THE DEVELOPMENT OF THE RESOURCES OF ALASKA
1912-1927.

By

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The problem under consideration is to trace the development of the resources of Alaska during the period from 1912 to 1927.

The writer wishes to express to Professor J. C. Malin of the University of Kansas her appreciation for his suggestions and helpful advice concerning this problem; and to all others who have in any way assisted with this paper.
A special homestead law for Alaska permits that a citizen of the United States with homestead rights may take up 320 acres of unsurveyed land for homestead purposes, on payment of the cost of the survey which usually amounts to several hundred dollars.\(^1\) A homestead entry made in the United States does not operate to disqualify him.\(^2\) Certain tracts of land along the Susitna River have been restored to public domain by an executive order signed by President Coolidge, August 10, 1926, which had been withdrawn under the Congressional act which authorized the building of the railroad. This land is located on the east side of the Susitna Valley and the surveyed sections are made subject to entry under the Alaska homestead laws, according to the executive order.\(^3\) The 1919 report of the Alaska Agricultural Experiment Stations states that it has been demonstrated that Alaska offers large agricultural possibilities and encouragement should be given settlers to take up homesteads in Alaska, and every possible aid should be given them after their arrival.\(^4\) It has been estimated that 1,296,000 acres of the lands tributary to the Government railroad in the Cook Inlet and Susitna regions are suitable for farming without costly drainage. This would provide 8,100 farms of 160 acres each. About half of the best land lies in the Susitna and Matanuska Valleys. The railroad passes through
both of these valleys. Mr. Georgeson, special agent in charge of the Government Stations says, "He doesn't advise anyone to come to Alaska to farm unless they have money so that they can afford to come up here and then move back if they don't like it. If they can afford to do that then I tell them to come, see, and decide for themselves."

There are no prairies in Alaska. The first step the settler must take is to clear the lands. Under natural conditions the ground is frozen beneath the moss for an unknown depth, but when the vegetation is cleared off the ice recedes gradually year by year to a depth of six or eight feet.

The impression has been altogether too prevalent that Alaska is a land of snow, icebergs and polar bears. "We are just beginning to realize that its climate in many respects is superior to that found in parts of the United States". It has been said that the 64,000,000 acres of farm land are capable of supporting a population of 10,000,000. The experiment stations have demonstrated that Alaska is not only a food-producing country but that if the resources of the territory are developed, the wheat fields of Alaska will play an important part in the economic life of the nation. "Alaska has great agricultural possibilities", the United States Dept. of Agriculture declares. Alaska imports from the states every year more than $5,000,000 worth of agricultural products which could be produced locally. A survey in 1922 by the Chief of the Division of Insular Stations, States Relations Service in Alaska, for the United States Department of Agriculture
has demonstrated that Alaskan agriculture can be self-sustaining.\textsuperscript{11}

Radishes, mustard, turnips, kale, and lettuce can be grown nearly anywhere. Brussels sprouts, onions, spinach, beets, potatoes, carrots, parsnips, parsley, cauliflower, rhubarb, and such herbs as caraway, mint, catnip, sage and thyme may be grown along the coast region and in the interior if the garden sites are selected with reference to shelter and exposure to the sun. Corn, beans, cucumbers, tomatoes, eggplant and melons have not been successfully grown under ordinary garden conditions.\textsuperscript{12} The principal difficulties of farming in Alaska are the scarcity of level ground and an overabundance of rain and cloudiness.\textsuperscript{13} Only spring wheat can be grown successfully in Alaska. So far no variety of winter wheat has been found that does not winterkill. Barley is destined to take the place of corn as a stock feed. Since it matures early it can be depended upon even in adverse seasons. Legumes are destined to play an important role in the agriculture of Alaska so various experiments have been carried out at the interior stations to determine their relative value for feed and for maintaining the fertility of the soil. The yellow-flowered sort, Medicago falcata, is the only hardy alfalfa that has so far been found. Common alfalfa invariably winterkills.\textsuperscript{14} The Washington correspondent of the Philadelphia "Public Ledger", says, "The development of the soil promises to make Alaska the Mecca of advanced farming."\textsuperscript{15}

An agricultural college and School of Mines was opened in Fairbanks, Alaska, in September, 1922. This is the first
institution of higher and technical learning in the Territory. This college is the farthest north of all the colleges in the world. When it opened it had six students and six professors but by the end of May, 1923, the enrollment was forty-four. It is the last of the Government land grant colleges. Charles E. Bunnell is the President. He was formerly in the Bureau of Education work. On the four sections of land granted to the territory as a site for the college is the Government experiment Station of the Dept. of Agriculture. The Alaska Experiment Station of the United States Bureau of Mines is also located at Fairbanks. Tuition in the college is free to both residents and non-residents of the Territory.

Sitka Station—The Sitka station started in 1898 is devoted entirely to fruit and vegetable growing, and plant breeding. An effort has been made to develop new varieties of berries and fruits which shall be better adapted to the region than those which are grown in more southern latitudes. There is no likelihood that cranberries can be cultivated with profit. The native cranberry is of excellent quality but is small, and the yield is very light. It does not seem very amenable to culture. It does better in its native habitat than when it is transplanted. For a number of years much attention has been devoted to breeding hardy strawberries. *Fragaria chiloensis*, a native of the coast region, and *F. platypetala*, a very hardy species of the interior have been crossed and thousands of hybreds have been produced. Three thousand seedlings fruited for the first time in 1918.
When a seedling hybrid plant has fruited it is given a number, and detailed records are kept of each plant, as to date of blooming, character of flower, date of ripening fruit, size and quality of berry, prolificacy, and vigor of the plant. All of those producing fruits that measure up to a certain standard of size, flavor and firmness are retained. Those which fall below this standard are rejected. There are very few hybrids with fruit in which large size, good color, good flavor, and firmness are combined. There seems to be no limit to the variation which can be produced. The important part was to produce hardy plants which could be cultivated in any part of Alaska. Numerous attempts had been made to grow strawberries from plants shipped in from the outside, but these efforts invariably failed until the station hybrids were introduced. Unsuccessful crosses have been made of raspberry and salmon berry. All hardy varieties of small fruits, including gooseberries, currants, and raspberries are at home in southeastern Alaska. Five varieties of apples were matured in the summer of 1911 at this station in a test orchard planted in 1903. Yellow Transparent has so far proved to be superior to all other apples and will likely lead for dissemination among the settlers. It is an early summer apple in the States, but is a fall apple in Alaska and in some seasons may not mature at all. Sweet cherries are invariably a failure but some varieties of sour cherries will often mature. Both plums and pears are failures. So far no variety has been found which can be depended upon even in favorable years.
In 1922 several hundred potatoes were tested at the Sitka Station. It has developed potatoes of superior quality. They are dry, mealy and excellent in flavor. They yield abundantly. They have deep-set eyes which causes much waste. It has been found advantageous not to cut the seed potatoes. Better yields have been obtained by planting medium sized whole potatoes. The official in charge of the Sitka Station in 1913 reported that the potato was the chief vegetable crop in Alaska and could be successfully grown, even north of the Arctic Circle, when proper locations were selected.

This region is not suited to grain growing. Feeds for livestock can be grown in abundance but grain crops do not mature. Since the agricultural efforts of the settlers in this region are thus confined to truck farming, the station has endeavored to solve the problems of horticulture. There is nothing raised for market at this station although occasionally surplus products are sold to local customers. Those vegetables, whose top or leaf forms the commercial article, can be successfully grown in this region. Beets, mangels, cabbage, cauliflower, kale, rutabagas, turnips, carrots, celery, celeriac, leek, onions, lettuce, parsley, spinach, Swiss chard, rhubarb and horseradish have been grown very successfully.

The aim of the Alaska Stations is to help the settlers and to ascertain the value of given varieties of fruit in other sections of the Territory. In order to do this, the Sitka Station maintains a small nursery for the propagation of all sorts of fruits that give any promise of value, and for the distribution of them among the settler. This is distributed free of charge. The only requirement is that the trees and
plants be properly cared for, and that a report be made as to the successes or failures with the stock supplied. Many requests were received and stock was sent which was thought to be most suitable for that section of the Territory. It is very difficult to send packages of live plants to distant interior points, because often packages have to await the river navigation and too they are often delayed at transfer points, with the result that most of the plants are dead when they arrive at their destination. It is hoped that when the railway is competed this difficulty will be avoided. Owing to the length of time required to send plants from the Sitka Station to interior points, it was desirable to have a similar nursery at Matanuska. Plans were under way for starting such a nursery in 1924.

Copper Center Station—The Copper Center Station was established in 1902 and during the period from 1903 to 1906 several varieties of oats were ripened three years out of four. In 1908 the station was temporarily closed. This was done for two reasons. First, it was an expensive station to operate, as all supplied had to be brought over the trail from Valdez. If they were brought in during the winter on a sled the cost of hauling was ten cents per pound, or if in the summer on horseback, the cost was fifty cents per pound. Second, it had been proved that grain growing was precarious in that valley. Out of six crops grown there was one perfectly matured and two which were but slightly damaged, and three crops were failures. Third, the funds were needed at the Fairbanks Station, where farming promises to be both successful and profitable.
was predicted than that when a railroad was constructed through the Copper River Valley and it was possible to ship freight at a reasonable cost, the work might be resumed either here or perhaps at another station farther up in the valley, or some point when a permanent settlement was made. 34

Kenai Station--The work at Kenai Station has been devoted to growing feed for livestock, to testing some of the grasses and forage plants, and to dairying. There are 26 acres under cultivation which has been reclaimed from the forest.

The appropriations for the fiscal years 1906 and 1907 each allowed $3,000 for experimentation with livestock in Alaska. Eleven head, two bulls and nine females, were purchased. One of the bulls was imported from Scotland as a yearling. These cattle were brought from Cowgill, and Carrollton, Missouri. Seven were kept at the Kenai Station and the remainder were sent to Wood Island. 35

Curing hay is simplified in this region because the rains are never dashing, but usually fall in a gentle drizzle. Owing to this, an ordinary cock of hay will withstand a long siege of rainy weather. The low temperature allows the hay to remain in the cock for several days without heating or molding. The southwest winds are always dry and blow continually night and day for several days thus preventing dew or frost. 36

Fairbanks Station--Work was begun in the spring of 1908 at the Fairbanks Station. 37 There were 90 acres under cultivation by 1912. It was estimated that there were 15,000 square miles of land available for agriculture in the Tanana Valley.
The first self-binder which was brought to Alaska cut grain at the Fairbanks Station in 1911. During 1914 a well was bored and water was reached at a depth of 80 feet and it rose to a height of 30 feet in the pipe. This well will permanently relieve the distress caused by the lack of water.

Fairbanks Station is operated as a demonstration farm. With few exceptions the crops are grown on a field scale. This station did not undertake any grain breeding. The object was to test many varieties of grain thoroughly under field conditions, and to demonstrate the best practices in farming in that region. In 1915 there were 50 bushels of spring wheat, 900 bushels of oats, 200 bushels of barley, 5 bushels of buckwheat, and a few bushels of rye harvested at this station. Finnish Black oats yielded 42 bushels per acre, spring wheat 40 bushels, and barley about the same. Fairbanks has held an agricultural fair each year for several years and the exhibits have improved from year to year. There was keen competition among the exhibitors for the prizes offered.

By 1918 one hundred acres of land had been cleared and were cultivated. Eighty acres were in crops and seventeen were summer fallowed. It is necessary to let the land rest or resort to fertilizers in a country where the soil remains in a frozen state for more than half of the years as the annual cropping very soon uses up the supply of available plant food. It has been demonstrated that soil responds readily to the use of commercial fertilizers. In several instances the crop has increased 100% by the application of a quantity of nitrate of soda before harrowing at seeding time. Nitrate of lime has
also been used very successfully. Red clover and peas are often used as fertilizers.

By 1914, the rabbits had increased in numbers until they had become a serious pest. Often whole fields of grain were eaten off as close as if cut by a mower. The only thing that could be done was to build rabbit-proof fences around the fields, and that was out of the question on account of the expense. The country is too large and the timber affords them hiding places which would frustrate attempts at rabbit drives. Many of them died in 1914 from some apparently contagious disease. The 1924 report showed that oats, barley, wheat, alfalfa, and clover had suffered much damage by them that year.

There were 102 homesteaders near Fairbanks in 1920 who were engaged in raising wheat, barley, oats, and other farm products. Cooperative experiments were carried on with the farmers around Fairbanks, through which the farmers were incidentally given a start in raising the varieties of grain grown at the station which were better adapted to the climate than grains which were received from the States. About 350 pounds of grain were furnished to each farmer who agreed to sow and cultivate them according to instructions sent out by the station. In many cases those who received the grain failed to comply with these conditions but efforts in this direction aroused the better farmers to see the need for grains suited to the country so it was planned to extend this service and to cooperate very closely with the farmers to make their work successful. The high price of wheat during 1917 stimulated
the farmers to take more interest in wheat growing. To further encourage the growing of wheat, all farmers were allowed to use the station flour mill to grind Graham flour at actual cost. This flour mill was installed in 1918 and Alaska grown wheat has been milled into flour which makes excellent bread. A flour-mill having a capacity of 25 barrels per day was purchased in 1920 by the Farmer's agricultural Association, which is backed by the business men of Fairbanks. This insures a market for wheat grown by the farmer. Demands for flour come from all parts of interior Alaska. From one teacupful of Siberian spring wheat planted in 1914 in the vicinity of Fairbanks, more than 2,000 bushels of wheat were harvested in 1920 with an average yield of 20 bushels per acre and a value of $5.50 per bushel according to the Alaskan Bureau of the Chamber of Commerce from White Horse. According to Mr. M.D. Snodgrass, the Superintendent of the Fairbanks Station, oats which yield 79 bushels per acre are not uncommon. Barley is one of the surest grain crops of the Interior.

