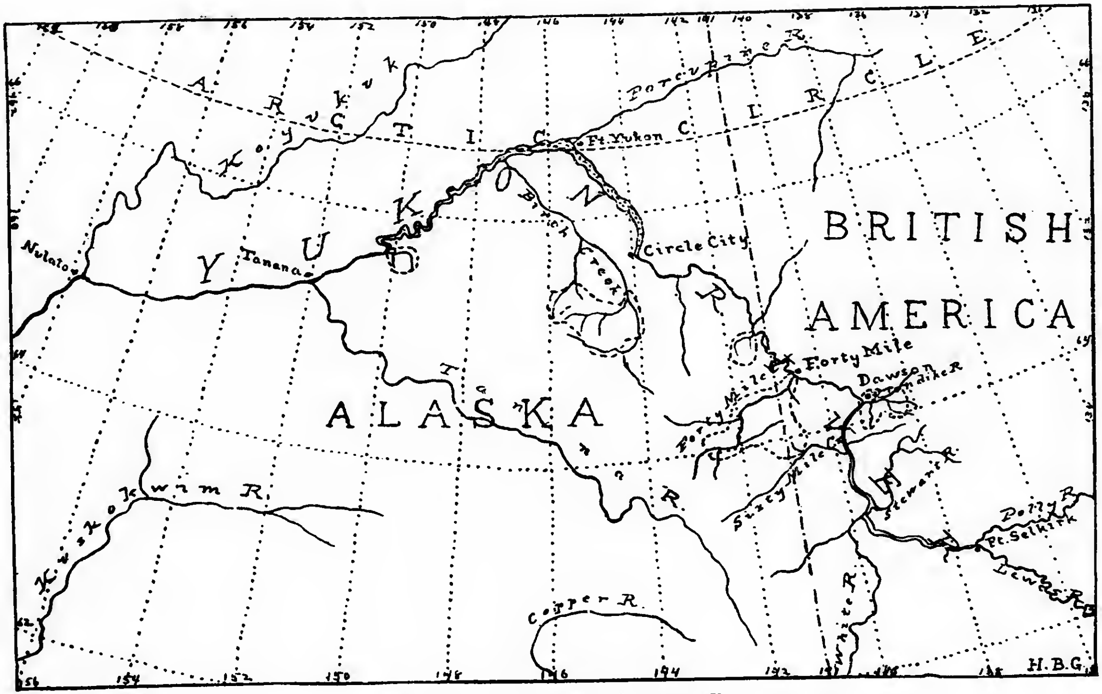


Drawn by the Author.

MAP OF A PART OF THE YUKON VALLEY.

Showing the areas in which placer mining is being carried on. Scale, approximately 1 in. = 100 miles.

dike placers are of the latter kind, and often in its gulches there are twenty-five feet of gravel deposit between the soil, or "muck," and the underlying bedrock. These gravel deposits are usually not gold-bearing throughout their entire thickness, but are divided into the "barren gravel" and the "pay streak," the latter being generally at the bottom and varying greatly in width and thickness.

In the Klondike district, on Bonanza creek, four feet of pay dirt has been reported with a width of thirty feet, yielding from fifty cents to one dollar to the pan all through. The bed-rock underlying the gravel is often found to contain gold, and it frequently pays to mine this, particularly when it is decayed and loose for a foot or so down. On Eldorado creek in the Klondike district it is said that profitable bed-rock is three feet thick.

Having found the pay streak under the mass of barren gravel, the prospector pursues different methods to reach it. If there is no great thickness of gravel, the miner "ground-sluices" the claim with the water from the creek, and, having stripped the gravel, shovels it into sluice-boxes, where the heavy metal is separated from the lighter gravels and is caught by the strips called "riffles" on the bottom of the boxes. It is finally recovered in the "clean-up" by amalgamation with mercury. This is done in the summer-time, and the amount of production depends largely upon the accidents of climate, for the working time may be cut short by the continuance of the spring flood period, or toward the middle of August drought may come, and last until the country freezes up in the middle of September.

