METHODS OF PREPARING SALMON.

CANNING.

EARLY DAYS OF THE INDUSTRY.

In the salmon industry canning is and has been almost from the time of the discovery of a feasible method of so preserving the fish, the principal branch. The first canning of salmon on the Pacific coast was on the Sacramento River in 1864, when G. W. and William Hume and Andrew S. Hapgood, operating under the firm name of Hapgood, Hume & Co., started the work on a scow at Washington, Yolo County, Calif. The Hume brothers, who came from Maine originally, had been fishing for salmon in the Sacramento River for some years before the idea of canning the fish had entered their minds, while Mr. Hapgood had previously been engaged in canning lobsters in Maine, and was induced by the Humes to participate in

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[a] Fraser River Salmon Situation: A Reclamation Project. By John Pease Babcock. Appendix V, Report, British Columbia Commissioner of Fisheries for the year ending Dec. 31, 1919, p. 3. Victoria, British Columbia, 1920.

order that they might have the benefit of his knowledge of canning methods. The late R. D. Hume, who worked in the original cannery and later became one of the best-known canners on the coast, thus describes the plant and the methods employed:[a]

Before the arrival of Mr. Hapgood (from Maine) the Hume brothers had purchased a large scow, on which they proposed to do the canning of salmon, and had added an extension to the cabin 18 by 24 feet in area, to be used as a can-making shop. This had a shed on the side next to the river for holding any cans that might be made in advance of the packing season. A few days after the arrival of Mr. Hapgood (Mar. 23, 1864), the tools and machinery were packed and put in position. Mr. Hapgood made some stovepipe and two or three sheet-iron fire pots, and in a short time was ready for can making. The following list of tools and machinery will show how primitive our facilities were as compared with present methods: 1 screw hand press, 1 set cast-iron top dies, 1 set cast-iron bottom dies, 1 pair squaring shears, 1 pair rotary shears, 1 pair bench shears, 1 pair hand shears or snips, 1 pair 24-inch rolls, 1 anvil (weight 50 pounds), 1 forging hammer, 1 tinner's hammer, 1 set punches for making stovepipe, 1 rivet set, 1 grooving set, 2 iron slabs grooved on one side to mold strips of solder, 1 iron clamp to hold bodies of cans while soldering the seams, 1 triangular piece of cast iron about three-eighths of an inch in thickness and 6 inches in length, with a wooden handle attached to the apex, also used for holding can bodies in place while being seamed.

The process of canning was as follows: The bodies of the cans were first cut to proper size by the squaring shears, a line was then scribed with a gauge about three-sixteenths of an inch from one edge, and they were next formed into cylindrical shape by the rolls. They were then taken to the soldering bench and one edge lapped by the other until the edge met the line that had been scribed and fastened there by being soldered a small part of the length to hold them in place for the further purpose of seaming. They were then placed either in the iron clamp, which had a piece of wood attached to its underside, and held firmly, the clamp being closed by the operation of a treadle, or were slipped on a piece of wood, which was bolted to the bench, while being held in place by the triangular hand seamer, which was pressed down on the lap of the seam by the left hand of the operator. When this had been done a piece of solder, which had been prepared by shaking in a can together with rosin, was placed on the seam and melted and rubbed lengthwise of the seam. After cooling the bodies were ready for the end or bottom, which operation was brought about by first cutting out circular blanks with the rotary shears, and then placing them in the cast-iron die and bringing the handle of the screw press around with a swing with force enough to form up the end or bottom. In this operation there were many difficulties, as the ends or bottoms would many times stick to the upper part of the die and refuse to come off, and finger nails were pretty short in those days. To get the ends out of the lower part of the die was not so bad, as a wooden plunger operated by a treadle knocked them out, but sometimes they were in pretty bad shape. When the bottoms or ends were ready they were slipped on the bodies and the edge of the bottom rolled about in a pan of powdered rosin until the seam was well dusted. A piece of solder similar in size and preparation as used for the side seam was placed in the can. They were then placed on the smooth side of the cast-iron slabs, and the operator, with a hot soldering copper shaped to fit the circle of the can, melted the solder and by turning the can rapidly soldered the full circumference. The output of this can factory was very imperfect, as at least one-half of the seams burst, owing to the lack of experience of the manager or want of good judgment.

When the can making was well underway Mr. Hapgood then turned his attention to getting the apparatus for canning on board the house-boat. This in the cooking department consisted of a kettle made of boiler iron about 36 inches in diameter and 5 feet in depth, set in a brick furnace and fired from underneath. Alongside was a round-bottom, cast-iron pot holding about 60 gallons of water and heated in the same manner. These kettles, with a dozen coolers or circular sheet-iron pans with ropes attached and with holes cut in the bottoms for drainage, a set of 5-inch blocks and tackle, with a sheet-iron fire pot and a scratch awl, completed the bathroom outfit. The can filling and soldering room was furnished with a table through the center, where cutting the salmon in pieces to suit and the filling of the cans was done. On each side of the room there was a bench running the full length, on the end of one of which the cans were placed to receive the pickle, which was used at that time instead of the small quantity of salt that is placed in the cans during the operations of these later days

[a] The First Salmon Cannery. By R. D. Hume. Pacific Fisherman, Vol. II, No. 1, January, 1904, pp. 19-21.

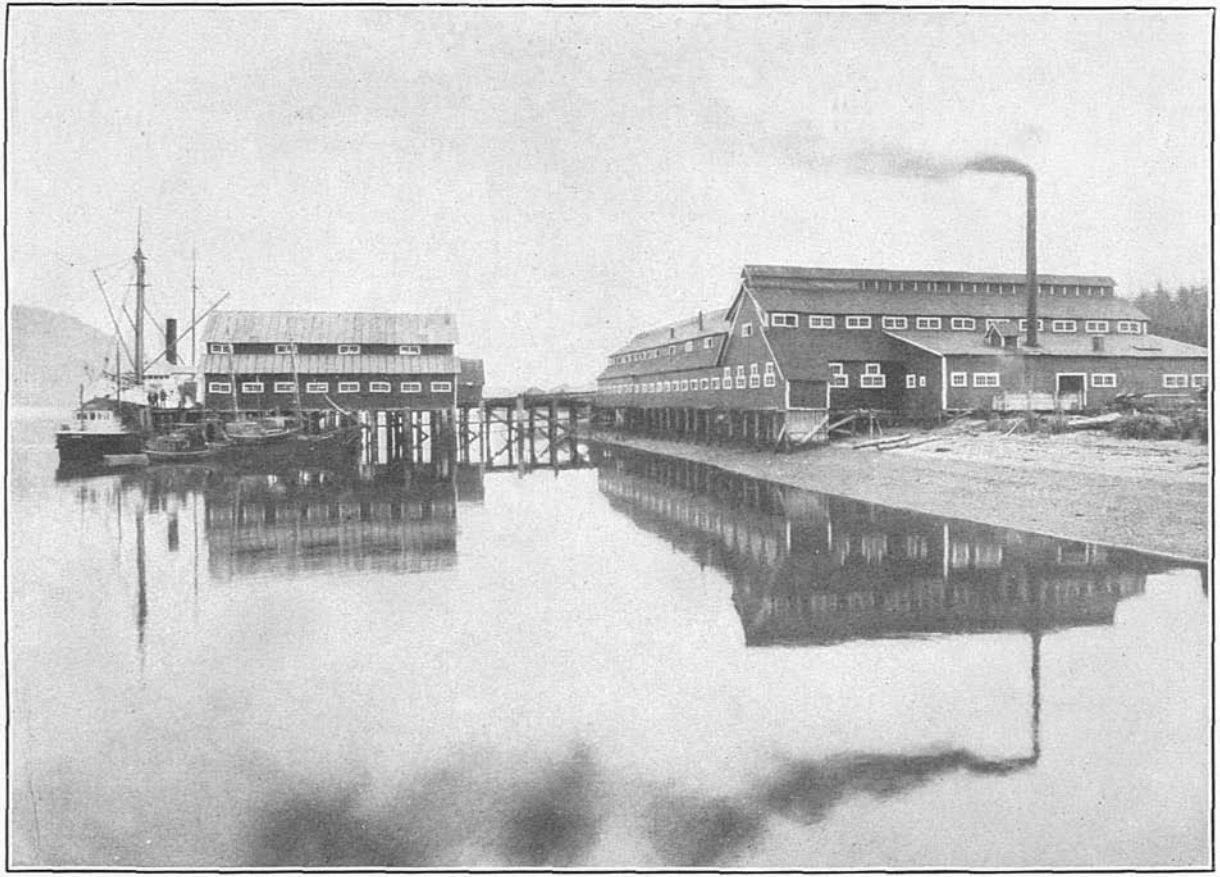

FIG. 26.—SALMON CANNERY AT HOONAH, ALASKA.

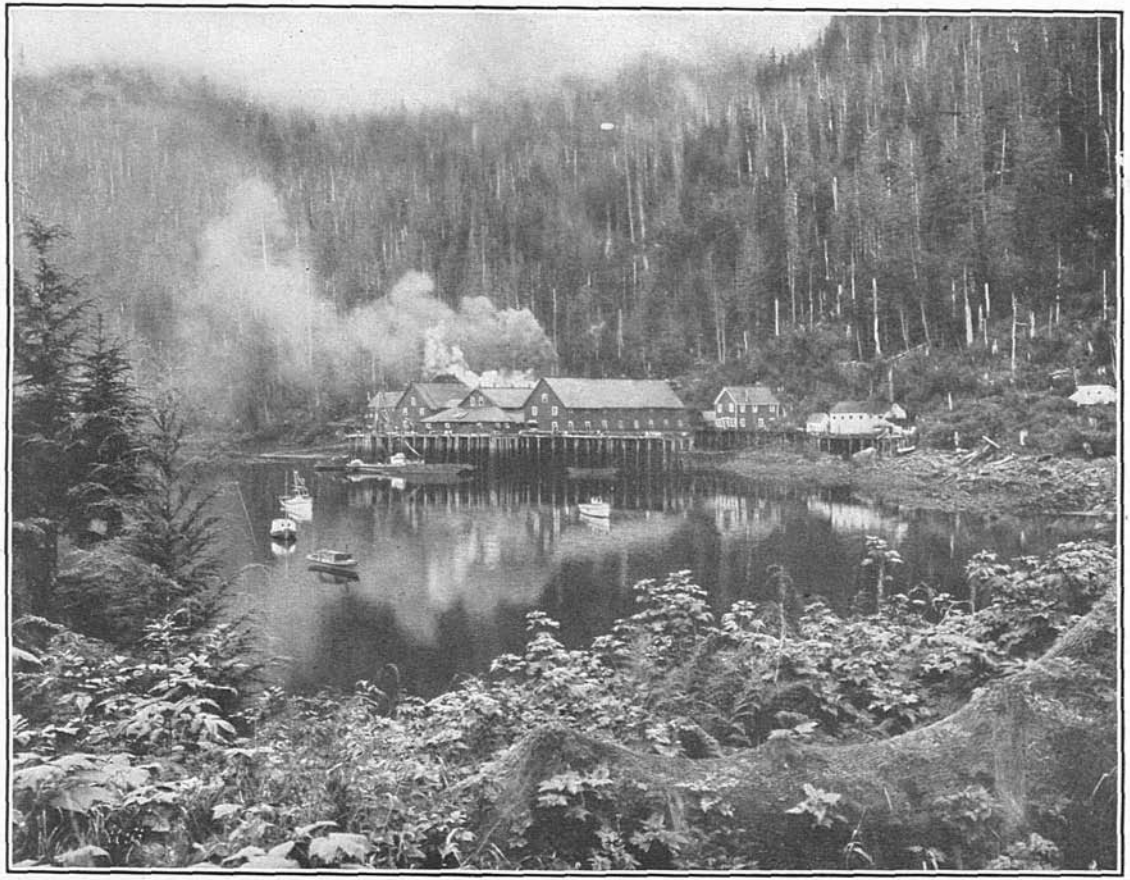

FIG. 27.—SALMON CANNERY AT SANTA ANA, ALASKA.

After the salmon had been cleaned by removing the entrails and washing them outside the covered portion of the scow, they were brought inside and placed on the table, and a man with a butcher knife in one hand and a stick in the other, which had a mark showing the length of the pieces desired, cut gashes in the side of the salmon as a guide and then cut the fish into sections corresponding to the length of the mark on the stick. He then proceeded to cut the sections in pieces to suit the cans. Then three or four operators placed the salmons in the cans and shoved them along the table to where a boy wiped the top edge and passed them along to two others who placed tops which fitted inside of the rim. The cans were then taken in wooden trays to the bench opposite the starting point, which was fitted with four sheet-iron pots, and at the one nearest the entrance to the house on the scow a man put a soldering flux on the top edge, which was made by adding zinc to muriatic acid, and then with a pointed soldering copper and a stick of solder melted the solder until a small portion could be drawn around the groove formed by the edge of the can and the bevel of the top. From there the cans were taken to the other parts of the bench, where two men finished soldering the head in, and then taken to the third man, who soldered, or, as it was called, buttoned, the end of the seam lap. The cooking department or bathroom, as it was called, was separated from the filling and soldering room by a partition. The cans were shoved through a hole in the partition.

At this time the process was a secret. Mr. Hapgood did the cooking and all the work done inside, no one but a member of the firm being allowed to go in. This privacy was continued until the firm moved to the Columbia River, and, the labor becoming too arduous for Mr. Hapgood to perform alone, a boy by the name of Charlie Taylor was taken in as an assistant. * * *

But to return to the original proposition: When the filled cans had been soldered and entered the bathroom they were put in the coolers and lowered into the cast-iron pot, one cooler of cans being cooked at a time. The cooler was lowered into the boiling fresh water until the cans were submerged to within 1 inch of the top ends and left to cook for one hour; then they were hoisted out and the vent holes in the center of the top soldered up, after which they were dumped into the boiler-iron kettle, which held a solution of salt and water of density sufficient to produce, when boiling, a heat of 228° to 230° F. They were cooked in this solution for one hour and then taken out of the kettle with an iron scoop shaped like a dip net, with a wooden handle about 6 feet in length. They were dumped into a tank of water on the other side of the partition which separated the bathroom from the packing room through an opening in the partition, receiving many a bump and bruise in the operation. Then they were washed with soap and rag to remove the dirt and grease, each can being handled separately. When this was done they were piled on the floor of the packing room and in a few days were painted with a mixture of red lead, turpentine, and linseed oil, for at that time buyers would have no canned salmon, no matter how good the quality, unless the cans were painted red.

When packs of 10,000 to 15,000 cases were made in a season only the absolutely essential machinery was used, the rest of the work, such as cutting and cleaning the fish and placing them in the cans, being done by hand. When larger canneries were constructed, especially in Alaska, where labor is expensive and difficult to obtain, the greater part of the workmen having to be brought up from the States, machinery to do as much as possible of the work became absolutely essential. The inventive genius of the country came to the rescue and one by one machines for cutting, sliming, and cleaning the fish, filling the cans, putting the tops on, and washing them were invented and put into use, while automatic weighing machines were produced and extensive improvements and alterations were made in the machines previously in use. There are to-day many large manufacturing establishments which devote all or the greater part of their facilities to furnishing machinery and supplies to this giant branch of the salmon industry.

When salmon canning was in its infancy, a pack of from 150 to 200 cases was considered a good day's work. Now it is not an uncommon occurrence for a cannery to turn out from 2,500 to 4,000 cases in one day, and there are a number which have even greater capacity.

The usual method of figuring the capacity of a salmon cannery is by the number of lines or units employed. The machinery arranged so that the fish pass through all the operations from filling to double seaming is known as a line, and the capacity is based upon the number of these lines in use in the plant.

During the height of the salmon run, a cannery is an exceedingly busy and interesting place, and a description of the methods used at the present time will show the giant strides the industry has made since the days of Hapgood, Hume & Co.

HANDLING THE SALMON.

At convenient spots near the fishing grounds large scows and lighters are anchored and the fishing crews deliver their catches aboard these, the tallyman on each scow keeping a record and giving the crew a receipt. Men fishing near the cannery deliver their catch alongside. Steamers and launches are used to tow out empty scows and bring in those filled. In the old days the fish were pitched by hand into bins on the wharves, but this laborious method has been superseded by the use of an elevator, which extends from a short distance above the top of the wharf to the water's edge, provision being made for raising or lowering the lower end according to the stage of the tide. This elevator is slanting, and is made of an endless chain operating in a shallow trough. About every 2 feet there is attached to the chain a crosspiece of wood. At the top of the elevator are chutes which deliver the fish at various convenient spots on the cutting-room floor.

A recent invention, which is rapidly coming into use, is the unloading scow. This is a scow divided by kid boards into compartments. On the side is an opening which, when not in use, is closed by planks dropped into grooves. The filled scow is run alongside an elevator with a flaring mouth box at the lower end. A chute is placed between the scow, opposite the door, and the elevator, the door opened, and the fish allowed to slide by gravity into the box, then up the elevator to the fish floor. As one compartment is emptied another is attacked by removing the partition boards, and so on until the scow is empty. Should the fish stick, a hose with running water is run a foot or more down into the pile, which loosens the fish and causes them to move freely. By the use of these scows the fish are unloaded in a very short time, with but little labor, and are not marked by pew holes, as under the old method.

If the salmon have been in the scows for from 20 to 24 hours they are used as soon as possible after being delivered at the cannery; otherwise that length of time is usually allowed to elapse, the cannerymen claiming that if not allowed to shrink the fish will be in such condition that when packed much juice will be formed, and lightweight cans will be produced. The danger of canning fish that are too fresh, however, is of minor importance as compared with the tendency in the other direction.

Before dressing the fish a stream of water is kept playing over them in order to remove the dirt and slime, after which men with pews separate the different species into piles.