In 1916 a Mogul 8-16 horsepower tractor was purchased for the Fairbanks Station at a price about equal to that demanded for a good team. It was thought that a tractor could be used more economically than teams for much of the heavy work. It cost $12 per day and the feed for a team and driver in 1918. It was found necessary to add extension rims and angle lugs to widen the tractor wheels and thus increase its power. Eight to ten horse-power tractors are better adapted to the work on the small farms than are the larger machines.
An electric-light plant was installed in 1925. The most successful farming, from a financial point of view has been carried on around Fairbanks. Farmers in 1912 got $60 to $100 per ton for their hay, 50¢ per plant for celery, 50¢ to $1.00 per pound for tomatoes grown in greenhouses, $2.00 to $5.00 per dozen for cucumbers, 30¢ per pound for fat hogs, 75¢ per pound for young pigs, $2.00 per dozen for eggs in winter and $1.25 to $2.00 per quart for strawberries. In 1914, there were three self-binders and two small threshing machines around Fairbanks. One of the threshing machines was operated by private enterprise and a few of the farmers attempted to thresh their own seed. An attempt to grow Kansas variety of winter wheat was unsuccessful in 1913.

The principal money crop of the farmers was potatoes. Thirty tons were raised on seven acres in 1912 and were worth nearly $3,000 at the low average price of five cents a pound. Nearly all of the potato growers kept a few hogs to consume their gulls and inferior tubers that could not be sold for table use. Turnips are a very important crop as they reach full development in a short season and can be grown 100 miles north of the Arctic Circle.

In May, 1914, six pure bred Duroc-Jersey hogs from Sunny-side, Washington were shipped to Fairbanks. The plan was to furnish interior Alaskan farmers with pure bred pigs at reason-able prices to help stock the country. A few farmers had been raising hogs but they had no pure bred stock. Another reason for introducing them was to use them in a system of rotation for the purpose of maintaining soil fertility. The hogs did
not do as well as was hoped. The pigs which farrowed in summer of 1914 all died during the winter. In 1915 the station had 25 head, four or five of which were kept for breeding purposes and the remainder sold. Several farmers kept hogs so the market was supplied. According to the 1914 report hogs were the only animals raised on a commercial scale and it was doubtful whether there was any profit in them. The 1916 report states that the hog raising business among the farmers has been materially reduced. There was practically no demand for breeders and none for any special type of hog. The actual cost of producing the feed is more than the animal is worth on the market. The market of interior Alaska was very limited then as there was practically no outlet for surplus products. Three Hampshire hogs were brought to Fairbanks Station in 1920. It was thought that they would be better adapted to the climate. The offspring was sold to the farmers at moderate prices.

Two head of milking shorthorns were received from Iowa in August, 1920. The dairy herds around Fairbanks had been condemned on account of tuberculosis and there arose a pressing need for milk especially for infants. The Station assisted by securing a purebred Toggenburg buck and doe and a three-quarter blood doe from Washington. It would have been very expensive to build up a dairy herd and the goats could live on one-fourth of the food which was required for a cow and their milk was highly desirable for children. It remains to be proved whether under present conditions stock of any kind can be raised in this part of Alaska with a profit.
It is doubtful whether $800 would cover the cost of actual expense in raising a colt to a working age of four years on feed bought at market prices.66

Kodiak Station---Kodiak Station is about 100 miles long and 40 miles wide, its greatest length extending in a general northeasterly and southwesterly direction. The island is situated off the mouth of Cook Inlet, and the village of Kodiak, where the experiment station had been placed, is located at the northern extremity of the island. It has a climate similar to that of Scotland or the milder portions of the Scandinavian Peninsula.67

Kodiak station is operated under great disadvantage as it is divided into two sections which are 15 miles apart. The reservation was made in 1898 and at that time it was not found practicable to secure all the land which was needed for the operation of a livestock breeding station. On April 1, 1912, President William H. Taft enlarged the reservation by the addition of 3,000 acres at Kalsin Bay, located on the northeast side of Kodiak Island. Near Island, which lies across the channel from the town of Kodiak, was reserved at the same time. The area of Near Island is approximately 200 acres.

The main area of the cattle range is at Kalsin Bay and a power boat is operated to make trips for communication between this place and the headquarters at Kodiak. The control and maintenance of a boat, together with the small boats which are necessary for transferring the live stock, feed and supplies from one place to the other increases the
expense of operation quite materially. Otherwise, this arrangement has been quite satisfactory. Kodiak station is the most expensive of the five experiment stations now in operation. This condition is due to its lack of good facilities for mail, passengers, and freight. All of the building materials must be transported from Puget Sound or elsewhere. Freight rates and labor are correspondingly high.

Kodiak Station is devoted chiefly to livestock breeding but some experimenting in the production of forage has been done. In May, 1912, all of the pastures of the station were covered with an 18 inch layer of volcanic ash from the Katmai volcano, over on the mainland 55 miles away. All of the cattle were shipped to Washington, as it was cheaper to ship the cattle than to import the feed into Alaska for them. They were kept in Washington for two years, during which time the pastures at Kodiak had recovered sufficiently to supply them with feed. The herd had grown to more than 100 head and 70 of them were sold and the remainder of the herd returned to Kodiak in 1914.

The station stock was largely Galloway cattle, but in 1916, six Holsteins were introduced to be used in cross-breeding with the Galloway cattle to see if a breed of cattle could be developed in Alaska that were hardy and thrifty and good rustlers like the Galloways, and at the same time retain some of the milking qualities of the Holsteins. The Holsteins are not so well adapted to the climate of the Alaska coast region as are the Galloway cattle. The cold storms cause them to drop in the flow of milk. They are not as active
rustlers for feed as the Galloway cattle, nor can they maintain themselves as well under adverse conditions. Nevertheless they have done fairly well. In 1918, there were five crossbred calves. Four of them were the offspring of cows bred to the Holstein bull and one the offspring of a Holstein bred to a Galloway bull. They are all black like the Galloways and are polled like them but are of a more rangy build. They have a sleek short coat like the Holsteins. The pure bred Galloway calf has a fuzzy curly coat. This is entirely absent from the cross-breeds. 71

In 1915, there were 68 head of cattle. Liver trouble had been practically the only disease attacking the herd. 72 Dairy work was begun in 1915 as soon as the cows became fresh. 73 During the summer of 1916, it was found that tuberculosis had developed. On the recommendation of Dr. Madisen, it was decided to retain the animals which reacted to the test but which gave no clinical symptoms of the disease and handle them according to the Bang method. All of the affected animals which showed clinical symptoms were killed and the reacting animals which otherwise appeared sound were isolated and bred in the ordinary way. The calves were removed when two days old and fed on sterilized milk and when six months old were placed with the sound herd if they did not react to the test, and those which did react were killed. 74 An appropriation of $2,000 was made by the Territorial Legislature for testing all cattle in the Territory for Tuberculosis. This appropriation was inadequate so the experiment stations of Alaska aided
the Territory by assigning B.C. Parker, a veterinarian attached to the Kodiak Station, to test the cattle. From August 22, to December 9, 1919, he had tested 193 head. One hundred and fifteen head were passed as sound and 73 were condemned and 5 were regarded as suspicious. In 1919 the Kodiak Station had 9 head of pure-bred Holstein-Friesian cattle and six cross-bred calves. The experiment of securing healthy calves from tubercular cows by the Bang method had been a success. The experiment was brought to a close in the spring of 1920 when the herd was again tested and all reactors were slaughtered in order that the station might have a clean herd.

The station's flock of sheep began with 20 ewes, some of which were quite old, and single ram. The flock increased normally for a couple of years. Two pure-bred rams, one a Lincoln and the other a Cotswold were purchased for the purpose of improving the flock but when the volcanic ashfall came in 1912 they were both suffocated along with several of the best ewes. In 1914, four brown bears killed 41 head of the sheep. The Station Report for that year says, "To protect the brown bear by law is equivalent to prohibiting the live stock industry by law in the regions which are dominated by the bear. Bear and livestock can not live peaceably together. In the few years that the bear has been protected by law it has increased so fast in certain sections one of which is the region about Kodiak, that neither man nor beast is safe from his attack. Nor can he be fenced out. On the Frye ranch, now abandoned, located a few miles from the
Kalsin Bay ranch, the bear has demolished the fences in many places, and so he has the fences on the experiment station. If the law gives no relief it will be necessary to employ armed guards to protect both cattle and sheep while at pasture. They can be safe only when locked up in a strong building. The practical destruction of the live stock industry would appear to be a high price to pay for the pleasure that may be enjoyed by a few sportsmen from the States who make occasional visits to Alaska in search of trophies. In 1915, the remaining 14 ewes were placed on an island in order to protect them from the bear and they maintained themselves in most excellent condition. It has been clearly demonstrated that sheep do well on the native pastures here and in normal winters they can be kept with very little feed.

The forage crops raised at Kodiak included oats, peas, vetch, some barley. The Kodiak Station does not have enough available land for cultivation and cannot supply forage sufficient to feed the herds through the winter. It should be borne in mind that grain of any kind does not mature at Kodiak. During the period that stock has been kept on the island the cattle have been pastured during the summer and late into the fall. During the remaining part of the year they have been fed almost exclusively on hay and silage made from the native grasses. On the whole, the fall of volcanic ash will benefit the country. The gardens about Kodiak are better now than before. Wherever the ash can be mixed with the original soil vegetation grows more luxuriantly.
than before.\textsuperscript{82}

The advanced cost of both supplies and labor as the result of the war has made the upkeep of the Kodiak Station difficult. The small appropriation allotted to it makes it impossible to maintain the station on the scale that was originally planned, and at the same time develop the other stations. The object of this station has been accomplished. It has been demonstrated that cattle will thrive in this part of Alaska.\textsuperscript{83} In December 1924, there were 41 head of cattle of both sexes and all ages at the station.\textsuperscript{84}

Matanuska Station—In 1915, Mr. M.D. Snodgrass, assistant in charge of the Kodiak Experiment Station was detailed to select a site in the Matanuska Valley for a new agricultural station. On recommendation of the Alaskan Engineering Commission twelve sections of land located at the junction of the main line of the railway and the branch line leading to the Matanuska coal fields had been reserved for a town site. Mr. Snodgrass selected 240 acres of section fifteen of this tract, with the consent of the commission for a station site. This tract is about two miles north of the junction of the railroads and is about 30 miles from the head of Kalm Arm.\textsuperscript{85}

Work was begun in the summer of 1917. Section 14 was added to the reservation. Nearly 12 acres were cleared during 1917 and 1918, and seeded to grain crops. The clearing of timber is laborious and expensive since prevailing wages are high. The simplest method is to burn the timber and undergrowth whenever the weather is dry enough to permit fires.
to run through the woods. There is usually a spell of dry weather in early summer. The moss and undergrowth is then burned. This method does not result in forest fires and is not destructive to useful timber. The fires creep through the moss, kill the timber and often burn the upper roots. Then the first high wind will throw the trees down and the unburned portion is cleared with ax and saw. This can be done for about $50 an acre under favorable conditions, while it costs $125 to $200 an acre to clear green timber even when donkey engines and heavy stump pullers were used. Water was struck at a depth of 70 feet. An electric light plant was installed in 1925 and is giving entire satisfaction. The plant furnishes light for barns and other buildings and also power for a two-horse power motor which is used to run the lighter machinery such as lathes, pumps, root cutters, and mills for crushing grain.

This station tried to secure varieties of both field and garden crops adapted to this region. In 1918, cooperative experiments were begun with homesteaders in the vicinity to test some varieties of grain and other crops which had been produced at Fairbanks and other stations. In the fall of 1920, fifteen young ewes and lambs were received from the Kodiak station. A purebred Cotswold ram was purchased from Oregon. It was necessary for the flocks at Kodiak to be reduced and it was thought desirable to introduce them into the Matanuska Valley where none had been kept. There are also a few cattle and goats at the station.

In the 1924 report of the Alaska Agricultural Experiment
Station it was stated that several varieties of wheat could be depended upon to mature in normal seasons. Barley was rapidly gaining favor with the farmers because of its suitability to the climate and its value as stock feed. Oats, vetch, and peas did fairly well when grown in combination, and was the main field crop of the station. So far no variety of clover had been found to survive the Interior winters. The season was too far advanced for the production of a good crop of potatoes and dry weather caused an uneven stand of rutabagas, mangels, carrots, and artichokes. Sunflowers and grasses produced a good stand. As yet the horticultural work had been confined largely to small fruits which had been received from the Sitka Station for propagation and distribution. Strawberries had not been very successful. Nearly all ordinary garden vegetables, including cabbage, kale, cauliflower, carrots, parsnips and peas, can be grown successfully in Matanuska. Sugar beets were grown with gratifying success.

Rampart Experiment Station—The Rampart Experiment Station is located in the Yukon Valley in latitude 66°30' north. It is about 75 miles south of the Arctic Circle. The frost-free period averages 97 days. The total annual precipitation is a little less than 10 inches, 5 inches of which usually comes during the growing season. Thirty acres of land were under cultivation in 1912.

This station is devoted chiefly to three lines of work, breeding of grain which are suited to the climate and which mature during the frost-free period, breeding and growing
seeds from hardy legumes, and testing vegetables and flowers to ascertain their adaptation to soil and climate. In 1918, 23 varieties of spring wheat were matured, 12 of which were hybrids. Of the 35 varieties of barley matured that year, 26 of them were hybrids. Twenty-one varieties of oats were matured and 13 of them were hybrids. This type of work was done in the northernmost experiment station because it was believed that varieties which originated and were successfully produced in the latitude of Rampart would succeed in all parts of the country south of the Arctic Circle. Potatoes were also tested and grown on a very small scale. The process followed with the grains and legumes was to secure the earliest varieties that matured between frosts, and then use them in pollinating later and more productive varieties.