Thus it happens sometimes that a summer's working-season is only sixty days long, and it is obvious that claims must be very rich indeed to make up for that short season. To obviate this difficulty, the miners have endeavored to extend their operations to cover the whole year, the severe winter as well as the genial summer, and the method of "burning and drifting" has been evolved. For these "winter workings" shafts and tunnels are driven, as in ordinary bed-rock mining, through the frozen gravel, but, in place of powder or dynamite, fire is used. A large blaze is built upon the surface, and by it the ground is melted. The thawed ground is then removed, and a shaft is started. By continuing the process the shaft finally reaches the pay streak, which is mined and laid by in dumps until the water flows in the spring, when it can be washed.

It can be seen that this is particularly advantageous in deep diggings, and it is a fact that all the large "stakes" have been taken out by winter working. For instance, previous to the development of Klondike, the largest amount ever taken out on one claim was $45,000, won by John Müller, on Miller Creek of Forty Mile District,

"TRACKING" TO THE GULCHES.

Drawn by H. T. Pratt from a sketch made on the ground by the author.

mainly by "burning and drifting." Klondike itself has typical winter workings, and it was by this process that all the large amounts of gold brought to San Francisco in July were extracted.

Until the discovery of Klondike the development of the interior had progressed in Alaska proper, toward the west, and the output had increased until in 1896 the production, exclusive of that in British territory, was in the neighborhood of $1,000,000. All this (as later the $2,000,000 or more of gold from the Klondike) was taken out by summer and winter workings with a minimum outlay of capital. The miners have whipsawed their lumber themselves, and made their own simple sluices and cradles, which, with gold pan and shovel, have constituted their entire mining outfit. Hydraulic mining has not even been attempted, and, while there is much gold-bearing quartz through the different placer areas, the expense of all kinds of machinery has precluded actual "quartz mining." It has, in fact, been the bane of the country that, on account of its severe climate, it is not self-supporting, and that difficulty of communication with the "States" has made the cost of living extraordinarily high. Correspondingly wages are high,—$10 a day, or a dollar an hour, and, during the first of the Klondike excitement, even higher. This is the reason why all placers whose product falls below $10 a day for each laborer must be abandoned, as stated above.

An expert on gold and gold-mining, Mr. Joseph De Lamar, recently published the statement that Alaska can never be compared with California, because of the difficulty of living there. It is undoubtedly true that the severe climate has greatly delayed the development of Alaska. Few wished to invest capital in a country where, because of its isolation during the long winter, the risk is so great and the returns so slow. To a certain extent, however, these difficulties can be overcome, and, if the Klondike stampede is for a time disastrous because of its unexpectedness, in the end it will undoubtedly be highly beneficial. The tide of capital has set that way. Alaska will no longer be a "poor man's country," but, by the competition which will obtain between rival companies, it may reasonably be expected that the cost of living will be materially reduced, machinery be brought in, and mining in an improved form be put on a permanent basis.

In order to accomplish these results, ingress and egress must be made easier. Up to the present time there have been two principal routes by which the gold fields are reached. One is by steamboat from Seattle or San Francisco, across the North Pacific to Unalaska in the Aleutian Islands, and thence to St. Michael's near the mouth of the Yukon. From here a transfer is made to the flat-bottomed river

GULCH MINING.

Drawn from a sketch made on the ground by the author.

steamboats which navigate as far as Dawson City, a distance of nearly 1,800 miles. Supplies have heretofore been brought into the country in this way by a journey of 4,000 miles, but the miners prefer the second route over the Chilkoot pass, by which they can reach the diggings about a month earlier. The Chilkoot pass route is full of difficulties, as is well known. Generally the miner crosses it in the early spring, before the lakes at the head of the Yukon are clear of ice, builds his small boat on Lake Linderman, and sails down the river, carrying his provisions with him.

