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DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES
HUGH M. SMITH, Commissioner

FISHING IN THE PRIAMUR DISTRICT
OF SIBERIA

By JOHN K. CALDWELL
American Consul at Vladivostok, Siberia

APPENDIX VI TO THE REPORT OF THE U. S. COMMISSIONER
OF FISHERIES FOR 1916



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FIGHTING IN THE PHILIPPINE DISTRICT
OF SIBUYAN

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FISHING IN THE PRIAMUR DISTRICT OF SIBERIA.^a

By JOHN K. CALDWELL, *American Consul at Vladivostok, Siberia.*

INTRODUCTION.

Fishing is probably the most important industry in the Russian Far East. It is the only industry in the district which not only attempts to supply the local market but exports to the European Russian and foreign markets.

The fishing industry is entirely under the control of the Russian Government and is a State property, with the exception of a few fishing stations belonging to the city of Nikolaievsk on the Amur, which are run by the municipality of that city, and also a few places on the seacoast and in the rivers, donated to local tribes of aborigines.

In the Maritime, Kamchatka, and Amur Provinces fishing is controlled by the Khabarovsk office of the Department of Domains. Administratively the waters are divided into two classes: (1) Waters allotted exclusively to Russian subjects, and (2) waters open to Japanese fishermen by virtue of the Russo-Japanese Fishing Convention of 1907. The first class comprises rivers and their estuaries, lakes, gulfs, bays, and harbors; the waters opened to foreign fishing comprise chiefly open seacoasts. Up to the present no foreigners other than Japanese have made any attempt to obtain such fishing rights. Very little is known as yet as to the value of the fishing places, for practically no study has been made of the Priamur waters. The works of Braginoff and Soldatoff, ichthyologists attached to the Khabarovsk office of the Department of Domains, merely pave the way for a more extensive study. Some practical knowledge of the value of certain fishing places exists, undoubtedly, among private fishermen, principally Japanese, but it is not general knowledge. Therefore the Department of Domains has no way of exploiting various fishing stations other than by allotting them to the highest bidder at public sale, and even then being very careful to allot them first for a very short period—from one to three years. After a strict watch

^a The investigation on which this report is based was requested by the Bureau of Fisheries. It is now published because of the value of the information to American fishing interests, particularly those of the Pacific coast.

of the amount of the catch, some idea of the value of the station is formed and it is allotted for a longer period—five years or more.

Naturally under such circumstances this industry can not attain proper development. The fishermen are not better informed than the Government as to the value of the stations sought at the public tenders; often they over or under value them, and owing to their limited knowledge, either overstock the stations with men, salt, barrels, provisions, etc., and through a small catch suffer heavy losses or insufficiently supply the stations and, therefore, are unable to take advantage of a good run of fish. On the other hand, the short terms of the contracts make it impossible to equip the stations properly. Lack of equipment for preparing the fish, except in the crudest way, has resulted until very recent times in inferior products at most of the stations, but some of the Russian fishing stations in Kamchatka are exceptions. In order to encourage the Russian fishing in Kamchatka and Tchukotski peninsular waters and in the Okhotsk Sea, and to counterbalance the Japanese predominance in these waters, in 1913 the head administration of the Agricultural and Land Organization gave to Denbigh & Biritch on a long lease a fishing station on the Kamchatka River (eastern shore of Kamchatka), and to S. Grushetsky & Co., one on the Bolshaya River (western shore of Kamchatka). In addition to the usual conditions of the lease (payment of royalty, the prohibition of foreign labor, etc.), each of these firms was to build a fish hatchery in the vicinity of its station, the capacity of which was to be 3,000,000 salmon per annum. Each of the above lessees was to release 500,000 fish in 1914, 1,000,000 in 1915, and 3,000,000 yearly from 1916 until the expiration of its lease. Owing to technical difficulties, the release of the first lot of fish was postponed until 1915.

By a normal development of this condition, which may become a law, each commercial fisherman will be compelled to release a much larger number of young fish than his catch. The larger interests will have their own hatcheries, where doubtless the smaller ones can buy their quota.

TRANSPORTATION DIFFICULTIES.

The closing of the coasting trade to foreigners deprived the fishermen of the possibility of making use of the cheap freight rates of foreign steamers, and has made them entirely dependent upon the Volunteer Fleet, which has a monopoly as a public carrier.

The Volunteer Fleet is complying strictly with all the obligations imposed by the terms of its contract with the Government. It is making the stipulated number of voyages with the stipulated number of vessels, but as a matter of fact the number of steamers is not

sufficient for the trade. According to section 3 of the contract, the Volunteer Fleet is obliged to put on the line not less than four steamers having a carrying capacity of not less than 1,000 tons each and adapted for northern navigation. Each steamer must have accommodations for not less than 20 cabin and 100 deck passengers, and regardless of the fact that the number of steamers has doubled, it is not sufficient for the entire satisfaction of the fishermen's needs, thereby causing heavy losses.

On account of the limited number of vessels, the Volunteer Fleet is forced to make long round trips to distant points with calls at many side ports. When leaving Vladivostok the vessels take on sufficient coal and water for the round trip. This occupies two-thirds of the carrying capacity and leaves very little space for cargo. These long trips force the greater number of the fishermen to ship men and provisions one and one-half months before they are required, and to hold their product a month after the catch is over. Owing to the long time that goods are on the way, the fishermen are obliged to salt their products very heavily, which tends to lower their price on the Russian market. Consequently, the fishermen are obliged to depend on the Japanese market. The high charges of the Volunteer Fleet for loading and discharging, and charges for c. o. d. delivery (2 per cent), add 14 to 15 cents per pood of 36.1128 pounds to the cost of fish products from Kamchatka. It is claimed that so long as the Volunteer Fleet continues to be the only steamship company serving the fishing industry, there is not much hope of a healthy and normal development of the fisheries. Also, the element of risk to the average fisherman is so great and so hard to calculate, that the fishing industry, which in Japan represents a safe commercial undertaking, in Russia becomes a game of chance.

Under present conditions the fishermen are subjected to the following risks: (1) Late arrival at the stations with men and provisions; (2) inability to ship prepared products; (3) enforced pay of workmen for overtime spent at the stations; (4) impossibility of obtaining additional salt and barrels if the catch is excessive, and of replacing men in case of strikes, for most of the stations are visited by steamers only twice each season.

From the time the fisherman arrives at the station, until his departure, he is without communication with the outside world. Although a telegraph line was built over a year ago along the shores of Kamchatka, it is not in operation owing to the lack of operators and other difficulties.

**COMPARATIVE COST OF OUTFITTING RUSSIAN AND JAPANESE
FISHING STATIONS.**

In order to emphasize the unfavorable conditions under which the Russian fishermen have to compete with the Japanese, the Chamber of Commerce committee gives comparative tables showing the cost of equipping an average Russian fishing station, catching about 60,000 fish and employing 30 men, and a Japanese sea-coast station of similar size.

RUSSIAN STATIONS IN KAMCHATKA.

30 men for 5 months, at \$20 per month.....	\$3,000.00
Return passage for them at \$8.75 per man.....	262.50
Freight on 35 tons of provisions and equipment.....	200.00
Freight on 1,800 sacks salt (90 tons).....	405.00
Freight on 155 tons prepared fish.....	1,284.50
Royalty on 155 tons.....	229.50
Land rental.....	37.00
Commission expenses.....	313.00
1,800 sacks of salt at 65 cents.....	1,170.00
Nets.....	350.00
Boats.....	50.00
Dories (native type).....	300.00
Incidentals.....	100.00
Total.....	7,701.50

It must be mentioned that there are very few experienced workmen, salters and caviar makers. Those who have had experience during past years have settled along the coast and have their own undertakings; therefore the fishermen are obliged to hire unreliable men. There are no fishery schools in the country, and the lack of instructors and good foremen is felt more and more each year.