In 1916 while the Government Railroad was being built in the interior and all idle men were provided with steady employment, it was difficult to obtain sufficient help to harvest the crop. The amount of work had become too great for the teams on hand and hired teams were very expensive and hard to get. During July and August of 1916 about 5 tons of fish offal were brought from a fish camp for fertilizer. It is necessary for the offal to be buried under at least 6 inches of earth because of the accompanying stench. Owing to the complete arrest of decomposition during a large part of the year it requires at least two summers to reduce it to a fertilizer status. In 1919 a tractor was purchased for the station.
Although repeated efforts had been made to grow strawberries in interior Alaska, it was not until the Sitka hybrids were introduced at the Rampart Station that strawberry culture in that section became possible.

Weather was unfavorable during the summer of 1924. A draught early in the summer caused grain crops to be short in straw, but in the latter part of the season all crops suffered from excessive rains.

In the summer of 1925 the Rampart Station was closed. The Yukon Valley had not developed as had seemed possible while there had been placer camps in many places in that vicinity. The station is very hard to reach because of the difficulty of transportation on the Yukon. The Government will retain the property and at some future time the station may be reopened.

The reindeer industry in Alaska began in 1892, with the importation by the Bureau of Education of 171 reindeer from Siberia. Dr. Sheldon Jackson made the first purchase with funds secured from benevolent individuals. By 1902 a total number of 1,280 reindeer had been imported to Alaska from Siberia.

The object of the importation was originally to furnish a supply of food and clothing for the Eskimo in the vicinity of Bering Strait. At that time the Eskimo living on the coastal regions from Point Barrow to the Alaskan Peninsula were nomadic hunters and fishermen. They were eking out a precarious existence upon the rapidly disappearing game animals and fish.
Soon after the beginning of the reindeer enterprise a number of Lapps were brought from Lapland and employed by the Bureau of Education as instructors of the Eskimo in the care and management of the reindeer. The Laplanders took a loan of 100 deer for 5 years from the Government, and gave their services as instructors for that period. At the end of 5 years the Lapp returned the 100 deer and became an independent herder himself with the large increase of deer he had obtained from the herd. The Lapp herders were not interested in the extension of the reindeer among the natives. Some of the largest herds were owned by them.

In introducing the reindeer as a means to promote the industrial life and to provide permanent livelihood for the Eskimo, the Government found it necessary to give the young natives a course of training. Those who received their deer directly from the Government, served an apprenticeship of five years. They were bound by a written contract, the strictest terms of which they could not violate without danger of suffering discharge from the service and loss of their annual allotment of deer.

H. M. Tjerngel, the Government's local superintendent in 1914 gave an account of the system of apprenticeship as it was then; "At each station promising young natives were selected by the local superintendent as apprentices for a term of four years. The number of apprentices at each herd was governed by the number of deer in the herd. At the end of his first year of apprenticeship, and apprentice received 4 female and 2 male deer; the second year, 5 females and 3 males; third
year, 6 females and 4 males; fourth year, 6 females and 4 males. In addition he received for the first 3 years provisions to the amount of $150, $100, $50 respectively. A native thus became the absolute owner of reindeer only after he has served an apprenticeship of 4 years. 108

The natives were very anxious to get deer and looked upon them as a safe investment for their earnings and usually took deer in preference to cash for services, when this could be done. The Government did not sell deer; this was done by the missions and natives alone. The missions supported and educated a number of young apprentice herders. The various missions were furnished a herd of 100 deer for a period of 5 years by the Government. At the end of this time the original number must be returned. The mission kept the increase of fawns which amounted to several hundred.

The herding and breeding of reindeer has become the most promising feature in the industrial education of the Eskimo. It is the main activity of many native villages in Arctic Alaska. "The progress made in civilization that has been made by lifting up the natives, formerly living as savages, to the estate of civilized, self-supporting herdsmen as accomplished through the reindeer industry is a remarkable achievement". The chief aim and fundamental policy of the Government was to turn the reindeer over to the natives as rapidly as they learned the industry and realized its value. With careful training the Eskimo boys made excellent herders. Besides being taught the art of deermanship, the apprentices were instructed in keeping accounts, the methods
of marketing reindeer, and in other practical matters connected with the industry. No apprentice became a herder unless he was proficient in the branches of elementary reading, arithmetic, and writing.

By 1912, no deterioration in the herds on account of inbreeding had been noticed. On the contrary, the chief of the Alaska division stated that the reindeer were larger than those imported from Siberia. He stated that Alaska had a better range than Siberia and that the climate was better adapted to the reindeer industry. The herds in Alaska average more than 700 reindeer each, so that the danger of inbreeding can not be serious. The wild caribou has been introduced into some of the herds and thus the size of the reindeer has been increased. The greatest menace to the reindeer industry are the fires which destroy vast stretches of valuable grazing lands. The Government gives the native free pasturage for his reindeer. 109

A herder must in turn employ and similarly distribute reindeer among his apprentices, thus aiding in the extension of the enterprise. A native was allowed to acquire reindeer by purchase from another native upon condition that he would be governed by the rules and regulations for the reindeer service. In order to make the native preserve and accumulate the reindeer entrusted to them, and to prevent the possibility of the reindeer industry being taken from the natives, no native has been permitted to sell or otherwise dispose of female reindeer to any person other than a native. 110

The following chart shows the growth of the reindeer industry for the period from June 30, 1911 to June 30, 1917
during which time the government protected the native Indians and Eskimos and gave them the complete control of the reindeer industry. But after that time the reservations were removed and the industry was opened to all who cared to invest their time and money in it.  

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total No.</th>
<th>% of Total income of native herds</th>
<th>% of Herds from the deer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td>28,476</td>
<td>54</td>
<td>6%</td>
</tr>
<tr>
<td>1913</td>
<td>47,266</td>
<td>62</td>
<td>6%</td>
</tr>
<tr>
<td>1914</td>
<td>57,872</td>
<td>65</td>
<td>6%</td>
</tr>
<tr>
<td>1915</td>
<td>70,243</td>
<td>76</td>
<td>6%</td>
</tr>
<tr>
<td>1916</td>
<td>82,151</td>
<td>85</td>
<td>6%</td>
</tr>
<tr>
<td>1917</td>
<td>98,582</td>
<td>98</td>
<td>7%</td>
</tr>
</tbody>
</table>

Under Eskimo care, these herds have increased at the rate of 100% in three years. But the animals that are in the hands of white men are doubled in numbers every two years. The white man looks further into the future and therefore butchers only male animals. The Eskimo butchers females every year to satisfy the demand of fashion in their clothing.

During August, 1911, forty reindeer from the herd at Unalaklet were delivered to the Department of Commerce and Labor. Twenty-five of them were placed on St. Paul Island and 15 on St. George Island. Fifty-five reindeer were delivered to the Department of Agriculture during September, 1913 from one of the herds of the Department of the Interior on the Alaska Peninsula. Nineteen of these reindeer were landed on Amaknak Island and 36 on Unmak Island of the Aleutian chain. During August, 1914, the Department
of Interior ordered 40 reindeer sent from Ugashik on the Alaska Peninsula, to Atka, a remote island in the Aleutian chain. The extension of the industry into southeast Alaska was begun by the shipment of 8 reindeer to Metlakahtla on Annette Island from the herd at Nome. The Aleutian Islands were set aside by the Executive Order under the Department of Agriculture and the Department of Commerce for the conservation of fish and fur-bearing animals, and for the raising of reindeer.\(^{120}\)

In the autumn of 1921 the Coast Guard Cutter, Unalga, transported for the Bureau of Education a herd of 54 reindeer from the Alaska Peninsula to Kodiak Island. The western half of Kodiak Island is untimbered and abounds in grazing lands on which great herds of reindeer can be supported. Through its system of distribution of reindeer the Bureau provided the natives of Kodiak Island with a source of food and established a future industry for this island from those ice-free harbors the meat can be easily shipped. By 1923 reindeer herds had been distributed among the principal native settlements from Point Barrow to the Alaska Peninsula. It was estimated that in June 1922, there were 259,000 reindeer of which two-thirds belonged to the natives and other third to the Government, to white men, and to Lapps.

There is unlimited pasturage for reindeer in the region along the Alaska Railroad. A herd of 1,352 reindeer were driven by the herders in the employ of the Bureau approximately 1,000 miles from the Bering Sea Coast to grazing lands near the railroad. In the past the exportation of reindeer meat has been confined to the shipments from the Nome region to Seattle during the short season of open navigation. But, now the railroad will
unlimited means of transportation for reindeer meat and hides from the interior to the coast at any time during the year. 121

Since 1917, fairs or conventions have been held whose primary purpose was to increase the interest and efficiency of those engaged in the reindeer industry by interchange of experiences and by competition. Great enthusiasm was shown by the large delegations which attended. Activities in connection with the reindeer industry, such as lassoing, driving, herding, pasturing, and butchering were discussed. Prizes were given for the best exhibits of harness, sled, fur clothing, snowshoes, and other paraphernalia connected with the industry. 122

It was estimated in 1924 that there were 350,000 reindeer in Alaska. One of the principal problems then confronting the Bureau of Education was the reorganization of the reindeer industry on a cooperative basis so as to make it possible to handle more efficiently the increasing herds and market the surplus meat. This reorganization attempted to care not only for the distribution of the herds as in the past, but to handle the industry on a business basis. 123

In 1920, the Biological Survey of United States and the Bureau of Education were given authority by the legislature to begin the task of building up the herds of reindeer in Alaska in order to supplement the meat supply in Alaska and other parts of the United States. The Federal authorities announced that the first step would be to introduce new breeding stock.

It was estimated that several million reindeer could be supported in the vast region, including the base of the Alaska
Peninsula, and immense areas further north. During the short summer the reindeer feeds on grass, especially coarse grass and weeds; also the foliage and fresh shoots of scrubby willows and other bushes. Throughout the long winter his nourishment is a certain kind of moss growing mainly on the hills and plateaus. When he feeds on this moss he must first paw away the snow.

According to the Bureau of Biological Survey of the Department of Agriculture, the grazing lands in Alaska could support 3,000,000 reindeer. From 40 to 60 acres are required to furnish grazing for one reindeer for one year it was learned from studies made by the Bureau.

Rapid increase in the size of the herds have been reported to the Bureau which foresees a promising future for the industry if modern methods of management are adopted. Former methods of handling which were sufficient for small herds are no longer adequate and modern methods to conform to the larger herds must be adopted. "Under proper management and organization the reindeer industry has a promising future but a decided change toward better methods must now take place if full progress is to be maintained." according to the Bureau of Biological Survey.

The Governor's Report for 1926 states that the yearly increase in the number of reindeer exceeds the demand for the meat, and an effort should be made to extend the market and provide for adequate transportation to centers of distribution for the frozen meat, otherwise the herds will deteriorate and the ranges become overstocked. The reindeer industry will never be developed to the extent of its possibilities so far as native herds are concerned, until provisions are made for closer super-
vision of the animals and herders. The herds are increasing so rapidly that irreparable damage will result unless some provision is made for protecting the ranges and allocating the grazing land. A law which would enable the Secretary of Interior to allocate and lease the grazing lands was introduced in 1926 but failed to receive consideration in the House of Congress.\textsuperscript{127}

The Bureau of Education shipped 20 carcasses in 1926 as an experiment and they reached Seattle in very good condition. The profit was very small. However, one of the reasons for this was the small size of the deer, which has resulted from deterioration of the herd due to a regulation which prevents the killing of small and undesirable female deer. Some action should be taken for the extermination of wolves which have caused much loss especially in the Cantwell herd. The Biological Survey has arranged to conduct experiments at the Alaska College at Fairbanks in the herding and raising of reindeer with the thought of increasing the size of the deer and improving the industry.\textsuperscript{128}

The Stanfield Act passed in 1927 authorized the Secretary of Interior to issue licenses for grazing on the public domain. Fees for the leases will be established with due regard to the general economic value of the grazing lands. The leases are to run for a period of 20 years. This is the first and only measure covering general grazing on the public domain which has passed Congress. Will C. Barnes of the Forest Service of the Department of Agriculture announced April 30, 1927 that this act would aid the reindeer industry in Alaska.
by opening the public domain to grazing. The measure was
originally drawn up to meet the needs of all those engaged
in the reindeer grazing due to the fact that a further
extension of that industry could not be handled in a busi-
ess like manner unless there was some definite system of
allotting specific range to each owner and seeing to it
that his animals were kept theron, also that the number
covered by the lease was not exceeded.

Heretofore, the larger part of the reindeer have grazed
far to the North, either close to the Arctic Circle, or far
above it, thus making it a very difficult matter for the
animals to be properly supervised or the meat to be shipped
to points in the United States. Now these herds are being
moved from these far northern ranges to the country immediate-
ly adjacent to the Government railroad extending almost 500
miles due north from Seward on the coast to Fairbanks in the
interior. On both sides of this railroad are large areas of
grazing lands, some in grass, but a larger part covered with
lichens, the favorite winter feed of the reindeer.129

In 1919, Stefanson, the Arctic Explorer said, "Our only
mistake has been our experimenting on such a small scale."
He also stated that Arctic Alaska is capable of producing
seven times as much meat as the entire output of mutton in
Canada.130  Fitzhugh Green of the United States Navy states
that it is estimated that the annual output of carcasses in
20 years will be well above a million. He says we shall see
the day when the reindeer meat will be one of the world's
chief sources of meat supply. Already in Norway and Sweden, 1.1 tons of reindeer steaks are eaten every year. In the spring of 1923 one thousand five hundred carcasses were shipped to New York by the way of San Francisco and the Panama Canal. The meat sold on a carcass basis at 35 cents a pound. A three-year old steer, dressed will weigh 120 to 150 pounds. The meat is not marbled. Practically all the fat lies as a blanket over his back an inch or more in thickness. This fat is eaten by the Eskimo as a delicacy. Distribution costs are high, but production costs are low. In 1921, it cost $140 a ton to transport reindeer meat from Nome to Minneapolis. A cold storage plant has been established at Nome which can handle 12,000 carcasses a year, for shipment to the United States. The Bureau of Markets bulletin states that within the next 15 years there may be between four and five million reindeer, with an animal surplus of a million carcasses that must reach a market somewhere outside the Territory. Sec. Fall stated in 1921, that reindeer meat could then be had in most of our cities and he predicted that not far in the future it would be a popular course on thousands of American and foreign tables.
CHAPTER II
FURS AND FISHERIES

Fur Industry—The quantity of fur shipped out of Alaska was the largest in 1918, when $1,363,600 was realized from the sale of furs shipped from Alaska. The commissioners reported that fur farming was receiving much attention but the results in 1920 were not as yet very satisfactory. In 1917, beaver trapping was prohibited until November, in 1923. The open season for foxes in the region draining into the Arctic Ocean north of the sixty-eighth parallel was extended 30 days so as to include April 14. An order was issued on September 18, 1918 which prohibited the use of dogs in pursuit and killing of fur-bearing animals. Among the favorite fur animals are red and white fox, marten, mink, and muskrat. In the spring of 1919, three islands were under lease for the development of the fur-bearing animal industry.

