Bulletin No. 247

Series { A. Economic Geology, 41
B. Descriptive Geology, 52

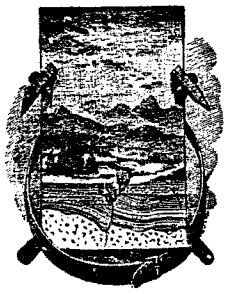
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

THE

FAIRHAVEN GOLD PLACERS, SEWARD PENINSULA, ALASKA

BY

FRED H. MOFFIT



WASHINGTON
GOVERNMENT PRINTING OFFICE
1905

GENERAL CONDITIONS.

TRAILS.

The camps of the gold field described above may be reached from Nome either by overland trail or by the water route through Bering Strait and the Arctic Ocean into Kotzebue Sound. Both routes are used, and each has certain advantages of its own not possessed by the other. Kotzebue Sound was frequently visited by vessels long before the discovery of gold on the creeks, and this method, all things considered, is still the most practicable way by which miners can obtain provisions and the other necessary supplies.

The distance from Nome to the town of Kiwalik, measured in a direct line between the two places, is very nearly 150 miles, but the distance actually traversed in going overland from one place to the other is considerably greater than this, owing to the indirectness of the trails through a region sometimes mountainous and always wet. A distance of more than 300 miles must be traveled when the sea route is chosen, but the time required is less and the difficulties of the cross-country journey are avoided. This method is, of necessity, used only during the summer months, since throughout the greater part of the year ice puts an end to all navigation. The open season begins about the middle of July, when the ice of the sound melts, its protected position preventing it from being reached and broken up earlier in the year by the storms of the outside sea. Navigation closes again about October 10, when the last boats leave Deering and Kiwalik to avoid the possibility of being frozen in for the winter. However, there is generally a week or more of good weather after that date. Deering and Kiwalik may thus be frequently reached by water during three months in the year, since the two small steamers running between Nome and Kotzebue Sound make regular trips twice each month with mail and freight.

The overland trails are used by the miners who wish to take in supplies over the snow or who desire to be on the creeks early in the season, and also by the men who carry the mails after the closing of navigation. Of the two principal trails, that used by the mail carriers is the more direct, but is not much traveled in summer. It starts from Council, ascends Fish River to a small tributary just north of Mosquito Creek, crosses over the divide to Death Valley, on the head of Tubutulik River, and reaches the Koyuk by way of a narrow mountain pass about 1,200 feet above sea level, and Timber Creek. After crossing Koyuk River and Big Bar Creek this trail continues up First Chance Creek and over a low divide to the head of Gold Run, thence northward along Kiwalik River to Candle. The northern half of the trail is not difficult for pack horses in the summer time if the traveler keeps on the ridges, where the moss is not so widely spread and the harder ground affords better footing.

The second route reaches Lanes Lan
Salmon Lake trail from Nome or by
A wagon road leads from Lanes La
Quartz Creek one travels northeast a
and Noxapaga rivers to Turner Creek.
ridge to Aurora and Eldorado creeks
turns eastward, crosses the head of
Goodhope River, and then follows t
which heads against the Inmachuk.

With horses the northward detour
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with flags, which indicate the less di
toward the east the traveler is usual
his own trail and must rely on his
doing so.

The second route reaches Lanes Landing by way of Nome River and Salmon Lake trail from Nome or by way of Teller and Marys Igloo. A wagon road leads from Lanes Landing to Quartz Creek. From Quartz Creek one travels northeast around the lowlands of Kuzitrin and Noxapaga rivers to Turner Creek, and thence along a low rounded ridge to Aurora and Eldorado creeks. At Eldorado Creek the trail turns eastward, crosses the head of Placer and Esperanza creeks to Goodhope River, and then follows the Cottonwood to Trail Creek, which heads against the Inmachuk.

With horses the northward detour from Turner Creek is necessary in order to avoid the lava-covered and nearly impassable country along the east fork of the Noxapaga. This trail is the one usually followed by prospectors starting from Nome in summer or in the springtime after the melting of the snow has put an end to the use of sleds, and, while perhaps somewhat longer than the trail from Council, does not cross as much rough ground.