The absence of credit institutions, which would make loans on fish, and the high rate of interest charged by private banks are also felt very much.

The Russians have no fishing fleet, but the Japanese possess a large deep-water fleet. According to the figures for 1910, there were 7,302 Japanese fishing sailboats, 49 fishing steamers, and 396 large fishing boats of European type, in addition to a large number of commercial vessels, which gave the Japanese a choice of vessels for the transportation of their products. Moreover, competition has kept freight rates low. Several small fishermen could charter a steamer on joint account, and in order to evade the rule prohibiting foreign steamers from navigating between stations, several stations could be rented in the name of one man and later subleased to the real owners.

In 1913 a Japanese steamer of 1,500 tons, having a speed of 9 knots, consuming from 15 to 20 tons of coal a day, could be chartered for about \$100 a day. The chartering of such a steamer for 30 days, taking 20 days for the return trip (Hakodate-Kamchatka) and 10 lay days, would have cost:

Voyage, 30 days, at \$100.....	\$3,000
Coal, 20 days' steaming, 400 tons, at \$3 per ton.....	1,200
Coal, 10 lay days, 100 tons, at \$3 per ton.....	300
Other expenses, maximum figures.....	250
Total.....	4,750

Such a steamer would carry about 1,500 tons of cargo per voyage, and therefore the freight would be only about \$3.17 per ton.

If the steamer was chartered on the basis that it pays all expenses, the cost in 1911 would have been:

	Charter cost per day.
500 tons.....	\$88 to \$100
2,000 tons.....	138 to 150
2,330 tons.....	160

This would have been the cost when chartered by the day, but a monthly charter would have been at least 10 per cent less; a charter for the whole season, especially if made early—say, in March—might have been had at as much as a 30 per cent reduction.

In this way the cost of transporting fish from Kamchatka to Japan was one-third less than to Vladivostok. The cost of transporting workmen from Hakodate to Kamchatka was about \$1.50 per man, one-fourth of what it cost for Russian workmen from Vladivostok. The same difference will be observed in regard to the cost of workmen. A Japanese workman costs a little over \$50 per season, viz: Wages, \$25; food, etc., \$19.50; and commission on catch, \$8.50. Also, there is never a shortage of men in Japan.

The cost of a Japanese fishing station would be:

Wages for season, 30 men, at \$25 per season.....	\$750.00
Commission on catch.....	250.00
Chartering schooner 5 months, at \$250 per month.....	1,250.00
Food for 30 men, at \$19.50 each per season.....	585.00
Passports, \$1.75 each for 30 men.....	52.50
Rent of fishing station.....	500.00
Nets and dories (same as Russian).....	800.00
1,800 sacks of salt, at 65 cents per sack.....	1,170.00
Total.....	5,357.50

Herewith is given a comparison of the working conditions of Russian and Japanese fishermen in Kamchatka:

RUSSIAN FISHERY.

1. The Russian fishing fleet is represented by 4 motor schooners and 3 steamers.

2. No Russian steamers are open for charter, and in the present state of the local industry even a subsidized purchase of steamers is not profitable.

3. Russian fishermen are bound by the schedule of the Volunteer Fleet, are unable to increase their stock of provisions, etc., at will, and at times run the risk of not arriving in time or not being able to ship the prepared product.

4. Delivery of fish cargoes, including discharging expenses, costs \$8.40 to \$10.50 a ton.

5. Transporting workmen from Vladivostok and return costs \$8.65 each.

6. Wages per season for workmen (5 months) amount to about \$100 per man.

7. Equipping and running a station to catch 60,000 fish costs about \$7,701.50.

8. Delivery of product to Vladivostok costs about \$8.40 per ton.

JAPANESE FISHERY.

1. The Japanese fishing fleet has 7,302 sailing vessels, Japanese type, 396 foreign type, and 49 steamers.

2. There are a great number of vessels in Japan, and the strong competition makes it easy to charter them on time or for the season.

3. Having a schooner or steamer at his disposal, the Japanese fisherman is always able to communicate with Hakodate, and runs no risk of not having his goods transported.

4. The delivery of all cargo costs the Japanese not over \$3 a ton.

5. Transporting Japanese workmen costs \$3 each.

6. Wages per season for workmen are about \$33.50 per man.

7. Outfitting and running a station to catch 60,000 fish costs about \$5,357.50.

8. Delivery of product to Hakodate does not cost more than \$3 per ton.

REGULATIONS GOVERNING FISHERIES.

The method of leasing fishing stations for exploitation, as well as the regulations for exploiting, vary according to the local conditions.

On the Amur River, within the limits of the Nikolaievsk, Mariinsk, and Khabarovsk districts, fishing stations are leased at public tender, written or oral. The placing of outfits for catching sturgeon only is permitted, except during the closed period, from the time the ice on the river breaks up to June 15-28, upon payment of a special ticket tax. For this purpose the supervisors of the districts make up a list of applicants for each district, and present it for ratification to the Priamur Department of Domains, after which public tenders are held in each district at the place of residence of the supervisor. Some of the stations are leased for long terms and some for one year.

No foreign workmen are allowed at the stations located on the Amur River. In the estuary of the Amur River foreign subjects are allowed to prepare the fish only, but not to catch them; the latter is to be done exclusively by Russian subjects. Fishing is carried on only by means of "zaezdka," a special kind of hedge made of poles with a trap arrangement at the end, or by means of throw nets.

Arrangements with hooks are permitted for catching sturgeon. The length of the net and hedge is established for each station and depends upon the width of the river. All other conditions are of a secondary nature.

The right to fish along the seacoast of the whole Russian Far East is open to Japanese subjects on an equal basis with Russians, by virtue of the Russo-Japanese Convention of 1907, which was concluded for a term of 12 years; the stations applied for, after being ratified by the Priamur Department of Domains, are sold at public tender, usually during February and March. The convention excludes certain bays and gulfs, in which fishing rights are granted only to Russian subjects. There is no restriction as to the nationality of the laborers employed at the sea fishing stations or as to the method of preparing the fish products, except that the manufacture of fertilizer from salmon is not permitted. The use of vessels under foreign flags is allowed. Throw nets can be used, but they are being replaced by permanent nets, the usual type of which are called "tateami."

In the bays and gulfs excluded by the Russo-Japanese Fishing Convention (Peter the Great Bay, Imperial Harbor, Vanina Bay, Avatchina Bay and several others), as well as in the rivers in the Okhotsk-Kamchatka district, the Priamur Department of Domains may, in accordance with an order of the Agricultural Department, grant fishing rights without public tender to trustworthy persons, first for one season, after which, if the business has been established on a firm basis, for a term of 12 years, under the control of the Minister of Agriculture and Land Organization (law of June 21, 1910, pertaining to river fishing stations).

A rental charge of 5 kopecks (2½ cents) per pood of 36.1128 pounds of prepared product is made, and an unalterable condition in such leases is that the lessee is obliged to use exclusively Russian laborers and sailing vessels under the Russian flag. The use of foreign steam vessels is not prohibited by the administration. Throw nets not longer than the width of the river at the place of catching are allowed as are also set nets, the "zaezdka" of the Amur type, which consist of a barrier placed across the river from the shore to deep water and end in a trap. In Peter the Great Bay, in addition to the above, set nets and large drag nets are permitted.

The length of the "zaezdka" can not be more than half of the channel width; in reality a large part of the channel of the river where "zaezdka" are used is kept free to permit the passage of fish up the river. All other minor conditions of the lease are covered in the contract.

The catching of sea kale, crabs, shrimps, and trepang is now almost exclusively carried on in Peter the Great Bay and the neighboring coast; it is concentrated in the hands of small fishermen who obtain special tickets for this purpose from the supervisor of the southwestern district.

THE FISHING INDUSTRY IN 1913.