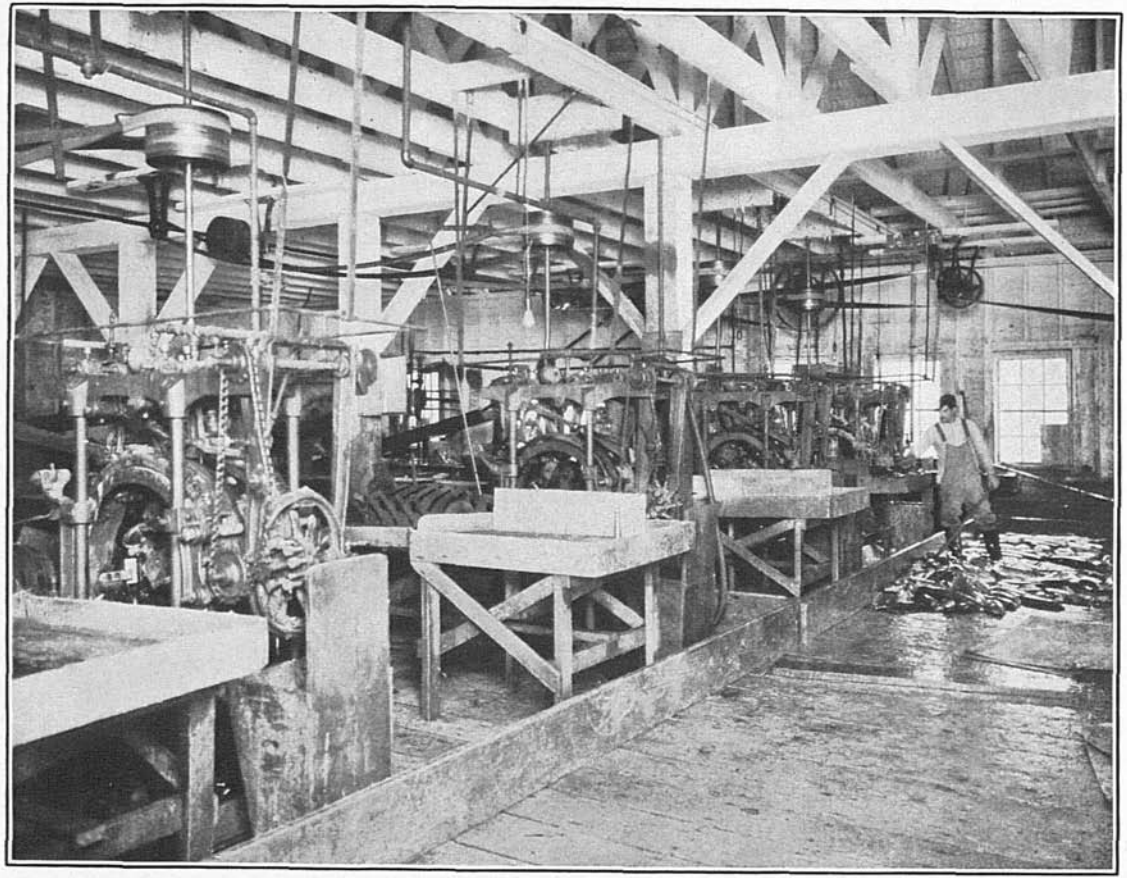

FIG. 28.—A BATTERY OF "IRON CHINKS."

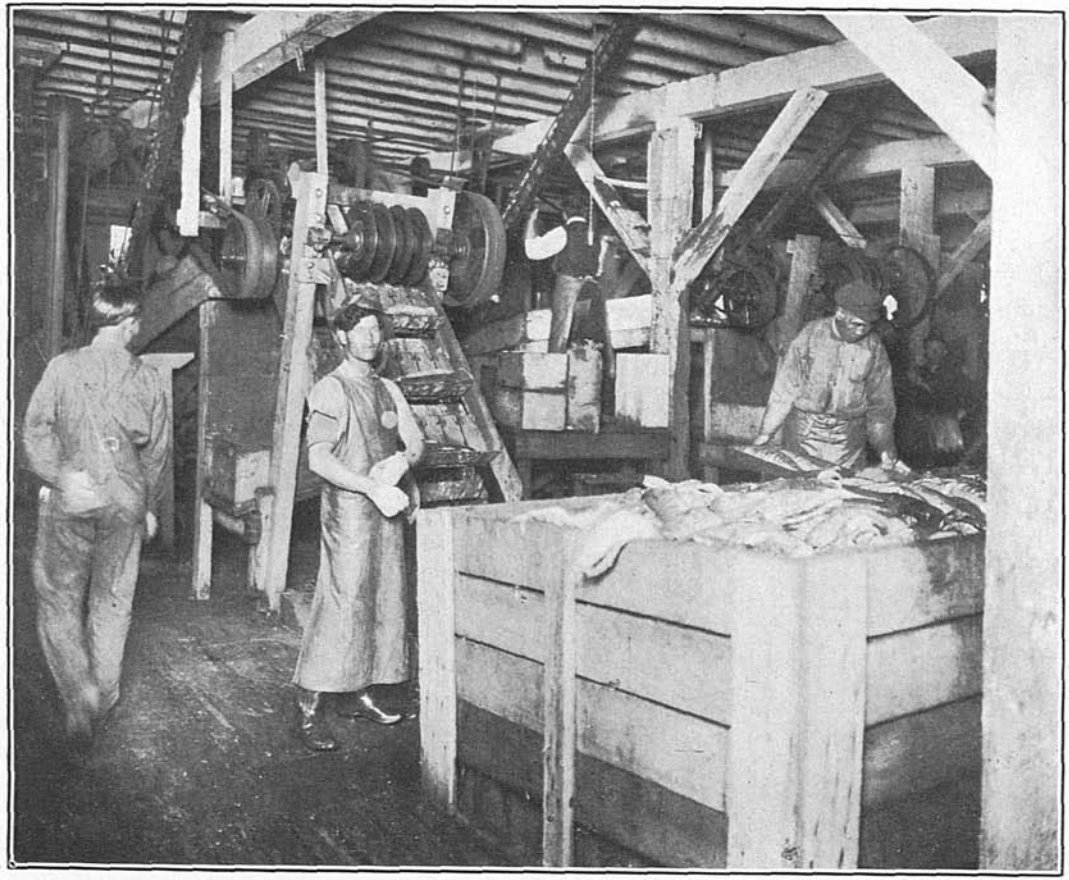

FIG. 29.—CUTTING SALMON INTO PIECES OF A SIZE TO FIT THE CAN.

DRESSING.

A number of the small canneries still use the old hand method of dressing the fish, and in such places the selection of the butchering or dressing gangs is of prime importance. Two men constitute a "butcher's gang," and the number of these gangs is dependent upon the output of the plant. Boys place the fish, with the head out, upon the cutting tables. One man cuts off the heads, and is followed by another who removes the fins, tails, and viscera. The offal is thrown into a chute, whence it passes into the water under the cannery or into a scow moored underneath, while the dressed fish is transferred to a tank of water, to be scaled, washed, and scraped. It is then passed to another tank of water, where it receives a second washing, scraping, and final brushing with a whisklike broom, which removes any offal, blood, and scales that were overlooked in the first washing, after which it is removed to large bins on either side of the cutting machine.

The most useful cannery inventions in recent years have been of machines for doing the work of the dressing gangs. The one commonly known as the "Iron Chink," now in general use in canneries where such machines are employed, was first used in 1903 at Fairhaven (now Bellingham), Wash. It removes the head, tail, and fins and opens and thoroughly cleans the fish ready to cut into pieces for the cans. By the use of these machines the dressing gang is almost entirely done away with, dispensing with 15 to 20 men. This same machine is now so arranged that the fish after dressing are also "slimed;" i. e., the thick mucus covering the skin removed, and the inside of the fish cleaned.

CUTTING.

The usual method of cutting the salmon is by a machine. This is generally a large wooden cylindrical carrier, elliptical in shape, thus having a larger carrying capacity. Ledges or rests on the outside the length of the carrier are wide enough to hold the fish, and are slit in cross section through the ledges and outer casing to receive the gang knives. The latter are circular, fixed on an axle at the proper distances apart, and revolve at the highest point reached by the carrier and independently of the latter. The carrier and gang knives are set in motion, each revolving on its own shaft. As a rest on the carrier comes to a horizontal position, men stationed at the fish bins lay a fish on each ledge as it passes. Thence it is conveyed to the revolving gang knives and, after being divided, passes through on the downward course, sliding off the rest into the filling chute. The knives in these machines are so arranged as to cut the fish transversely in sections the exact length of the cans to be filled.

The rotary cutter shunts the tail pieces to one side, and these are carried by means of a chute to baskets. The tail pieces are generally canned separately. As the tail portion is much smaller, with less meat, it can not be placed in the cans with the middle and head sections without detracting from their value, but if packed under a distinct and separate label, as is now done, there is no reason why the tails should not supply the demand for a cheap grade of fish.

In some of the smaller canneries, especially in those packing flat cans, the gang knives are worked by hand. In this case, the knives are not circular, but elongated or semicircular in shape, tapering at

the outer ends. They are mounted on an axle having a large iron lever at one end, and when this lever is raised the ends of the gang knives are thrown up and back. The fish is then placed in position under them and the lever pulled forward, the knives, with a scimitar-like movement, dividing the fish.

The original method of cutting was by means of a long knife wielded by a Chinaman who stood at a regular butcher's block. Although his strokes were incredibly quick, the rotary cutting machine is a vast improvement over the old way.

SALTING.

Every can of salmon is seasoned with one-fourth of an ounce of salt, which, to insure uniformity, is added by mechanical means. A table is used, in the top of which are holes equal distances apart. On the underside of the top is a sheet-iron plate, with an equal number of holes, which slides in a groove at the sides, and is worked either by a hand or foot lever. Just below is an open space large enough to accommodate a tray holding 36 or 48 cans. A workman stands in front of the table and slides a tray of cans into the open space. He then throws a quantity of salt upon the table and immediately scrapes this off with a thin piece of wood, each hole being filled in the operation, and the salt being prevented from falling through by the iron plate underneath. The lever is then pressed, the iron plate moves forward until the holes in it are directly under the holes in the table top, when the salt drops through into the cans. This operation can be repeated four or five times in a minute. Most canneries now use a small salter attached to the filling machine and this deposits the required amount in the can as it is passing by on its way to be filled.

FILLING THE CANS.

Most canneries now use filling machines for all sizes of cans, although a few, more particularly those packing flat and odd-sized cans, still fill by hand.

The filling machine consists of a chute with a belt to which are attached wire racks about 4 inches apart, set at an angle to prevent the salt from spilling out, into which the salted cans are fed from the floor above and pass into the machine. At the same time the divided sections of salmon pass down another chute into the mouth of what looks like a hand coffee mill. They pass through here down a smaller chute and are forced by two dogs into a receptacle through which the plunger, or filler, passes. Here the plunger comes opposite the open mouth of the empty can, which when it reaches this point is caught by a clasp or hook and held in front of the plunger, which is immediately thrust forward through a chamber filled with salmon, cutting the fish longitudinally and at the same time filling the can. The next movement forces the can out upon a table. When running at full speed, one of these machines will fill about 80 cans a minute.

On being released by the clamp and rolling upon the table they are righted by a workman and pushed onto an endless belt, upon which they pass into the weighing machine. If of the proper weight, they pass through this machine, but if below the required weight the cans are shunted to one side, where workers add the quantity of fish needed, a supply of small bits being kept at hand for this pur-

pose. Generally the cans overrun in weight, frequently as much as 2 or 3 ounces. Occasionally a can is weighed on a small balance scales in order to see that the machine is in perfect adjustment.

After passing the weighing machine any bones and scraps of flesh which may be sticking up out of the can are clipped away by workers armed with scissors.

In the hand method the fillers stand on each side of a long table with a trough running down the middle from end to end. This is filled with the cut pieces of salmon, and the fillers, usually women and children, put large pieces into the cans at first and then smaller pieces to occupy the vacant spaces.

From the weighing machine the cans pass to the clinching machine, which attaches the top of the can loosely to the body in such a way that it allows the air in the can to escape, yet prevents the fish from coming in direct contact with the steam of the exhaust box. Also the water resulting from the condensation of steam, which accumulates in the exhaust box, is kept from entering the can and thus bleaching the flesh.

In many plants the cans are washed by jets of water or steam directed against them in a closed box as they are passing from the clincher to the exhaust box.

The cans then pass into a steam exhauster, consisting in one type of a box about 30 feet in length, in which are three endless-chain belts running side by side. Under and over each belt are steam coils, and under each of the lower coils are single pipes, which through small holes throw jets of live steam upon the coils, creating an intense heat. The cans pass along the first belt, are then transferred to the second belt, on which they return to the entrance of the box, whence they pass to the third belt, and continuing along this to the end pass out to the double seamer, the whole operation occupying from 5 to 15 minutes, preferably 15. One style of exhauster has 10 ovals formed by the pipe, and the cans pass along these from side to side of the exhauster until discharged at the far end. Another type is formed of a long tube through which the cans pass and are heated by perforated steam pipes. Upright exhausters, in which the cans travel along a spiral, are also in use. By this means the contents of the can are heated and the greater part of the air exhausted, which is the object of the first cooking in the retort under the method formerly in general use. In Alaska, where 1-pound tall cans form the bulk of the pack, the cans are exhausted at a temperature from 206° to 212° F., 210° being the favorite.

A recent invention, which the inventor claims will do away with the steam exhaust box, and thus save a large amount of valuable floor space in the canning "line," is the power vacuum pump, known as vacuum exhausting machine, by means of which air is exhausted from the cans, accomplishing the same purpose as the steam exhaust box. Some of these machines have been in active use for several seasons, with most satisfactory results.

Leaving the exhauster the cans pass to the double seamer, which fastens the cover on tightly with a double seam or crimp. It should be stated that no solder is used in attaching the top on the can, the curled flanges of the cover being coated around the outer edge with cement or other sealing fluid to take its place. Solder, however, is used in joining the side seam of the can, this being done when the can

is manufactured. The cans then leave the machine on an endless conveyer, pass through a machine which washes the outside of the cans, and thence to the men who transfer them to the coolers, which are immediately placed upon the trucks and run into the retort for the one cooking they are to receive. By the use of these cans the soldering machine used in the old-style method is done away with. It also does away with the first cooking and the subsequent venting and soldering, a saving both in labor and time consumed.

COOKING.

The processing time varies in each district and sometimes for each species. In Alaska 1-pound tall reds, cohos, chums, and pinks are generally cooked from 90 to 120 minutes, at 12 to 18 pounds pressure and at a temperature of 242° to 248° F. One-pound flats and half-pound cans are generally cooked about 10 minutes less time. Owing to their larger bones, king salmon are generally cooked from 10 to 20 minutes longer than the other species; steelhead trout also.

On Puget Sound 1-pound tall sockeyes, cohos, and pinks are generally cooked for 90 minutes at a pressure of 10 pounds and at a temperature of 240° F. Halves and 1-pound flats are generally cooked at the same temperature but for only 80 minutes. Chum talls are generally cooked for 105 minutes at a pressure of 10 pounds and at a temperature of 240°; while spring or king salmon are cooked for 120 minutes at a pressure of 10 pounds and at a temperature of 240°.

It is the custom at all canneries, no matter what the system, to allow about 5 minutes at the beginning of the cooking to work up the required heat of the retort, and when cooking is completed there is a like period for reducing the temperature and pressure before opening the doors. The cooking times given above are exclusive of the two 5-minute periods noted here.

It should be distinctly understood that the processing times noted are only approximate. The condition of the fish, the weather—whether hot or cold, rainy or dry—etc., all must be taken into account. The canner can not go far astray, however, if he keeps generally within the narrow margins noted above. In the early days much secrecy and mystery was thrown about the cooking, and the work was carried on in a separate room, known as the "bathroom," under lock and key. The first cooking was done in common tubs. The early retorts were made of wood. Later, round iron kettles were substituted, nearly one-half consisting of cover, and round crates were used for holding the cans. At the present time only rectangular horizontal iron or steel retorts are used, and access to these is had by means of miniature railroad tracks.

For many years cannery men believed that the double cooking of salmon was absolutely necessary, but in 1898 F. A. Seufert, at his cannery on the Columbia River, at Seuferts, Oreg., a short distance above The Dalles, discarded this idea, and has since used a one-cooking method. By the new process the cans are tested for leaks after the center hole in the top is soldered up, as before, and are left in the retort 70 minutes at 245° F. and 12 pounds steam pressure. According to its originator, this method saves more than one-half the labor in the bathroom, saves nearly one-half the labor in washing the cans after cooking, and also better retains the color of the fish.