The Commissioners have reported various prosecutions and seizures of furs for violation of the fur-bearing animal regulations. The confiscated furs have yielded several thousand dollars in revenue to the Government. The chief violations have been the selling of unprime furs which are obviously taken out of season, and the possession or sale of beaver, marten, and fur-seal skins.¹

The skins of 1,139 blue and white foxes caught on the Pribilof Islands during the season 1920-21 were sold for $109,398.² Fox farming was one of the most important industries in 1925 and it was estimated that there were approximately 391 farms containing over 36,000 foxes. The need of a suit-
able leasing law was keenly felt as then the fox farmer could not lease the public domain outside of the National forests. During 1925 more than $2,000,000 worth of furs were produced.

Under the new Alaska game law the Secretary of Agriculture appointed a commission in 1925, which would cooperate with the department in its provisions for the conservation of the valuable resources of game and fur in the Territory. The Alaskans' attitude toward the new law indicated an excellent opportunity for building up and perpetuating one of Alaska's most valuable resources. The new game commission members, and one from each of the four judicial divisions of the Territory and the chief representative of the Biological Survey in Alaska, met in April and May, of 1925 and recommended a set of regulations for the conservation of wild bird and mammal life in Alaska.

In 1926, the Biological Survey estimated that the improvements on about 400 fur farms amounted to $6,000,000. On the recommendation of the Secretary of the Interior, Congress passed a law in 1925 which authorized the leasing of public domain for use in the propagation of fur-bearing animals. This privilege will put the fur-bearing industry on a much better basis and encourage further investments in the business. It was estimated that Alaska could produce ten times the present amount of $2,000,000 worth of pelts each year. According to Ernest P. Walker, chief officer of the Bureau of Biological Survey that this increase could be brought about by increasing the breeding on lands already occupied by fur-bearing
animals and by placing breeding stock on other lands not occupied by them at present.\(^6\)

In 1926 slight changes were made in the boundaries of fur districts. An open season on beaver from May 1 to May 31 was to be allowed during the spring of 1927. The season's number of sealing beaver was limited to 20 beaver per person. A closed season on brown and grizzly bears from June 21 to the end of August was established with the provision that permits killing when endangering persons or property. Special protection of game, fur animals, and birds in the lower Laku River region was removed and the beavers and muskrats which had been introduced on the Kodiak-Afognak Islands were given absolute protection.\(^7\) Again in 1927, a revision was made in the regulations of fur-bearing animals. An area in east central Alaska was opened to beaver trapping during the month of April, with a limit of 10 beavers to the trapper during the season. Nine small areas were designated in which fur-bearing animals were not to be taken. These areas were set aside as breeding grounds for beavers and muskrats.\(^8\)

**Fur Seal Industry**—In 1786, Gerrasim Pribilof located the group of islands now bearing his name, as the great breeding place of the fur seal. These islands came into the possession of the United States in 1867 with the purchase of Alaska and were declared a special Government reservation. From 1870 to 1910 leases were granted giving first to the Alaska Commercial Company and later to the North American Commercial Company.
the exclusive right to kill seals on these islands. From 1870-1890 the Alaska Commercial Company often took more than 100,000 sealskins during one season. During the period from 1890 to 1910 the North American Commercial Company was not permitted to kill the seals in such large numbers. By an act of Congress approved April 12, 1910, the killing of fur-bearing animals was prohibited for the purpose of maintaining and increasing the fur industry. The immediate control of these islands was placed in charge of the Secretary of Commerce and Labor. Each year its agents kill as many young male seals as are thought best to not check the natural growth of the herd. An international agreement was necessary to stop the killing of seals on the high seas where they seek their food and spend a large part of the year. Previous to this agreement the seals had been slaughtered indiscriminately. A great deal of the damage was done by schooners from Japan, over which the United States had no control so long as they did not come within three miles of its shores. If shotguns were banished from the North Pacific it would be a great thing for the baby seals. The following table shows the results of the seal census taken in the period from 1912 to 1926.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of seals of all ages and sexes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td>215,738 *13</td>
</tr>
<tr>
<td>1913</td>
<td>268,305</td>
</tr>
<tr>
<td>1914</td>
<td>294,687</td>
</tr>
<tr>
<td>1915</td>
<td>363,972</td>
</tr>
<tr>
<td>1916</td>
<td>417,281</td>
</tr>
<tr>
<td>1917</td>
<td>468,692</td>
</tr>
<tr>
<td>1918</td>
<td>496,432</td>
</tr>
<tr>
<td>1919</td>
<td>524,235</td>
</tr>
<tr>
<td>1920</td>
<td>552,718</td>
</tr>
<tr>
<td>1921</td>
<td>581,443</td>
</tr>
</tbody>
</table>
Table continued.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of seals of all ages and sexes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1922</td>
<td>604,962</td>
</tr>
<tr>
<td>1923</td>
<td>653,008</td>
</tr>
<tr>
<td>1924</td>
<td>697,158 *14</td>
</tr>
<tr>
<td>1925</td>
<td>723,050 *15</td>
</tr>
</tbody>
</table>

In 1919, $1,379,348 was realized from the sale of skins of surplus males while permitting an increase of 10% in the herd. Alaska depends on the preservation and wise use, not the destruction of its natural resources says W.H. Chapman of Yale University.16

In the fall of 1926, Japan asked for a revision of the North Pacific Seals Convention. Japan complained that the seals were migrating into her territorial waters and destroying her fish. The problem has been under the consideration of the Department of State and the Department of Commerce which has direct charge of the two Pribilof Islands in the Bering Sea where the seals live.17

The Bureau of Fisheries, of the Department of Commerce reported on April 4, 1927, that the total take of seal skins for the season would be approximately 20,000 skins. According to the new plan for sealing operations, 10,000 three-year old male seals were to be marked for the breeding reserve and all the remaining three-year old seals which were taken in the drives were to be killed. Efforts are being made to secure additional information of the feeding habits of fur seals by examining the stomach contents of the seals taken by the Indians in the waters of Southeastern Alaska and Washington. The Indians obtained a limited number of seals, according to the North Pacific Sealing Convention.18
Fisheries—A number of hatcheries are scattered along the Alaska coast where more than a thousand million baby salmon have been hatched in the last few years, says W. D. Hulbert, in his report in 1912. At that time part of them belonged to the Government and part belonged to the cannery men. The license fee then was four cents per case which the cannery men paid in part by the 40 cents which they received per 100 for young salmon which they turned loose in the waters. Even at this time there was a strong feeling that the Government should operate the hatcheries and let the cannery men pay their fees in cash, also that the practice of using herring for fertilizer should cease. 19

The exports of fish to the United States from 1903 to 1912 were as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1903</td>
<td>$8,512,642</td>
</tr>
<tr>
<td>1904</td>
<td>9,040,780</td>
</tr>
<tr>
<td>1905</td>
<td>9,010,069</td>
</tr>
<tr>
<td>1906</td>
<td>7,249,428</td>
</tr>
<tr>
<td>1907</td>
<td>9,148,250</td>
</tr>
<tr>
<td>1908</td>
<td>8,932,116</td>
</tr>
<tr>
<td>1909</td>
<td>10,824,950</td>
</tr>
<tr>
<td>1910</td>
<td>10,404,807</td>
</tr>
<tr>
<td>1911</td>
<td>11,175,712</td>
</tr>
<tr>
<td>1912</td>
<td>14,300,240</td>
</tr>
</tbody>
</table>

As a commercial product halibut ranked next to salmon in 1912. 21

In certain parts of Alaska the law required that nets be closed on Sunday so that the fish would have a better chance to reach the streams. The Government had been trying to see that enough fish got past the nets each year to keep up the number but the agents had trouble trying to enforce the laws as the nets were so scattered. 22
In 1915, E. Lester Jones, the Deputy Commissioner of Fisheries, conducted an investigation of the conditions of Alaska fisheries and reported that he feared that salmon, herring, cod, trout, and other fish would go the way the buffalo has gone unless adequate conservative measures were soon adopted and enforced. He recommended, "that the full control of fisheries be vested in the Department of Commerce; that license tax be imposed upon all fishing gear; that herring and the edible portions of food fishes be no longer used in the manufacture of fertilizer and oil; that all power boat trolling be forbidden; that at least 5 new government hatcheries be constructed and that all hatcheries now in operation be taken over by the Government; that an annual close season be established, and that the present weekly close season be increased; also that the protection now afforded gulls and similar waterfowl destructive to young fish be removed."

The total of fisheries products, which includes fur seal skins and other aquatic furs, for the year from 1913 to 1918 are given below, also from 1919 to 1926 which does not include aquatic furs:

<table>
<thead>
<tr>
<th>Year</th>
<th>Value of fishery products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>$15,739,068</td>
</tr>
<tr>
<td>1914</td>
<td>$21,242,975</td>
</tr>
<tr>
<td>1915</td>
<td>$20,999,343</td>
</tr>
<tr>
<td>1916</td>
<td>$26,466,980</td>
</tr>
<tr>
<td>1917</td>
<td>$51,466,980</td>
</tr>
<tr>
<td>1918</td>
<td>$26,466,980</td>
</tr>
<tr>
<td>1919</td>
<td>$60,232,067</td>
</tr>
<tr>
<td>1920</td>
<td>$41,492,124</td>
</tr>
<tr>
<td>1921</td>
<td>$24,086,867</td>
</tr>
<tr>
<td>1922</td>
<td>$36,170,948</td>
</tr>
<tr>
<td>1923</td>
<td>$38,678,825</td>
</tr>
<tr>
<td>1924</td>
<td>$40,289,273</td>
</tr>
<tr>
<td>1925</td>
<td>$40,038,749</td>
</tr>
<tr>
<td>1926</td>
<td></td>
</tr>
</tbody>
</table>
It was predicted that the Alaskan waters were capable of producing as large a quantity of herring each year as was imported from Sweden before the War. Packers who received from $3.00 to $4.00 per case of salmon before the War received $9.00 during 1918. Many cold storage plants had been erected as the halibut industry was developing rapidly during the War.

According to the Governor's report of 1921, the Territorial Fish Commission had been carrying on investigations and experiments to determine what means should be employed to prevent a further reduction of the salmon supply. The need for protecting the eggs deposited in the streams was deemed paramount. For this purpose a hatchery was constructed at Juneau, and racks were placed in the streams for the capture of salmon, from which eggs are taken and placed in hatching troughs until they reached the eyed stage. Then they were transplanted to a barren lake which had an outlet to salt water, or buried in sand and gravel bars of streams where they are protected from other fish and allowed to hatch under natural conditions. Obstructions from streams were cleared so as to permit the ascent of the salmon and the seining of the trout therefrom to protect the eggs and fry.

In 1920, the total number of persons engaged in fisheries in Alaska was 27,483 while in 1921 the number had been reduced to 15,070. The investment in fisheries had fallen during these years from $70,986,221 in 1920 to $39,001,874 in 1921.

The three Governmental Departments, the Treasury, Commerce and Justice, declared war, in 1922, against the outlaws and fish pirates in Southeastern Alaskan waters who
had seriously injured the Pacific Coast fishing industry since 1919. The Attorney-General ordered three sub-chasers to Alaskan waters for patrol duty. Bishop Rowe, who had been doing missionary work in Alaska for 27 years stated that although the Bureau of Fisheries, two years ago had made regulations prohibiting commercial fishing on the Yukon and other rivers after September 1, 1921, it was still going on wholesale. It was working a hardship upon the natives who depended upon these fish for food for themselves and their dogs. Secretary Hoover of the Department of Commerce settled the controversy between the Indians and the big salmon fisheries interests in favor of the Indians.

In 1923, Delegate D.A. Sutherland introduced a resolution for the investigation of administration of Alaskan Fish Reserves by a House Commission. He had charged that the Department had given a monopoly of Alaskan salmon fisheries to three San Francisco and Chicago packing concerns. Sec. Hoover said "that having fitted a lid on the further destruct of the Northwestern Alaskan fisheries until Congress acts, I intend to sit on it whether Delegate Sutherland, certain canners and can fishermen or more of the same sort like it or not. These fisheries are a precious asset to the American people, and we have a right at least to demand that they shall not be diminished in their fertility by the action of persons to whom profit is more precious than the maintenance of our national food supply."

George Williams, an elderly native complained to President
Harding, during his visit to Alaska in the summer of 1923, that the canneries had so monopolized the fisheries that the natives found it difficult to secure their food. President Harding expressed his sympathy and stated that he hoped to be able to settle this problem but it could not be done by a return to primitive conditions. He also stated that the methods which were then used for catching salmon would result in their extermination within a few years and put an end to what was then one of the largest industries in Alaska. On Secretary Hoover's recommendation an Executive Order created two salmon fishery reserves in Northern Alaska in July 1923.

The Alaska Fisheries Conservation Act called a halt to the business practice of so expanding a market that a National asset must be destroyed at its source in order to meet it. This act subordinates immediate profits for the few to the permanent profit of the many, yet it does not permanently injure the property of those whose wealth is in Alaskan fisheries. It was stated that few sources of wealth were likely to be so permanent and so uniformly productive as this now that it is given fairly adequate protection.