Along the extensive coast line of the Priamur district many varieties of commercially valuable fish are found. The northern waters of Tchukotski and Kamchatka produce mostly salmon varieties, the principal of which are gorbusha, known in Alaska as humpback or pink salmon; keta, the Alaskan chum, or dog salmon; kisutch, the Alaskan coho, or silver salmon; tchavitchcha, the Alaskan king, or chinook salmon; krasnaya, the Alaskan sockeye, blueback, or red salmon, and golets, known in Alaska as Dolly Varden trout.

Dolly Varden trout are occasionally caught, when they happen to run with the salmon.

Undoubtedly there are other kinds of fish in these waters, for in years past American whalers visited the cod banks of Kamchatka, but at present there is no cod fishing. Practically no attention is paid to any but the salmon, the principal reason for this being the almost total absence of local population and supplies, compelling the fishermen to obtain laborers and all supplies from distant places. As soon as the run of the principal fish is over the station is closed, the men sent away, and no one is left to watch later runs or to study the possibilities. Also the early winters would prevent late shipping of fish if any were caught, and the catch would have to be held until the arrival of the first steamer in the spring.

The waters of the Priamur district are subdivided into several sections. Following is given a short description of the characteristics of each.

NIKOLAIEVSK DISTRICT.

This district comprises the whole lower part of the Amur River from the village Zimmermanovka down to the mouth of the river, about 300 miles; the River Amgun, 200 miles; the Amur estuary, about 150 miles on the mainland and about 130 miles on the coast of Sakhalin Island and about 865 miles of the coast line on the southwestern shore of the Okhotsk Sea.

In addition to the regular fish-catching stations there are the salting stations, which do not catch but only buy and handle fish, caviar, etc., from other fishermen, mostly local peasants, natives, and industrial fishermen. These salting stations, as will be seen from the following table, are quite numerous.

According to official figures for 1913 the number of fishing stations of all kinds in this region was as follows:

Kind of station.	Number of stations.	Term of lease.	Annual rental.
Government stations:			
Catching.....	{ 23	Long term.....	\$109,012.00
	{ 7	One year.....	10,677.00
Salting.....	{ 47	Long term.....	19,742.10
	{ 34	One year.....	20,967.00
Total.....	111		160,398.10
Municipal stations:			
Catching.....	{ 14	Long term.....	56,282.10
	{ 13	One year.....	28,692.00
Salting.....	{ 1	Long term.....	
		One year.....	125.00
Total.....	28		85,099.10
Grand total.....	139		245,497.20

In addition to the above stations 53 Russian villages and over 122 native settlements participated in the fishing industry.

In 1913 the run of humpback salmon, which began in the estuary on June 16 and in the river June 18 or 19, lasted during the whole season; this species was also found in the autumn chum run. The run was above the average and almost equal to the run of 1912. At the Government stations below Nikolaievsk 2,845,687 fish were caught, at the municipal stations 2,731,546, and at the Government stations above Nikolaievsk 111,000, while only 1,780,561 fish were caught by the local population. The summer and autumn runs of chum salmon were very irregular, especially the autumn run, which was divided into four separate runs, the last of which was so unexpected that many fishermen had already closed their stations for the season before it appeared.

The Nikolaievsk district was formerly the chief source of supply of fish to Japan, and the great majority of Nikolaievsk fishermen were largely dependent upon Japan, not only for a market but also for working capital. The Japanese, however, finally offered such low prices for the fish and made the credit conditions so unfavorable that the fishermen were compelled to look for another outlet for their product. Such an outlet was found in European Russia, and the secret of success of this new departure of the business was salmon caviar.

Only a few years ago salmon caviar was almost an inedible product; it was carelessly prepared, crumpled, and poorly packed. About six or seven years ago the Volga River black caviar dealers became interested in the Amur salmon caviar and began to experiment with it. They introduced cleaner and more careful methods of washing and a better method of packing it, with satisfactory results. The caviar was thoroughly tested, stood transportation, and gradually

came to be one of the most valuable by-products of the fishing industry, commanding a much higher price than the fish itself.

The newcomers also changed the method of salting fish, and instead of producing crude briny fish prepared with inferior salt from Japan they carefully selected the fish and thoroughly washed and mildly salted them with the best salt. The resulting product, called "semga," is similar to European cured salmon. The best qualities stand the railway transportation to European Russia, where they command a very high price.

The Government met the fishermen halfway by lowering the freight rates and by extending more liberal credits through the Government bank, as is shown in the following extract from an order of the Government bank regarding loans to fishermen, against promissory notes with one signature for working capital:

With a view to extending credit to the fishermen of the far east the Government bank has found it possible to allow the issuance of loans to the fishermen for working capital against the following guaranties:

1. Fishing equipment; mortgages on fishing property and buildings.
2. Real estate, situated outside the fishing station, or a sold warranty.

All applications of fishermen are to be submitted, in accordance with clauses 30 and 65 of the bank's by-laws, for approval of the discount and loan committee of the branch, and forwarded to the council of the bank for ratification.

Further, in view of the fact that the property which is to serve as a guaranty for the loan is situated on land rented from the Government, and taking into consideration the special conditions of the rental of these lands, the bank has found it necessary to establish, in agreement with the Department of Land Organization and Agriculture, the following regulations:

1. Credits will be opened only after an investigation of the financial standing of the fisherman, made with the assistance of a local representative of the Priamur branch of the Department of Domains.

2. Credits will be in accordance with the verified appraisement of the fishing property made by the Priamur branch of the Department of Domains.

3. When opening a credit against goods, a special notarial application to the Department of Domains is to be made by the borrower, stating that he gives the Department of Domains the right to cancel his rent contract at the first demand of the Government bank, and to use money deposited and sums due to him for the property, for the purpose of paying his debts to the bank.

4. The application mentioned in paragraph 3 is to contain a clause by which the borrower agrees not to remove any buildings at the fishing stations, nor to turn them over to another person without having obtained the required permit from the bank.

5. The application mentioned in paragraph 3 is to be turned over by the bank to the Priamur branch of the Department of Domains with the request that the bank be assured that the conditions of the application will be carried out by the Department of Domains.

The Japanese, realizing their mistake, have put up a strong fight for the Nikolaievsk district. As late as 1913 the Japanese firm P. N. Shimada, at Nikolaievsk, offered the Nikolaievsk fishermen the following prices for fish prepared in Japanese style: Summer hump-

back salmon \$1.25, summer chum salmon \$3.50, and autumn chum salmon \$7 per 100 fish, the salt to be supplied free by Shimada. This proposal did not meet with much success.

The following tables show by species the catch of salmon in the Nikolaievsk district and the quantity prepared for the Russian market, 1909 to 1913:

Years.	Catch.			Prepared for Russian market.			
	Hump-back.	Chum.		Hump-back.	Chum.		Caviar.
		Summer run.	Autumn run.		Summer run.	Autumn run.	
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Tons.</i>
1909.....	2,209,433	9,574,285	4,858,099	145,373	877,423	1,398,416	1,040
1910.....	5,076,286	12,536,171	5,814,498	1,005,274	2,497,165	1,975,033	1,397
1911.....	2,621,449	10,749,482	4,686,236	523,338	2,197,168	2,424,890	1,123
1912.....	5,822,729	7,199,309	3,669,073	1,154,913	4,009,574	2,886,869	1,171
1913.....	5,688,233	7,985,579	4,324,187	4,806,629	6,608,804	3,212,499	1,107

The number of salmon—fresh, salted, and frozen—delivered to Japanese buyers, 1909 to 1914, was, by species, as follows:

Years.	Fresh and salted.			Frozen.	
	Humpback.	Chum, summer run.	Chum, autumn run.	Hump-back and chum, summer run.	Chum, autumn run.
1909.....	2,029,200	8,733,623	3,510,847	48,463	157,081
1910.....	4,071,012	10,039,101	3,195,506	15,000	343,959
1911.....	2,081,625	8,025,216	2,368,798	105,328	129,801
1912.....	4,686,016	3,295,603	780,303	102,000	120,000
1913.....	881,604	1,231,775	953,688	118,000	158,000