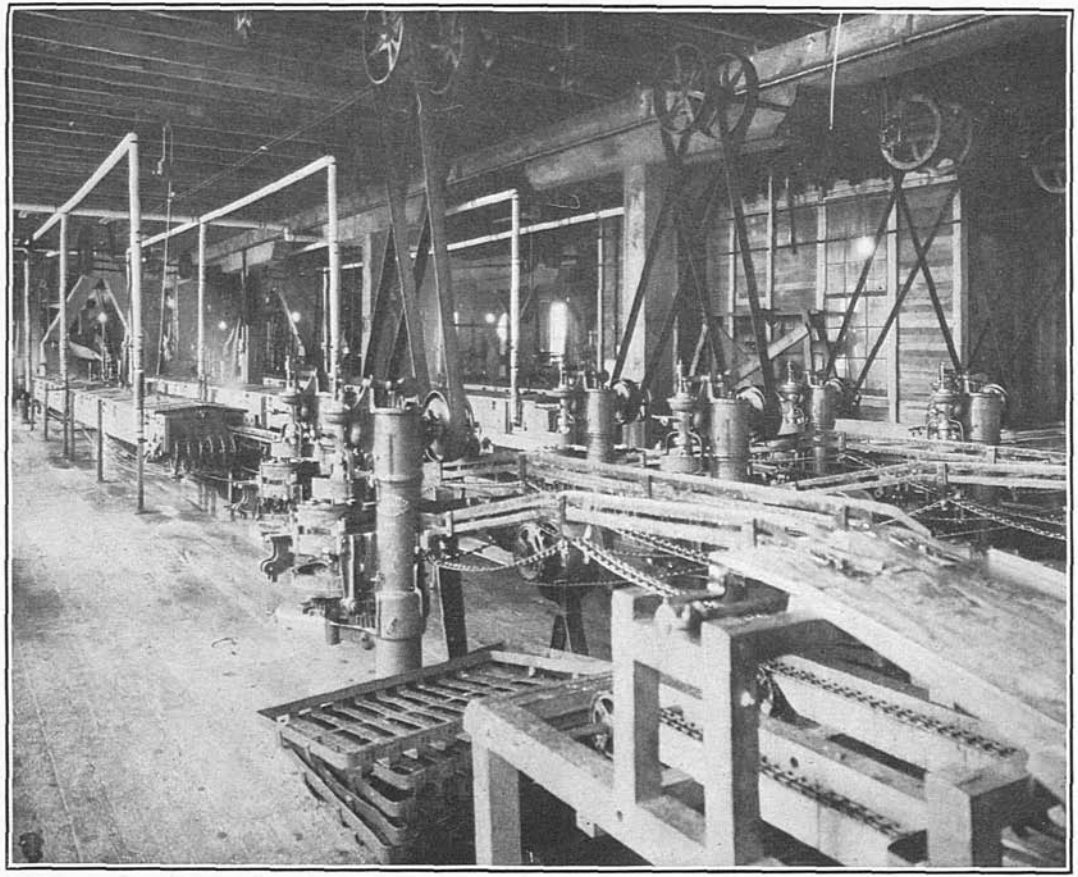

FIG. 30.—EXHAUST BOXES AND THE DOUBLE SEAMERS.

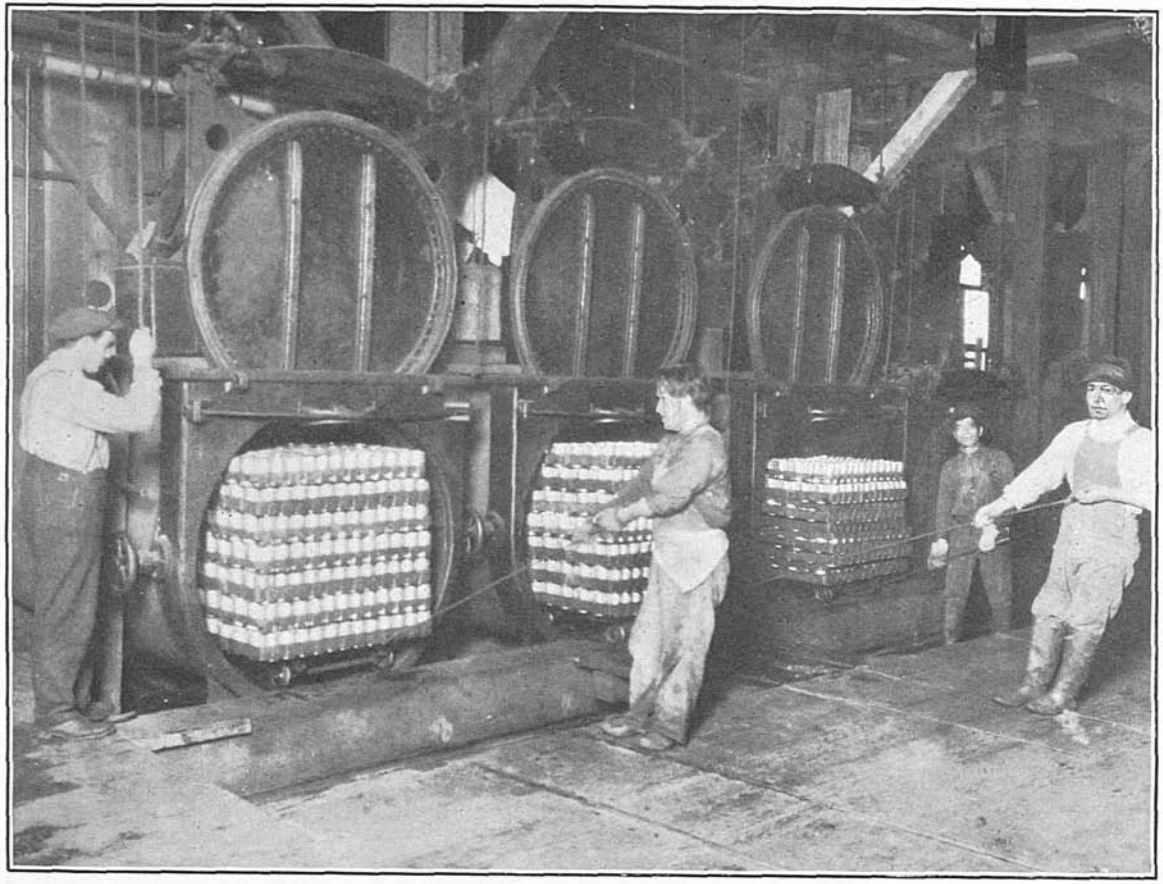

FIG. 31.—COOKING THE SALMON IN RETORTS.

REPAIRING CANS.

Imperfect cans which are discovered after cooking and are repaired at once and whose contents are recooked are still very good, the only difficulty being that by blowing or venting them a second time they lose weight. The above goods usually go in with the regular pack of their kind and are not classed as regular "do-overs." The latter were generally defective cans, which, owing to pressure of other work, could not be repaired until considerable time had elapsed, by which time decomposition had set in. The cans which can not be repaired immediately are now thrown onto the cannery dump.

On coming from the retort the coolers are lowered into a bath of lye, or, as in some canneries, the cans are run through such a bath on an endless belt, which, with the aid of a slight rinsing and a few rubs with a brush over the top, removes from the can all the grease and other material. The belt then passes them into another bath where the lye is washed off in hot fresh water. The cans then go to the cooling room, where a stream of water is played upon them, or during rainy weather are placed out of doors upon the wharf, and there allowed to cool, in order to stop the heat inside the can from continuing to cook the fish. In some canneries the lye bath before cooling is dispensed with, as the earlier washings are supposed to have cleaned the cans.

The top and bottom of the cans contract in cooling, and for several hours a sharp popping noise is heard. Here, as in nearly every process through which they pass, the cans are again tested, this time by tapping the tops with a small piece of iron about 6 inches long, or, sometimes, a 12-penny nail. The sound conveys to the ear of the tester an unmistakable meaning as to the condition of the can, and the faulty cans that escape notice during the other tests are almost invariably found in this one.

LACQUERING.

A common custom in the salmon-canning industry, but one that is not common in the canning of vegetables, fruits, etc., is that of lacquering the cans. This idea of protecting the can on the outside has been followed from the very beginning, for two reasons: (1) That the English market which, at that time especially, absorbed the greater part of these goods insisted on their shipments being finished in this way, and (2) from the fact, as these canners speedily found out, that if they did not protect their cans in some way enormous losses through rust would ensue.

The first experiment of this nature was to paint the cans by hand with red paint, treating each singly. Next a composition of logwood extract and alcohol was tried, which, however, did not produce satisfactory results for a very plain reason—the can was dyed instead of being lacquered. The next attempt was to varnish the cans with a japan varnish reduced with alcohol, but this was found to dry too slowly for speedy handling. After extended experimentation the quick-drying brown lacquer of the present time was evolved, which carries asphaltum in the form of an asphalt varnish as its base, this being supplanted in some cases by gilsonite. This lacquer can be procured in either a heavy or light body, is generally reduced with ben-

zene or gasoline, and is applied according to the requirements of the market, which in some localities demands a heavy coating and in others a much lighter finish, the latter giving a rich golden brown color. Some experiments have also been made in using brighter colored lacquers for this work. Several of these, made to give a bright golden, copper, or other color, are extremely attractive in appearance, while at the same time protecting the tin against rust quite as well as the brown.

The industry soon outgrew the hand method of lacquering, and the process which for a number of years was universal in the trade and is still used by some canneries succeeded it. For this there are a number of rectangular box vats about 40 by 80 inches and 18 inches in depth, the number varying with the capacity of the cannery. These are usually lined with galvanized metal and provided with a gridiron-shaped iron frame, hung from a windlass or other tackle for lifting or lowering from top to bottom of the vat. The cans are loaded on this gridiron, being placed in an inclined position to allow the draining of the lacquer, and are lowered in the vat sufficiently to submerge them in the lacquer with which the vat is charged to a depth of 7 to 10 inches. The loaded gridiron is then raised to the top of the vat and the cans allowed to drain and dry before piling. This method, while being more effective in regard to the volume of work, was still of necessity a very slow and tedious operation. In damp or rainy weather, especially when it is not possible to open warehouse doors and windows, the gas arising from a number of these vats makes effective drying almost impossible.

Another principal objection to this method of lacquering, which applied also to all earlier attempts, was the impossibility of obtaining an even coat of lacquer when the can was allowed to dry in any stationary position. There was also a large waste by evaporation.

Notwithstanding repeated efforts at invention, however, it was not until 1901 that an effective machine for handling this difficult work was put on the market. The apparatus now in use by a number of canneries receives the cans on a revolving wheel fitted with rests for holding them while passing through the lacquer bath. From here they roll upon an endless chain which revolves the cans as they pass through a long box in which a hot blast dries them before they reach the end of the machine. The rotating or rolling motion given to the can after the lacquer bath, preventing the lacquer from draining to and consequently accumulating on any part of its surface, also has the effect of distributing the lacquer evenly and results in a clean and neatly finished can. The air blast facilitates the work of drying to such an extent that it requires only about two minutes after being deposited on the drying bed of the machine for the cans to be ready for handling, while the quantity of cans which can be handled in a day is vastly greater than by the old method.

A few flat and oval cans are not lacquered, but are protected from rust by wrapping in tissue paper, over which the label is placed.

Several of the largest operators have stopped lacquering the sides of the cans, depending upon the label to protect this portion from rust. Enameled ends are used, and, as these are bought from can makers, these operators are thus enabled to get away entirely from the dangers of lacquering.

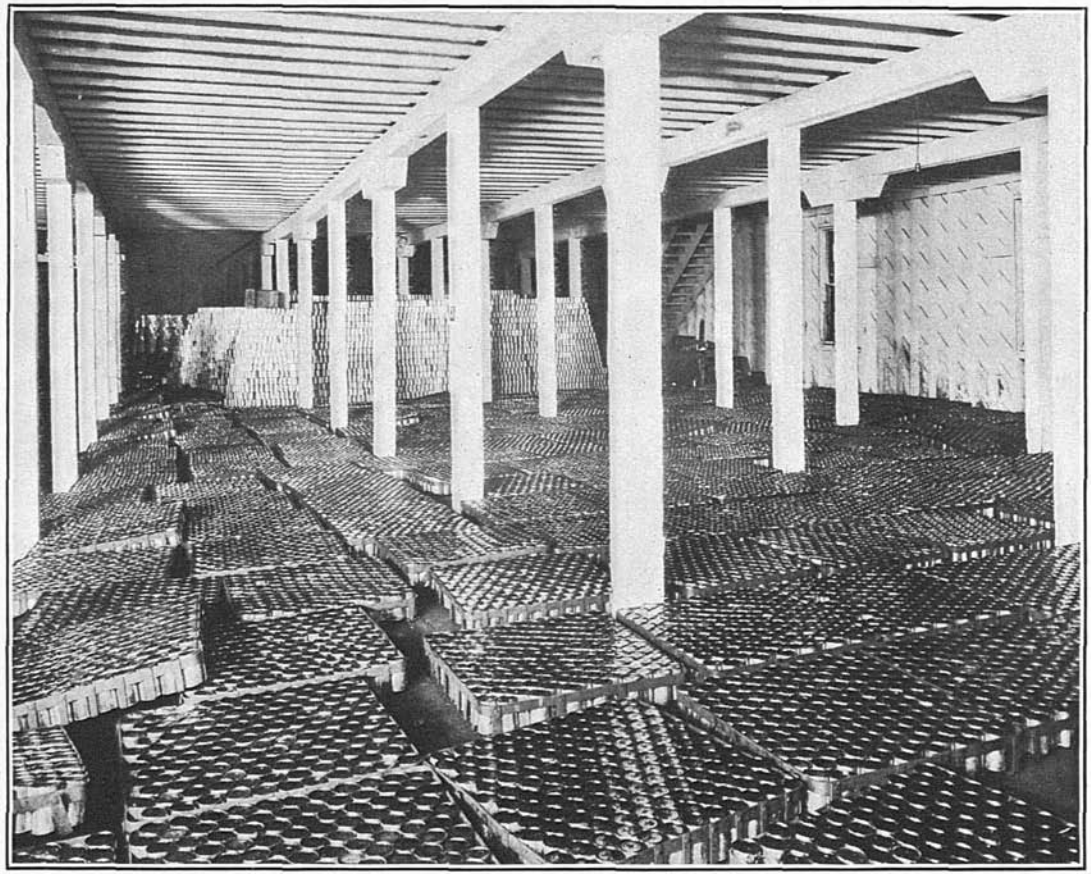

FIG. 32.—COOKED SALMON CANS COOLING.

FIG. 33.—SALMON ON THE FLOOR OF THE FISH HOUSE.

FIG. 34.—SALMON CAN-LABELING MACHINE.

LABELING.

While machines have been made for this purpose, and some of them are in use, the work is usually done by hand. A number of men or women seat themselves about 4 feet apart in front of the pile of cans. Each man has in front of him a package of several hundred labels, and by bunching them on a slant so that successive margins protrude beyond each preceding, he can apply paste to the entire number with one stroke of the brush. A can is placed on the label, is quickly rolled, and the label is on much quicker than one can tell it. Each man places to his right the cans he labels, forming a pile of length and width equal to his unlabeled pile, and when the entire lot has been labeled it has been shifted only about 4 feet. Cans of fancy brands of salmon put up on the Columbia River and in the Puget Sound region are wrapped in colored tissue paper before the label is put on. Cartons similar to those used by the sardine packers would make good containers for fancy brands and would be much cheaper than the present method.

Some of the canners now have their labels lithographed directly on the tin, and the whole covered with a transparent la quer.

Several attempts have been made to popularize salmon packed in glass and porcelain jars, and while these have met with some favor, it was not sufficient to warrant a continuance of the practice for any length of time. But few are being so packed at the present time.

BRANDS.

A very important feature of the canning industry is the selection of appropriate brands or labels for the various grades of salmon. Each company has a number of these, which it has acquired either by designing them or by absorbing another company which owned them. A well-known brand has a value in itself and sometimes is a very important asset. A company will sometimes market a considerable part of its product in one section, and here, where the consumer has become familiar with the brand and pleased with the contents of the can, he will ask for and accept no other, despite the fact that the latter might be, and probably is, the equal of the product he has been using.

For many years but few salmon canners appreciated the value of a can label, and it has taken some bitter experiences to drive home to the rest that a properly designed label placed upon good goods and the owner protected in its use by the law has real value, just as much as boats, nets, buildings, machinery, or the thousand and one material things required to carry on the business.

A free trade definition of a label would be that it is an artistic representation or intellectual production, stamped directly upon an article of manufacture, or upon a slip or piece of paper or other material, to be attached in any manner to manufactured articles, to bottles, boxes, and packages containing them, to indicate the contents of the package, the name of the manufacturer, or the place of manufacture, the quality and quantity of the goods, directions for use, etc.

Labels are subject to the copyright law and should be registered before use or publication. If not registered, there is no protection in law against infringement. The continued use of a label, however,

will give the person so using a certain proprietary right in it, which can be enforced in a court of equity and may be defended by injunctions, which will generally be granted. Such proceedings are expensive, annoying to a busy man, and at best will protect one only after at least a certain amount of damage has been done, and it is far safer to avoid this by registering the label at the time of issue, which will give one the further advantage in that a description of the character and quality of the article labeled can be set forth, which will, to a certain extent at least, be protected with the label.

The commercial value of a label and name is represented by the more or less general demand for the goods protected by it. In the canned-salmon industry, as in that of other food-packing industries, certain labels, through the good quality of the goods marketed under them and the publicity created for them, have become of very considerable value to the owners. A case in point is the label Royal Crown, owned by the late R. D. Hume. This was one of the earliest brands marketed in England, and some years later a certain Liverpool firm of salmon handlers paid Mr. Hume the sum of $10,000 for the exclusive right to its use in England.

In designing a label there are several things which should be borne in mind. It should bear an easily remembered name and design; a name difficult of pronunciation should be avoided at all costs. For many years glaring red labels have been popular, but the success met with by those using more subdued and artistic designs and coloring indicates that the public appreciate them more than they do the older and coarser types. The design should be as simple as possible, as experience has demonstrated that a simple form—so s mple that it can be fully understood by a mere glance—will gain by regular repetition, while a more complicated design will lose in this process.

A good many now in the business still remember the small label that was used on salmon cans before 1870. Labels about 3 by 5 inches in size, printed in one color, on white or colored newspaper, served merely the purpose of distinguishing cans, telling contents and manufacturer, and were without commercial value. About the year 1870 a few canners commenced to import from the East and Europe full-sized labels, i. e., labels that went all around the can. These were called by some "Pennington" labels, as a firm of that name supplied quite a number of them.

For some years they were used for the best grades only. They were printed in four and five colors, the design showing invariably a number of panels of different shapes and sizes. The lettering was not always plain and sometimes even intentionally irregular and puzzling. The colors were placed side by side, in boldest contrast, without any attempt to harmonize them.

