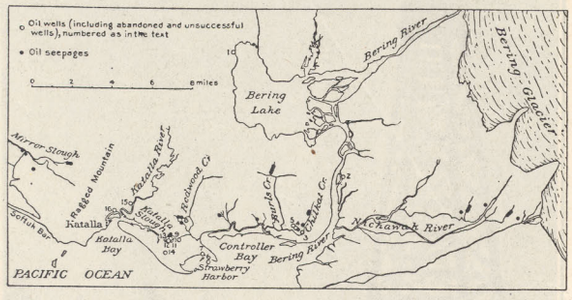
is thick and dark green in appearance, the volatile gases having largely evaporated. It will burn fiercely when a match is applied, but this is a rather dangerous experiment on account of the large amount of gas around these seepages. They are numerous on each side of Katalla, for a distance of about 30 miles; also for about the same distance eastward from Yakataga, at the eastern end of the belt. The mountains of this range are composed of alternating strata of sandstone and shale, with a few strata of conglomerate. The mountains in the Yakataga section rise somewhat precipitously from the coastal plain on the seaward side, and the alternating strata of white sandstone and dark shale rock, having a strike parallel with the range itself, give the range a beribboned appearance for miles which is very striking. The territory between the Katalla and the Yakataga sections is occupied in part by the wide alluvial deposits of several glacial rivers, which issue through brakes in the mountain range and have their sources in the main Alaska range, 30 to 50 miles back. The evidences of oil are not so abundant here, although



(Martin, U. S. Geol. Surv.)

KATALLA OILFIELDS.

seepages are found in these river valleys upon the farther or northerly side of the coast range, some 10 or 12 miles from the sea.

Along certain portions of this range for miles seepages occur in every gulch and 'draw,' forming small pools and dribbling rivulets of oil. In places whole mountain-sides at the base seem to be saturated with the oil, evidences of which can be found by digging to bedrock almost anywhere. Some streams, such as Johnson creek, carry so much oil down to the sea that its irridescent colors can be seen on the surface of every pool and eddy, and the peculiar odor of the oil can be detected half a mile distant when approaching the stream. There is a little lake of oil near the head of this stream. In winter the freezing of the water causes the stream to rise and fall between its banks of snow, which become saturated with oil for a distance of two or three feet, vertically, giving a peculiar yellowish color to the snow. In places gas rises with the oil, and in many places there are gas seepages where no oil appears.

The inhabitants of this section find the oil useful for many purposes. At Yakataga an auriferous sea-beach has afforded a living for a little community of miners for many years. Some of these men have set barrels in the seepages, which are so arranged that the water is discharged and the oil remains. They find the oil convenient for building fires; they also use it for lubricating and other purposes.

At Mirror slough, in the extreme western part of the Katalla region, there is a large gas seepage, which, when lighted, will continue to burn till the tide comes in and extinguishes it. The fresh oil from the wells is very explosive, and may be lighted with a match held at some distance from the oil.

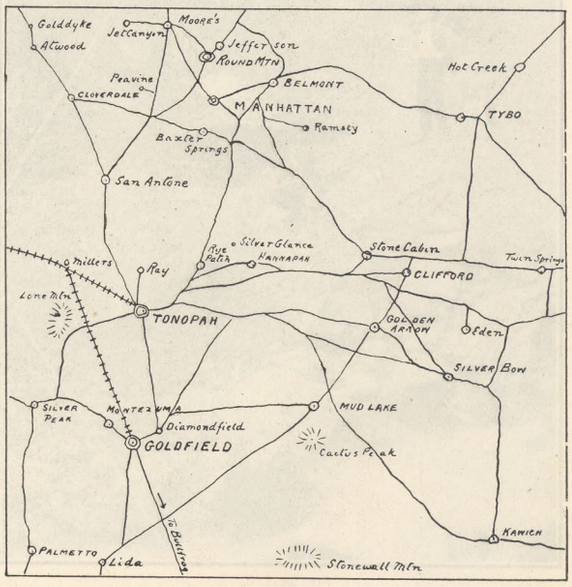
Preparations are being made at Katalla for a more extensive prospecting of the field. The oil thus far obtained comes from a stratum not far below the surface of the ground, though some of the wells have penetrated below this. It is thought by many that this oil has worked its way up through crevasses and cleavage in the formation and has spread its way through the receptive sandstones near the surface. It is believed that deep drilling will be necessary to determine the source of the oil supply. Owing to the large amount of gas made by the wells, and the pressure, it is thought that when the oil is found at depth, it will be under great pressure. It seems certain that an oil belt of this extent, where probably hundreds of barrels of oil are thrown off by seepages every month, must have a large body of oil behind it.

Antelope Mining District of Nevada

This district, which takes its name from an important group of springs, is about thirty miles east of Goldfield, in the southern part of the Cactus mountains, one of the desert ranges, between 6000 and 7000 ft. in elevation. It is connected with Goldfield by good wagon, automobile, and stage lines. The district was examined last January by F. C. Schrader, and the U. S. Geological Survey has just issued a brief report (Bull. 530-J) upon the district, written by him.

Gold was discovered here in 1903, when the region was visited by a wave of prospectors that followed in the wake of the Tonopah boom. Since that time several isolated prospects have been held, but the discovery of high-grade ore which caused the formation of the present camp was made in November 1911. Soon after that date there were more than 150 men in the district prospecting and making locations, and by the close of the year, a $15,000 five-day option had been taken on the discovery claim.

When Mr. Schrader visited the district two townsites were being developed, supplies and machinery coming in,



MAP SHOWING SITUATION OF CACTUS PEAK.