The water route, when conditions permit its use, is so much quicker and easier that it is to be preferred by those who wish to go into the country themselves or who have freight to be taken in. One great objection to it lies in the lateness of the season when the first boats enter the sound, since conditions on the creeks are favorable for some work before the middle of July.

There is still a third route from the south to the north side of Seward Peninsula, which, however, is rarely used. Starting from Norton Bay at the mouth of Koyuk River, the trail follows the stream to the northward about 15 miles, then ascends the east fork and crosses over the divide to the head of the west fork of Buckland River. This furnishes a comparatively easy method of reaching Bear Creek from Norton Bay, but is not a practicable road to Kiwalik or Inmachuk rivers. As has already been stated, the Buckland does not afford a favorable means of reaching Bear Creek from the north. The overland trip from Candle to Bear Creek can be made with pack horses in from twenty-four to twenty-six hours, while on the other hand it required in one case sixteen days of hard work to take a boat load of supplies up Buckland River from Kiwalik to Cub Creek, a small tributary of the Bear. Throughout Seward Peninsula winter is the chosen time for traveling and for freighting supplies where boats can not be used, and, as a result of this, the trails are obscurely marked or more often do not show at all in summer. Some bad stretches in the more frequently traversed roads near Lanes Landing are marked with flags, which indicate the less difficult crossing places, but farther toward the east the traveler is usually under the necessity of choosing his own trail and must rely on his own experience and judgment in doing so.

58TH CONGRESS, 3d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 391.