It was soon discovered that the highly colored panels, while striking, lost all effect when massed on the retailer's shelves, and the different brands looked so much alike that the individual designs could not well be remembered by the customer, the only really distinctive feature being the name, and that was generally printed so small and indistinct that it could not be readily seen at a distance.

To remedy these defects, the designers soon reduced the number of panels and subdivisions, increasing meanwhile the size of the remaining ones and filling them with distinctive designs, still colored as simply as before, with no attempt at blending of colors. The back-

ground, at first perfectly plain, commenced to show patterns more or less complicated, and at times quite pretentious, so as to take away from the design proper.

Gradually the panel design disappeared. In place of it some showed one continuous picture on the label, which was very unsatisfactory and soon disappeared, as only a fraction of the picture could be seen at one time. Others had two subdivisions, one showing the name of the brand with its illustrations, occasionally used as a trade-mark, the other showing the article packed in the can, both named and illustrated. Unfortunately, these subdivisions were so large that the roundness of the can prevented one from seeing the picture as a whole, but this was soon remedied by making the subdivisions narrower and filling in between with directions, weight of contents, etc.

From this point on the general plan of labels underwent few changes except that the work, both of the artist and pressman, improved wonderfully, some of the labels now designed and printed being real works of art.

Up to a few years ago one of the most serious evils in the trade was the use of misleading and lying brands. The high-grade product would almost invariably be correctly and fully branded, but "chums" and "pinks" were usually branded as "Fresh salmon," "Ch ice salmon," etc., which would deceive all persons but those well acquainted with the industry. "Do-overs," and very poor fish, were usually marketed under a brand which bore the name of a fictitious company or of no company at all.

The passage of State laws of varying degrees of efficiency governing the branding of salmon helped slightly to remedy this condition of affairs, but it was not until the pure food and drugs act, approved June 30, 1906, was put into force by the Government that any radical improvement was noticeable. At the present time but few misleading brands are in use.

BOXING OR CASING.

A case of salmon generally contains 48 one-pound cans or their equivalent, i. e., 24 two-pound cans or 96 half-pound cans. Some canneries pack their half-pound cans in cases of 48. These cases are usually made of wood and cost from 9 to 11 cents each knocked down.

CAN MAKING.

Some of the canneries in the coast States and Alaska purchase their cans ready-made, but the usual method is to purchase the sheet tin and make up the cans in the canneries. This is especially necessary in Alaska, as it would be impossible to find room on the cannery ships for such a bulk as they would make in addition to the other supplies necessary. Furthermore, the making of cans provides work for a large part of the crew, otherwise unemployed while the rest are getting ready the other necessary paraphernalia. The work is done by machinery and occupies several weeks' time.

Of recent years the objection to the great amount of space occupied by the cans when shipped by freight has been overcome by making the body of the can, pressing it flat, and shipping it in this compact shape along with the ends. At the cannery is a machine for rimming the flattened body into a round shape once more, when the end can be put on with the regular double seamer.

CANNING SMOKED SALMON.

A number of ventures in the line of canning smoked salmon have been made on this coast, but most of the pioneers were not content or able to invest the amount of capital needed and wait the time required to create a demand for such products, and soon quit.

One of the leading British Columbia packers, H. Bell-Irving & Co., some years ago put up in cans some pink salmon which had been treated to an artificial smoke in a vat, and these are said to have made a favorable impression in Australia. Another canner operating on the Fraser River smoked pink salmon, and then, cutting them to the proper length, packed them dry in half-pound cans.

In 1908 the Columbia Canning Co. put up at its cannery on Chilkoot Inlet, Alaska, some smoked salmon which had been shaved into thin strips like dried beef. These, called "Flaxamo," were packed in oil and were very good, especially in making sandwiches.

In 1915 two companies began in Seattle the smoking, slicing, and canning of coho and king salmon. These were put up in oblong flat cans of various sizes, similar to sardine cans, 2¼, 4½, and 7½ ounces, respectively, while for a special trade a 7½-pound can was also packed. These fish were cut quite thin, about 40 to 50 slices to the pound, and were packed in hermetically sealed cans with cottonseed oil. The fish were all hard smoked before slicing and canning.

The same companies are also putting up kippered salmon in cans.

Salmon loaf, made by mixing salmon with flour and various other ingredients, thus producing a paste, is also being canned by several packers.

A straight salmon paste, made solely from the flesh of the salmon, and mixed with oil and spices, is being manufactured by one of the leading packers.

HOME CANNING.

At a number of places along the coast it has become the custom for the thrifty housewives to do a little home canning of salmon for winter use when the fish are abundant and cheap, and they find canning salmon as easy as canning vegetables and fruit. The fish are dressed, skinned, and the backbone removed. It is then cut into transverse strips of a size to fit either a pint or a quart glass jar, whichever is to be used. The jars are then filled with the pieces, salted to taste, the rubber ring put on, after which the can cover is put on loosely so that the steam may escape. Strips of thin wood are placed at the bottom of a kettle or wash boiler and the cans set down on them. Enough cold water is then poured into the kettle to bring it up to within about 2 inches of the top of the cans. The kettle is then put on the stove and, after it comes to a boil, note is made of the time, and the cans are cooked from one and one-half to three hours. There seems to be a great variation in the time of cooking on the part of the operators. Some even cook only one hour, but these generally use a preservaline. About three hours seems to be the best time, as the bones are then quite soft. At the end of the cooking period the tops are tightened, the kettle removed from the stove, and the water and cans allowed to cool in the kettle.

Portable retorts and hand double seamers are now available for household use, and as a result many are using tin cans as containers. A recent improvement on the double seamer permits of the use of a tin container three times, thus materially reducing the heavy expense for cans.

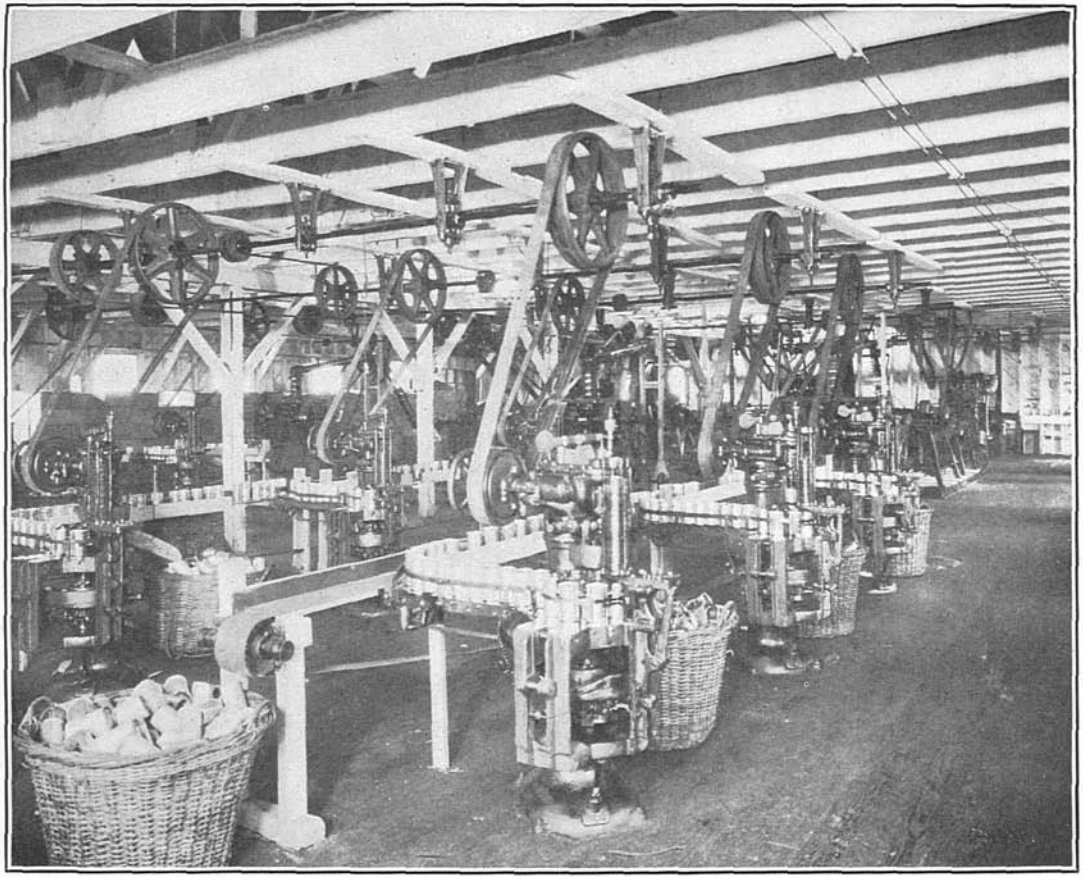

FIG. 35.—MAKING SALMON CANS.

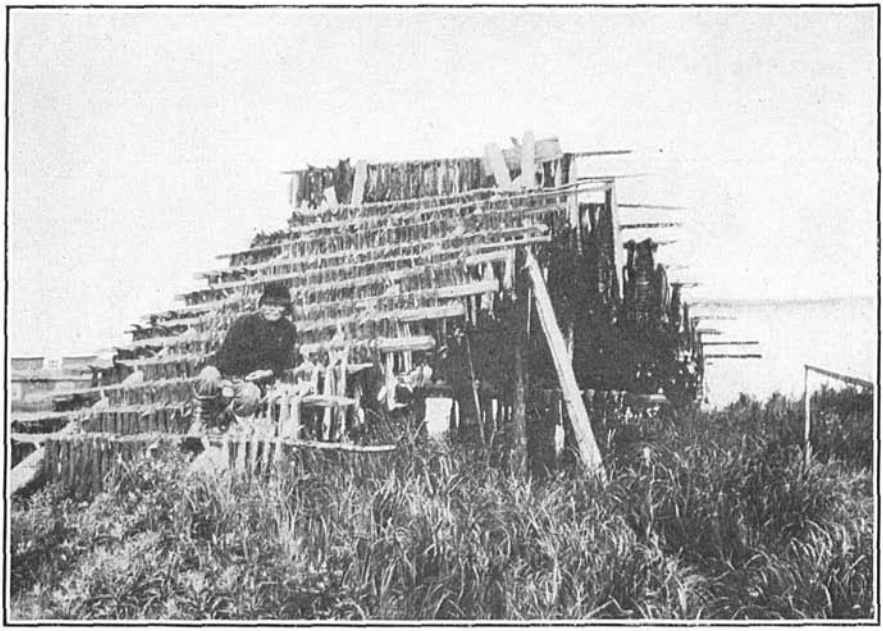

FIG. 36.—AN INDIAN SALMON DRYING RACK, BERING SEA, ALASKA.

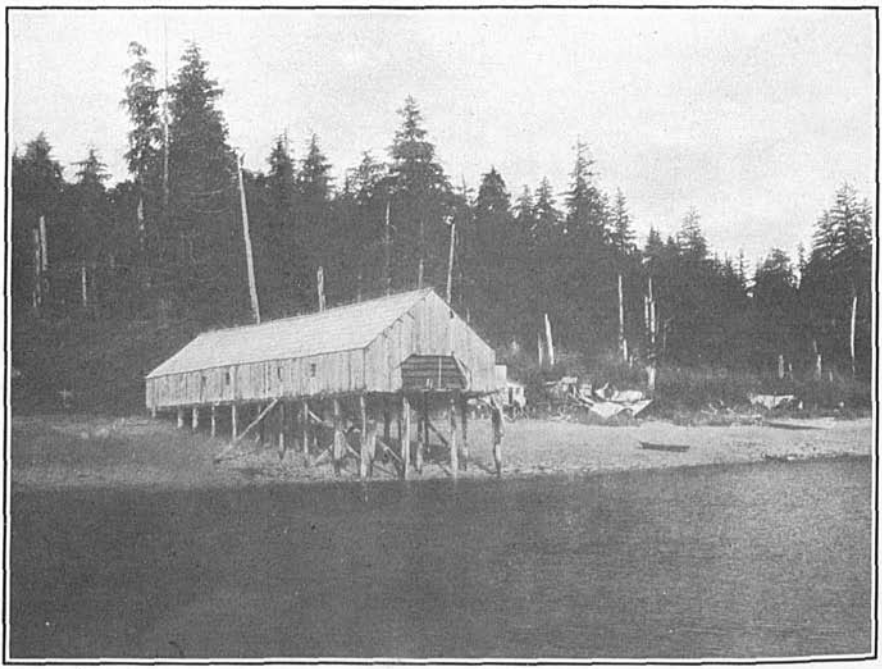

FIG. 37.—THE BARONOVICH SALMON SALTERY; THE OLDEST SALTERY IN ALASKA.

INSPECTION OF PLANTS PACKING CANNED SALMON.

For some years there has been a desire on the part of a majority of the salmon canners for some form of inspection of the plants and of the pack made. The widespread suspicion that the salmon pack of 1918 was considerably below standard, which suspicion resulted in heavy monetary loss to the packers, gave a great impetus to this desire. The National Canners' Association, an organization composed of the majority of the canners of the United States, a few years before, at the request of the sardine canners of Maine, organized them into the sardine section of the association, and by an assessment of a small sum per case raised sufficient funds to provide an inspection service to see that the plants were put into and kept in a satisfactory sanitary condition and also to inspect the goods packed and, if they were up to the standards fixed in advance, to affix to the cans suitable certificates attesting this.

At its annual convention in 1919 the association decided to extend a similar service to any other section willing to assess itself to pay the necessary expense. In explanation of its plan the association issued the following circular shortly after the convention had adjourned:

1. This service is installed by the National Canners' Association, with which a direct contract is made by each canner.
2. It runs for a term of three years and is applied in States or local territories where similar conditions are to be met.
3. The cost of the inspection is paid by the canners in the territory named through an assessment which, in the past, has been collected by the can companies with which each canner deals. This cost is added to the can invoice, and is remitted by the can companies to the treasurer of the National Canners' Association each month.
4. In order to meet the preliminary expenses of the inspection before the regular fund becomes available, each canner who signs a contract will pay into the treasury of the National Canners' Association, within 30 days after signing the contract, an assessment of one-half cent per case on his pack of 1918, on the commodities to be inspected. Should the total sum raised during the season be greater than the expenses of inspection during the season, a refund of all or a portion of the one-half cent per case will be made after a small sum is reserved to maintain a consistent surplus.
5. The treasurer of the National Canners' Association distributes this money to the local sections where the money is to be spent.
6. The National Canners' Association has no profit in this inspection—its only requirement being that each canner under inspection is a member of the association, and pays the membership and general dues.
7. A director or supervisor of inspection is appointed by the National Canners' Association who in turn appoints his assistants. The salaries of the director or supervisor and his assistants are fixed by the National Canners' Association which works in harmony with the judgment of the advisory board. The director or supervisor must be a man of superior ability, preferably one with scientific training. He must also be a good executive.
8. The director or supervisor acts in conjunction with the advisory board which may consist of five, seven, or nine members. This advisory board is elected by the canners in the States or Territories covered. The duties of this board are what its name implies, "advisors." In point of actual experience, it is found this advisory board is able to settle all practical disputes and misunderstandings which may arise under this method of inspection. There is always a final appeal to the executive committee of the National Canners' Association.
9. The National Canners' Association does not promise or guarantee to issue certificates of inspection, but in territories where inspection has existed, the certificates have been issued on products which merit the same. It should be distinctly understood, however, that this does not form any part of the contract.
10. The cost in territories where inspection has been applied has been one and one-quarter to two cents per case. It is impossible to advise in advance definitely what the cost will be, as the local conditions differ. It should be borne in mind that there must always be a sufficient number of inspectors to protect the inspection, and

if canners are widely scattered, this, as a matter of course, will increase the number numerically—not in proportion to the pack.

11. The inspection covers sanitation in plants, quarters for employees, and sanitation of the product. It is also proposed, as the work progresses, to apply inspection to the character of the raw product, and grading of the same. This grading on staples will be worked out on recommendation from the advisory board, which will be harmonized so as to give a uniform grade to each product through the entire country.

12. In localities where inspection has been installed, local laboratories purchased and financed by the funds for inspection, have been found most useful. These laboratories furnish prompt facilities for canners for testing their product and working out manufacturing problems which come up during the activities of the canning season. These laboratories are established and work in harmony with the research laboratories of the National Canners' Association, Washington, D. C.

13. This inspection can well be made the basis of a consistent publicity advertising campaign, should the industry adopt it generally, in time to guarantee its working satisfactorily during the canning season of 1919. The present plan, however, does not include this publicity campaign, as this is a matter which must necessarily be passed upon later by the canners themselves.

14. Copy of contract with each canner is herewith inclosed, or information.

On February 17, 1919, the matter of adopting this inspection system was submitted to the salmon canners of the Pacific coast and accepted by a large majority. A chief inspector and a number of assistants were appointed, who carried on a sanitary inspection of the various canneries during the following summer. It is the intention ultimately to extend this inspection to the pack itself.

INVESTIGATION OF CANNED SALMON INDUSTRY.

In 1917 and 1918 an investigation of the canned salmon industry was made by the Federal Trade Commission and many valuable statistical data were gathered and published.[a]

The following table shows, with other data, the average number of fish per case of each grade packed in the different geographical sections.

NUMBER OF FISH CANNED AND PURCHASED, NUMBER OF CASES PACKED, AND AVERAGE NUMBER OF FISH PER CASE.[b]

1916.