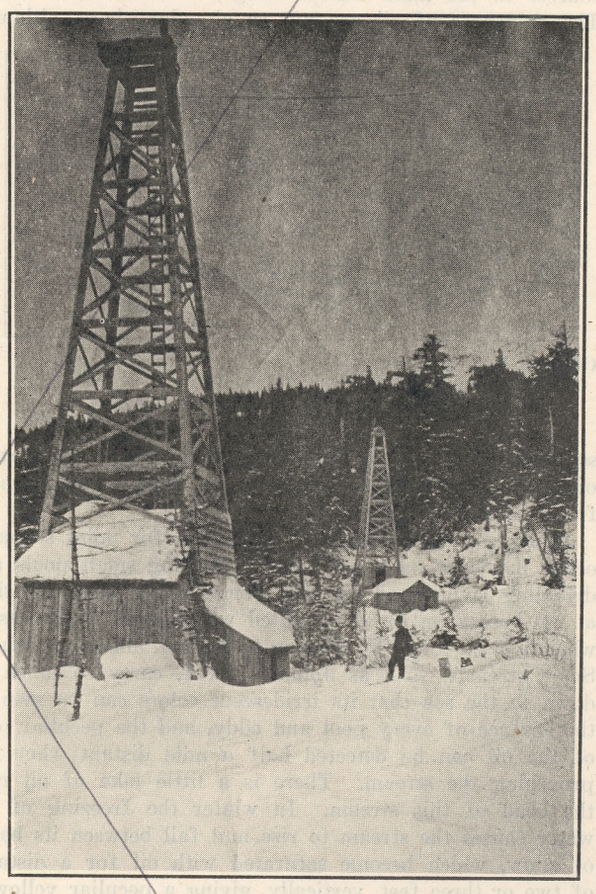
some ore was being hauled out, and considerable ground had been opened, but development was still confined to the 'oxidized' zone. The discovery shaft at that time had reached a depth of 23 ft. and practically all the material excavated from it—about 30 tons—was ore that averaged about $200 per ton, and contained some rich bunches. The deposits are silver and gold, which are found in or associated with veins and fissures in the rhyolite. The veins are about 20 in number, ranging in width from 1 to 20 ft. Some of them are persistent and have a known extent of 2000 or more feet. The valuable ore minerals are chiefly horn silver, argentite, and gold. Four-fifths of the value is in silver and one-fifth in gold. Some of the ore contains considerable free gold, which may be extracted mechanically in panning. The light color of this gold indicates that it is alloyed with native silver. According to latest accounts, received in April, the outlook for the district is encouraging. The 'main strike' shaft had at that time attained a reported depth of 85 ft., with continuation of the ore favorable in amount and grade. Good ore has also been found at several other places, and plans are made for the early building of a mill.

The Katalla, Alaska, Oilfield

By Arthur Thompson

Few people in the United States know that there is an area extending along the coast of Alaska for more than a hundred miles which contains pertoleum. In fact, the Alaska coast land eastward from the Copper river delta almost to Icy bay, at the foot of Mount St. Elias, is underlain with oil-bearing strata. Hundreds of seepages of oil are scattered along this belt and extend some distance back from the sea. It is not generally known, even in Alaska, that there are producing oil wells at Katalla, near the western end of this oil belt, and that these have been yielding petroleum of an especially high quality for more than a year, and that a little refinery situated near the wells has been making gasoline and kerosene from this oil. The westerly or Katalla part of this oil belt was reconnoitred by G. C. Martin, of the U. S. Geological Survey, in 1906, and was reported as oil bearing and favorable for exploration. This report,* including maps of the region, was published by the Government, and may be obtained of the United States Geological Survey at Washington, D. C. The larger area to the east has never been explored by the Government geologists. In it are many large seepages and other favorable indications of oil.

OIL SEEPAGE NEAR KATALLA.



OIL WELLS AT KATALLA.

Analysis of the oil shows that it has a paraffine base and contains about 38.5% naphtha and gasoline, and about 31% of kerosene, the remainder being paraffine and lubrication oils of high quality. The petroleum produced from these wells contains such a high percentage of the lighter volatile oils that persons sending out samples have been accused of 'doctoring' the oil. Gasoline produced at the local refinery is shipped to the coast towns, Katalla, Cordova, and Valdez, where it is in great demand for use in launches and in gasoline engines on account of its high efficiency, being preferred to the gasoline imported from the states. Valdez, which is the centre of a prosperous gold and copper mining region, has a dock controlled by the municipality, where the Alaska gasoline is given a half rate, the wharfage charge being 50c. per ton on local gasoline, and $1 on the imported article.

These facts are significant. They indicate that the coal of the Bering river and the Matanuska fields, when finally put upon the market, may have a strong competitor in the native oil of this same region. This crude oil is too valuable to use as a fuel as it comes from the wells. Two-thirds of its content may be taken out in gasoline for use in gas-engines and kerosene for lighting, and the remainder may be sold for fuel purposes, or it may be still further refined, yielding valuable lubricating oils, heavy greases, paraffine, and many by-products. It is worth several times as much per barrel as the fuel oil of California. While the oil world may look more or less complacently upon the opening of a new field in California producing a heavy asphalt oil, there will be a great oil excitement and an unprecedented period of development in this part of Alaska when further exploration shall demonstrate, as I believe it will, that there is a vast oil belt in Alaska which contains an incalculable amount of the finest petroleum in the world.

The Alaska coast, along which this oil belt lies, is skirted by a low range of mountains from 1000 to 2000 ft. high, which rise abruptly from the coastal plain a few miles from the sea. Along the base of this range, upon the seaward side, and extending up the 'draws' and gulches to the top of the range, are hundreds of seepages of oil. It

*'Geol. and Min. Res. Controller Bay Region, Alaska,' Bull. 335, U. S. Geol. Survey.