In 1913 in the Nikolaievsk district salmon were prepared for the Russian and other than Japanese markets, as follows:

	Hump-back.	Chum, summer run.	Chum, autumn run.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
Salted.....	5,920	16,794	14,918
Smoked.....	284	5	8
Canned.....	15	41	527

These figures show the small quantity of fish that is canned in this district. Some experts claim that the Amur salmon is not suitable for canning purposes. In the whole district there is only

one canning factory, that of W. J. Miller, the 1913 output of which is shown in the following table:

	Quantity.		Value per case.
	Cases.	Cans.	
Humpback and chum salmon:			
Natural, round cans.....	600	28,800	\$3. 90
In jelly, round cans.....	58	3,480	6. 00
In tomatoes, oval cans.....	64	3,200	9. 00
Pickled, oval cans.....	132	6,600	9. 00
In tomatoes, round cans.....	486	24,300	7. 00
Pickled, round cans.....	41	2,050	7. 00
In tomatoes, round $\frac{1}{2}$ cans.....	237	23,700	10. 00
Pickled, round $\frac{1}{2}$ cans.....	70	7,000	10. 00
Total.....	1,688	99,130	-----
Caviar.....	53	4,420	20. 40
Sturgeon:			
In tomatoes and pickled, square $\frac{1}{2}$ cans.....	60	6,000	18. 00
In tomatoes and pickled, square $\frac{1}{4}$ cans.....	15	750	16. 00
Total.....	75	6,750	-----

In 1913, by the steamer *Broadmore*, the following frozen fish were shipped: Chum salmon (summer run), 118,000, at \$6.25 per 100 fish, and chum salmon (autumn run), 108,000, at \$12.50 per hundred. Also, 50,000 fish were taken up the river in a refrigerating barge.

SAKHALIN DISTRICT.

This district includes the entire coast line of Sakhalin Island with the exception of that facing the Amur estuary, which belongs to the Nikolaievsk district. It is the smallest district and is now of no great importance. Before the Russo-Japanese War it was the most important district so far as herring fishing was concerned. The richest local fishermen, Semenoff, Denbigh, Birtch, and others, made their fortunes here.

The 1913 catch was not good, due to storms and a poor run of herring, the principal fish of the district. The catch was as follows:

Years.	Chum salmon.	Humpback salmon.	Herring.
1911.....	31,000	286,000	12,640,000
1912.....	16,000	126,000	14,036,000
1913.....	38,000	183,000	4,483,000

The product prepared amounted to 1,212 tons in 1911, 1,068 tons in 1912, and only 690 tons in 1913.

In 1913 there were 14 stations on the island, of which 2 fish-catching and 2 fish-salting stations were in nonconventional waters, and 10 in conventional waters, 5 of the latter belonging to Russian and 5 to Japanese fishermen.

The catch in 1913 was made into the following products:

	Tons.
Fish, salted Russian method.....	79
Caviar, Russian method.....	22
Fish, dry-salted for Japanese market.....	274
Herring fertilizer.....	274
Fish oil.....	38
Caviar for Japanese market.....	3
Total.....	690

OKHOTSK-KAMCHATKA DISTRICT.

The northern waters of the Priamur, including the above-named district, are still dominated by Japanese fishermen. The Russo-Japanese Fishing Convention of 1907 opened the doors of this district to them, and in these waters they are far better equipped than the Russian fishermen. A fair knowledge of the fishing grounds was already at the disposal of Japanese fishermen, because Japanese schooners were in the habit of visiting and fishing in these waters long before such rights were explicitly granted to them. They also had at their command a large force of good, experienced, and cheap labor, a large sailing fleet, cheap credits, and ready markets at home.

The Russians, on the contrary, were very much handicapped; the waters were entirely unknown to them; they had no workmen, no fleet, no credit, no capital, and no market but the Japanese. Naturally, under such circumstances, the Russians had to begin in a very moderate way and principally at places outside the conventional area, in rivers and closed bays which were visited by the Volunteer Fleet steamers. Further development of Russian fishing in these waters could progress but slowly. Some progress was made, but the full "Russification" of the industry in these waters is a question for the remote future.

Since 1907 the progress of Japanese fishing can be seen in the increased number of fishing stations, the larger number of workmen at the stations, and the replacement of the sailing fleet by steamers. The present general appearance of the Japanese fishing station is just the same as in the past—temporary bamboo structures covered with matting, and the method of salting is the dry-salting process under the open sky, without washing the fish. Only at places where there is a good run of red, or sockeye, salmon is there an increase of canned products, which are prepared merely with salt and without spices, and a correspondingly better equipment of the outfits.

The bulk of the products prepared by the Japanese is sold in Japan and China. Of the canned salmon some is consumed in Japan and some is exported to England; no goods are prepared for the Russian market.

Russian fishing in the Okhotsk-Kamchatka district is, as previously stated, concentrated in the nonconventional waters, bays, and harbors, which are rented exclusively to Russian subjects on condition that they employ only Russian workmen and ships.

Since 1907 quite a change is noticeable in the position of Russian fisheries in these waters. During the first years the Russians prepared fish almost exclusively by the Japanese method of dry salting, only caviar being prepared for the Russian market. The number of salting stations, where Russian caviar makers buy raw caviar from Japanese fishermen and prepare it for the Russian markets, is still growing. Three well-equipped Russian fish-canning factories have been built, two on the river and one on the coast.

This region covers the coast line of the northern part of the Okhotsk Sea from Port Ayan to Penjin Promontory, about 1,620 miles. Regardless of occasional good catches, the Okhotsk shores are considered poor in fishery resources, and the natives are often unable to catch enough fish to provide for themselves and their dogs during the winter. In order to establish a reserve area and to guarantee the future stock of fish in this region, clause 11 of the fishing law of June 11, 1911, has been put in force since 1913, and the following waters have been closed for fishing: Uliya and Urak Rivers, $2\frac{2}{3}$ miles along the shore each way from the mouth of the rivers; Okhota and Kukhtui, being two outlets of the same river, $3\frac{1}{3}$ miles to the west from Okhota River and $3\frac{1}{3}$ miles to the east from Kukhtui River, as well as the territory between, about $2\frac{1}{3}$ miles; Kola, Tau, Yana, Arman, Ola, Yama, Takhyama, Nayakhan, and Gizhiga Rivers, $2\frac{2}{3}$ miles on both sides of the mouth of each river.

The run of chum salmon in 1913 was of average proportions. It began July 14 and was heaviest between August 2 and 27; single fish were caught as late as early September. The run of humpback salmon was good. The catch was effected along the coast at seven fishing stations, six Japanese and one Russian. The number of salmon caught in 1913, compared with the two preceding years, was as follows:

	Chum.	Hump- back.	Sockeye.
1911 (4 stations).....	641,000		38,000
1912 (4 stations).....	730,000	16,000	9,000
1913 (7 stations).....	679,948	204,014	

The product prepared amounted to 1,729 tons in 1911, 1,891 tons in 1912, and 2,005 tons in 1913. Of the 1913 product 1,928 tons were dry salted for the Japanese market, and 71 tons of Russian caviar and 6 tons of Japanese caviar were prepared.

At the river stations, outside of conventional waters, nine fishing stations and six salting stations were in operation in 1913, the catch amounting to 555,102 chum salmon, 41,252 humpback salmon, 3,198 coho salmon, and 17,035 Dolly Varden trout, from which there were prepared 534 tons of fish and 136 tons of caviar for the Russian market and 772 tons of fish for the Japanese market, a total product of 1,442 tons.

The catch in the entire district in 1913 consisted of 1,235,050 chum salmon, 245,266 humpback salmon, 3,198 coho salmon, and 17,035 Dolly Varden trout, and the product prepared amounted to 534 tons of fish and 207 tons of caviar for the Russian market and 2,700 tons of fish and 6 tons of caviar for the Japanese market.