Bulletin No. 250

Series { A, Economic Geology, 43
B, Descriptive Geology, 54

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

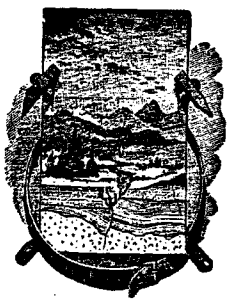
CHARLES D. WALCOTT, DIRECTOR

THE PETROLEUM FIELDS OF THE PACIFIC COAST OF ALASKA

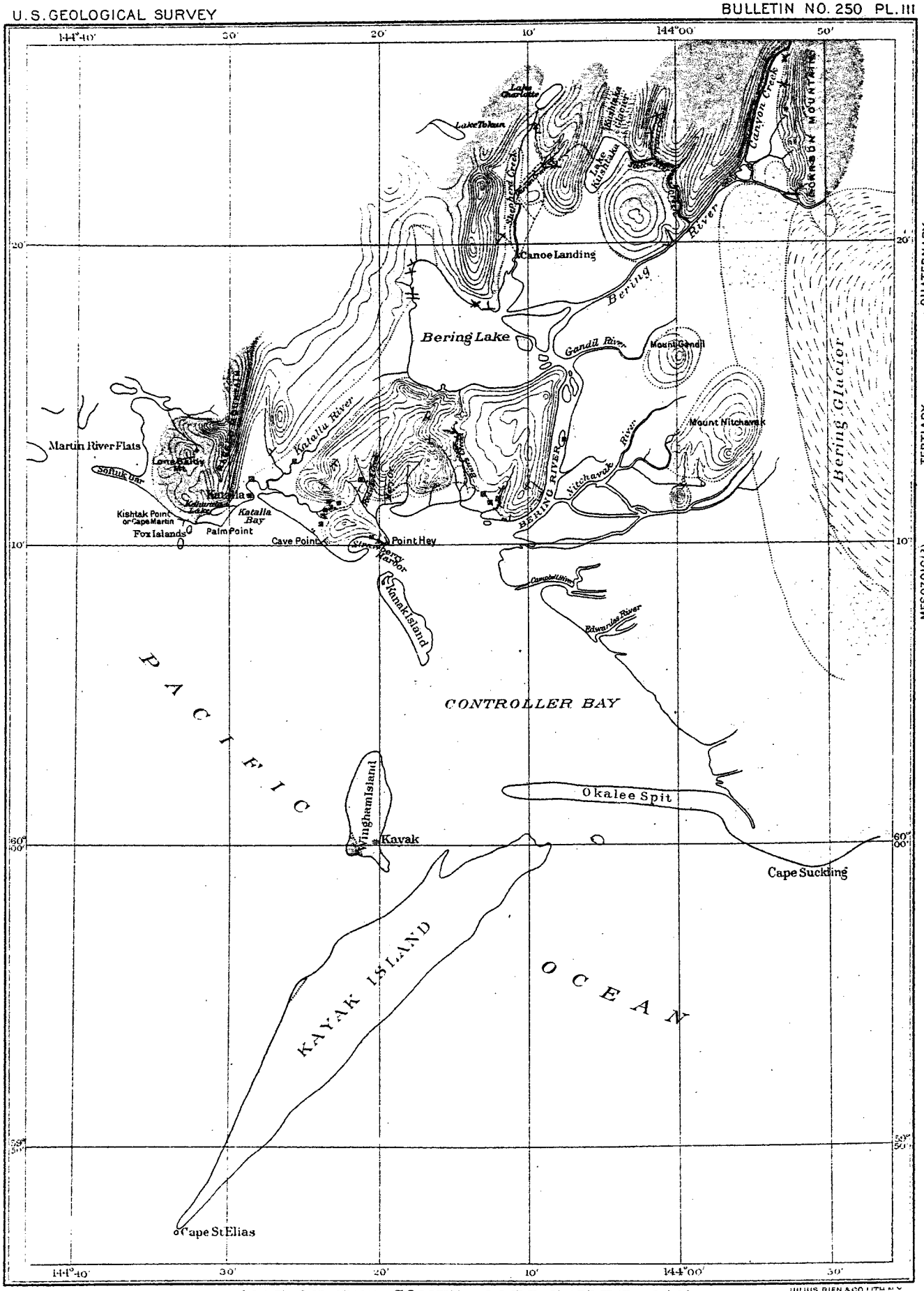
WITH AN ACCOUNT OF THE BERING RIVER COAL DEPOSITS

BY

GEORGE C. MARTIN



WASHINGTON
GOVERNMENT PRINTING OFFICE
1905



MAP OF THE CONTROLLER BAY REGION

JULIUS BIEN & CO. LITH. N.Y.

Bulletin No. 277

Series { A, Economic Geology, 65
B, Descriptive Geology, 80

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

MINERAL RESOURCES OF KENAI PENINSULA, ALASKA

GOLD FIELDS OF THE TURNAGAIN ARM REGION

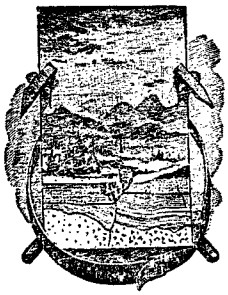
BY

FRED H. MOFFIT

COAL FIELDS OF THE KACHEMAK BAY REGION

BY

RALPH W. STONE



WASHINGTON

GOVERNMENT PRINTING OFFICE

1906

of gold. Extensive preparations for mining pyritiferous deposits were made but finally discontinued and nothing beside assessment work has been done for the last two years. A wharf was constructed and one or two tunnels were started on the claims. A stamp mill also was landed, but was never set up, and is still stored at the beach.

COPPER.

Small pieces of native copper are found with the placer gold on several of the streams previously described. This copper was most abundant in the sluice boxes on Lynx Creek and led finally to the discovery of a ledge carrying copper sulphides, located on the mountain side at the upper end of the valley and well above the stream. Although the presence of the outcrop has been known for some time no steps toward determining its commercial value were taken till some time during 1904, when a company was raised for its exploitation. Much of the season was spent in preparation for opening the deposit and the field operations of the company did not begin until some time in August, so that comparatively little rock work had been done when the Survey party left the peninsula. An adit level, driven to strike the lode below the outcrop, had not cut it in the early part of October, but it was reported that work would be continued during the winter. At present supplies are brought to the camp from Sunrise by pack train, but if this prospect should develop into a paying mine connection with the Alaska Central Railroad could be established without serious difficulty.

ECONOMIC CONDITIONS.

ROUTES AND TRAILS.