According to Henry O'Malley, the United States Commissioner of Fisheries, the total output of fishery products, including aquatic furs, since the purchase of Alaska is about $625,000,000 as against about $517,000,000 for all minerals. He states that the peculiarity of salmon returning to its birthplace has one inevitable result. Since each stream is
visited only by the fish hatched in it, when the ascending salmon are all caught and propagation prevented, that stream is no longer a salmon stream. No other salmon will visit it so if it is restocked it must be done artificially. There is much irregularity in the salmon runs from year to year which so far has not been explained. There are great fluctuations which are somewhat regular in their occurrence. Almost the entire commercial catch of salmon is made from mature schools on their way to the spawning grounds. Unless their migration paths are learned, and a close watch is kept on each stream to allow an adequate reserve of spawning fish to escape, the supply will surely be depleted. In districts where the stream enters boldly on the outer coast line the salmon are not seen and are not subject to capture until they school immediately outside the river’s mouth. But in southeastern Alaska they pass through long salt water channels on their way to spawning beds and are in danger of being caught during the entire distance. Most of the commercial fishing is done by the use of traps, seines, and gill-nets.

The herring industry yields products valued around $2,000,000 annually. The chief use of herring is for human consumption, but it is also used for bait for halibut, and for the manufacture of oil and fertilizer, according to Mr. O'Malley the herring industry is far from being developed to its potential capacity.46

Commissioner O'Malley spent several months during 1926 inspecting the fishery operations and conditions in Alaska.47
Studies of salmon migration routes in Southeastern Alaska were made during 1924, by tagging salmon taken from traps at five localities in that district. Weirs for counting salmon that are ascending to the spawning grounds were maintained in Karluk and Chignik Rivers and at streams tributary to Alitak Bay waters. The closed season provided for in the North Pacific Halibut Treaty became effective in 1924.\(^{48}\) Dr. Rich, one of the members of a party from the Bureau of Fisheries reported 1,120,000 salmon which were seen migrating seaward within a two week period in the Karluk River. He stated that the number of fish moving upstream had been so large at times that the water in front of the schools made a sizeable wave across the river. During the height of the migratory period, two men who were doing the tagging marked approximately 49,000 salmon the average length of which was five inches. In a single day the two markers tagged exactly 8,000 fish.\(^{49}\) Studies of salmon migratory routes were continued in 1926 by the tagging of 13,645 salmon of various species in Southeastern Alaska and 2,000 reds at Port Moller on the Alaska Peninsula.\(^{50}\)

The Bureau of Fisheries of the Department of Commerce announced that the season's pack for 1926 would probably show a 46% increase over last year. This increase has taken place in the face of the further restrictions, which have been placed upon fishing by the Government which have been deemed necessary for conservation purposes in certain places. It indicates the effectiveness of such regulations which have been broadened in scope by the new Alaska fisheries act of
June 6, 1924. The results of these regulations are practically evident in the increased pack of pink salmon which was larger in 1926 than in any previous year. The pink salmon matures in two years, and the fish returning in 1926 are the progeny of the breeding pink or humpback salmon that escaped in 1924, the first season that the new regulation went into effect.51

Weirs for counting salmon were again installed in Anan Creek and in Karluk and Chignik Rivers. A new weir was completed in May, 1926, in the red-salmon stream flowing into Morshevoi Lagoon and work was begun on another in the stream at Thin Point Lagoon, which are both on the south side of the Alaska Peninsula. Weir operations were to be undertaken in the Ugashik Region it was reported.52 The reports on the operation of weirs in Alaskan waters for counting the salmon escapement during the season of 1926 were made public in February, 1927, by the Bureau of Fisheries of the Department of Commerce. The following chart gives a condensed statement of these reports:

<table>
<thead>
<tr>
<th>Place</th>
<th>Time</th>
<th>Number of fish escaping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anan Creek</td>
<td>June 12-Aug. 31</td>
<td>123,510</td>
</tr>
<tr>
<td>Karluk River</td>
<td>May 20-Oct. 14</td>
<td>2,572,754</td>
</tr>
<tr>
<td>Alitak Bay</td>
<td>May 22-Sept. 30</td>
<td>917,845</td>
</tr>
<tr>
<td>Litnik</td>
<td>June 1-Aug. 28</td>
<td>28,016</td>
</tr>
<tr>
<td>Chignik River</td>
<td>June 1-Sept. 25</td>
<td>1,040,819</td>
</tr>
<tr>
<td>Morzhovoi Lagoon</td>
<td>June 22-Aug. 30</td>
<td>13,769</td>
</tr>
<tr>
<td>Three Point Lagoon</td>
<td>July 10-Aug. 28</td>
<td>8,829</td>
</tr>
<tr>
<td>Ugashik River</td>
<td>June 12-Aug. 12</td>
<td>787,143</td>
</tr>
</tbody>
</table>

Total season's escapement 5,492,685.

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*53
CHAPTER III

FORESTS.

Surveys--In 1911, fourteen parties of the Geological Survey were at work studying the mineral resources of Alaska. There were 60 men engaged in this work. P.S. Smith explored the Noatak River; A.G. Maddren studied the geology and mineral resources north of Porcupine River; C.E. Ellsworth investigated the water supply for placer mining in the Fairbanks and Creek District; E.A. Porter did the same work for the Fortymile District; L.M. Prindle mapped and studied the mineral resources in the Yukon-Tanana District; H.M. Eakin did the same type of work for the Rampart quadrangle between 150°-154°; D.C. Witherspoon made topographical surveys of the Hanagita Valley and Bremner River basin; F.H. Moffit made geological surveys and studied the mineral resources in the same place; J.W. Bagley made a topographical base map of Valdez Inlet; R.H. Sargent mapped the western part of Kenai peninsula; J.C. Martin studied the coal resources in Kenia Peninsula; B.L. Johnson studied the lode and placer deposits in the northern part of the Kenai Peninsula; S.R. Capps studied the geology and mineral resources of the Yentna placer district; A.H. Brooks, the geologist in charge of the Alaska surveys spent some time in the Lower Copper River region, in the Valdez Inlet mining district and in the Kenai Peninsula. 1

An expedition was sent out by the Geological Survey in February 1925, and they explored some 7,000 square miles in the extreme northern reaches of the Territory. The greater
part of this territory had not been seen by white men. The route which they followed led down the Tanana and Yukon Rivers, overland to an Eskimo village on Bering Sea. From there they followed the coast northward across Norton Sound and the Seward Peninsula to Kotzebue. The party arrived here on April 8. It had just taken 26 days of actual travel to make the trip. Surveys had been made on the south side of the Brooks Range and were carried across to the headquarters of the Utukok River.²

The Navy Department announced August 11, 1926 that the Navy Aerial Survey Expedition which was then engaged in making aerial photographs of Alaska had discovered excellent possibilities for water power at Lake Grace. Fifteen islands had been mapped, also the Cleveland peninsula and part of another large island during the previous week. Two flights were made each day by the two planes. They were doing their work together. It will only take a few days to do what would have taken years by the old methods of surveying. In addition the continuous photographs which are obtained are more valuable than the topographic charts and occasional photographs secured by tedious surveys through the forests and over the mountains.³ The method by which these photographs are made has been described by D.D. Wilber, Secretary of the Navy. Each picture is taken through 3 lenses. One is pointed directly down, and the others are pointed obliquely to the sides. By this means, the photograph includes not only the territory directly underneath, but the surrounding area within a radius
of over two and one-half miles. Each photograph is lapped 60% over on its neighbor so that they can be checked against each other. After the pictures are taken, the details from each of them are sketched in upon a large map of the country. The photographs were taken at rapid intervals, sometimes every five seconds, depending upon the speed of the airplane. Secretary Wilber stated that it would have been practically impossible to have secured a thorough survey of Alaska without the use of the airplane because of the density of the growth which makes overland traveling extremely difficult.

This survey is designed to aid in the establishment of pulpwood and newspaper development, water-power projects, and lumbering operations in Alaska. The Navy, through its Bureau of Aeronautics; the Interior Department through the Geological Survey and the Department of Agriculture through the Forest Service participated in the survey. The district engineer of the Forest Service, J.C. Dort explained that it was the purpose of the expedition to map the southern half of the Tongass National Park. He stated that nowhere in all the Federal domain of the United States was there better supplies of pulp wood and water power than there were in Alaska. It was found that water power could be developed at $50 per horsepower, which was about half the cost in some places in United States. This survey will make available more information concerning the national forest resources of Tongass that would likely have been acquired in 20 years of
work from the ground.5

Plans have been approved for a Geological and topographical survey in the vicinity of Mount Spurr in the Alaska Range. This is part of the unexplored region of Alaska lying between the head of Cook Inlet and the Kuskokwim River basin. This is a part of the general program of mapping this Northern Territory which has been carried forward by the Geological Survey for the last 30 years as rapidly as funds and men have been secured. This tract was surveyed in 1926, but the object of this party is to map this country, also the areas covered by earlier surveys in the vicinity of Tuxedni Bay and Lake Clark.6 In February 1927, plans were in progress by the Geological Survey to explore one of the large unsurveyed areas of Alaska above the Arctic Circle east from the Chandalar River. They plan to chart the topography and determine the location of possible gold bearing veins from which known placers have been formed according to an announcement made by the Department of the Interior.7

Forests--The Forest Service of the Department of the Interior estimated that the woodland area of Alaska was approximately 100,000,000 acres, or about 27% of the entire land surface. About 20,000,000 acres may possibly bear timber of sufficient size that it can be used as saw timber, while the remaining 50,000,000 acres is woodland which bears some saw timber but most of the timber is small and of a more scattered character. As lumber, the Alaskan product is distinctly inferior to that of Washington and Oregon. The
Forest Service recommended its use as pulp wood rather than for general mill purposes. At present, most of the cutting is done by small saw mills for local use and for the manufacture of cases in which salmon is packed. It is estimated that the latter uses more than one-third of the entire cut.

The heaviest and most accessible timber is in Southeastern Alaska, and in the vicinity of Prince William Sound. The forests on the coast are chiefly Sitka Spruce, Western hemlock, Western red cedar, and Alaska yellow cypress. Spruce is the largest and most valuable of the four kinds. Some of the spruce trees are six feet in diameter and are 200 feet high. The forests of the interior are mainly white spruce, white burch and cottonwood.

Fires do a great deal of damage to the interior forests. On the coast, fires are rare because of the moist climate. It would require small armies of men to fight them as is done in the States but it is entirely out of the question to secure them because labor costs from $5.00 to $8.00 per day and can not be had at any price in many places.

The interior forests are of great importance locally in furnishing material for construction and fuel. The settler can usually find timber sufficiently large to construct his improvements, except in long-settled districts. The timber is of great importance for use in mining development.

The National Forests cover a large part of the Coast region. The Chugach Forest has 5,130,304 acres and the Tongass 15,449,302 acres. From 1906 to 1922 a total of
482,945,000 board feet of lumber had been cut which was valued on the stump at $681,071.71. Of the sum 35% is paid to the local government for roads and schools.  

The coast forests offer excellent opportunity for the development of wood pulp, and wood using industries for the timber is plentiful, of the right size and quality, and accessible to water transportation, and easily logged. 16

Chief Forester Henry S. Graves, in his report in 1915, stated that the external appearance of the Chugach Forest was deceptive. Within the forest some trees are found which are from 2 to 3 feet in diameter and 100 feet high. In some places the production would amount to 50,000 feet per acre. One corner of Chugach Forest contains some coal claims in the Bering Field. The Tongass forests are heavier and lie nearer the Pacific States. There are only the two National Forests.

The National Forests are under the Administration of the Forest Service. The National Forest work is decentralized and local, most of the business being transacted on the grounds without reference to Washington. 17 Settlers, farmers, prospectors, fishermen and similar persons are permitted to take timber from the forests for personal use, without formal permit and free of charge in amounts not exceeding 20,000 board feet, or 25 cords in any one year. All mature lumber may be offered for sale at not less than appraised value if its cutting will improve the forest. 18

The total receipts from the National Forests for the fiscal year ended June 30, 1921 were $61,325 while the cost of administration was $60,581. 19
Secretary Meredith of the Department of Agriculture approved the establishment of a new National Forest District on June 1, 1921. Its head quarters were to be located at Juneau. It was to be called the Alaska District. Charles H. Floy was placed in charge as district forester. The President authorized an Inter-Department Committee to coordinate federal activities which concerned Alaska. E.A. Sherman was appointed to represent the Department of Agriculture on the new committee. He had formerly been associate forester of the Forest Service in Alaska.

In 1926, the Department of the Interior announced the regulations governing the exportation of timber from Alaska. Enough timber for a 10 year's supply for mills was permitted to be cut from National Forests or public lands if it did not endanger the supply for local use. The 10-year period within which the timber must be cut began at the time the sale was made if the mill had been previously built but if it was yet to be built not over two years would be allowed for its construction. Applicants must file their applications in duplicate in the United States Land Office and give all required information. A deposit of $200 was required as evidence of good faith and to help pay the cost of appraisal. All contracts were to contain provisions against waste and precaution against forest fires.

Wood Pulp--In May 1920, the Secretary of Agriculture, Meredith, called attention to the favorable situation in Alaska for the establishment of paper mills to relieve the paper shortage throughout the country. He stated that the
chief drawbacks to paper making in Alaska were the large investments required for new plants, the lack of development in Alaska, and the high charges for transportation. It was estimated that the National Forests contained 100,000,000 cords of timber suitable for the manufacture of newsprint and other grades of paper. To encourage the paper industry the Department of Agriculture prepared to contract sufficient stumpage to supply paper mills for 30 years. The timber was to be paid for from month to month as it was cut, which would relieve the necessity for large investments in raw material. Spruce timber was offered at 50 cents a cord and hemlock at 25 cents. These rates were to apply during the first 5 years after the plant was installed and thereafter the prices were to be adjusted. Hemlock and spruce were the standard pulpwood for the United States mills in the Pacific Northwest, but hemlock was consumed in greater amounts than any other single species.