The output for the entire Okhotsk district for the years 1911 to 1913 was 2,426 tons in 1911, 322 tons in 1912, and 3,447 tons in 1913.

West Kamchatka district.—This district includes the coast line from the Sopotchnaya River down to the southern Osernof shore fishing stations, a distance of about 335 miles. Kamchatka is very interesting between the middle of July and the last of August, the season for the red and pink salmon. On the west coast the Osernaya River is the only stream that the red salmon inhabit in any quantities. All fishing is done with a device called "kaku-ami," which consists of a main net and a fence net. The main net is 70 fathoms long and the fence net is 120 fathoms long. The fence net extends outward so as to guide the fish toward the main net. This device is set near the seashore in 10 fathoms of water, where the salmon run. When the fish are caught, the main net is hauled up by a boat and the fish are transferred to a bag net called "waku-ami," used for landing the fish.

In 1913 there were 152 fishing stations in this district of which only 9 were leased by Russians and 143 by Japanese. In 1912 there were 133 of such stations. At the public tenders for 1913 the Russians obtained 19 stations but transferred 10 of them to Japanese, after having made an arrangement with them in regard to the caviar.

One hundred and forty-eight stations were operated while 4 were idle. A certain growth of interest is noticed in the fishing in these waters, especially in the northern part of the district, but principally by Japanese fishermen. The stations are gradually moving toward the north, and the present empty coast lying between the Rivers Palana and Sopotchnaya will soon be occupied by fishermen. The increase in the number of stations will be seen from the following figures: 1910, 102 stations; 1911, 139 stations; 1912, 133 stations, and 1913, 148 stations. These figures do not include 15 river stations belonging to Russians, of which only 13 were operated in 1913.

The rental has also increased with the increase in the number of stations. In 1912 the highest price paid for one station was \$2,540,

and the average price per station was \$1,094. In 1913 the highest price was \$3,333 and the average \$1,390. In 1912 the total sum collected by the Government from the stations was \$113,348 and in 1913, \$175,674.

In this district there are also the following rivers where fishing is prohibited: Tigil River, 2 $\frac{2}{3}$ miles to the north and south of its mouth; Oblukovina, 3 miles on both sides of its mouth; Kolpokara, 4 $\frac{1}{2}$ miles to the north and 3 miles to the south of its mouth; Vorovskaya, 3 miles on both sides of its mouth; Kol, 3 miles on both sides of its mouth; Kikchik, 3 miles to the north and 1 $\frac{2}{3}$ miles south; Bolshaya, 5 $\frac{1}{2}$ miles north and 2 $\frac{2}{3}$ miles south; Goliguina and Opala, 3 miles north of Opala and 3 miles south of Goliguina and the territory between them; and Osernaya, 3 miles to the north and 1 $\frac{2}{3}$ miles to the south.

Formerly only sailing vessels served the stations in this district; later steamers made their appearance, and now a combination of steamers and sailing craft is growing in general use, the latter working as auxiliaries, feeding the steamers. The improvement in transportation is indicated in the following table of percentages:

	1910	1911	1912	1913
Japanese schooners.....	80	67.6	54.9	42.6
Japanese steamers.....	15	20.9	20.3	18.2
Auxiliary schooners.....	5	11.5	24.8	39.2

The 1913 catch was not good; heavy storms kept the schools of fish from approaching the shore, and often prevented any fishing. The total catch was as follows:

	King salmon.	Chum salmon.	Hump-back salmon.	Sockeye salmon.	Coho salmon.	Dolly Varden trout.
Coast stations:	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
Russian (8).....	95	191,873	1,340,685	25,447	1,198
Japanese (140).....	5,216	3,902,646	24,160,762	1,269,176	67,076
River stations: Russian (13).....	4,196	373,812	1,842,090	226,653	33,195	99,690
Total.....	9,507	4,468,331	27,343,537	1,521,276	101,469	99,690

The output at the coast stations in 1913 amounted to 37,604 tons of fish, of which 1,030 tons, chiefly sockeyes, were canned, and the balance was Japanese dry-salted. There were prepared 1,134 tons of caviar, 102 tons according to the Japanese method, and the balance by Russian method.

A comparison of this catch with previous years is given below:

	1909	1910	1911	1912	1913
Number of stations.....	109	102	139	133	148
Output..... tons.	15,518	23,857	48,322	24,559	37,604

The catch of the river stations was utilized as follows:

	Tons.
Fish prepared for Russian market.....	2, 846
Fish canned for European market.....	105
Fish dry-salted for Japanese market.....	840
Fish fertilizer.....	4
Caviar, Russian method.....	215
	4, 010

The catch on the river stations in 1912 and 1913 was as follows:

	King salmon.	Chum salmon.	Hump- back salmon.	Sockeye salmon.	Coho salmon.	Dolly Varden trout.
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
1912, 12 stations.....	3, 000	246, 000	930, 000	480, 000	33, 000	71, 000
1913, 13 stations.....	4, 196	373, 812	1, 842, 090	226, 653	33, 195	99, 690

The fish from this district are gradually attracting the attention of buyers. The improvements in the equipment of fishing stations warrant preparing a better product and thereby diminish the dependency of the district upon the Japanese market.

In 1913 Schelohoff Bros., of Astrakhan, Suvoroff & Sons, of Odessa, Yasikoff, of Petrograd, and Kapeikin, a large Siberian fish dealer, made liberal advances of money to the fishermen in order that they might prepare the catch in accordance with the Russian method, and some of them commissioned their own specialists to superintend the preparation. It is only natural that under such conditions the district will gradually become independent of Japanese buyers. In 1911, out of 3,595 tons of fish products, 2,095 tons, or 58 per cent, were shipped to Japan: in 1912, of 2,831 tons, 835 tons, or 30 per cent; whereas in 1913, of 4,010 tons, only 845 tons, or 21 per cent, were shipped to Japan.

There were 12 canneries in the district in 1913, of which 2 were river stations, viz, Eckerman's on Polana River and Maynard's on Kolkopkava River. The best canneries are well equipped with modern machinery and are run by a Japanese firm, which is backed by an English concern.

In 1913 the canneries on the coast produced 41,186 cases of canned salmon, and 4,208 cases were packed at river stations.

The largest cannery is located on the Osernaya River. The shore property is valued at \$100,000. There are 120 white, 30 Japanese, and 40 Korean employees. The company runs one transporting vessel of 2,200 tons valued at \$150,000, one power fishing boat of 400 tons valued at \$20,000, and eight lighters. The apparatus consists of two 250-foot haul or beach seines. In 1915 the catch was 60,000 sockeye, 500,000 humpback, and 75,000 chum salmon. The product was 5,200 cases (48 one-pound flat cans per case) of sockeyes valued

at \$40,000, 19,800 cases of humpbacks worth \$120,000, and 4,000 cases of chums worth \$24,000. Also 5,000 pounds of dry-salted humpbacks were prepared, as well as 7,200 pounds of salmon fertilizer worth \$72. This plant was built in 1914. The buildings are of steel shipped from England; the machinery is all American. One net is operated by the company and one by local inhabitants known as "colonists."

The Osernaya River is a natural place to find red, or sockeye, salmon, but owing to the Japanese concessions higher up the coast very few reds now reach the river.

Another plant is operated on the Bolsheresk River, the shore property being valued at \$5,000. This plant employs 200 whites and 50 Japanese and uses two 250-foot haul or beach seines. The product in 1915 was 700,000 pounds of pickled sockeye salmon. The concession at present is used for salting only, but the erection of a cannery for humpback salmon is being discussed. No reds are found in the river, but there is an abundance of humpbacks.