The point he most dreads is the Miles cañon, where the Lewes river narrows to fifty feet and plunges between basalt walls at a rate of twenty miles an hour. The cañon itself is only five-eighths of a mile in length, but there is a vast amount of experience crowded into the few seconds of its passage. As one miner expressed it after going through the cañon:

"I wouldn't have missed that trip for fifty dollars!" and then significantly added: "But I wouldn't make it again for five hundred."

The cañon spreads out in the middle, forming a circular eddy, and a story is told of two Swedes, whose boat, carried out of the main current, circled about in this central basin for many hours, while they were wholly unable to guide its course. At last, when they were worn out with terror and fatigue, a caprice of the current sent them dashing and plunging unexpectedly through the lower part of the cañon. The White Horse Rapids, three miles below this dangerous spot, is even worse, and in its turbulent plunge many valuable outfits and even lives have been lost. There are also other less dangerous rapids still further down, through which the miner passes on his way to the camp.

While the ocean voyage and passage up the river will, of course, be maintained on the lower Yukon for purposes of traffic and supply, some more direct route to the gold fields of the upper river must be established in the future. The journey by way of the Chilkoot pass—"over the trail" in the language of the miners—is the shortest one to the headwaters of the Lewes river, but, on the other hand, from the salt water at Dyea across the Coast range to Cañon lake, the way is one of the greatest difficulty. The summit of the pass is 3,560 feet above sea-level, and is reached only by the hardest climbing. It is obvious to all who are acquainted with this region that a railroad through it would involve an immense expense.

There is, however, another pass, which crosses the coast range a little further to the southeast. This is known as White pass (No. 3 on map), so named by Mr. Wm. Ogilvie, the experienced Canadian surveyor, in honor of a Minister of the Interior of the Dominion. Its

SHOOTING MILES CAÑON.

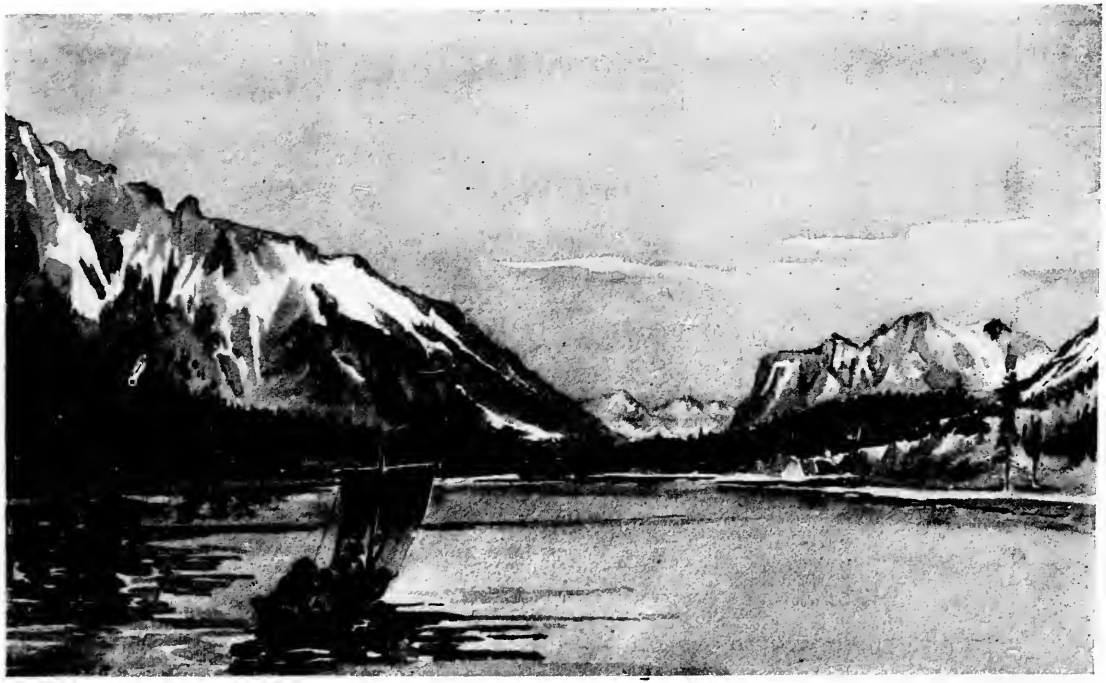
Drawn from a sketch made on the ground by the author.