Colonel W.B. Greeley, the chief forester of United States, made an inspection of the timber, and waterpower resources in 1920. He estimated that the Territory had sufficient timber resources to produce 1,500,000 tons of paper annually, which was approximately one-third of the paper used in the United States and was almost equal to the amount which was imported yearly from Canada. He expressed the opinion that wise handling of these forests would result in the development of a paper industry as permanent as that of Scandinavia. Mr. Greeley predicted that the present shortage and high cost of all grades of paper would place
the forest industries of Alaska on a par with her fishing and mining.

Alaska probably contains the largest quantity of clear high grade spruce in the United States. During the War this spruce passed every test for airplane construction, and it is now being shipped in increasing quantities to the Eastern States for car and factory stock and high grade finish.27

Colonel Greeley stated that the greatest needs of Alaska were capital and transportation. Also that the handling of Federal resources and interests in Alaska should be localized and long range administration and red tape should be abolished. He announced that airplane patrol of these forests would be put into effect as soon as possible. Ninety-five per cent of the work connected with National Forests was conducted by the forest supervisor and superintendents who lived in Alaska. The pulp development has been held back by low prices in Eastern markets as well as high transportation charges.

The two National Forests, the Tongass in Southeastern Alaska, and the Chugach in the Cordova region, where the pulp wood is to be secured, were opened in 1920 by Chief Forester Greeley. Sufficient timber was offered under a firm contract to supply the pulp and paper mills for 30 years. The Government was to reserve a block of timber which would assure further operation for 15 years, thus making continued operation assured for a period of 45 years.

The first sale of pulp wood was made in 1920 to the Alaska Pulp and Paper Company which constructed the first
pulp plant at Port Snettisham in Southeastern Alaska.  

One hundred million cubic feet of timber were purchased from the Forest Service to supply this mill, which will probably be the forerunner of a large pulp and paper factory at that point. This mill, which is not far from Juneau is operated by hydro-electric power. It has a capacity of 20 tons per day with power resources available for increasing the output to 250 tons. Samples of spruce pulp were sent to the Department of Agriculture in March 1921, which had been made in the first run of the new mill. Hemlock will also be ground for newsprint purpose. The mill will probably be enlarged so as to make paper. Forest officials stated that the establishment of this mill had marked another milestone of progress in pulp production for the newsprint industry.

Another sale of about 100,000,000 cubic feet of spruce cedar, and hemlock, in the district about 60 miles north of Ketchikan was made in 1921, to the Alaskan-American Paper Corporation of New York. This company applied for power rights on Orchard Lake where their pulp and paper mill was to be erected. Chief Forester Greeley stated in 1920, that Eastern capital was becoming interested in a second and larger mill at Juneau, which was to be constructed in the near future.

In 1923, the Tongass forest was divided into 4 zones each embracing sufficient lumber to furnish a large paper mill with a permanent supply of raw material. Forest Service officials stated that an area of the Tongass national
forest containing 2,000,000 feet of pulp wood would be placed on the market soon in response to inquiries from prospective manufacturers.34

Alaskan forests also contain the second chief essential of paper-manufacturing, which is water-power. It is probable that the potential horse-power is not less than a quarter of a million, but no accurate survey had been made before 1921.35 The Federal Power Commission had been cooperating with the Forest Service to secure water-power data and reliable information regarding water-power sites which were heretofore unknown. A site was discovered in 1923 which would permit the development of from 22,000 to 24,000 horse power at a low cost.36

It had been known for several years that the forests of Alaska offered excellent opportunities for the development of the pulp and paper industry but until 1925 no serious effort had been made by the Government to bring these resources to the attention of the paper manufacturers. In view of the fact that the timber and power resources were available, and since the investigations by competent authorities had not resulted in any attempt at the utilization of these resources, it was evident that there must be some reason why capital had not been interested. Upon careful investigation it was found that paper manufacturers had not been informed of the possibilities, and that contracts offered by the Government in the past had not been satisfactory. Objectionable features in the contracts were removed under the authorization of the Secretary Of Agriculture and exhaustive reports were
prepared by the Government engineers showing the timber resources and available water-power. These reports were presented to pulp and paper manufacturers throughout the United States as a result of which, the prospects for future development in this field are excellent. 37

The Federal Power Commission issued several permits in 1925 authorizing the development of some of the larger units. 38 The two largest timber sales ever offered by the Forest Service of the Department of Agriculture, were advertised for competition bids in January, 1927. These are for the sale of pulp wood, each including 5,000,000 board feet. Announcement of the offerings was made by Secretary of Agriculture, Jardine. One sale is in the northern part of the Tongass Forest and the other in the southern part near Ketchikan.

The condition of each sale is that at least a 200 ton paper mill be established, with the opportunity to expand to 500 tons. Good water power for grinding the wood into pulp is available for each of these sales, and the applicants for the timber have in each case filed requests for power permits. The commission will advertise these power applications while the timber is being advertised so that both may be awarded to the bidder who offers the best terms. An investment of at least $8,000,000 to $10,000,000 in water power development manufacturing plant, and logging equipment will be necessary in connection with each project. These advertisements were made in response to applications for timber and water power permits filed by a number of companies or groups of responsible persons. 39
The sale of the Ketchikan unit was opened for bids on April 15, 1927. April 19, the Forest Service announced that L. and J.D. Deilerbeck of San Francisco had purchased 8,350,000 cords of pulp wood in the Tongass Forest. His bid was 80 cents per 100 cubic feet for spruce and 40 cents per hundred for hemlock pulp wood. It was estimated that 75% of the timber to be cut is hemlock. It will probably take two years to make engineering studies necessary, before the construction of the mill can be made and it may be 5 years before paper is actually produced under this award. Bids for a similar quantity of timber in the north end of the Tongass National Forest will be opened on April 25.

The Juneau unit, in the north end of this forest was sold to George T. Cameron, president of the San Francisco Chronicle, who will have associated with him, Harry Chandler, owner of the Los Angeles Times. These newspapers use about 60,000 tons of paper annually, thus a market is assured for the greater part of the product of their mills. Each award is accompanied by a recommendation to the Federal Power Commission that a permit for the development of specific water powers be granted to these purchasers, in preference to other applicants. The Federal Power Commission announced that ten power projects had been approved by June 2. These include the two for the development of the wood pulp industry. Thus the vision of the Forest Service approaches reality.
CHAPTER IV
MINING.

Minerals—Alaska mining began in 1860.¹ The possibilities of Alaska's mineral resources became widely known during the gold rush in 1899 when rich deposits of placer gold were found in various parts of the Territory. Until about 1915 gold constituted the larger part of Alaska's mineral production. Gold production reached its height at 1906 which was largely due to the great output from Nome and Fairbanks. Since then gold production has gradually declined.² About 75% of the mineral wealth of Alaska has come from the small but rich deposits called "bonanzas". These deposits can be exploited under adverse conditions and yield large net returns. Bonanza mining is always the first to develop and is important for attracting population, for forming communities and for establishing transportation systems. The Alaska bonanza deposits have not been exhausted by any means. However, a permanent stable mining industry cannot be founded on this style of mining. Permanency must be based on the development of the larger units which have lesser unit value. Such ventures depend for their profits a great deal upon the magnitude of the operations. Large mining operations can not be successful under the haphazard and expensive transportation facilities which are generally characteristic of the frontier. The evolution from bonanza mining to a stable permanent industry must take places in all mineral bearing regions.³
The value of the minerals produced in Alaska up to the close of 1920 was $461,474,789. The following chart shows the value of the mineral output since 1919 up to the present time:

<table>
<thead>
<tr>
<th>Year</th>
<th>Value of mineral output.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919</td>
<td>$19,620,913</td>
</tr>
<tr>
<td>1920</td>
<td>$23,303,757</td>
</tr>
<tr>
<td>1921</td>
<td>$17,004,124</td>
</tr>
<tr>
<td>1922</td>
<td>$19,506,355</td>
</tr>
<tr>
<td>1923</td>
<td>$20,320,643</td>
</tr>
<tr>
<td>1924</td>
<td>$17,457,333</td>
</tr>
<tr>
<td>1925</td>
<td>$18,220,692</td>
</tr>
<tr>
<td>1926</td>
<td>$17,490,000</td>
</tr>
</tbody>
</table>

Total $152,903,827

Two of the largest gold mines in the world are located at Juneau. One is the Alaska Juneau and the other is the Alaska Gastineau. In 1918 each of them were handling 8,000 tons of ore per day. The Juneau mines produced $52,000,000 worth of ore before the ocean broke through, ruining two-thirds of the property. The remaining one-third is now shut off from the rest of the property by a concrete dam. The Alaska Juneau Mining Company reported a deficit of $253,980 in 1919, $67,451 in 1920, $168,732 in 1921 and $166,679 in 1922. The Alaska Gold Mines Company reported a deficit of $270,722 in 1917, $647,974 in 1918, $809,979 in 1919, and $812,991 in 1920. The deficits include the charges for depreciation. Shortage of labor increased the cost per ton for operation which accounts for part of the deficit in 1918.

It was reported in 1922 that placer gold, which ran as high as $4.00 to the pan, was discovered 60 miles from the...
Alaska Railroad on the Toklat River. The find was made by the Indians. 17 The benefits to the gold mining industry of interior Alaska derived from the completion of the Alaska Railroad are rather slow to show as the work of testing larger areas of placer ground and engineering work necessary to install machinery requires considerable time. Increased prospecting for metal-bearing ledges will eventually increase production. 18

Governor Parks in his report for 1926 states that there is a gradual resumption in both placer and lode mining in all districts. The gold production of 1924 was greater than that of 1923. The present law, which limits the number and size of placer claims that may be located by an individual, should be repealed, he says. The cost of dredging machinery is large and unless a large block of ground can be obtained the dredging companies can not afford the investment. The present law was designed to prevent monopolies, but the future development must come through exploring the two-grade gravels and the existing laws do not encourage explorations in this class of deposits. 19

Placer mines produced less gold in 1925 than in 1924, but this decrease was more than made up by the increased production of the gold lode, which now yields almost as much as the placers. Extensive preparation for future mining is being made at Fairbanks which will not be completed for at least two years. 20 It was estimated that 29 dredges were in operation in 1926 which produced $2,200,000 worth of gold. This was somewhat more than $500,000 in excess of the 1925 output by the same method. 21
Experiments were conducted in 1926 in the vicinity of Nome to perfect a method for thawing the frozen gravels with cold water. These experiments were successful and large areas of low-grade ground may be dredged. Prospecting for both lode and placer deposits have been stimulated in the Fairbanks district. Work has been undertaken on several small quartz properties near Fairbanks and increased gold production may result. New dredges are to be installed in the Tanana River region. Most of the lode mining is done in southeastern Alaska. The Juneau district leads in production, followed by the Chichagof Island and Hyder. 22

"Mining conditions in Alaska are encouraging not only for continuation of production at present rate but for gradual increase," according to the Department of the Interior. There is a shortage of enterprising prospectors which is a serious drawback that has resulted because wages are lower in Alaska than in United States, though expenses are higher. Capital is needed worse as more extensive equipment is required but it will not be attracted to Alaska unless the returns are likely to be higher than in the States, as investments are less alluring. 23 The total value of mineral output in Alaska since 1880 is $553,304,968. 24

The decline in gold production from 1906 to 1916 was more than offset by the increased production of copper which began in 1914 at the outbreak of the World War. The years immediately following the War showed a decrease in production due to high costs of labor and material. Many operators
became discouraged, but with the readjustments that have taken place the condition is gradually changing and interest is being revived. There are many new mining enterprises recently established. The Kennecott coppermine produced the largest part of the $34,000,000 produced in 1917. Increase in the value of the mineral output in 1925, as in 1924, was due largely to the increase in the value of copper. Less copper was produced in 1925 than in 1924.

Dan Sutherland, Congressional Delegate reported that a 72 foot ledge of silver lead was discovered at Copper Mountain, just north of Mount McKinley. It is said to carry values up to $400 a ton and to be one of the largest deposits in Alaska. The place is 50 miles west of McKinley Station on the Alaska Railroad. Twenty-three claims were bonded by the discoverers, A.M. Grant and Frank Giles to J.J. Price and Tom Aiken. Most of the silver produced in 1926 was recovered from copper ores. Probably three-fourths of the production of this year came from this source.

The output of marble for 1926 came entirely from the quarries of the Vermont Marble Company at Toksook, on Prince of Wales Island. Tin ore was derived from placers near York in Seward Peninsula, and from the Hot Springs district in the Yukon-Tanana region. Some platinum came from Dime Creek, Seward Peninsula.

Coal—"In the matter of coal resources Alaska has no competitor" according to Alfred H. Brooks of the United States Geological Survey. The Bering River field is 25 miles
from tide water. Forty-six square miles had been surveyed by 1910 in which the coal ranged from 6 to 20 feet in thickness. In 1911, work had been done in more than 300 places, but none of it had been extensive. There were 30 tunnels with a total of 3000 feet. Estimates of the amount of coal in the Bering field are unreliable because the structure is very complex. The rocks are folded, faulted, jointed, and crushed. The whole region was very much disturbed geologically when the Chugach Mountains were thrown up, and the coal was ground between the strata like wheat between milestones. Some of it can still be taken out in lumps but in some places it is so badly crushed that a man can pull the coal out by the handfuls.

This crushed and sheared condition is likely to be a serious handicap to the utilization of these coals. Where firm and unbroken masses of coal are found they can be readily crushed. Such coal cannot escape being broken during mining and shipping. The crushed and friable condition of the anthracite is likely to seriously impair its market value. The grades of coking coal may be converted into coke before shipping.