A Japanese firm has a cannery 5 miles north of the Osernaya River, employing 400 Japanese; the land plant is valued at \$35,000. The plant has one transporting vessel worth \$1,500, six lighters worth \$1,000, and three 5,000-foot floating traps valued at \$5,000. This cannery was built in 1913. The building is of wood and was constructed first in Hakodate, taken apart, and reassembled in Kamchatka. The machinery is American made. In 1914 the can-making machines were removed to Hakodate, and the cans are now made there. The company has three coast concessions, one at the cannery and one on either side. They put up 27,000 cases of sockeyes in 1913 and 15,000 cases in 1914. The product in 1915 was 20,000 cases (48 half-pound flat cans per case) of sockeyes, worth \$100,000; 18,000 cases (48 one-pound flat cans per case) of sockeyes, worth \$126,000, and 15,000 cases (48 one-pound flat cans per case) of humpbacks, worth \$60,000. They also dry-salt a considerable quantity of humpbacks.

Farther up the coast there is another cannery which makes its cans and does all work by hand. Beyond this plant there seem to be no sockeye salmon along the west coast of Kamchatka.

East Kamchatka district.—This district covers the coast line of the eastern Kamchatka and Anadir Peninsulas, about 1,843 miles. The majority of the fishing stations are concentrated around Karaguinsky (Count Litka) Bay, in the straits from the Malo-Voyam River to Kitchigin River, about 135 miles long, and in the region of Kamchatka River.

The area closed to fishing in this district consists of the shore line, 7 miles to the west and $2\frac{2}{3}$ miles to the east of the mouth of Kamchatka River.

The run of fish in 1913 was retarded very much by late ice, which remained until the end of June and in some places as late even as July. However, the run of fish, especially of chum salmon, was good. At some places (Pankara and Russakova Rivers) large schools of fish, averaging $1\frac{1}{2}$ to 2 miles wide, appeared early in August, but the stations were closed. The Anadir River had a good run. There were hardly any runs of sockeye and coho salmon between the Kitchigin and Yki Rivers, and a rather small run in the region of the Kamchatka River, which is of special importance on account of the canneries.

In 1912 at 10 coast fishing stations, 700,000 sockeyes and 250,000 cohos were caught, while in 1913, at nine stations only 393,000 sockeyes and 95,000 cohos were taken.

The catch of salmon at the coast stations for the years 1911 to 1913 was as follows:

	King.	Chum.	Humpback.	Sockeye.	Coho.
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
1911, 38 stations.....	8,000	3,085,000	1,627,000	750,000	218,000
1912, 54 stations.....	29,000	3,414,000	497,000	745,000	249,000
1913, 61 stations.....	30,167	6,464,224	2,623,997	399,207	98,043

The output amounted to 11,399 tons in 1911, 11,467 tons in 1912, and 21,192 tons in 1913. Of the 1913 product 250 tons of fish were salted according to the Russian method, 19,076 tons dry-salted by the Japanese method, 1,030 tons were canned, 700 tons of caviar were prepared for the Russian market, and 136 tons for the Japanese market. Twenty-five cases of crabs were also canned.

At the river stations, 28 in number, of which 26 were operated in 1913, the catch in that year was 1,315 king salmon, 1,055,045 chum salmon, 647,595 humpback salmon, 460,494 sockeye salmon, 54,780 coho salmon, 18,671 Dolly Varden trout, and 88,740 herring. Products prepared amounted to 1,405 tons of fish, Russian salted, 611 tons canned, 2,261 tons Japanese dry-salted, and 198 tons of Russian caviar, a total of 4,475 tons.

The grand total of the 1913 catch in this district was:

	King salmon.	Chum salmon.	Humpback salmon.	Sockeye salmon.	Coho salmon.	Dolly Varden trout.	Herring.
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
In conventional waters.....	30,167	6,464,224	2,623,997	399,207	98,043	18,671	88,740
Outside conventional waters.....	1,315	1,055,045	647,595	460,494	54,780	18,671	88,740
Total.....	31,482	7,519,269	3,271,592	859,701	152,823	18,671	88,740

The total output of prepared products was 25,668 tons, divided as follows: Fish, Russian salted, 1,655 tons; fish, canned, 1,641 tons; fish, Japanese dry-salted, 21,337 tons; Russian caviar, 898 tons, and

Japanese caviar, 137 tons. The total output in 1912 was 15,663 tons, and in 1911, 16,388 tons.

All canning factories in this district are located in the neighborhood of the Kamchatka River. One belongs to the Russian firm, Denbigh & Co., and the others to Japanese. Denbigh & Co. operate two excellently equipped power canning plants with American modern machinery, and during 1913, 1914, and 1915 they packed salmon as follows:

Years.	Sockeye.	Coho.	Chum.	Hump-back.	King.	Total.
	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>	<i>Cases.</i>
1913.....	33,000	10,000	18,000			61,000
1914.....	41,203	11,253	19,103			71,559
1915.....	36,763	26,176	39,426	1,441	20	103,826

SOUTHWESTERN DISTRICT.

This district covers the waters from the southern boundary of the Amur River estuary (the line between Capes Lazaref and Pogibi) down to the Chosen frontier, including Vanina Bay, Imperial Harbor, Peter the Great Bay, and other bays. The total length of the shore line is about 1,350 miles.

This district may be divided into two principal parts: The northern, from Lazaref-Pogibi line to Cape Povorotni, which, with the exception of various bays, includes the conventional waters; and the southern part, composed of Peter the Great Bay and Posiet Bay, both of which are excluded from the conventional waters.

In the northern part the fishing stations are rented on the public-tender basis, and the great majority of the station owners and workmen are Japanese. Chum and humpback salmon are caught to some extent, especially the latter, but the principal fish is herring. The spring herring is made into fertilizer by the Japanese, and some fish oil is extracted. During the past three to five years the Tartar Straits fishermen have begun to salt herring in a very crude way, and the product commands a rather low price. The principal group of herring-fishing stations begins to the north of Imperial Harbor, about Datta Bay, and continues 50 to 60 miles to the south.

In the southern part there is a wider range in the varieties caught, viz: Crabs, shrimps, oysters, trepang, and sea kale. In this section fishing is exclusively in the hands of Russian subjects, who fish during the entire year.

Peter the Great Bay chiefly supplies the Vladivostok market with fresh and frozen fish, crabs, shrimps, etc., and during the spring run of herring large quantities, fresh and mildly salted, are shipped to Chosen, Japan, and China. It supplies Vladivostok with herring, bass, carp, flounders, trout, and chum and humpback salmon.

In conventional waters the 1913 catch was smaller than in 1912 and 1911 and was about equal to that of 1910, which was considered a poor year, as will be seen from the following figures: 1910, 25,000,000 herring and 1,383 tons of fish fertilizer; 1911, 32,800,000 herring and 2,033 tons of fertilizer; 1912, 27,950,000 herring and 1,857 tons of fertilizer; 1913, 25,070,000 herring and 1,388 tons of fertilizer.

In excluded bays the run was somewhat better, and in St. Olga and Vanina Bays it was very good. The result of the catch of herring for the years 1910 to 1913 was: 1910, 1,375,000; 1911, 2,050,000; 1912, 3,477,000; 1913, 2,441,000.

The poor catch of 1911 and 1912 greatly diminished the fishing interest in Peter the Great Bay, and the number of fishing stations decreased from 44 in 1912 to 17 in 1913. The catch of 1913 was, comparatively speaking, good, especially the herring catch. The following figures show the herring catch in the years 1910 to 1913: 1910, 6,018,000; 1911, 4,476,000; 1912, 5,142,000; 1913, 10,391,000.

The catch of dorse was smaller than in 1912; that of smelt was better. About 400,000 crabs were caught; about 15,000 of these were sold fresh at Vladivostok, and a small frozen consignment was shipped to European Russia. The balance, about 125 tons, was dried for the Chinese market.