altitude is 2,600 feet above the sea. From the mouth of the Skagway river in Taiya inlet to its summit the distance is seventeen miles, nine of which are said to be through a cañon which presents great obstacles; but the approach to the lakes on the north of the Coast range is easy, and the route is reported to be practicable. It is lately reported that the Canadians have built a trail through it, and are laying a telegraph line into the interior.

Supposing the headwaters of the Lewes to have been reached by a railroad through either the Chilkoot or the White pass, the river affords an easy line of travel for four months of the year. During this time, while it is free from ice, flat-bottomed steamboats of light draft can be used. The main difficulties to be overcome are shallow water and rapids. Light-draft steamers on the Lewes could pass all these, with the possible exception of the White Horse, which, however, with the Cañon, could be avoided by a steamboat route through Lake Ahklen down the Hootalinqua river. An entrance to this line would be made through the Taku pass (No. 4), about 75 miles from Juneau. Its feasibility as an approach to the interior was demonstrated by Schwatka and Hayes, who in 1891 made the trip through it to the Yukon valley. The objection to this route is its length.

As I have stated, the river would be open to travel only from the middle or last of May to the middle of September. It might be advisable, then, to have a railroad down the Yukon. Could one be put through cheaply from salt water to the diggings? Chilkoot pass is unsuitable; so one of the others must be utilized. The topography of the upper lake country is that of rugged, steep mountains. The snowfall in winter is not deep, yet deeper than in the gold districts, and blizzards are frequent. The difficulty of building and maintaining a railroad would be considerable.

At Mud Lake the country becomes flat, and is characterized by rolling hills, into which the streams have cut narrow valleys. This type of typography continues as far as Fort Selkirk, one hundred and fifty miles above Klondike, where the Rampart mountain range crosses the river. This Rampart country, with its cliffs and mountains, presents many obstructions to travel. Altogether, a railroad down the Lewes valley would be rather rough. However, there is still another pass about fifty miles northwest of the Chilkoot. It is called the Chilkat pass, and is said to be much lower than the one usually taken by the miners. It is through this that Jack Dalton, a well-known pioneer, has led a train of cattle by a short route to the gold fields. This line of travel is known as "Dalton's trail," and by it one can pass overland through a level grassy country to the confluence of the Pelly and Lewes rivers. The time necessary for making this trip on foot is said



LAKE LINDERMAN, LOOKING NORTH.

Drawn from a sketch made on the ground by the author.

to be only fifteen days, and it is thought that this, the most direct route of all, may become the main line into the interior.

Besides the ways mentioned, various others have been suggested; the route up the Stikine river, crossing overland to the Yukon from Telegraph creek, is perhaps the best of these, since it is open as late as October, while travel by the others becomes dangerous by the first week of September. Another route from the east through Northwest Territory to the Mackenzie river, thence westward to the Porcupine and down to the Yukon, is said to be contemplated by a Canadian company. This, however, would be a long route, and would lose the advantage, possessed by the Stikine line, of passing through the Cassian and other gold districts of British Columbia.

The miners, however, not only look forward to easier means of entering the country, when "grub" will be much cheaper and easier to get than now, but dream of wagon roads from the towns to the diggings. When these are put through, they will no longer be obliged to "pack" their outfits on their backs and carry them through mosquito-infested swamps, or to tow their boats a hundred miles against a rapid current. While such a condition is still in the dim future, it is within the limits of possibilities. The move has been made in the right direction, and in a few years Alaska may not be so bad a place to live or travel in.

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