When coal containing bitumen is thrown on a hot fire it immediately cakes and forms a semi-solid mass so that for steaming purposes and for making coke it is as good as lump coal. It is almost impossible however to use the anthracite coal unless it is in lumps as it never cakes. The crushing is a disadvantage in the semi-bituminous coal because in most
mines it is necessary to have some support to the roof, and the general custom is to leave pillars of coal. As this coal is not firm enough to carry a heavy weight, timber props are necessary and they add considerable to the expense of mining. Most of the coal is lignite or a very low grade subbituminous. The lignite is usually brown and lighter in weight than true coal. It is said to yield excellent gas.

Anthracite coal from the north end of Bering Lake was tested in the battleship Nebraska and found to yield nearly 20% more energy than Eastern fuel. Semibituminous coal is excellent for steaming purposes. This is found in the southwestern portion of the Bering field. Between the two there is a belt of "semi-anthracite", which is a soft coal, which burns without smoke and produces a great deal of heat. Dr. Marten tested 32 samples of coal taken from different parts of the field and found an average which showed 6.02% moisture, 10.44% volatile combustible, 75.3% fixed carbon, 8.23% ash, and 1.47% sulphur. Nobody knows what the Bering River coal is worth and it is doubtful if it can be profitably mined under present conditions.

So far as is definitely known there are only two fields of really high grade coal according to W.D. Hulbert, which are within reasonably easy reach. The Matanuska field is probably the better. The Matanuska field is 25 miles from tidewater in summer and 150 in winter. The depth of the coal runs from five to 36 feet.

Chemical analysis of specimens of coal of the Matanuska
with the Wilkes-Barre and Lehigh fields in Pennsylvania indicate that Alaskan coal is slightly better quality for generating heat. Its percentage of fixed carbon is 84.32 which is more than the coal in the Wilkes-Barre region, while the percentage of ash is 2.05 which is less than the other. The proportion of sulphur, 0.57, is the least in any anthracite coal found thus far in America. The Guggenheim syndicate had 75 miles of railroad built by 1910 out of 175 miles required to reach Cordova from these fields.41

A commission, consisting of 3 naval officers, a mining engineer and a geologist were sent to Alaska in April of 1919 to plan the development of the Matanuska coal fields.42 The request for $1,000,000 for the development of a coal field in Alaska by the Navy Department was passed in 1902. For the first time in history the Navy began mining its own coal in Alaska. For years it was known that certain Alaskan coal possessed a greater number of heat units and was more satisfactory for naval use than any coal mined in the United States but it had failed to receive an appropriation to enable it to send officers to superintend the mining of coal for the Pacific fleet. Previously, the Navy had shipped coal from Pennsylvania or West Virginia as no coal found in the Pacific Coast states was satisfactory for Naval use. Also in 1920 Secretary of Interior Payne and Secretary of Navy, Daniels made a visit to Alaska to select a naval coaling site on one of the Aleutian Islands halfway between Seattle and Japan, over the "great circle" route. It is said that ships flying between Seattle and the Orient will save 1000 ton in
cargo carrying capacity on each voyage if a midway coaling station is established here. Another object of this visit was to look into the possibilities of Alaska as an oil source for both naval and merchant vessels. 43

In 1925, the production of coal decreased, but extensive explorations were under way. 44 In 1926, the production was maintained at the usual rate and the coal came largely from the Evan Jones, Alaska, Matanuska and Premier mines, in the Matanuska region and the Suntrana mine, in the Healy River field. Interest in the Bering River field was revived during 1926 but no productive mining was carried on.

The market still continues to be the controlling factor of Alaskan coal production, and several companies have made special efforts to build up an outlet for their coal. As a result shipments have been made to points in southeastern Alaska, but the Alaska Railroad continues to use the largest quantity of the coal. In areas where Alaska coals should have decided trade advantage they have not supplanted coal shipped from the outside fields. 45

An amendment was made to the Alaska coal leasing regulations in circular letter number 1049, sent out by William Cpry, Commissioner of the United States Land Office. An actual bona fide expenditure of $100 must be made for each acre for mine operation and development purposes. This was adopted as the minimum basis for granting leases, with the requirement that not less than one-fifth of the required investment shall be expended during the first year and same amount each year for the four succeeding years. If the fixed
investment was to be over $50,000 a bond with approved surety of $10,000 should be furnished by the lessee. If the investment was fixed at $50,000 or less a bond similarly conditioned for $5,000 must be furnished. In lieu of corporate surety the applicant might deposit United States bonds of a par value equal to the amount of his bond.46

A coal lease was authorized July 2, 1926 by the Department of the Interior to the Rawson Coal Company on 1,210 acres of public lands in the Matanuska field, Seward Meridian. The company according to the agreement must pay a royalty to the Government of two cents per ton, mine run, on all coal produced. An investment of $121,000 on the property must be made during the first five years of the lease.47

According to Mr. Carrington Weems, there is good reason to believe that coal deposits on the Arctic slope are more extensive than all other fields combined, covering roughly 3000 square miles.48 Unfortunately, the development of Alaska waits on improved means of communication and transportation. If Alaska coal fields were developed there would be no danger of exhaustion of the coal supply for thousands of years according to Alfred H. Brooks.49

The wages for coal miners are quite uniform. In 1925, underground coal miners and timermen received $8.60 per day; under ground laborers, trammers, and ropersiders $7.80 per day and outside labor $5.50 per day. Fire bosses received $250 per month, and foremen from $250 to $300 per month. Board costs from $1.50 to $2.00 per day.50

Oil--It was announced early in 1920 that oil had been
been discovered in Southern and Southeastern Alaska. The "Juneau Daily Empire", an Alaskan newspaper, stated that 35,000 acres had been filed upon by prospectors.51 Four hundred and ninety-four applications were filed by 1921 which covered 1,100,553 acres. There was a great deal of prospecting, particularly in the Gold Bay field, but the only producing wells were those of the Chilkat Oil Company at Ketchikan. The daily output of these wells was 40 barrels.52 Alexander Malcom Smith, an explorer in the Arctic Regions for 35 years, reported the discovery of two lakes of oil near Point Barrow in 1922. He says oil could be shipped from Point Barrow to Japan 25 cents a barrel cheaper than it could be sent to San Francisco.53

The Mineral Land Leasing Law provided that a group of permittees, not exceeding five in number, could turn their permits to a corporation or company which would undertake to develop the tracts. This provision was made in order to encourage prospectors who held permits but could not supply capital for drilling apparatus and other expenses. Regulations containing a "free period" were also made. These regulations exempted the prospector from paying a royalty to the Government on oil produced on one-fourth of the area of the permit. A similar exemption on the remaining three-fourths of the tract provided a well was not discovered which produced more than 100 barrels daily. Otherwise the Government was to receive a 5% royalty.

In 1922, the Department of the Interior granted prospecting permits to the Standard Oil Company of California and the
General Petroleum Company. The Standard Oil Company got prospecting rights on 3 permits issued to W.C. Lee and others. The lands are adjacent but there was thought to be no cooperative agreement between the two companies. It was reported that they were to send their drilling apparatus from Seattle to their Alaskan claims in August, 1922. They planned to spend approximately $2,000,000 in development of these leases.54

Col. Alfred F. Brooks, in charge of the geological survey work in Alaska predicted the development of a rich oil field on the Arctic Coast before the House Committee on Territories.55 Continued exploration in the various oil fields was done in 1925 but no wells on the Alaska Peninsula were producing oil in commercial quantities.56 The Report issued by the Department of the Interior in 1926 says that "the region is most assuredly not one where everybody can get rich in oil without enormous expenditure of capital for development, and no one should risk funds whose loss will seriously embarrass him, because development of oil in the region is distinctly a wildcat undertaking of the most speculative character and at the same time the development can be successful only if undertaken on a large scale."

The oil fields are too expensive for average firms. The difficulties of the commercial development of oil in the naval petroleum reserve in the extreme northern part of Alaska, are the inaccessibility of the region and the lack of transportation facilities for getting the oil to market. The stakes to be played are high, the risks grave, and the expenses of development large.57
The United States Daily for January 3, 1927 states that all petroleum produced in Alaska continued to come from the wells near Katalla. In addition to the oil wells, a refinery is operated. The gasoline and distillate produced are much in demand locally because of their high quality. The exploration at Pearl Creek Dome in the Alaska Peninsula, which had been in progress for 3 years by the Standard Oil Company was definitely suspended when a test well was abandoned at a depth of 5,034 feet. According to the Standard Oil Bulletin of April 1926 this well proved wholly unproductive in spite of the predictions of the company's geologists to the contrary. Although, these conclusions are true, the test does not condemn the other parts of the Alaska Peninsula. The published reports of the Geological Survey stated that there were structural features where the probable oil-bearing formations were nearer the surface. No drilling was done in 1926 by the Associated Oil Company whose holdings in that area were near those of the Standard Oil Company. A test well had been drilled by this company to a depth of 3,000 feet.58
CHAPTER V.
RAILROADS.

According to Mr. C.E. Swergel of the New York Central Road there were only three short railroads in operation in Alaska in 1913. The White Pass and Yukon, only 25 miles of which were in Alaska, was built in 1898-1900. The Copper River and Northwestern was 197 miles long, and the Alaska Northern leading inland from the southwestern coast was 70 miles long.¹

Rates on all Alaskan railways are very high as compared with those in the United States. In 1912, the passenger rate on the White Pass and the Alaska Northern was 20 cents per mile. The rate on class C freight for a distance of 110 miles, part of which is in British Columbia was 3 cents per pound or $30 per ton; on carload lots; and 3.6 cents per pound on $72 lots or smaller shipments. This made the minimum cost $1200 per carload of 20 tons of class C freight over this road. It was doubted where the roads were making any profits even with these rates. According to the law in 1912 all railways in active operation were required to pay an annual "license fee" of $100 per mile but in a few cases Congress had, by a special act remitted the fees of different roads in consideration of the difficulties which surrounded their operations.² The freight rates on the necessities of life amounted to $135 a year for every man, woman, and child in the interior of Alaska. That is one thing that keeps down
the population of Alaska. During 8 or 9 months of the year
the mouth of the Yukon River is ice-bound so that steamers
can make the trip only during the summer. The river traffic
is in the hands of a trust. The stage fare in 1914 from
Valdez to Fairbanks was $125. The distance between the two
towns is about 400 miles. This is more than 10 times the
normal passenger fare in the United States. At the road
house along the Government road meals were $2.00 each and
a bed was $2.00.3

President Wilson was directed by law to locate and to
build not to exceed 1000 miles of railroad at a maximum
cost of $35,000,000 to develop the resources of Alaska and
to connect an open harbor on the southern coast with the
navigable rivers of the interior. He designated Seward as
the southern terminus of the proposed Government railroad.
The Matanuska Coal fields would be opened by this route.4
President Wilson appointed Colonel Frederick Mears as Chair-
man and Chief Engineer of the Alaskan Engineering Commission
in charge of the construction of the railroad. Colonel Mears
had been on this commission but had gone into the army during
the War. He was with General Goethals during the construction
of the Panama Canal and built the Panama Railroad and was
general manager of the American railroad lines in France.
William C. Edes was appointed as the Consulting Engineer to
the commission.5

The road was begun in 1914, the year of the Great War.
It was to run from Seward to Fairbanks.6 Swamps, frozen
tundra, huge rock barriers and difficult mountain passes had to be conquered. All of the construction materials had to be shipped from Seattle which was 1,776 miles south of Seward. The road was constructed from 3 operating bases, Seward, on Resurrection Bay, the southern terminus of the line; Anchorage, the main operating base at the head of Cook Inlet, 114 miles north of Seward; and Fairbanks, the northern terminus.

Two old railroads, the Alaska Northern, which ran from Seward to Cook Inlet, and the Nenana Railroad which ran between Fairbanks and Chatanika, were purchased. Only seven miles of the Nenana railroad were used. It cost the Government $300,000. The Alaska Northern cost $1,157,839 and only part of it could be used. After Spencer Summit, which is 53 miles from Seward, was reached it was necessary to abandon much of the grade and construct a new road. Sixty-one miles from Anchorage, the right of way was blasted out of solid rock. It was necessary to swing suspension bridges across deep chasms, and build roads along cliffs. In the winter the materials were hauled on sleds and in the summer they were hauled on ferry boats.

The Alaska Engineering Commission followed the same system as the builders of the Panama Canal. Snug houses were provided for the 1,000 to 3,000 men who were constantly employed. At Anchorage a town site was laid out. Streets and sidewalks were constructed, electric lights and waterworks were installed, and a hospital built. Such facilities were duplicated on a smaller scale in other places. The
commission assumed the responsibility of civil government. Work was never stopped during the war, but it was slowed down quite materially as several thousands of men went to the army and the supply of steel was cut off. However, after the armistice was signed several thousands of applications for work on the railroad were received from men formerly there and others who had never been there. By 1919, plenty of steel and other materials were available.

The railroad passes through the mountains, not around them. The grades on the line never exceed 2% and on the greater part of the route the maximum grade is 1%. So far as mileage is concerned this railroad does not compare with the world's more notable systems but with respect to engineering skill required it was a notable enterprise. Seward, which is named after the man who negotiated the purchase of Alaska from the Russian Empire, is one of the best harbors on the Pacific. It is open all the year and is completely sheltered. The road passing through Anchorage was the most difficult to build. This part is a succession of trestles and tunnels which explains the high cost of the line. This road crosses the Mount McKinley National Park and from there crosses a long stretch of marsh land. After crossing several rivers the road reaches the Nenana River which is a tributary of the Yukon.

In 1920, a bill was passed which appropriated an additional $17,000,000 for the construction of this railroad. The engineer of the commission, J.L. McPherson explained that it was more economical to construct the road in two sections,
and that the original appropriation was insufficient because wages had increased 59%, cost of material 161%, and cost of transportation 147%. Mr. McPherson stated that the average cost per mile would not exceed $73,300 which in his estimation was very reasonable when the difficulties of railroad work in Alaska were considered. The road has 601 miles of track including sidings. One of the heaviest expense items was the Tanana bridge which it was estimated, would cost $1,220,298. In 1921, a bill was passed appropriating $4,000,000 to complete the construction of the railroad. This was needed to construct a 1,340 foot bridge across the Tanana River and other similar work. Fifty-two million dollars had already been appropriated for the building of this road.