Shrimp fishing is very little developed; about 10 tons were caught in 1913. Sea kale was obtained to the extent of only 1,000 tons. Only 125,000 oysters were brought to Vladivostok, and 9 tons of trepang were prepared for the Chinese market. These figures do not include fish, etc., caught by local peasants.

The grand total for 1913 of the catch in this district was:

	Peter the Great and other bays excluded by the convention, but including the catch of 33 villages.	Conventional waters.		Peter the Great and other bays excluded by the convention, but including the catch of 33 villages.	Conventional waters.
Number of fish caught:			Products prepared—Con.		
Chum salmon	102,000	36,000	Fish, fertilizer.. tons ..	182	1,388
Humpback salmon	213,000	445,000	Caviar, Japanese market..... tons		5
Herring.....	15,849,000	25,070,000	Caviar, Russian market..... tons	8	21
Dorse.....	933,000		Fish oil, Russian market..... tons	31	85
Smelt.....	3,400,000		Fish for Russian market..... tons	1,799	
Mackerel.....	150,000	1,900	Fish for Chinese and Chosen markets..... tons	1,167	
Flounder.....	287,600		Crabs..... do	125	
Roach.....	79,000		Sea kale..... do	1,866	
Cod.....	46,000		Trepang..... do	9	
Trout.....		11,800	Shrimps..... do	29	
Sturgeon.....	155				
Others.....	761,000	467,000			
Products prepared:					
Fish, dry-salted for Japanese market..... tons		533			

Import of herring at Shanghai.—According to the “Priamurskaya Vyedomosti,” the agent of Commerce and Industry for China and Japan states that the Shanghai market is supplied with fish similar to herring, caught in Chinese waters, and the importation of herring depends upon the local catch of this fish, of which there is not enough to satisfy the demands. Large foreign firms import quantities of American and Japanese herring, the price varying from \$2.37 to \$2.84 per hundred pounds. The average weight of one herring is about 1 pound.

At the end of March or the beginning of April the catch of fish in Chinese waters begins, and therefore the prices on imported herring decrease. Toward warm weather the demand ceases altogether.

American herring, of an average weight of one-fourth pound, have a good market in Shanghai during autumn, winter, and spring, and they bring from \$2.37 to \$3.32 per hundred pounds.

All kinds of fish dried in the open air find a good market in Shanghai during the entire year. The prices range from \$2.84 to \$3.79 per hundred pounds, depending upon the kind of fish, the smaller sizes bringing better prices. The fish are packed in bales.

During recent years the Vladivostok fish dealers have made attempts to introduce their herring into China, but notwithstanding that their herring are better than the local or the American product the attempts have not been very successful. This is explained by the fact that the buyers of fish at Vladivostok do not live up to their contracts. There were instances where the boxes contained more Chinese cheap salt than fish. However, fish of good quality that have succeeded in reaching Shanghai have been well received, and consignments before the Chinese spring holidays have brought as much as \$8.50 per hundred pounds.

Up to the present Russian fish dealers have been dealing through small commission agents, whose services were not satisfactory. Unfortunately, almost all of the Russian fishermen in Vladivostok are without sufficient capital to place the industry on a business basis. They have not the money to secure a large catch early enough in the spring to enable them to deliver it to the market before the Chinese holidays and before the local fish appear on the market. The principal run of herring occurs after the Chinese holidays, and therefore arrangements are needed to enable the fishermen to preserve the fish until the fall, when the market again becomes profitable.

AMUR RIVER.

The figures obtainable of the Amur River fishing are far less accurate than those of sea fishing. The control of this fishing is intrusted to Government foresters and not to special men, as in the sea-fishing

districts; the foresters regard it as a secondary matter and give it scant attention. On the other hand, fish on the Amur are to a large extent replacing cereals for the local inhabitants, not only for natives but also for Russians, and for this reason as many free fishing stations are given to the inhabitants as are deemed necessary to insure their food supply. Owing to alleged abuse of this privilege and to the inadequate and lax control by the foresters, the several rules and regulations providing for close seasons for the most valuable fish and prohibiting the use of certain methods of capture can not, it appears, be enforced among the river fishermen.

The Amur River region is quite different from the northern waters. Here chum and humpback salmon are the principal fish, and two or three runs of each of these varieties occur annually. The Amur River fishing has a very far-reaching effect on the whole life of the Maritime and Amur Provinces. The principal fishing is concentrated in the northern part of the river and in its estuaries. The width of the river, the frequent storms during the runs, and the regulations governing the construction and size of the fishing gear all assist in allowing the fish to pass the innumerable fishing stations at the mouth of the river and its estuary and to reach the upper parts of the stream. The runs of fish up the river replace, in the Maritime Province, the harvest time in other sections of Russia. By far the greater part of the inhabitants along the river catch fish; they are eaten fresh and are salted, dried, and prepared in other ways for future consumption. In the diet of the peasants and natives of the Amur River system fish replaces grain. The natives prepare the fundamental food for their dogs from the fish heads and bones. In the Maritime Province the salmon ascend the Amur as far as the Ussuri River and its tributaries; in the Amur Province they often ascend as far as Blagovestchensk.

Beyond Nikolaievsk only the surplus salmon are sold, the bulk of the catch being prepared for home consumption.

The lower part of the Amur River and its estuary is occupied by the largest, oldest, and best fishing stations, some of which are already fully equipped with proper quays, sheds, ice cellars, and even refrigerators, electric lights, and yard railroads. The longer a station exists the better it is studied and the greater its value becomes. In March, 1916, public tenders were held for some of the best stations, and the increase in their value can be seen from the following figures: In 1908 one of these stations was leased for \$1,500; in 1912 the same lessee paid \$3,000 for it, and last March (1916) it was leased by an outsider for \$21,000. Another station, regarded as one of the best, was leased by the same man for 12 years at \$2,500 per annum; this year the old lessee offered \$48,000 for it, but was outbid by a new man, who offered \$58,000 per annum.

The expensive outfitting of the fishing stations, regardless of the rent period, is due to the fact that, in order to encourage better equipment, the Government introduced a clause into the rules of the rental contracts and the public tender conditions by which, in cases where fishing stations changed hands, the new owner must buy all the equipment from the former owner at cost price. In case the parties do not agree to the valuation of the property, the Department of Domains is authorized to appraise it, which valuation is binding for both parties. The practice of the last three to four years shows very satisfactory results from these conditions, and since the introduction of this rule many fishing stations have been improved and equipped to a greater extent than in former years.

Sturgeon, perch, bass, carp, and many other fishes are caught at the Amur River stations, but the volume of their catch is not large, and the fish are consumed locally.

Fishing on the Amur River is divided into two districts—the Mariinsk, or the lower Amur district, and the Khabarovsk district.

Mariinsk district.—This district includes the area from the village Troitskoe to the village Sophiskoe, or a tract about 278 miles long. Of 147 fishing stations existing in this district in 1913, only 27 stations were commercial; the balance (120) were given free to 18 Russian and 49 native villages.

The result of the 1913 catch of salmon was as follows, the total being compared with the two preceding years:

	Hump- back.	Chum.	
		Summer run.	Autumn run.
		<i>Number.</i>	<i>Number.</i>
1913.			
Russian peasants.....		44,400	480,321
Natives.....		650	330,334
Commercial fishing.....		32,410	174,401
Total.....		77,460	985,056
Total, 1912.....	450	117,700	1,033,559
Total, 1911.....		78,461	1,118,770

In addition to the fish prepared for home consumption, the local inhabitants put some of the products on the market, viz: Salted summer chums 73 tons, autumn chums 1,476 tons, and 68 tons of caviar. In addition to this, 116 tons of summer chums, 877 tons of autumn chums, and 62 tons of caviar were prepared by commercial fishermen.

Khabarovsk district.—This district includes the river line from the northern boundary of the Mariinsk district up the river to Khabarovsk, about 127 miles. The district is very similar to the Mariinsk

district. In 1913 there were 39 free fishing stations in the district, allotted to 20 Russian and 19 native villages, and 3 commercial fishing stations.