District.	Grade of fish.	Number of companies reporting.	Number of fish canned.	Number of fish purchased.	Percentage of fish canned which were purchased.	Number of cases packed.	Average number of fish per case.
West Alaska	Kings	7	111,381	27,175	24.39	26,003	4.28
Central Alaska	do	6	25,483	11,602	45.52	5,854	4.35
Southeast Alaska	do	20	148,286	136,597	92.12	34,344	4.31
Puget Sound	do	15	180,580	80,574	44.62	25,606	7.05
Columbia River	do	9	865,392	842,127	97.31	265,376	3.26
Outside rivers[c]	do	7	60,656	60,143	99.15	18,607	3.25
Totals and averages		64	1,391,778	1,158,218	83.66	375,790	3.73
West Alaska	Reds	8	16,564,413	1,017,042	6.13	1,223,950	13.52
Central Alaska	do	6	1,387,647	547,261	39.43	118,891	11.67
Southeast Alaska	do	29	1,609,978	784,503	48.70	123,767	13.00
Puget Sound	do	17	2,593,240	168,584	6.50	198,205	13.04
Columbia River	do	8	775,382	439,900	56.73	67,334	11.52
Outside rivers[c]	do	1	59,352	59,352	100.00	4,645	12.78
Totals and averages		69	22,990,012	3,016,642	13.28	1,736,792	13.24

[a] Report of the Federal Trade Commission on Canned Foods. Canned salmon. December, 1918. 83 pp. Washington, 1919.

[b] Report of the Federal Trade Commission: Op. cit., pp. 15, 16.

[c] Coastal streams in Washington, Oregon, and California.

NUMBER OF FISH CANNED AND PURCHASED, NUMBER OF CASES PACKED, AND AVERAGE NUMBER OF FISH PER CASE—Continued.

1916.

District.	Grade of fish.	Number of companies reporting.	Number of fish canned.	Number of fish purchased.	Percentage of fish canned which were purchased.	Number of cases packed.	Average number of fish per case.
West Alaska	Medium reds	4	394,048	46,619	11.83	36,078	10.92
Central Alaska	do	6	305,246	131,998	43.22	37,275	8.19
Southeast Alaska	do	29	1,018,014	505,937	49.67	117,422	8.69
Puget Sound	do	17	1,099,374	677,485	61.62	110,658	9.93
Columbia River	do	10	346,597	310,216	89.50	42,782	8.10
Outside rivers [a]	do	8	349,053	349,348	100.09	34,937	9.99
Totals and averages		74	3,512,332	2,331,819	66.38	379,152	9.26
West Alaska	Pinks	3	4,153,353	540,248	13.00	214,482	19.36
Central Alaska	do	6	4,102,775	1,821,558	44.39	212,169	19.33
Southeast Alaska	do	27	12,266,379	4,772,128	38.89	879,953	13.93
Puget Sound	do	8	1,800,875	607	.....	70,979	25.37
Totals and averages		44	22,323,382	7,134,541	31.99	1,377,583	16.19
West Alaska	Chums	7	1,144,595	289,663	25.30	97,528	11.74
Central Alaska	do	6	331,423	160,465	48.41	37,870	8.75
Southeast Alaska	do	28	3,661,176	2,296,478	62.72	344,213	10.63
Puget Sound	do	15	2,981,678	1,887,278	63.29	387,373	7.70
Columbia River	do	8	374,370	358,255	95.69	62,043	6.34
Outside rivers [a]	do	5	110,809	106,973	96.53	16,896	6.56
Totals and averages		69	8,604,051	5,099,112	59.26	945,923	9.10
Columbia River	Steelheads	7	103,774	102,117	98.40	16,991	6.10
Totals and averages		7	103,774	102,117	98.40	16,991	6.10

1917.

West Alaska	Kings	8	107,590	18,407	17.10	21,398	5.03
Central Alaska	do	9	34,158	19,872	58.19	6,675	5.11
Southeast Alaska	do	22	283,643	202,693	71.46	45,674	6.21
Puget Sound	do	18	209,360	105,731	50.54	53,485	3.91
Columbia River	do	10	959,846	643,063	6.99	278,291	3.51
Outside rivers [a]	do	9	45,378	43,468	95.75	12,940	2.30
Totals and averages		76	1,639,975	1,033,234	63.00	413,463	3.96
West Alaska	Reds	9	21,449,913	1,192,000	5.56	1,433,780	14.90
Central Alaska	do	9	2,271,939	974,653	42.89	189,921	11.96
Southeast Alaska	do	33	1,964,993	1,074,658	54.95	158,582	12.03
Puget Sound	do	27	4,731,861	1,233,489	26.00	372,467	12.73
Columbia River	do	7	1,213,887	688,637	56.72	98,076	12.36
Outside rivers [a]	do	2	21,868	21,868	100.00	1,769	12.36
Totals and averages		87	31,654,511	5,185,305	16.40	2,254,595	14.13
West Alaska	Medium reds	3	145,837	18,385	12.60	13,406	10.87
Central Alaska	do	9	238,572	141,424	59.29	30,430	7.84
Southeast Alaska	do	33	1,033,339	419,046	40.55	98,324	10.51
Puget Sound	do	27	813,269	501,857	73.90	91,991	8.84
Columbia River	do	10	728,221	587,879	80.72	47,861	15.11
Outside rivers [a]	do	10	394,779	376,224	95.29	34,417	11.48
Totals and averages		92	3,349,017	2,044,815	61.05	316,429	10.58
West Alaska	Pinks	2	3,958,391	1,175,743	29.70	219,508	18.03
Central Alaska	do	10	5,221,887	2,172,476	41.62	324,230	16.11
Southeast Alaska	do	33	24,166,834	10,473,748	43.30	1,362,187	17.26
Puget Sound	do	26	11,805,693	6,361,891	53.80	858,396	13.68
Columbia River	do	1	77,081	14,635	18.98	4,761	16.21
Outside rivers [a]	do	1	62,892	62,892	100.00	4,222	14.89
Totals and averages		73	45,292,778	20,261,390	44.90	2,773,304	16.29
West Alaska	Chums	9	527,982	194,962	36.92	54,215	9.74
Central Alaska	do	33	728,514	418,419	57.43	79,208	9.20
Southeast Alaska	do	26	4,087,578	2,554,968	62.49	480,895	8.50
Puget Sound	do	27	2,547,457	1,852,350	72.71	249,390	10.22
Columbia River	do	8	277,836	123,436	44.42	28,085	9.89
Outside rivers [a]	do	7	88,736	84,413	95.12	11,655	7.61
Totals and averages		119	8,258,103	5,228,548	63.31	903,448	9.14
Puget Sound	Steelheads	1	33	33	100.00	5	6.60
Columbia River	do	10	138,421	145,581	105.01	22,234	6.71
Outside Rivers [a]	do	1	787	787	100.00	126	6.24
Totals and averages		12	139,241	146,401	105.00	22,365	6.22

[a] Coastal streams in Washington, Oregon, and California.

The following table shows the relative importance of different species within each district. In 1916 the red or sockeye salmon was the most abundant, but in 1917 the humpback had usurped this place by a small m rgin.

RELATIVE IMPORTANCE OF DIFFERENT SPECIES WITHIN EACH DISTRICT.[a]

[Per cent which each species is of total pack by districts.]

District.	King or chinook.	Red or sockeye.	Medium red.	Pinks or humpback.	Chum.	Steelhead.	Total, all grades.
1916.							
West Alaska	1.6	85.4	1.6	2.6	8.8	.....	100
Central Alaska	2.0	53.7	5.1	32.9	6.3	.....	100
Southeast Alaska	.8	11.8	8.1	57.7	21.6	.....	100
Puget Sound	5.5	11.4	21.4	.2	61.4	0.1	100
Columbia River	69.9	1.1	11.2	.1	13.5	4.2	100
Outside rivers	40.0	5.4	29.7	3.0	21.8	.1	100
Per cent of total	8.6	36.8	8.3	26.6	19.4	.3	100
1917.							
West Alaska	1.2	95.1	.3	.2	3.2	.....	100
Central Alaska	1.9	72.2	3.6	13.3	9.0	.....	100
Southeast Alaska	.9	6.5	4.5	65.3	22.8	.....	100
Puget Sound	3.1	21.1	6.4	51.7	17.7	.....	100
Columbia River	71.2	1.5	13.6	.1	9.9	3.7	100
Outside rivers	39.9	2.8	32.9	9.2	15.0	.2	100
Per cent of total	6.9	34.2	5.1	38.3	15.3	.2	100

[a] Report of the Federal Trade Commission: Op. cit., p. 33.

The following table shows the relative importance of districts in the production of each species in 1916 and 1917. Southeast Alaska leads in each year, with 35.1 and 38.1 per cent, respectively. Western Alaska was second in 1916, but was forced down to third place by Puget Sound in 1917. In 1916 Central Alaska produced 21 per cent of the humpback pack, but in 1917 this was reduced to 4.1 per cent. Puget Sound advanced from 0.1 per cent of the humpback pack in 1916 to 30.7 per cent in 1917. Humpbacks run in this district only every other year.

RELATIVE IMPORTANCE OF DISTRICTS IN PRODUCTION OF EACH SPECIES.[a]

[Per cent of total amount of each species packed in various districts.]

District.	King or chinook.	Red or sockeye.	Medium red.	Pinks or humpback.	Chum.	Steelhead.	Total, all grades.
1916.							
West Alaska	4.9	59.9	4.9	2.5	11.8	.....	25.9
Central Alaska	4.0	24.8	10.5	21.0	5.5	.....	17.0
Southeast Alaska	3.3	11.2	34.4	76.0	39.1	.....	35.1
Puget Sound	6.9	3.4	28.1	.1	34.4	0.6	10.8
Columbia River	66.9	.3	11.2	.1	5.8	98.5	8.2
Outside rivers	14.0	.4	10.9	.3	3.4	.9	3.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1917.							
West Alaska	3.4	53.5	1.3	.1	4.0	.....	19.1
Central Alaska	3.3	24.9	8.2	4.1	6.9	.....	11.8
Southeast Alaska	4.9	7.2	32.8	64.6	57.0	.....	38.1
Puget Sound	10.3	14.0	28.0	30.7	26.1	.....	22.6
Columbia River	66.7	.2	17.1	.0	4.1	98.4	6.4
Outside rivers	11.4	.2	12.6	.5	1.9	1.6	2.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] Report of the Federal Trade Commission: Op. cit., p. 34.

MILD CURING.

The beginning of the business of mild-curing salmon, or "sweet pickling," as it is sometimes called, is of comparatively recent date.

In 1889 a German dealer came to the Columbia River and tried to interest some of the cannery men in the business. J. O. Hanthorn, M. J. Kinney, and J. W. Cook were persuaded to prepare some, and the plant of the Northwest Cold Storage Co., at Portland, was used to keep the fish at a low temperature during repacking and preparation for shipment. These fish were shipped to Germany, but the shippers received no financial returns, word coming back that the fish were not satisfactory.

Owing to this lack of success from the first effort, no further attempt was made until 1894, when Mueller & Loring, of Chicago, put up a carload of mild-cured salmon at Kalama, Wash., and shipped it to Germany. In 1896 Charles Ruckles and Wallace Bros., of Kalama, packed several carloads for the German market. It was not until 1898 that the business was permanently established on the Columbia, the Trescott Packing Co. and S. Schmidt & Sons putting up plants at Warrenton and Astoria, respectively.

In 1900 the Trescott Packing Co. began packing the spring and fall runs, and the Sacramento River Packers' Association packed the fall run, on the Sacramento River, the business being carried on here every year since.

In 1901 the Sacramento River Packers' Association began at Monterey the mild curing of the spring salmon that were taken with hook and line in the open ocean.

S. Elmore & Co. started the industry in 1902 at Tillamook, and the business began on Puget Sound in 1901, when the San Juan Fishing & Packing Co. and the Seattle Fish Co. took it up. The Pacific Cold Storage Co. began the next year at Anacortes.

Prior to 1906 several of the Alaska cannery men put up each season a few tierces of mild-cured salmon, but it was not until this time that the industry really began as such. In that year J. Lindenberger (Inc.) started packing at Ketchikan, Alaska. The following year several other plants were started, and in 1910 almost all of the king salmon taken in southeast Alaska were mild cured. The same is true to-day.

For mild curing the fresh fish must be given greater care in handling than is the case with any other process. Care must be exercised to see that the flesh of the fish is not bruised or broken, and in order to make sure of this the handlers usually pack several fish in one box, with cracked ice over and around them if the weather is warm. As soon as a box is filled, it is put in the hold, where the boxes are stacked one upon another, but prevent more weight than is represented inside one box coming upon any one fish.

In dressing, the head is removed, care being taken to leave as much of the bony structure of the head as possible to assist in holding the side of the hooks when it is being smoked later on; the fish is then split down the belly to the vent, the entrails removed, when a cut is made on either side of the blood clot in the back, and the fish passed to the "washer," who holds the fish on its back in a slot on the table under a spray of water, and removes the membrane of skin which covers the inside of the backbone and inside of which a good

deal of thick blood lies, by means of a large spoon or some similar form of scraper. A knife should not be employed. Some curers do not remove the fins at this stage, while others do.

The body is then scored along the sides with a small knife, care being used to cut the skin only; this allows the salt to penetrate more freely and thus assist the process of cure. A specially prepared eccentric wheel is sometimes used for this purpose, which makes a series of small cuts varying from half an inch at the tail to 1½ inches long at the shoulder, and from 2 to 3 inches apart.

The fish is now ready for the splitter, who turns it on its back with the open belly toward him and forces the shoulder down on a sharp-pointed nail, so the fish will not slip during the operation. A crosscut is first made across the root of the tail to the bone, but no deeper. Then the knife is entered at the vent, immediately above the bone, and a cut, which should go no farther back than the middle of the backbone, is drawn down to the crosscut already made. Then raising the lug with his left hand, the splitter enters the knife at the shoulder above the bone, and with one sweep from head to tail, separates the entire side. This is the more easily done if the fins have been previously removed. If the work is perfect, there will be no flesh left on the bone, but a line of fat will show down the center of the side. This improves the appearance of the fish and adds to its value.

In order to remove the bone from the remaining half of the fish, the splitter inserts the knife under the bone, about the vent, and draws down toward the tail, but care must be taken, as before, not to go farther back than the spine. The splitter now takes the fish off the nail, holding it by the lug, his left thumb resting on the upper, or inside of the fish, and his fingers on the lower, or skin side. The tail is now pointing away from the splitter, who enters his knife carefully under the backbone, and with one dextrous outward sweep separates the bone from the fish right down to the root of the tail. When abreast of the crosscut, however, he turns the knife sharply downward, and cuts off the fish the same as on the other side. As with the first half, no flesh should be left adhering to the bone, and the line of fat should show down the center. In other words, the two sides should be exactly alike.

The sides are dipped into cold water in the dress tank, and are then laid, skin side down, on the table with the thin or belly edge toward the front. A man then removes any blood remaining in the veins on the inside of the fish, by pressing it away from him toward the back of the fish, either with his fingers or with a spoon. If the blood is not squeezed out in this way the salt will harden it during the process of curing, and the flesh will become dark in color. The sides are then dipped in a tank of weak brine and crushed ice to give them a final wash, but should on no account be left to soak in the brine. Upon removal, they are again scraped to insure the removal of all the blood from the veins.

Great care must be used in handling the newly split sides, as they are very tender and may be easily broken or bruised. In lifting them by the lug or collar bone, the curer should have his fingers to the inside and his thumb to the outer or skin side; otherwise the skin may be broken.

The sides are then taken to the salter, who lays them, skin side down, on a salting table, on which has been dumped a quantity of dairy salt, and gently rubs the flesh with the salt, lifts it up with only such salt as will adhere to it, and places it in the tierce.

The tierces in which the salmon sides are packed are stout casks made of fir or spruce, bound with six strong galvanized hoops. They contain about 800 pounds of fish, but when full of pickle the gross weight of cask and content is between 1,100 and 1,200 pounds. A plug hole is bored in the head of the tierce.

Two or three handfuls of salt are thrown over the bottom of the tierce, then a layer of salmon sides, skin down, and two or three handfuls of salt are sprinkled over them. In packing two sides of fish, crossed head and tail are packed close to opposite sides of the tierce, the back or thick part of each side being placed close up against the side of the tierce. Other sides of fish are packed from the sides toward the center of the tierce, napes and tails alternately, the back of each side being drawn halfway up and resting on the side already laid. When complete, the layer should be perfectly level, and this depends a good deal on how the last or center piece is laid. Salt is sprinkled between each layer in the manner and quantity noted above and the process continued until the tierce is full. The tiers should be crossed in packing. The top layer should be placed with the skin up and have extra salt put on. From 85 to 100 pounds of salt are used to 800 pounds of fish.

The tierce is then headed up, after which pickle is poured in until the tierce is quite full. This pickle may be made with the same salt as is used for rousing and sprinkling the fish. Perfectly clear water should be provided and broken ice should be added in liberal quantities, if the weather is warm. Before using, the pickle should be strained through a fine sieve or a clean cloth, to remove froth and sediment. A centigrade saltmeter is used by most mild curers. The pickle is made to a strength of at least 90°, but it usually weakens to about 70° during the first 10 days of cure, whereas after repacking it should not readily come below 85°, and it should retain that strength for a long time.

When tierces have been filled with pickle they are rolled inside a cold-storage room, with a temperature of 35 to 38° F., where they may be tiered two tiers high. Very little variation in the temperature is allowable, as it would start the oil or fat in the flesh, allowing it to escape into the brine.

Unless the tierces are kept quite full of pickle the sides of fish are apt to be broken when the cask is rolled about. The tierces must be examined frequently to see that they are full of brine, as there are always small leaks, while the staves absorb more or less moisture. Furthermore, if the tierces were allowed to leak, ugly yellow spots would show on the parts of the fish that were left dry. Thus it is of the utmost importance, both during the two or three weeks allowed for pining and also after repacking, to see that they are kept full of pickle. Several gallons of pickle may be absorbed by each cask during the first two or three weeks of cure.

The actual shrinkage during the two or three weeks in which the fish lie in the first packing may be reckoned at 30 per cent. Fat, well-conditioned fish, especially those which are caught in the ocean, shrink less, but poor fish, especially those caught when well on their

way to the spawning grounds, shrink more—sometimes up to 35 per cent.