Many of the first prospectors in the Turnagain field came into the region from Prince William Sound by way of Portage Glacier, for at that time there were no steamers making regular trips to Cook Inlet and, moreover, it was unsafe for boats to enter during a large part of the year because of ice. Winter mails continued to be brought in and sent out in this way for a number of years in the earlier history of the field until the overland mail routes from Seward were established. The passage over the glacier, though not very difficult at the proper season, is often dangerous because of the fierce storms which sweep through the gap and have caused suffering and death in a number of cases. At present this route is not frequently used.

During the open season on Cook Inlet—that is, from the end of March to the beginning of November—the most convenient and customary means of reaching Hope or Sunrise is by the small steamer which connects with the ocean-going boats at Seldovia and carries mail, freight, and passengers to the upper end of the inlet. During the early days large boats occasionally went up the inlet in the summer months, touching at Tyonok, where it was necessary to transfer to small boats, often dories, in order to reach Turnagain Arm. At present these large vessels do not go farther north than Seldovia or Homer. The harbor at the former place is well protected, but small, while the anchorage behind Homer Spit, farther up Kachemak Bay, is swept by strong winds at certain seasons.

Large boats can not enter Turnagain Arm, but small ones of light draft reach Hope or Sunrise at high water and usually lie over until the next high tide to leave. At low water they are stranded on the mud flats. The completion of the Alaska Central Railroad will probably change the freight and passenger route into this region. Seward, the coastal terminus, possesses a splendid harbor, whose chief fault is its great depth. It is open all the year round and is well protected on every side. The railroad company has constructed a good wharf, at which steamers unload directly, without lightering, and had completed about 12 miles of track when work was shut down for the winter. Although the route chosen does not pass the camps on Sixmile

Creek, it crosses the upper end of the
be readily established.

The trail from Seward to Sunrise al
Lakes to Johnson and Bench creeks, a
one followed by the Survey party in
trail leads from the forks of Sixmile to
of Kenai Lake. This trail connects wi
Resurrection Creek may be reached fr
again Arm from Mills Creek by way
been constructed from Hope to the hy
Resurrection Creek, whence a trail le
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Creek may be reached from the shore
part of which is corduroy.

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except the temporary one, most of wh
followed the dryest ground and und
The horses of the Survey party were
without packs, consequently little cutti
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Climatic conditions on Kenai Penins
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The climate of that part of the peninsu
is much like that of the interior, except
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or from the west, for the deep, straight
trolling influence on its direction, regar
Fair weather usually accompanies the w
rain. Different temperatures prevail in
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weather it is 10° warmer at Sunrise than
lies 2 or 3 feet in the valleys, but is not
side of the peninsula.

Work is begun on the creeks about the
the first or middle of October. In 1904
November 15—an exceptionally long sea

Most of the claims of the Turnagain A
ing as far as water pressure is concerned,
The water supply is largely dependent on
pass quickly in the spring a short flood p

Creek, it crosses the upper end of the arm, from which connection with Sunrise can be readily established.

The trail from Seward to Sunrise along the east end of Lake Kenai and the Trail Lakes to Johnson and Bench creeks, and thence down East Fork of Sixmile, was the one followed by the Survey party in the trip across the peninsula. A very good trail leads from the forks of Sixmile to Mills Creek also, and thence to the lower end of Kenai Lake. This trail connects with the Trail Lakes trail by way of Moose Pass. Resurrection Creek may be reached from Sunrise by trail along the shore of Turnagain Arm from Mills Creek by way of Pass or Summit creeks. A good road has been constructed from Hope to the hydraulic plant 3 miles above Sixmile Point on Resurrection Creek, whence a trail leads to Pass and Fox creeks. There are also good roads up Bear Creek and from Hope to Palmer Creek. The camps on Crow Creek may be reached from the shore of the arm by a road lately completed, a large part of which is corduroy.