The line was formally opened Feb. 10, 1922. Except for the steel bridge over the Tanana River through train service was possible from Seward to Fairbanks. This line cost approximately $86,000,000. The virtual completion of the railroad from Anchorage to Fairbanks was made during November, 1921. The railroad was officially designated "The Alaska Railroad" in March, 1922. Then it had a total mileage of 540 miles in operation. The last mile of track was completed in June, 1923 which permitted through passenger and freight service without change of cars from Seward to Fairbanks. The construction of 470 miles required nine years, eight months and five days at an approximate cost of $84,000 per mile.
President Harding drove the golden spike which symbolized the connection of the Pacific and Arctic Oceans by rail during the summer of 1922.\textsuperscript{17} The new railroad runs two trains a week, each made up of both freight and passenger cars. The trip is made in two days. The total length of the road is 467 miles.\textsuperscript{18}

The total operating expenses from 1915 to Dec. 31, 1922 were \$9,536,294.14 and the total revenues were \$2,481,099.66 making a deficit of \$7,055,234.48. The deficit for the past four years was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1922</td>
<td>$1,055,455.55</td>
</tr>
<tr>
<td>1923</td>
<td>700,000</td>
</tr>
<tr>
<td>1924</td>
<td>1,736,576</td>
</tr>
<tr>
<td>1925</td>
<td>1,586,715</td>
</tr>
</tbody>
</table>

The deficit of 1925 included \$280,040 charged to expenses on account of replacement of bridges and trestles. The necessity for pushing the work during the short working season makes the cost of maintenance high. Embankments were not raised to sufficient height; a limited amount of ballast was placed under the ties; trestles were built of spruce when such construction would save time; and bridges, with a few exceptions were built on a pile foundation of native spruce. Until these conditions can be corrected the cost of maintenance must be high. The life of native spruce is found to be short and renewal is becoming necessary. These bridges and trestles are being replaced by steel and concrete as rapidly as funds are available.

The Government railroad operated every month during the year though the amount of freight and the number of
passengers handled during the winter was small. It is important however for the proper development of the service that such service should be performed. Anchorage is the railroads headquarters and the repair shops are there.\(^{20}\)

The Alaska Anthracite Railroad company asked for authority from the Interstate Commerce Commission on April 23, 1921 to issue $1,500,000 in 6%, 20-year bonds to complete their railroad.\(^{21}\) It was begun in 1916, but work was suspended during the war after about 22 miles of road had been completed. Permission was granted on May 28, 1921 to sell the bonds. It was desired to complete the line during the open season in 1921 to open up large coal deposits in the Territory.\(^{22}\)

The Copper River and Northwestern connect the well known Kennecott Copper mines with the sea board. Two hundred miles of single track line were built in the years 1908-11 at a cost of $16,000,000 an average of $80,000 per mile. The seaboard terminus is Cordova. A pile trestle nearly a mile in length was built across the Copper River, and the road from there follows the Chitina River. Over $1,000,000 worth of copper ore is shipped each month over the road, and thousands of cases of salmon are shipped each summer.\(^{23}\)

There were 547 miles of railroad of both standard and narrow gauge in Alaska in 1917.\(^{24}\) The roads constructed in Alaska until 1926 were not hard surface roads. They are covered with gravel and are suitable only for wagons, auto-
mobiles and light trucks. Very heavy loads cannot be hauled over them except when they are frozen. In 1919, Major Herbert L. Buell of the Engineers Corps asked the committee to increase the House appropriation of $100,000 for post roads in Alaska to $300,000. He estimated that $270,000 would be required to maintain these roads and the remainder would be used for the construction of additional roads in south-eastern Alaska. He stated that the production of precious metals would decrease if these roads were not maintained. In 1917, there were 920 miles of wagon road, 629 miles of winter sled road and 2,210 miles of trail in Alaska. The Secretary of Agriculture approved expenditures amounting to $532,500 for the construction of 55.3 miles of roads in Alaska. Of this amount $35,000 was to be appropriated by the Territorial Government.

The train service was improved by adding motor cars to the equipment and operating them between stations on days when regular trains were not running. The Territorial legislature appropriated funds for the construction of airplane landing fields in isolated places. This mode of commercial travel will undoubtedly stimulate mining developments in isolated regions, which can now only be reached after days of arduous travel.
CHAPTER VI
POLICIES OF THE PRESIDENTS AND OTHERS.

Roosevelt—Roosevelt said "In my judgment the Government should have the right to keep the fee of the coal, oil and gas fields in its own possession and to lease the rights to develop them under proper regulation; or else if the Congress will not adopt this method, the coal deposits should be sold under limitations to conserve them as public utilities, the right to mine coal being separated from the title to the soil." He also said "I do not believe in the policy of State-owned railroads as a general thing; but I am quite willing to see the Panama Railroad owned and run by the Government as it actually is; and in the same way, if difficulty occurs in connection with what has been done in Controller Bay, I feel that it would be a good thing for the United States to build and operate the short line of railway (with its terminals) which would connect the Bay with the coal fields. I advocate with all my heart the conditions of development being made such as to give ample return to those willing to undertake the work, and, as there is an element of hazard in the work, I would prefer to see the Government in, if at all, on the side of liberality in making those conditions." Current Opinion for March, 1922 stated that the conservation policy of Roosevelt had resulted in putting 92% of the coal, oil, timber, and other resources effectively beyond reach not only of the unscrupul-
ous corporate interests, but of the legitimate settlers as well. "It has taken from thousands all that they possessed, the fruits of years of labor and hardship; subjected others to suspicion and disgrace and has turned over to the mercies of a jealous bureaucracy the destinies of a people 5,000 miles away". A large measure of the stagnation of Alaska is attributed to that policy and the conditions succeeding it. The slump following the War had somewhat to do with it however, as 3,000 young men went to War and 4,000 others left with the close of the mining operations. The resident of Alaska does not object so much to government control of resources as to the method of operation. Thirty-eight bureaus are trying to conduct his affairs for him and the result is confused long distance service. There is so much red tape to be gone through to get a claim that the people give up in despair. "With restrictions on the natural resources—the timber, oil and coal tied up, the discouragements to capital, the lack of transportation, and the consequent absence of industries, all the results of the Government's conservation policy, it is not surprising that the investor and homesteader are looking elsewhere."

In August, 1912, President Taft appointed the Alaska Railroad Commission, whose members were Dr. A.H. Brooks, Leonard M. Cox, Colen M. Ingersoll and Major J.J. Morrow. The purpose of this Commission was to visit and made immediate report of the transportation question; to examine routes from
the seaboard to the interior, to the coal fields, and to navigable waterways; to secure surveys and other information regarding cost of construction and cost of operation; to secure information with respect to the coal fields and their proximity to railroad routes; to make a report of the facts to Congress together with conclusions and recommendations for the best routes. They recommended two routes, one from Cordova to the Bering River coal field and to the Yukon and Tanana Valleys, and the other from Seward to the Matanuska coal fields and to the Kuskokwin Valley.

In his letter of transmittal to Congress, President Taft writes "I am very much opposed to government operation, but I believe that Government ownership and private operation under lease is the proper solution of the difficulty."4

It was predicted that as time passes the outstanding feature of the Wilson administration would be the building of the Government Railroad from Seward to Fairbanks to open and populate Alaska.5 In 1919, President Wilson signed a joint resolution which suspended legal requirements of assessment work on mining claims in Alaska for 1917, 1918 and 1919.6

The chief question before President Harding was whether Congress should be asked to make further appropriation to open up the Alaskan Territory for gradual permanent settlement or whether the resources of the country should be opened
for development by private interests. In his last public speech at Seattle on July 27, 1923, President Harding stated that, "Against a program of ruinous exploitation we must stand firmly and our adopted program must be for the development of Alaska for the Alaskans". President Harding planned to coordinate the 30 bureaus which were authorized by law to deal with the Alaskan affairs. He had ascertained that this multiplicity of authority was conflicting and believed that it had paralyzed Alaska's development. President Harding was much opposed to development by capitalists whose only thought was to "make their pile" and get back to homes in a milder climate. He indicated clearly that he was opposed to opening up Alaska to development through encouragement to capital by any marked lowering of the bars of Government restriction. While he painted an optimistic picture of the prospects he offered no constructive program which would put Alaska on the road to prosperity. He thought private capital should be given an opportunity to develop mining and oil. He planned to keep the Government Railroad under Government control even though it was operating at a loss. He predicted that the Panhandle of Alaska together with the southern part would soon be admitted as a state. He stated at the end of his Seattle Speech that, "He, who undertakes to forecast the future of Alaska and formulate a program for its realization on the strength of such a fleeting glimpse as has been permitted to us will be a wiser and bolder man than I." He stated that regulation of fisheries
must come by Executive Order if not by Congress, also that he did not look for a rapid development of Alaska. He decided that the forest conservation policy was not too drastic as he had feared it was before he made his visit to Alaska.

President Coolidge's plan was to carry out the policy outlined by President Harding in his Seattle speech. On April 8, 1927, a joint recommendation was submitted to Congress by Secretary of the Interior, Secretary of Agriculture, Jardine, and Secretary of Commerce, Hoover. This recommendation provides that each of the three departments have a single administrative head in Alaska for all its activities. These three heads were to be selected from the present chief officers in charge of the principal activities of each of the Departments now stationed in Alaska, and they were to form an advisory board of Federal administration in the Territory. These officers were to be given authority to act on public matters without the necessity of referring them to Washington. This bill, the secretaries believe would prevent duplication and overlapping of Federal functions in Alaska and eliminate unnecessary expense.

A representation was to be sent to Alaska during June of this year to abolish as far as possible the long distance administration of affairs of the Territory and to coordinate the various Governmental activities according to an announcement made on May 28, by Dr. Hubert Work, Secretary of the
Department of the Interior. These representatives will visit the cities of Seattle, Juneau, and other points, and will survey the work of the Alaska Railroad, the health, education, and the remainder of the activities of the Bureau of Education. Secretary Work advocates a policy on the part of the Department of doing everything for Alaska in Alaska that can be done there.  

In May, 1927, the opening of approximately 14,437 acres of unreserved lands will be made. These lands will be available for entry under the homestead law by qualified former service men of the World War, and also to entry by those persons who claim a preference right superior to that of the soldiers. Since April 13, 1926 a departure can be made from the cardinal direction in order to secure desirable lands, where it is not feasible or economical to include such lands in the rectangular form. There is no limit as to the amount of such departure.

"The railways of Alaska are the keys to the wealth of Alaska," according to Secretary Fisher of the Department of the Interior in 1912. The railroad question is part of the question of coal lands, agricultural lands, and forest lands. The question is how shall a natural monopoly be brought under the absolute control of the nation and be made to serve the people without waste. In Secretary Fisher's opinion, Alaska should be developed properly as well as promptly. Coal fields should be owned by the Government, but leased to private parties with the Government owning and
and operating the roads. Mr. Fisher insisted that the business of mining coal and operating railways should be kept in separate hands, and that private owned railroads should be under strict Government control.18

Secretary Lane of the Department of the Interior in 1914 said, "In my judgment, the way to deal with the problem of Alaska's resources is to establish a board of directors to have this work in charge". All the national assets in the Territory should be placed in the hands of this board, to be used primarily for her improvement—her lands, fisheries, Indians, Eskimos, seals, forests, mines, waterways, railroads,—all that the nation owns, cares for controls, or regulates. Congress should determine in broad outline the policies which this board should elaborate and administer, much as is done in the Philippines.19 Secretary Lane described Alaska as the largest body of unused and neglected land in the United States. He predicted that in time the Susitna Valley would be one of the greatest cattle producing sections in the United States. He advocated the leasing of coal lands on a royalty basis, in a manner similar to that then pursued by Montana and Colorado with their coal lands.20 Instead of one government in Alaska there are many. There is a Government of the forests, of the fisheries, of the reindeer and natives, of cables and telegraphs. There is a government of certain lands and forests and another for public lands and forests. Each of these governments is intent upon its own particular business, jealous of its own
success and all are more or less unrelated and independent in their operations. Mr. Lane stated that the keys to Alaska's wealth were the railroads and that these keys should be held by the National Government. Also that Alaska's future was not as that of a land of mines, and fisheries, but of towns, farms, mills and factories, with millions of strong and energetic people. "We can only secure the highest and fullest use of Alaska by making her railways wholly subordinate to her industrial and social life and needs." 22

Secretary of Interior, A.B. Fall, predicted in 1922, that the return from the development of Alaska wouldn't only pay the complete cost of the soldier's bonus, but that the entire debt of the United States could be paid by returns from an "opened-up" Alaska and the rest of the public domain. He thought that the laws should be liberalized and Alaska opened up under such rules and regulations that the boys back from the War could do what their forefathers did in California in 1849. 23

Delegate Sutherland introduced a bill into the House in March, 1922, which authorized the appropriation of $5,000,000 to begin work to make oil and minerals available. This bill would direct the Secretary of the Interior, through such agencies as he might select to arrange for the drilling for oil and mining of other minerals on the public lands of Alaska and in case of discovery, to dispose of the projects through competitive bidding or other means. 24 He also stated that immediate legislative relief was necessary to prevent a
gradual but constant exodus of white residents from the Territory. 25

Governor Scott C. Bone says in his first annual report in 1921, that "capital and people are required to develop the resources of the Territory, and until it is made easier to obtain a foothold, the Territory will not progress. Under the present long-range system of government, individual initiative has been halted and the pioneer spirit mained". He stated that the population had decreased 10,000 during the last decade and that the Territory has not progressed or prospered during the last fiscal year. 26 He advocated conservation of fisheries as being of the utmost importance. 27

According to the New Republic of June 1915, "there is a new kind of pioneering to be done in Alaska, the pioneering of an educated Alaska. It is a task beside which the building of the Panama Canal is a small enterprise, for Alaska is not merely a highway, it is the opportunity of a great state." 28
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