After holding the fish in storage for at least 20 and not more than 90 days they are taken out of the tierces. Each side of fish should be lifted out carefully, as described above, and sponged with a large sponge until all salt and slime are entirely removed, leaving only a clean, red side of fish. Either pure ice water or ice pickle may be used for this washing, but it will depend entirely on the quality and condition of the fish. Soft, poor fish would require pickle, but good firm fish may be washed in clean ice water.

The sides are then weighed and graded accordingly, 6 to 8 pounds, 8 to 10 pounds, and so on, being the grades. Sides of 11 pounds and over are called *large* fish, and "L" is marked on the side of the tierce. Some curers grade their sides from 9 to 11 pounds and class them as *medium* and mark them "M;" smaller sides are termed *small* and are marked "S."

After the sides have been graded they should be counted and repacked, the defective sides, such as thin-bellied, torn or broken, being put by themselves. Fish which are considered perfect are called No. 1; those which do not come up to that standard are termed No. 2, and are marked accordingly; while fish that have any taint of sourness are marked "T." In repacking, the sides of fish should be replaced as nearly as possible in their original position, those curved in shape being placed against the sides of the cask and straight pieces laid in the center of the tier. No salt is used in repacking, but as soon as the tierce is filled, the head put in, and the air test applied it is laid on its bilge and filled up with ice-cold pickle made to a strength of 90° salometer (90 per cent saturation) that can be made from fresh or salt water, whichever is handiest and cleanest, half-ground salt being used. There will be about 830 pounds of fish on an average in the tierce after repacking, and some 14 gallons of pickle may be required to fill the cask up. They are then put back into cold storage and pickled at the bilge daily for at least a week. If kept for any length of time, they would, of course, have to be tested, regularly—a tap with a hammer would do—and any leakage promptly rectified. If properly cured, the fish should keep in good condition for months in cold storage, provided the casks are sound and kept full of pickle.

On the head of each tierce are put the following marks: Initials of packer or packers; initials of place where packed; number of tierce (consecutive); number of sides in tierce, the tare, and the gross weight (weight of pickle not counted); quality of fish (I, II, or T); and size of fish (L, M, or S).

If of first quality, no mark is necessary, but second-quality and tainted fish have to be noted.

In the early days of the industry different preparations, which included salicylic and boracic acids, were used to help preserve the fish. This caused much complaint from the Germans, and finally their Government subjected our product to a rigid inspection, with most salutary results, as now it is one of the purest and best products put up on this coast, the use of acids being done away with entirely.

The king salmon is almost invariably the species mild cured, being the only one large enough to answer the requirements of the trade. In 1907 a Ketchikan (Alaska) packer put up a quantity of coho, dog, and humpback salmon, but he found so much difficulty in disposing

of the product that he abandoned further efforts in this line. A few cohos are put up each year.

The principal consumers of the mild-cured salmon are the smokers, who take them from the tierce, wash and soak them for a few minutes, and then have a practically fresh fish to smoke, and not, as in the days when hard-pickled salmon were used, one that had lost most of its oil and flavor through the excessive amount of salt needed to preserve it.

The greater part of the product put up on this coast goes to Europe, Germany being the principal consumer, but considerable quantities are sold in Norway, Sweden, and other countries, while the smokers of the cities east of the Rocky Mountains use large quantities every year.

In Germany, the principal market for mild-cured salmon, nearly all of the fish are smoked. One of the most popular ways of using the smoked salmon is in the making of sandwiches, and probably the greater portion of these are used in the beer halls and the automatic restaurants in that country.

PICKLING.

The earliest method of preserving salmon on the coast was by pickling. At times this industry attained to large proportions, but during the last 10 years it has been declining, largely because the canners are able to pay more for the raw fish than the salters. All species of salmon are pickled, but the most popular is the red salmon.

In dressing salmon for pickling the head is removed, the fish split along the back, the cut ending with a downward curve on the tail. The viscera and two-thirds of the backbone are removed, and the blood, gurry, and black stomach membrane scraped away. The fish are then thoroughly scrubbed and washed in cold water. They are next placed in pickling butts with about 15 pounds of half-ground salt to every 100 pounds of fish. The fish should be laid in a tier, flesh side up, and the salt well sprinkled over it, repeating until the tank is full. Several boards are then laid across the fish and these are weighted down with large stones in order to keep the fish submerged in the pickle which will form. The fish remain here about one week, the brine being held at about 90°. They are then removed, rubbed clean with a scrub brush, and repacked in market barrels, one sack of salt being used to every three barrels of 200 pounds each. About 40 to 52 red salmon, 25 to 35 coho salmon, 70 to 80 humpback salmon, 10 to 14 king salmon, and 25 to 30 dog salmon are required in packing a barrel of pickled salmon.

A few salteries also pack "bellies." This product is merely the belly of the fish, which is the fattest portion, and as most of the packers threw away the rest of the fish, thus causing a very large waste of choice food, this method has come under the ban of the law in some of the coast States and in Alaska. As a result, but few "bellies" are packed now, and most of these only when some economic use is made of the remainder. Humpback salmon furnish the major part of the "belly" pack.

In preparing salmon bellies, the operator first cuts off the two pectoral fins, and them removes the head, care being taken to follow the curve of the body until the backbone is reached, which should

then be severed straight across. With the smaller salmon the fish is then turned on its back, and the operator inserts his knife in the body just above the backbone and cuts down through the body, the knife coming out just in front of the vent. If properly done, the cut will come close to the upper wall of the stomach. With large king salmon it is sometimes necessary to make the cut first on one side, then turn the fish over and make the cut on the other side. The belly is then laid flat on the cutting table and the membrane at one end cut so the belly will lie flat. The bellies are then washed and salted the same as hard-salted salmon.

When bellies are cut, the backs are saved and either dried in the open air, without salt, or else pickled.

With large kings, the operator, after the belly has been cut out, scrapes the inside of the remainder of the carcass. The knife is then inserted under the backbone at the end nearest the tail, and it is cut away with as little flesh as possible adhering to it. The blood is then scraped off, the fish thoroughly washed, and then salted the same as the whole fish.

Some of the old-time fishermen save parts of the salmon heads as food. In this event, the head is split lengthwise clear to the bony covering which protects the top of the head. The gill rakers are then removed from each side of the split head, leaving the nutritious parts intact. The cleaned heads are then salted down the same as whole salmon.

DRY SALTING.

During the progress of the Russian-Japanese War the preparation of dry-salted dog salmon became an important industry, but as soon as the Japanese fishermen resumed their former occupations the demand fell off so much that the industry was virtually abandoned in the United States, although a number of Japanese continue it in British Columbia. The fish, after being dressed, were packed in boxes, in salt, these boxes holding about 560 pounds of fish, and were shipped in this condition to Japan.

At a number of places in Alaska the bellies of red and coho salmon are cut out and salted, after which the backs are dried in the sun and, thus cured, are used for fox food at the numerous fox ranches. This product is called "ukalu."

SMOKING.

The smoking of salmon is virtually a continuation of the pickling, as the fish must be pickled before being smoked, the main purpose of the pickling being to preserve them until the time arrives for smoking, which may be weeks or months after the fish are caught. For smoking the salmon are taken out of the barrel and soaked until as much of the salt as possible is removed. They are then put into the smokehouse and subjected to the heat and smoke of a fairly hot fire for about two days in order that they may be thoroughly dried and hardened. Exposure to a smoldering fire (alder wood is a favorite fuel) for about three days completes the process.

For shipment smoked salmon are packed in wooden boxes, oil paper being placed between the fish.

In the manufacture of smoked salmon, the mild-cured product is most in demand. The necessary quantity of sides is taken from the

cold-storage and placed in large tanks filled with fresh water. In these they are soaked over night, the water being changed several times, depending upon the salinity of the fish, the variation of which depends upon the length of time the product has been held in storage, those held longest absorbing the most salt.

After soaking, the sides are taken from the tanks, piled on tables, and allowed to drain as much as possible. They are then taken one at a time, laid flesh side down, and a bacon hanger, which is made of wire and has six or more points bent at right angles to the frame, terminating at the top in a hook, is pressed firmly into the flesh on the skin side and at the upper end of the side. They are then hung upon a round stick, which latter is then set in position in the smokehouse, each end resting upon supports on the side. The fish are placed so that no two of them will touch. When the smokehouse is full, a small fire of any nonresinous wood is then built underneath to dry them, the ventilator in the top being left open so the moist air can escape. The fires should not be allowed to become too hot; the object is to give the fish smoke rather than heat, as in the latter case they would become partially cooked. For a mild cure, for ready consumption, from 8 to 10 hours, according to the condition of the fish, should be sufficient. If immediate sale should not be possible the fish must be kept in a cold-storage room with a temperature of about 24° F.

In sections where the products move more slowly into consumption, a harder smoking is wanted. In this event, they are held over the fire until dried, which would depend upon climatic conditions, but probably around two days. After the fish have dried sufficiently, the fire is smothered with sawdust, which produces a dense smoke, giving the sides their color. During the latter period the ventilator is partly closed, but must be watched to prevent the fish from sweating.

When thoroughly smoked the sides are removed from the smokehouse, taken off the hanger, and each side wrapped in paper, then packed in wooden boxes holding each 30 pounds.

Kippered salmon.—On the Pacific coast practically all of the kippered salmon is prepared from frozen white-meated king salmon, which on account of the color of the flesh is not in much demand. It is, however, fully the equal, in both flavor and food value, of the red-meated kings. It is not absolutely essential that the fish be first frozen, as the fresh fish may be kippered after dressing, but the latter is always a little soft when so prepared, owing to an excess of moisture, which is largely removed in freezing. Fresh salmon is available only part of the year, so it is found most convenient to freeze and store the stock and work it up when needed throughout the year.

Before freezing, the fish have been dressed, so when thawed in cold-running water, it is only necessary to split and cut them into pieces of a pound or less, these being about 6 inches long, or perhaps 3 inches broad, depending upon the part of the fish the piece is taken from, and place them in a tank of strong brine to season for several hours. They are then dipped in a harmless vegetable coloring, similar to that used by the butchers for coloring sausage; this gives the outside of the product a red color, a concession to popular prejudice.

From the coloring tank, the pieces are placed on a tray with wood frame and bottom of one-half inch square meshed wire; care is taken that the pieces do not touch each other.

The tray is then slipped into a rack which will hold a number of these, placed one above the other, and this rack is then run on a track into the smokehouse.

A medium fire is then kindled which dries and slightly smokes the pieces from 16 to 18 hours.

When they reach a proper stage the fire is enlarged, but great care must be exercised in order to prevent their being overheated, and this is done by means of the damper at the bottom of the smokehouse and the ventilator at the top. The fish are baked in this manner from 25 to 35 minutes, the thermometer showing from 250 to 275° of heat.

When the cooking is completed the cars are pulled out and the fish allowed to cool, after which each piece is wrapped in a square of parchment paper and packed in a box or basket which holds 10 pounds.

The product is quite perishable, and if it can not be used at once, when of course it is at its best, must be placed in cold storage. The packer endeavors to turn out daily only the amount he can market that day.

Beleke.—A smoked product, known locally as "beleke," is put up at Kodiak, Alaska, from red and coho salmons. Steelhead trout are the best for this purpose, but are not often utilized owing to their scarcity in this region. In preparing "beleke" only the backs of the fish are used, the belly part being cut out and pickled separately. The backs are divided into three grades, according to size, viz, "small," "medium," and "large." They are first put into a brine, the "large" being put in first, followed by the "medium" and "small" at intervals of one hour each, so that all will be cured at about the same time. The coho backs, being the largest, are kept in the brine from 19 to 20 hours, while the red salmon backs, which are smaller, remain in the brine only about 16 hours. After being thoroughly salted the backs are removed from the brine and rinsed in fresh water, then hung in the air for about 24 hours to dry and to allow a thin skin to form on the outside. They are then hung in the smokehouse, in the presenec of a little fire of cottonwood or alder. On dry days the gable windows are thrown open and the wind allowed to pass through while the smoking is going on. The smoking must be done slowly, two weeks being devoted to it.

There is a good demand for this product locally, the fish selling for from 15 to 20 cents a pair, but little effort has been made to extend its sale outside of central Alaska.

FREEZING.

The process of preserving fish by freezing was first introduced in 1888. Previous to this the comparatively ancient method of packing with ice, or in rare instances letting the fish freeze naturally during the winter months, was followed. Packing with ice is in quite general use to-day for shipments of fish which are to be preserved for short periods of time. Cooling with ice never results in a temperature lower than 32° F., which, of course, does not freeze the fish.

The freezing of salmon and steelhead trout began on the Sacramento and Columbia Rivers in the late eighties. It was taken up in a small way on Puget Sound in 1892. That year Wallace Bros. and Ainsworth & Dunn froze a small lot, the work being done for them by the Seattle Ice Co. (now the Ice Delivery Co.), and the venture was so successful that the next year nearly all of the wholesale dealers on the Sound took up the business. The Crescent Creamery, of Tacoma, also engaged in the business for the fish dealers for a year or two shortly thereafter. In 1902 the British Columbia Packers' Association bought a large cold-storage plant at New Westminster, British Columbia, at that time the only large and modern plant in the Province, and began the active freezing of fish. Since then a number of excellent plants have been built and operated. In Alaska the preparing of frozen salmon began in 1902. The San Juan Fishing & Packing Co., soon to be succeeded by the Pacific Cold Storage Co., put up a cannery and cold-storage plant at Taku Harbor, in southeast Alaska, in 1901, though it did not operate the cold-storage portion until 1902. The Taku Harbor Canning & Cold Storage Co. later on succeeded to the ownership and operation of this plant. This is the only plant which was operated in Alaska until the New England Fish Co. erected in 1909 a large plant at Ketchikan for the freezing of halibut primarily, but considerable quantities of salmon have been frozen also.

In 1911 the schooner *Metha Nelson* was fitted up as a floating freezer by the Alaska Packers Association and sent to Kodiak Island. As the vessel arrived in San Francisco shortly before the State's closed season on salmon began, and it was a difficult matter to dispose of the catch before then, the business was abandoned.

In 1912 J. Lindenberger (Inc.) opened a freezing plant at Craig, on Fish Egg Island, Alaska, while the ship *William H. Smith* was outfitted as a floating cannery and freezer by the Weiding & Independent Fisheries Co., at Saginaw Bay, Alaska. The latter operated only one season.

The year 1913 saw quite a development in the industry. The Columbia & Northern Fishing & Packing Co., at Wrangell, the Juneau Cold Storage Co., at Juneau, the Booth Fisheries Co., at Sitka, and the floating cold-storage ship *Glory of the Seas*, by the Glacier Fish Co., at Idaho Inlet, were all started this year.

In 1914 the Ketchikan Cold Storage Co. opened a freezer for the general commercial freezing of fish.

In 1917 the San Juan Fishing & Packing Co. built and operated a cold-storage plant at Seward.

In 1918 Henry Goemaere operated for the first time a plant at Washington Bay; while the National Independent Fisheries Co. and the Trout Fisheries Co. froze salmon at Ketchikan. All the other freezers operated as usual, the only change being the purchase by Libby, McNeill & Libby of the cold-storage plant and cannery of the Taku Harbor Canning & Cold Storage Co. at Taku Harbor.

The freezing of salmon is almost invariably carried on in connection with other methods of handling and preserving, and the purpose is usually to secure the fish when numerous and cheap, freeze them, and then hold them until the runs are over and the fish are once more in good demand at high prices. The business proved so profitable,

however, that the dealers began to look for wider markets for their product. Europe, more especially Germany, was prospected and a profitable market soon developed, with the result that to-day frozen Pacific salmon can be secured in nearly every town of any size in western Europe, while large quantities are marketed all over our own country.

There are four important features in packing and using frozen salmon: (1) To get fresh fish; (2) to keep them cold (about 15° above zero) after they are frozen; (3) to keep a coat of ice on them; and (4) to allow them to thaw slowly in cold water or in the air before cooking.

In selecting salmon for freezing, only the finest and freshest of each species are used. The current belief that freezing destroys the flavor of the fish is erroneous, the flavor depending entirely upon the condition before freezing, and the quicker they are frozen after being caught the better will the natural flavor of the fish be preserved. Frozen salmon are just as wholesome as fresh, and their chemical constituents are almost identical. The danger lies in the temptation to freeze the fish after decomposition has set in, but, fortunately, this is now very rarely practiced in the salmon industry.

The coho, or silver, and the chum, or dog, salmon are the choicest of the salmons for freezing. The other species, except the red, or sockeye, which is too oily and rarely frozen, are also frozen in varying quantities. The steelhead trout, which is ranked by the Pacific coast dealers among the salmon, is considered the choicest fish of all for freezing.

Some of the most modern plants in the country are on this coast. These have numerous freezers, generally, in which a temperature of from 25° to 30° F. below zero can be maintained if desired, although a temperature of more than 10° below zero is rarely ever required. All freezing is by direct expansion and each freezer is piped with about 2 feet of 1¼-inch pipe per cubic foot of freezing space. The bunkers in the freezers are in pairs, generally nine pipes wide, spaced 10 inches apart. This leaves about a 3½-foot passage through the center of each freezer opposite the swing doors. The salmon are laid on metal sheets, which are placed on the tiers of pipes.

After freezing the salmon are passed through openings in the rear of the freezers into the glazing room, which has a temperature of about 20° F., where they are dipped into water, and when removed are covered with a thin glaze of ice, which may be thickened by repeated dippings. This is an extra precaution to exclude the air from the fish.

After being thoroughly frozen and glazed, each fish is covered first with a parchment, like rolls of butter, and then with a piece of heavy brown paper. They are then packed in boxes holding about 250 pounds each, placed in cold-storage cars and shipped.

The method of freezing fish in brine is now under serious consideration by a number of fishermen and dealers A brine freezer may be of small capacity and carried on a fishing boat or it may be a freezer of large capacity at some central point convenient for receiving the catches. In this method a strong brine solution, cooled by circulation through crushed ice, is used for freezing the fish. By this method large fish may be frozen in from 1 to 3 hours, a great saving in time as compared with the method at present in use.