There is no trail for horses down Kenai River from the upper to the lower lake except the temporary one, most of which was cleared out by the Survey party. It followed the dryest ground and undoubtedly could be straightened somewhat. The horses of the Survey party were taken over the ridge north of Lake Skilak without packs, consequently little cutting was necessary, and there is practically no trail there at all. Moose River may be reached from the lower end of Lake Skilak without difficulty, but the writer would strongly advise against taking loaded horses from that point to Kenai. It was done by the Survey party late in the summer, when conditions were most favorable, but there is danger of losing the horses. Possibly by following the river bank a better though much longer trail could be found.

CLIMATE.

Climatic conditions on Kenai Peninsula are not the same over the whole area. The south slope of Kenai Mountains and the lower part of Cook Inlet are influenced more directly by the currents and winds of the Pacific, and the climate there is similar to that of southeastern Alaska. There is much rainy or foggy weather and extreme temperatures are not known. During the winter of 1903–4 a temperature of —2° F. was reached only once at Seward, and the same was true at Seldovia.

The climate of that part of the peninsula that lies north and northwest of the divide is much like that of the interior, except that it is more changeable. The winter temperatures are much lower in this region than along the coast, the difference sometimes being as great as 30°, while in summer the temperatures are higher. Other weather conditions are more local. Clouds and rain may prevail for days on Turnagain Arm while the sun shines brightly on Cook Inlet; or these conditions may be reversed. On Turnagain Arm, in summer at least, the wind is either from the east or from the west, for the deep, straight valley of the arm seems to have a local controlling influence on its direction, regardless of whatever way it may blow outside. Fair weather usually accompanies the west winds, while east winds bring cloud and rain. Different temperatures prevail in different valleys. It is said that the temperatures on East Fork are lower than on Canyon Creek, and that in the coldest weather it is 10° warmer at Sunrise than at the Forks. On Sixmile Creek the snow lies 2 or 3 feet in the valleys, but is not so deep along Kenai River and on the west side of the peninsula.

Work is begun on the creeks about the first or middle of May and is continued till the first or middle of October. In 1904 gravels were washed on Crow Creek until November 15—an exceptionally long season.

Most of the claims of the Turnagain Arm field are well situated for hydraulic mining as far as water pressure is concerned, and water is obtained without great expense. The water supply is largely dependent on melting snows, consequently when the snow goes quickly in the spring a short flood period may occur, followed on small streams

Bulletin No. 278

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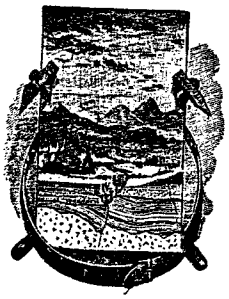
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

GEOLOGY AND COAL RESOURCES OF THE CAPE LISBURNE REGION, ALASKA

BY

ARTHUR J. COLLIER



WASHINGTON
GOVERNMENT PRINTING OFFICE
1906

ROUTES OF TRAVEL.

The most frequented routes of travel are naturally by boat along the coasts. Two trails overland from Point Hope to Corwin Bluff were shown on a map drawn by natives. One of these follows the coast line northward from Point Hope and crosses the Lisburne Hills near Wevok. The other crosses the mountains by way of Kukpuk Canyon, and then follows up a northern tributary, which heads about 6 miles south of Corwin Bluff.

Winter travel between Point Barrow and Kotzebue Sound usually leaves the coast at Kukpowruk or Pitmegea River, and reaches the coast again at the mouth of the Kivalina River, south of Cape Thompson, thereby saving considerable distance.

W. T. Lopp,[a] with the reindeer herd of the Point Barrow relief expedition, followed this route in 1898. An old route through the interior from Kotzebue Sound to Icy Cape, said to have been used by the natives in years past, is up the Noatak and one of its northern tributaries to the headwaters of the Utukok, which flows into the sea at Icy Cape.[b]

GEOLOGY.

STRATIGRAPHY.

The rocks of the Cape Lisburne region are, so far as known, all sedimentary. The bed rocks fall naturally into two groups—the Paleozoic and Mesozoic—and their distribution is indicated by the topography, since the Paleozoic rocks produce the high relief of the Lisburne Hills while the Mesozoic rocks underlie the region of low relief which lies northeast of them. Pleistocene and Recent sediments and ground ice form a third group, whose greatest area is found in the Point Hope peninsula. The distribution of the various formations is shown on the geologic map, Pl. I. The general stratigraphic relations are shown in the following tabular statement:

Tabular statement of stratigraphy, Cape Lisburne region, Alaska.