According to official reports 278,514 fish were caught in 1913, i. e., 268,514 autumn chum salmon at the free stations and 10,000 at the commercial stations. About 154,000 fish were used for home consumption, the balance being sold fresh and salted in the neighboring markets.

Sturgeon fishing is greatly developed in this district; about 4,623 sturgeon, weighing over 34 tons, were registered in the 1913 catch, but the actual number is very much higher, as many fish were not registered. In addition to sturgeon, about 158 tons of pike, bream, carp, crucian carp, sheatfish, etc., were caught by the peasants.

SUMMARY OF CATCH IN 1913.

The total number of fish caught in the waters of the Russian Far East, and the quantity of product prepared there, in 1913, is as follows:

NUMBER OF FISH CAUGHT.

Districts:	Salmon.					Dolly Varden trout.	Herring.
	King.	Chum.	Humpback.	Sockeye.	Coho.		
Khabarovsk.....		278,514					
Marlinsk.....		1,062,516					
Nikolaievsk.....		18,262,373	7,468,794				12,600
Southwestern.....		138,750	657,981		1,915	11,824	40,919,600
Sakhalin.....		77,279	184,524				4,482,500
Okhotsk.....		1,235,050	245,266		3,198	17,035	
West Kamchatka.....	9,507	4,468,331	27,343,537	1,521,276	101,471	104,750	100,000
East Kamchatka.....	31,482	7,519,272	3,271,592	859,701	152,823	18,671	88,740
Total.....	40,989	33,042,085	39,171,694	2,380,977	259,407	152,280	45,603,440

PRODUCTS PREPARED FOR MARKET.

Districts.	Salmon.		Herring.	
	For European market.	For Japanese market.	For European market.	For Japanese market.
	Tons.	Tons.	Tons.	Tons.
Khabarovsk.....	415			
Marlinsk.....	2,672			
Nikolaievsk.....	42,944	7,204	3	
Southwestern.....	310	533	784	1,881
Sakhalin.....	101	277	38	274
Okhotsk.....	741	2,867		
West Kamchatka.....	5,331	37,422	12	
East Kamchatka.....	4,180	21,473	11	
Total.....	56,694	69,776	848	2,155

MISCELLANEOUS FISHES PREPARED BY DISTRICTS.

Species.	Khabarovsk.	Nikolai-evsk.	South-western.	West Kamchatka.	Total.
	Tons.	Tons.	Tons.	Tons.	
Sturgeon.....	34	113			147
Dorse.....			45		45
Mackerel.....			166		166
Smelt.....			50		50
Shrimp.....			29		29
Crab.....			125	5	130
Sea kale.....			1,867		1,867
Other.....	158	548	594		1,300
Total.....	192	661	2,876	5	3,734

JAPANESE INTEREST IN RUSSIAN FISHERIES.

EXPORTS FROM RUSSIAN FAR EASTERN WATERS TO JAPAN.

The "Vyestnik Finansof, Promyshlennosti i Torgovli" (Messenger of Finance, Industry and Commerce; No. 50, of Dec. 13 to 26, 1915) gives the following statistics of the exports of fish from the Priamur district to Japan from 1907 to 1913, inclusive, showing the per cent of increase or decrease in each year as compared with the preceding:

Years.	Quantity.	Value.	Increase (+) or decrease (-) compared with preceding year.	Years.	Quantity.	Value.	Increase (+) or decrease (-) compared with preceding year.
	<i>Tons.</i>		<i>Per cent.</i>		<i>Tons.</i>		<i>Per cent.</i>
1907.....	34,058	\$1,421,398		1911.....	105,821	\$3,614,077	+32.38
1908.....	40,944	1,867,690	+21	1912.....	65,513	3,046,623	-38.08
1909.....	61,225	2,419,442	+48	1913.....	92,270	3,460,260	+13.34
1910.....	71,572	2,690,072	+18				

According to the kind of fish or products, the exports of 1913 consisted of the following:

Product.	Quantity.	Value.	Product.	Quantity.	Value.
	<i>Tons.</i>			<i>Tons.</i>	
Chum salmon.....	38,481	\$1,898,495	Caviar.....	436	\$25,805
Humpback salmon.....	47,987	1,138,693	Other.....	228	10,964
Fertilizer.....	2,383	109,721			
Canned fish.....	2,025	257,947	Total.....	92,270	3,460,260
Herring.....	730	18,635			

The localities or districts from whence these goods were shipped were as follows:

Districts.	Quantity.	Value.	Districts.	Quantity.	Value.
	<i>Tons.</i>			<i>Tons.</i>	
Kamchatka.....	62,900	\$2,889,734	Sakhalin.....	701	\$30,647
Nikolai-evsk.....	2,738	141,106	Maritime Province.....	3,410	139,168
Tamlevo.....	3,200	141,597			
Okhotsk.....	2,652	117,981	Total.....	75,601	3,460,233

These goods were shipped to various Japanese ports. The importance of these ports as fish markets may be seen from the following figures which give the amount of fish landed during the period 1911-1913, in percentages of the grand total of imports:

Ports.	1911	1912	1913	Ports.	1911	1912	1913
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Hakodate.....	64.9	68.4	73.75	Tsuruga.....	3.6	1.1	1.19
Yokohama.....	10.6	10.1	9.38	Aomari.....	1.1	1.4	.59
Ningata.....	7.9	8.3	7.84	Others.....	1.2	1.4	1.04
Otaru.....	5.9	5.2	3.29				
Fusiki.....	4.8	4.1	2.92		100	100	100

JAPANESE FISHING STATIONS.

The Japanese Advertiser of March 22, 1916, had the following in reference to Japanese fishing stations in the Russian far eastern waters:

Owing to the increased demand for tinned fish as provisions of war, the attention of industrial circles has been directed to fishing enterprises. The fishing along the coast provinces of Asiatic Russia has been made the object of much interest and competition among the Japanese and Russians. Though various knotty problems that impaired the interest of the Japanese have recently been settled in their favor by the lenient attitude of the Russian authorities, the Japanese have now been hard hit by the increase of the lease rate for the fishing zone. According to the statement of Mr. Matsuzaki, Director of the Marine Industry Bureau, the tender for the present year for the lease of fishing zones in the coast provinces has resulted in the loss of 26 zones for the Japanese side from that of last year. The quotations have risen remarkably, evidently because of the ever-increasing demand for preserved fish. For instance, a zone for which the Imperial Marine Goods Co., obtained the lease last year at 6,660 yen, has gone to a Russian concern at 21,000 yen. Another zone which a Japanese firm obtained at only 3,100 yen last year, has also gone to a Russian firm at 22,000 yen. The inability of the Japanese to bid higher may partly be ascribed to the shortage of ships and the rise in the charter rate, but the real reason is the Russian competition, caused by the prosperity in the trade in fish.

The fishing enterprise in the coast provinces has formerly been practically monopolized by Japanese. But the recent development in fishing has attracted the attention of Russian business men, and they have obtained the financial help of foreign capitalists interested and scored a success in the campaign. The fishing enterprise requires large and perfect tinning plants, but the Russians lack these plants, and it is easy to imagine that the foreign capitalists, having the plants at their disposal, have invested capital in backing the Russian fishermen. Mr. Matsuzaki has warned the Japanese fishing firms to beware of this new development.

The following is a table showing the number of fishing zones leased to Japanese and Russians for this and last year and the amounts of the leases:

Years.	Number of fishing zones.			Amount of lease.		
	Japanese.	Russian.	Total.	Japanese.	Russian.	Total.
1915.....	231	34	265	<i>Yen.</i> 702,244	<i>Yen.</i> 143,118	<i>Yen.</i> 845,362
1916.....	205	42	247	723,585	170,278	893,863

* A yen is equal to about \$0.498.

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