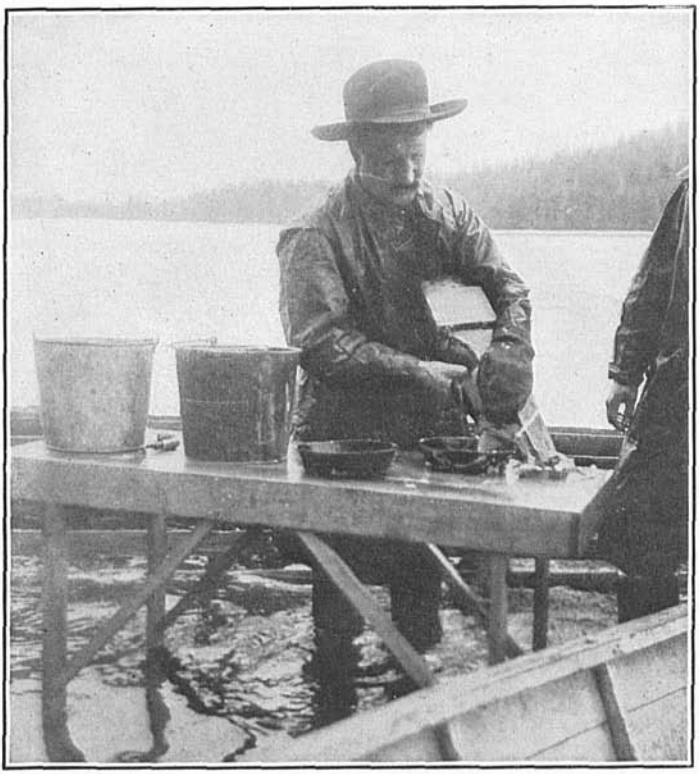

FIG. 40.—STRIPPING SALMON WITH AID OF STRAIT JACKET.

FIG. 41.—CHEHALIS HATCHERY, WASHINGTON FISH AND GAME COMMISSION, SHOWING RACKS TO PREVENT SALMON FROM GOING UPSTREAM, AND PEN FOR HOLDING SPAWNING FISH.

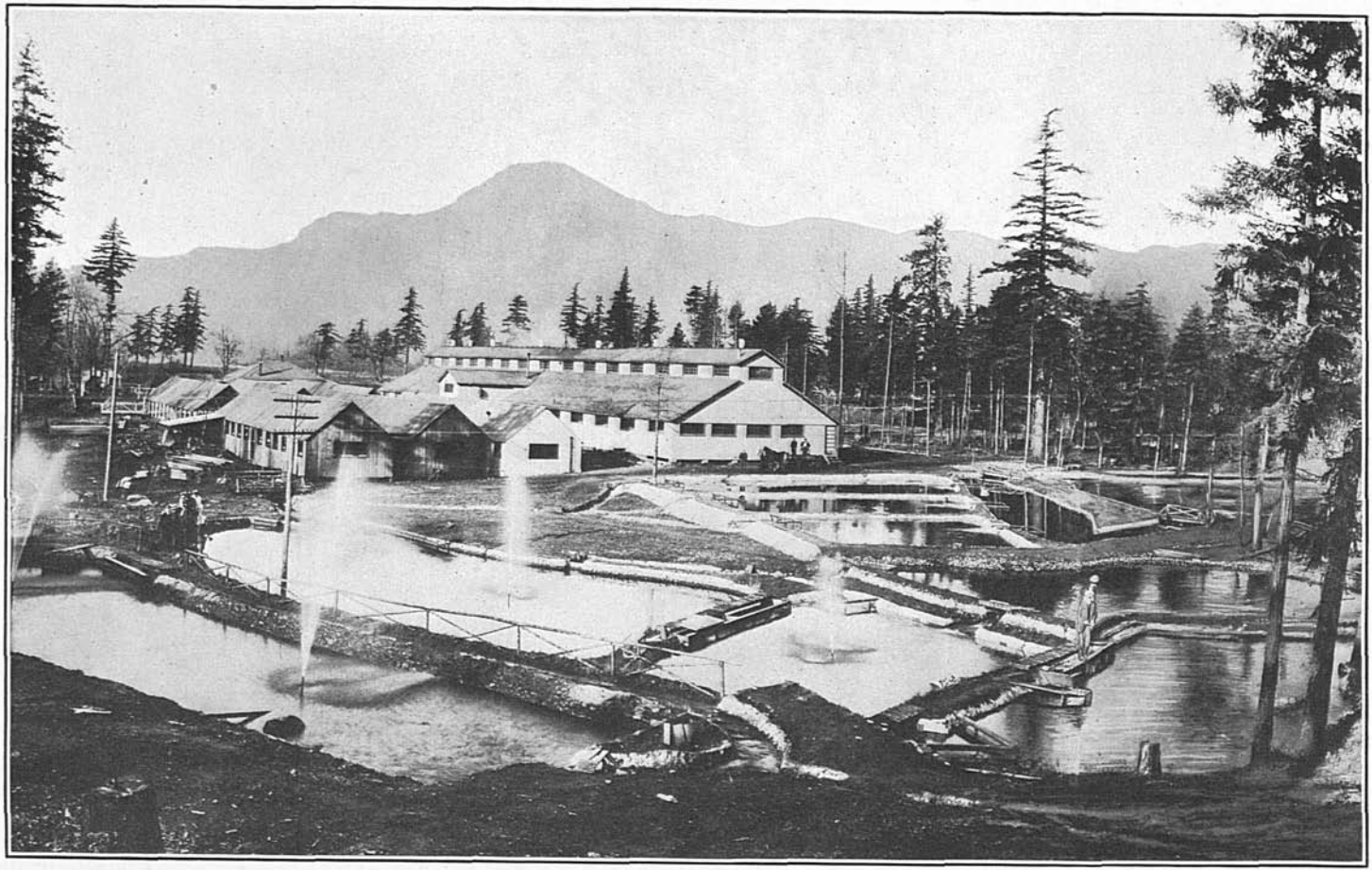

FIG. 42.—BONNEVILLE SALMON HATCHERY OF THE OREGON FISH AND GAME COMMISSION, SHOWING REARING PONDS.

UTILIZING SALMON EGGS AND MELT.

Every year immense quantities of salmon eggs are thrown away in the fisheries of the west coast, though t ere is but little doubt that, if properly prepared, a market could in time be found for this now waste part of the fish. In France there is a good market for a product known as "rogue," which is the spawn of cod, haddock, hake, and pollock, salted in casks, and which is used as bait in the sardine fisheries. Salmon spawn is the choicest and most successful bait used on this coast, and if properly prepared would undoubtedly answer the purpose as well as the regular "rogue" if not better, owing to its oiliness and attractive color. The roes should be soaked for some days in old brine and then packed in strong casks holding about 25 gallons each. It might also prove to be a good bait for tolling mackerel on the Atlantic coast.

In 1910 a considerable quantity of salmon roe was prepared in Siberia and sold in competition with caviar, which is prepared from sturgeon eggs. The product met with favor in Europe and now large quantities are prepared each season.

In this country Miss Ida Tuholski, of San Francisco, who had been engaged in the preparation of sturgeon caviar for some years, put up a number of sample lots of salmon caviar which are fully the equal of the best sturgeon caviar. Capital has been chary, however, about engaging in the business, although undoubtedly it will be an important industry some day.

For making caviar the eggs should be as fresh as possible, and in order to make sure of this the salmon are taken alive, if possible, shortly after coming from the water, killed and bled, the belly opened up and the roe taken out. This work can best be done on work and living scows anchored close to the fishing camps. The roe is placed upon a stand, the top of which is formed of a small-meshed galvanized-iron wire screen. On the underside is arranged a zinc-lined trough. The operator gently rubs the mass of eggs back and forth over the screen, the mesh of which is just large enough to let the eggs drop through, and, as they are separated from the membrane by the rubbing, they fall through into the trough and are thence drawn off into tubs by means of a sliding door at the end of the trough.

After all the roe has been separated the tub is removed and a certain proportion of salt (the sturgeon caviar makers employ the best Luneburg, Germany, salt in this work, while some of the Siberian makers of salmon caviar use No. 2 Berkshire salt from England) is added to the roe, after which the mass is mixed with the hands. The most delicate part of the whole operation is in the manner of mixing. No direct rule can be given for doing this portion of the work, as the condition of the roe regulates the time consumed and the manner of handling. It requires practical experience to become proficient, but this should be an easy matter for one used to handling salted products. The sturgeon caviar makers use about 11 pounds of salt in preparing a keg of caviar.

After the salt has been added the mass of eggs first dries up, but in a few minutes the strength of the salt draws from the eggs their watery constituents and a copious brine is formed, which can be poured off when the tub becomes too full. In Siberia the caviar

makers put the eggs into a brine solution of 19 to 22 per cent Baumé strength immediately after they come from the trough. The salted eggs are then poured into very fine-meshed sieves which hold about 10 pounds each. In the caviar house are arranged long, sloping boards with narrow strips nailed on each side. On these the sieves are placed and left here from 8 to 20 hours in order to thoroughly drain.

The Siberian caviar makers hasten the operation by putting the eggs into a brine solution as noted above, leave them there for from 25 to 45 minutes, then place them in bags and subject them to heavy pressure, after which they are packed. While this method occupies less time, it is not thought the resulting product is as good as that prepared by the slower method outlined above.

The eggs are then transferred to small casks (holding about 135 pounds). The sturgeon caviar makers use oak or pine casks, but some of the Siberian makers say that oak casks turn the salmon caviar black. The casks are steamed before use in order to prevent any possible leakage. It is especially necessary that the kegs or barrels used be air-tight, as otherwise the product will spoil. Barrels such as used in packing salt salmon are rarely ever tight enough to hold caviar. The casks are covered and allowed to stand until the gas escapes and the eggs settle. The vacant space caused by the settling is then filled, the cask headed up and put in a cool place until ready for shipment.

The Siberian salmon caviar makers use a small quantity of "preservaline" in each keg for the purpose of aiding in preserving them, as cold-storage facilities are quite primitive as yet in that country, and it is the addition of this powder which forms the mysterious part to the uninitiated. No preservative would be needed in Alaska, however, as the kegs could be shipped in cold storage along with the mild-cured salmon.

Several establishments are putting up these eggs in jars and hermetically sealed cans for use as bait in sport fishing.

In 1916 one of the companies operating in Alaska put up some salmon melt in cans. No difficulty was experienced in canning this product and it met with considerable favor from those who tried it, but nothing has been done with it since.

MISCELLANEOUS PRODUCTS.

A few years ago a company on the Columbia River put up what was known as "fish pudding." In preparing this the salmon was ground fine, mixed with milk and eggs, and then packed in tin cans. The preparation was soon abandoned.

In 1903 one of the Point Roberts canneries packed a new product which was called "salmon paste." For this the fish was ground up, cooked, seasoned with spices, etc., and made into fish balls, a very palatable dish when warmed over.

In 1905 a Seattle concern began the manufacture of wienerwurst sausages from halibut and salmon.

The Indians in the Bristol Bay region of Alaska occasionally dress the skins of salmon and make of them leather for the tops of boots, also bags and other small articles.

A product, which was first made in Norway, is prepared by means of an invention which quickly dries and pulverizes the flesh of fresh

fish. The resulting powder, called "fish flour," is easy to transport from one place to another and has great nutritive value. It is probable that the tailpieces of the fish, which are at present thrown away, and the cheaper grades of salmon might be prepared in this way and thus furnish another market for salmon.

MEAL, FERTILIZER, AND OIL.

As early as 1888 there was a small plant at Astoria, Oreg., where the refuse of the canneries was utilized for the manufacture of oil and fertilizer. In that year 8,000 gallons of oil (chiefly from salmon heads) and 90 tons of fertilizer were prepared. The oil was worth 22½ cents per gallon and the fertilizer had a market value of $20 per ton. Most of the refuse was dumped into the river, however. In 1898 a similar plant was established in the Puget Sound district of Washington. At present the plants of the Robinson Fisheries Co. at Anacortes; the Pacific American Fisheries at Eliza Island, near Bellingham; the Wannenwetsch Reducing Co., at Blaine; and the Japanese-American Fertilizer Co. on Lummi Island, all on Puget Sound, operate quite largely on the offal from the Sound salmon canneries.

In 1882 the Alaska Oil & Guano Co. established a fertilizer plant at Killisnoo, Alaska, for the extraction of oil and fertilizer from herring, and has operated the plant continuously ever since. In some years large quantities of whole salmon have been handled at this plant, and the resulting product was found to sell as well as that from herring.

In Alaska the Fish Canners By-Products (Ltd.), in 1914 built a large plant at Ward Cove, near Ketchikan, where salmon offal is used in the preparation of fertilizer, meal, and oil. The company is now experimenting in the preparation of various chemical products from the raw material.

Probably the most serious evil in the salmon industry to-day is the enormous wastage which annually occurs. About one-fourth of the total weight of each fish handled at the various packing plants is thrown away. With the exception of the tailpiece, which is discarded at some canneries owing to the excessive amount of bone which would be in the product if canned, this waste material could not be utilized as food, comprising as it does the head, viscera, fins, and tail. When not conveniently near the very few fertilizer plants at present in operation this product is either allowed to pass through chutes into the water under the cannery, or is dumped into scows and towed to the ocean or the deeper waters of the sounds, and there thrown overboard. This procedure is not only exceedingly wasteful, but is also far from beneficial to the waters where deposited.

The great desideratum in the salmon fisheries of the Pacific coast at the present time is the invention of a small odorless fertilizer plant, costing not more than $2,500 or $3,000, which can be installed at the various salmon canneries and salteries. The offal from the cannery could there be utilized and the product obtained would doubtless net a fair return on such an investment, while at the same time the present (in the aggregate) enormous waste would be stopped, and the waters adjacent to the canneries rendered far more agreeable to the fishes as well as to the people on shore. It is absolutely essen-

tial that the plant shall be odorless, as the smell of the ordinary fertilizer establishment would be very offensive to persons visiting the cannery and would not enhance the demand for canned salmon. At the present time the cheapest plant available costs about $10,000, and very few canneries can afford to invest this sum of money in the disposal of their own offal alone.

A great impetus has been given to the industry during the last two years, owing to the big demand which has come from the farmers and poultrymen for fish meal or scrap, which, after it has been mixed with other ingredients, can be fed to cattle, hogs, and poultry. Experiments carried out at various agricultural experiment stations, both here and in Europe, show conclusively that this class of food increases the appetite of the animal, and consequently the weight, while it does not affect the flavor of the flesh of the animals.

SHIPPING FRESH SALMON DIRECT TO CONSUMER.

An important new feature in the salmon industry is the shipping of individual salmon direct to consumers by express, or, for certain short distances, by parcel post, for a certain fixed sum, which includes the fish itself and the cost of delivering same to the buyer.

This business began in Tacoma, Wash., in 1914, and those who originated it advertised throughout the country that they would ship a fresh salmon to any express office in the United States (except Southern Express), express prepaid, for $1.25, weight 7 to 8 pounds. In 1915 the cost, delivered east of the Mississippi River, was raised to $1.50 each, the old rate of $1.25 still being in force for shipments west of the Mississippi River. The price has since been increased to $2.50 for any place in the United States. The number of shippers has increased very much, and the business is now carried on from a number of places in Washington, Oregon, and California.

In shipping an individual fish, it is packed in a box containing 20 pounds of cracked ice. These boxes are collected by the express companies and are generally sent out in their own regular cars attached to trains leaving in the evening. About every 15 to 20 hours the box is opened and from 5 to 7 pounds, depending upon the weather, of cracked ice added to the box to make up the loss through melting.

As the Post Office Department will not accept packages in which ice is used for preserving fish, the use of the parcel post for shipments of individual fish is limited to the first postal zone (up to 50 miles from the initial point), except in winter, when the postmasters are authorized, in their discretion, to accept shipments for the second zone (50 to 100 miles from the initial point). In making fresh-fish shipments by parcel post, frozen fish are generally used.

Most of the orders come from the Middle West, where fresh fish are not abundant, but orders are received from all sections of the country.

The success met with in shipping fresh salmon led to a considerable expansion of the industry, with the result that now one can obtain not only a fresh salmon, but also may purchase salt, smoked, and kippered salmon, salt codfish, and fresh halibut, smelt, crabs, and other sea food in their season.

NUTRITIVE QUALITIES OF SALMON.

More and more attention is being paid by the consuming public to the nutritive qualities of the food products offered them, and this is especially true as regards fishery products.

The proper functions of food are two-fold, first, to furnish protein for building and repairing the body, and second, to supply energy for heat and muscular work. Foods which supply an abundance of both at a reasonable price are of the greatest importance from an economical standpoint.

ANALYSES OF CANNED AND FRESH PACIFIC SALMON.

Despite the great prominence of the salmon industry, but little time has been devoted to it by the chemist.

Prof. W. O. Atwater was the first American investigator to devote any portion of his energies to the analysis of Pacific salmon. In "Principles of Nutrition and Nutritive Value of Food" (Farmers Bulletin No. 142, United States Department of Agriculture, 1901), he gives the following analysis of canned Pacific coast salmon:

Water, 63.5 per cent; protein, 21.8 per cent; fat, 12.1 per cent; ash, 2.6 per cent; fuel value per pound, 915 calories.[a]

C. F. Langworthy, in "Fish as Food" (Farmers Bulletin No. 85, United States Department of Agriculture, 1898), gives the following analyses of fresh and canned Pacific coast salmon:

Fresh salmon, California (sections): Refuse (bone, skin, etc.), 5.2 per cent; water, 60.3 per cent; protein, 16.5 per cent; fat, 17 per cent; mineral matter, 1 per cent; total nutrients, 34.5 per cent; fuel value per pound, 1,025 calories.