Age.	Formation name.	Contact relations.	Thickness in feet.	Lithologic character.
Recent		Unconformity	50+	Sands, gravels, etc.
Pleistocene		Unconformity	50+	Gravels, silts, talus, and ground ice.
Lower Cretaceous?		Conformity	10,000+	Sandstones interbedded with shales. Nonfossiliferous.
Upper Jurassic	Corwin	Unconformity	15,000+	Calcareous and carbonaceous shales with sandstones and conglomerates at infrequent intervals. Many coal beds. Jurassic plants. No marine fauna.
Lower Carboniferous, Mississippian.	Lisburne	Conformity	3,000+	*a*. Massive limestones interstratified with white cherts. Extensive coral and bryozoan fauna.
		Conformity	1,000+	*b*. Thinly bedded shales, slates, cherts, and limestones. Fauna includes brachiopods, trilobites, cephalopods, and lamellibranchs.
		Conformity?	500+	*c*. Thinly bedded, black shales, slates, and limestones. Several coal beds. Lower carboniferous flora. Brachiopod and coral fauna.
Devonian?			2,000+	Calcareous sandstones and slates. No fossils found.

[a] Jarvis, D. H., Report of the cruise of the U. S. revenue cutter *Bear:* Treas. Dept. Doc. No. 2101, pp. 67–68.

[b] Jarvis, D. H., Report of the cruise of the U. S. revenue cutter *Bear:* Treas. Dept. Doc. No. 2101, p. 72.

PALEOZOIC FORM

DEVONIAN RO

Probably the oldest formation of the regio
stones and interbedded calcareous slates, whi
burne Hills, where they form the sea cliffs f
Inlet, and are exposed for about 10 miles alo
stones range in thickness from 1 to 10 feet e
thinner. The massive members often present
ary mica. The total thickness has not been d
less than 1,000 feet.

The structure consists of a series of broad, c
30°. The beds being massive, the strains to w
been taken up in two sets of well-defined joint
slaty cleavage in the softer. The most promine
from N. 20° W. to N. 50° W., and is more ne
other set of joints strikes northeast. The relati
slaty cleavage in the softer is exposed with diag
called the Ears, about 3 miles south of Cape Dy

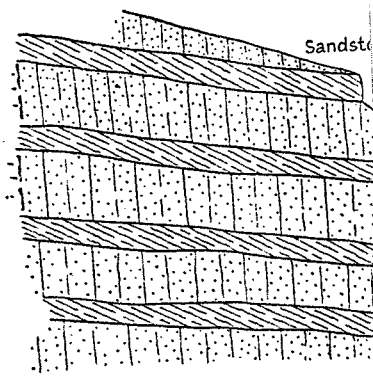


FIG. 1.—Sketch of detail of jointing and cleavage in pre

Calcite and quartz veins are often developed
been prospected in some instances, but, so far as
gold or silver. One of the largest seen, a calcit
Hope, has furnished material which was burned

The age of the formation is inferred from its
which overlie it with apparent conformity, thou
could be obtained. It is certainly older than Lo
placed in the Devonian.

The Devonian rocks identified in other parts
but seem to be characterized mainly by great d
them can be definitely correlated with those of
Seward Peninsula, 160 miles south of the region,
series consisting of schists and massive limestone
to be mainly of Silurian age. In the western ex
of this series give place to a series of slates whi
with Carboniferous limestones now correlated

[a] Brooks, A. H., The geography and geology of Alaska
pp. 218–221.

59TH CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 934.

Bulletin No. 295

Series { A, Economic Geology, 82
B, Descriptive Geology, 101

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

THE YUKON-TANANA REGION, ALASKA

DESCRIPTION OF CIRCLE QUADRANGLE

BY
L. M. PRINDLE

WASHINGTON
GOVERNMENT PRINTING OFFICE
1906

The distribution of timber is shown in fig. 2. The ridges (with the exception of the highest, which are rock and talus slopes) are covered mostly with moss or a sparse growth of dwarf birch and occasional clumps of alders. A light growth of small spruce covers the lower ridges and along with birch and poplar becomes abundant on their slopes. Spruce timber, 2 feet or more in diameter at the butt, is distributed in small areas along the lower valleys of the largest streams and more abundantly in the valleys of the two main rivers. Tamarack is common in the valley of the Tanana and in those of its most important tributaries. Timber for mining purposes is available to only a limited extent in the valleys of the gold-producing creeks, and in most cases must be transported a considerable distance. Small timber for fuel is abundant, but in the Birch Creek region is confined mostly to the lower parts of the valleys.

Feed for stock is found in the headwater valleys of the streams throughout most of the region, and in parts of the valleys of the larger streams is abundant. In the Crooked Creek Valley, near Central House, are natural meadows, where some of the grass is cut for winter use. Pack animals have in general but little difficulty in finding sufficient feed from the latter part of June to the first of September and cases are reported where horses have wintered in the open, dependent only on the natural resources. There are good gardens at the road houses in the Birch Creek region, and the rich soil produces all the common vegetables in abundance.

TRANSPORTATION.

In 1905 transportation by steamer had reached considerable development, a score or more of boats, some of them using oil for fuel, plying on Yukon and Tanana rivers and carrying thousands of tons of freight. The upper Tanana is difficult of navigation and, although steamers carried supplies as far as the Goodpaster and, in one case during 1905, as far as the head of the Tanana, there was no regular transportation to these points. Improvements in transportation for the most part cease at the steamer landings, and the wagon roads so long in use on the Canadian side of the boundary give place to primitive pack trails which in wet weather are most difficult to travel. In the Dawson region the miner on a lonely gulch may be visited twice a week by the representative of a general store who delivers supplies at a rate but slightly above that paid in town, and with the advent of the railroad and improved wagon roads a similar condition is coming to prevail in the Fairbanks region. In the Birch Creek region, however, with conditions for road construction equally as favorable as in the Dawson region, where the Canadian government has constructed such excellent roads, the miner must either have all supplies for the year transported in the winter, or must pay 20 to 25 cents for every pound carried by pack train from the Yukon a distance of 40 to 50 miles to the creeks. The production of the Birch Creek region, although not a large one, averaging about $200,000 a year, is yet sufficient even under unfavorable conditions to support a few hundred people, and the capacity of the region is such that it might be expected to respond to any improvements in transportation with increased production. It would seem highly desirable, therefore, that the Birch Creek region should be included in any general scheme of road construction for the placer regions in the interior of Alaska.

There is a station of the Government telegraph line at Kechumstuk near the southeast corner of the quadrangle but outside its area; another on North Fork of Fortymile, three at intervals of about 30 miles on the Goodpaster, and one at the mouth of the Salcha outside the quadrangle, but accessible to miners in the Salcha region. Trails have been constructed along the telegraph line and in places afford good traveling. Circle and the Birch Creek region are unfortunately without telegraphic communication.

The area covered by the map
and one consequently where it is
the existence of a formation in ur
The known facts, however, appea
the distribution of the formations
the narrow areas traversed.

The rocks include representati
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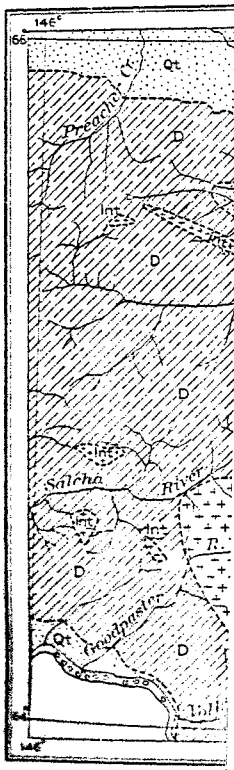
products of solidification from a n



Qt=Quaternary.
T=Tertiary.

Fig

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report they are divided
metamorphosed rocks, m
rocks which have been
some of which, like the se
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in time. Their distrib