Canned salmon: Refuse (bone, skin, etc.), 3.9 per cent; salt, 1 per cent; water, 59.3 per cent; protein, 19.3 per cent; fat, 15.3 per cent; mineral, 1.2 per cent; total nutrients, 35.8 per cent; fuel value per pound, 1,005 calories.

Dr. Harvey W. Wiley gives the following as the composition of a Pacific coast salmon (species not given):[b]

Fresh—Water, 63.61 per cent; protein, 17.46 per cent; fat, 17.87 per cent; ash, 1.06 per cent. Dry—Protein, 52.31 per cent; fat, 49.05 per cent; ash, 2.92 per cent.

On page 137 of the same work Dr. Wiley gives the following as the mean of three samples of Pacific coast canned salmon:

Composition of canned salmon.—Mean of three samples. Water-free substance: Protein, 53.52 per cent; fat, 40.52 per cent; ash, 6.24 per cent.

Prof. Knisely,[c] of the Oregon State Agricultural College at Corvallis, Oreg., analyzed canned salmon packed at the Funter Bay (Alaska) cannery of the Thlinket Packing Co., with the following results:

Species.	Moisture.	Protein.	Fat.	Ash.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Sockeye or red	64.74	24.19	9.11	2.06
Coho or medium red	68.22	26.56	3.61	1.66
Humpback or pink	69.43	24.00	4.86	1.68
Keta or chum	67.08	25.06	6.59	1.26

[a] The unit used to show the fuel value is the "calorie," which is the amount of heat required to raise the temperature of about 1 pound of water 4° F.

[b] Foods and their Adulteration, etc., p. 135. By Harvey W. Wiley. 8°, Philadelphia, 1907.

[c] Pacific Fisherman, Vol. VI, No. 1, January, 1908, p. 21.

H. M. Loomis, formerly chief of the Seattle food and drug inspection laboratory, Bureau of Chemistry, United States Department of Agriculture, reports as follows on analyses of both canned and fresh Pacific salmon made at this laboratory.[a]

CANNED SALMON (1911 PACK.)[a]

Sample.	Water.	Ethyl ether extract.[b]	Protein (N x 6.25).	Total ash.	NaCl.[c]	Ammoniacal nitrogen.	
						Richardson method.	Alcohol vapor method.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
No. 1. Puget Sound sockeye	62.44	15.17	20.25	2.50	0.79	0.0403	0.0348
No. 2. Puget Sound sockeye	61.84	13.74	21.77	2.73	1.10	.0437	.0410
No. 3. Alaska medium red	69.97	7.81	20.40	2.58	1.09	.04965	.....
No. 4. Alaska chum	73.48	2.88	21.33	2.57	.83	.0563	.0557
No. 5. Alaska pink or humpback	74.12	4.75	19.75	1.98	.50	.0404	.....
No. 6. Alaska red	70.88	5.26	21.79	2.35	.64	.0455	.....

FRESH SALMON (CAUGHT MAY 7, 1912), EDIBLE PORTIONS.

	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Puget Sound sockeye	67.48	8.86	22.24	1.36	.....	0.0121	0.0205
Puget Sound steelhead or salmon trout	67.89	9.39	21.80	1.35	.....	.0135	.0218

[a] Each sample is average of two or more cans. All samples, except No. 2, are old form 1-pound tall cans. No. 2 is ½-pound flat cans.
[b] Represents the fat.
[c] Represents the salt.

ANALYSES OF CANNED SALMON BY SOUTH DAKOTA AUTHORITIES.

In 1916 the South Dakota Food and Drug Department analyzed a considerable number of samples of canned salmon for the purpose of determining, if possible, whether inferior grades of the fish were substituted for the better grades, and for the further purpose of discovering some means of identifying the different types of salmon by chemical analysis.

Thirty-three samples of commercial canned salmon, including 30 different brands, were analyzed. Thirteen of these were labeled as belonging to the sockeye class, five to the coho, six to the humpback, and one to the chum. Five samples were not labeled as to variety. One sample was labeled "Salmon Steaks" and two samples were labeled "Fresh Alaska." The last eight samples, because they were not labeled to show the common name of the fish contained in the can, were in violation of the F. I. D. No. 105 referred to above.

All of the cans but one were labeled to show the net weight of fish in the can. Sixteen per cent of them contained less than the declared amount of contents, but the greatest shortage was but 3.1 per cent of the declared weight, while the greatest excess in weight was 18.7 per cent of the declared weight. The weight is usually stated considerably under the actual amount of the contents.

The amount of liquid in the cans is an important factor to consider in computing the value of the contents. The free liquor in the cans examined varied widely from 3.95 per cent in sample number 15–209, labeled salmon steaks, to 26.54 per cent in sample number 15–63, which was not labeled as to variety. As a rule, the largest amount of free liquor is found in the lower priced grades, but there are exceptions, notably number 15–70, which contained 24.14 per cent of free liquor.

It will be noticed from the results given in the table that the amount of total moisture varies inversely as the amount of fat (called ether extract in the table). That is, salmon containing an excessive amount of moisture contains little fat, but those samples which contain the lower amounts of moisture contain the largest amounts of fat. The protein content seems to be fairly constant in all samples, the average amount

[a] Salmon Canning Industry of North America. By H. M. Loomis. Original communications, Eighth International Congress of Applied Chemistry, Washington and New York, Sept. 4 to 13, 1912, Vol. XVIII, pp. 239–245. The Rumford Press, Concord, N. H.

being 19.34 per cent, while the minimum found is 15.66 per cent and the maximum 22.45 per cent. The total phosphoric acid varies from 4.2 per cent to 9.8 per cent, the average being 6.6 per cent.

As would be expected, the samples containing the larger proportions of fat liberate the larger quantities of heat units, or calories, per pound, and it will be noted that the price is not in all cases an accurate measure of value, some of the higher priced varieties being in reality much lower in actual cost, when their food value is taken into consideration, than some of the cheaper varieties.[a]

The table below has been condensed from that shown in the report. The brand, name of the jobber, and the data about these samples, where the species is not shown on the label, have been eliminated, as they were not essential to our purpose. All of the other data have been reproduced exactly as they appeared in the original report. Not a single one of the samples apparently bore the packer's label, all being jobber's labels.

Laboratory No.	Variety.	Total moisture.	Ether extract.	Protein.	Ash.	
					Soluble.	Insoluble.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
15-56	Red	52.32	17.68	19.50	2.15	0.81
15-210	Fancy sockeye	59.29	16.83	18.28	1.63	.88
15-209	Salmon steaks	60.45	17.96	17.31	1.47	.33
15-60	Fancy red	60.46	15.40	18.22	1.33	2.89
15-72	Sockeye	60.80	18.19	19.15	.81	.78
15-65	....do	60.95	15.94	18.56	1.50	1.11
15-59	Red sockeye	61.60	15.48	16.89	1.99	.67
15-64	....do	62.18	13.10	19.13	1.45	.65
15-204	Red Alaska	65.44	10.57	20.31	2.15	.51
15-58	Coho salmon	65.65	9.62	17.32	1.61	1.33
15-220	Red Alaska	66.12	8.63	21.22	1.73	.82
15-64	Coho salmon	67.18	9.59	17.60	1.18	1.20
15-222	Pink salmon	69.53	6.62	20.48	1.85	.78
15-219	Red salmon	69.87	6.36	20.38	2.24	.67
15-207	Pink salmon	70.45	7.28	17.66	1.53	.90
15-221	Chum	70.52	4.57	19.73	.80	.72
15-205	Red salmon	70.86	4.04	21.11	1.60	1.13
15-70	....do	71.45	4.47	20.75	2.15	1.00
15-61	Pink salmon	71.64	4.35	18.31	1.56	1.01
15-208	Gorbouscha [b]	73.17	5.33	17.35	1.27	.45
15-206	Alaska salmon [c]	73.30	2.43	21.22	1.45	.96
15-214	....do	73.76	3.98	18.31	1.62	.54
15-57	Pink Alaska	74.08	3.90	15.66	1.50	1.02

Laboratory No.	Variety.	Phosphoric acid. [d]		Sodium chloride.	Calories per lb.	Price per lb.
		Soluble.	Insoluble.			
		Per cent.	*Per cent.*	*Per cent.*	*Number.*	*Value.*
15-56	Red	4.2	3.5	1.45	1,110	$0.31
15-210	Fancy sockeye	4.2	4.0	.81	1,050	.30
15-209	Salmon steaks	3.7	1.5	.51	1,080	.36
15-60	Fancy red	2.8	3.8	.53	900	.29
15-72	Sockeye	3.1	3.7	.14	1,125	.25
15-65	....do	2.2	5.3	.68	1,020	.29
15-59	Red sockeye	3.6	2.6	1.10	965	.....
15-64	....do	3.2	3.5	.60	910	.30
15-204	Red Alaska	4.0	2.3	1.15	825	.....
15-58	Coho salmon	2.5	5.7	1.02	730	.25
15-220	Red Alaska	1.9	2.8	.82	760	.....
15-64	Coho salmon	2.4	5.9	.53	730	.21
15-222	Pink salmon	1.8	3.6	.90	660	.....
15-219	Red salmon	2.0	2.7	1.26	545	.....
15-207	Pink salmon	3.4	4.1	.74	635	.15
15-221	Chum	1.0	4.1	Trace.	565	.....
15-205	Red salmon	3.3	3.2	.65	560	.30
15-70	....do	2.7	3.1	1.17	575	.39
15-61	Pink salmon	2.4	4.7	.84	525	.15
15-208	Gorbouscha [b]	2.9	2.1	.45	550	.....
15-206	Alaska salmon [c]	2.7	4.4	.66	500	.15
15-214	....do	1.7	2.5	.75	510	.15
15-57	Pink Alaska	2.0	4.5	.85	455	.25

[a] Bulletin, South Dakota Food and Drug Department, Vol. IV, Nos. 2 and 3, October-December, 1916, pp. 8-11.

[b] Probably pink salmon (author). [c] Probably chum salmon (author). [d] Mgm. of P_2O_5 per gram.

ANALYSIS OF SALTED SALMON.

Falkenburg & Co., of Seattle, have recently made an analysis of the food value of salted salmon, as follows:[a]

Regarding the salmon recently inspected and analyzed for you by ourselves with the following results:

Protein	21.97 per cent.
Fat	4.34 per cent.
Salt	19.08 per cent.
Ash	.84 per cent.
Moisture	54.35 per cent.
Calories per pound	592

If this salmon were freshened, as is the custom in preparing it for the table, removing all but about 2 per cent of the salt, the fish would then have the following analysis:

Protein	27.13 per cent.
Fat	5.36 per cent.
Salt	2.47 per cent.
Moisture	65.11 per cent.
Ash	1.03 per cent.
Calories per pound	734

Bulletin No. 28 of the United States Department of Agriculture, "Chemical Composition of American Food Products" gives on page 51 the food value of the average canned salmon as purchased as follows:

Refuse	14.2 per cent.
Protein	19.5 per cent.
Fat	7.5 per cent.
Ash	2.0 per cent.
Moisture	56.8 per cent.
Calories per pound	680

STATISTICS OF THE SALMON OUTPUT.

SALMON CATCH IN 1918.

The following tables show the total catch, by species, of salmon and steelhead trout on the Pacific coast of North America in 1918, and the catch, by apparatus and species, for each geographic section of Alaska and Washington in 1918:

SUMMARY, BY SECTION AND SPECIES, OF PACIFIC COAST SALMON CATCH IN 1918.

Section.	Pounds.	Section.	Pounds.
Alaska:		Washington—Continued.	
Coho, or medium red	17,470,086	Steelhead	1,446,733
Chum, or keta	113,286,544	Sockeye, or red	4,127,280
Humpback, or pink	193,265,448		
King, or spring	16,010,764	Total	49,609,847
Red, or sockeye	176,690,325		
		Oregon: Salmon [b] [c]	34,551,253
Total	516,723,167		
		California: Salmon [b]	13,026,076
Washington:			
Coho, or medium red	12,621,704	British Columbia: Salmon [b]	152,992,500
Chum, or keta	10,153,240		
Humpback, or pink	353,568	Grand total	766,902,843
King, or spring	20,907,322		

[a] Pacific Fisherman, Seattle, Wash., Vol. XVII, No. 4, April, 1919, p. 76.
[b] Species not given separately.
[c] Estimated.

SALMON CATCH IN 1918, BY APPARATUS AND SPECIES, FOR EACH GEOGRAPHIC SECTION OF ALASKA.[a]

Apparatus and species.	Southeast Alaska.	Central Alaska.	Western Alaska.	Total.
Seines:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Coho, or silver	2,239,596	546,966	23,454	2,810,016
Chum, or keta	42,507,872	15,239,240	1,744,448	59,491,560
Humpback, or pink	53,774,192	19,615,380	443,504	73,833,076
King, or spring	368,830	32,296	119,658	521,784
Red, or sockeye	3,979,215	9,528,400	4,492,510	18,000,125
Total	102,869,705	44,962,282	6,823,574	154,655,561
Gill nets:				
Coho, or silver	1,495,494	2,757,504	763,164	5,016,162
Chum, or keta	1,589,760	2,199,696	5,459,944	9,249,400
Humpback, or pink	365,540	118,388	885,992	1,369,920
King, or spring	460,570	1,983,190	2,040,808	4,484,568
Red, or sockeye	2,583,605	8,688,790	117,100,100	128,372,495
Total	6,494,969	15,747,568	126,250,008	148,492,545
Pound nets:				
Coho, or silver	4,198,356	2,030,592	60,000	6,288,948
Chum, or keta	29,164,536	11,276,288	1,681,560	42,121,384
Humpback, or pink	96,348,088	19,941,668	1,722,468	118,012,824
King, or spring	696,674	614,922	217,844	1,529,440
Red, or sockeye	7,113,930	20,191,895	1,892,915	29,198,740
Total	137,522,184	54,054,365	5,574,787	197,151,336
Lines:				
Coho, or silver	1,802,370			1,802,370
Chum, or keta	236,000			236,000
Humpback, or pink	37,076			37,076
King, or spring	8,177,818			8,177,818
Red, or sockeye	105,540			105,540
Total	10,358,804			10,358,804
Dip nets:				
Coho, or silver		51,018		51,018
King, or spring		195,580		195,580
Red, or sockeye		1,013,425		1,013,425
Total		1,260,023		1,260,023
Wheels:				
Coho, or silver			1,501,572	1,501,572
Chum, or keta			2,188,200	2,188,200
Humpback, or pink			12,552	12,552
King, or spring			1,102,574	1,102,574
Total			4,804,898	4,804,898
Total:				
Coho, or silver	9,735,816	5,386,080	2,348,190	17,470,086
Chum, or keta	73,498,168	28,714,224	11,074,152	113,286,544
Humpback, or pink	150,525,496	39,675,436	3,044,516	193,265,448
King, or spring	9,703,892	2,825,988	3,480,884	16,010,764
Red, or sockeye	13,782,290	39,422,510	123,485,525	176,690,325
Grand total	257,245,662	116,024,238	143,453,267	516,723,167

[a] Figured from data in "Alaska Fisheries and Fur Industries in 1918," pp. 42, 43. By Ward T. Bower. U. S. Bureau of Fisheries Document No. 872, Appendix VII, Report U. S. Commissioner of Fisheries, 1918. Washington, 1919. In changing from number of fish to pounds the species were figured on the following basis: Coho, 6 pounds; chum, 8 pounds; humpback, 4 pounds; king, 22 pounds; and red, 5 pounds.

SALMON CATCH IN 1918, BY APPARATUS AND SPECIES FOR EACH GEOGRAPHIC DISTRICT OF WASHINGTON.

Apparatus and species.	Puget Sound.	Grays Harbor.	Willapa Harbor.	Columbia River.	Total.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Seines, drag:					
Coho, or silver	148,086			41,898	189,984
Chum, or keta	478,304			5,600	483,904
Chinook, or spring	21,208			470,448	491,656
Humpback, or pink	92			908	1,000
Sockeye, or red	385			67,845	68,230
Steelhead				158,568	158,568
Total	648,075			745,267	1,393,342
Seines, purse:					
Coho, or silver	3,083,838			145,908	3,229,746
Chum, or keta	6,398,664				6,398,664
Chinook, or spring	325,182			952,116	1,277,298
Humpback, or pink	12,388			1,540	13,928
Sockeye, or red	225,365			935	226,300
Steelhead	95,320			27,840	123,160
Total	10,140,757			1,128,339	11,269,096
Pound, or trap, nets:					
Coho, or silver	4,219,038	55,272	253,404	577,398	5,105,112
Chum, or keta	1,390,256	22,920	132,528	93,496	1,639,200
Chinook, or spring	8,392,098	50,754	180,488	2,109,294	10,732,634
Humpback, or pink	240,724			688	241,412
Sockeye, or red	2,479,550			90,355	2,569,905
Steelhead	95,864	56	112	432,016	528,048
Total	16,817,530	129,002	566,532	3,303,247	20,816,311
Gill nets:					
Coho, or silver	1,072,860	423,570	102,162	310,698	1,909,290
Chum, or keta	749,104	102,256	40,640	262,336	1,154,336
Chinook, or spring	856,812	415,866	133,408	4,783,284	6,189,370
Humpback, or pink	6,072			12,320	18,392
Sockeye, or red	88,260	4,125	15	534,115	626,515
Steelhead	19,624	4,120	344	396,824	420,912
Total	2,792,732	949,937	276,569	6,299,577	10,318,815
Set nets:					
Coho, or silver	586,776	327,780	133,508	11,340	1,059,404
Chum, or keta	211,568	95,936	130,888	13,024	451,416
Chinook, or spring	332,662	168,652	28,930	103,004	633,248
Humpback, or pink	2,216	644		26,072	28,932
Sockeye, or red	770	1,630	470	105,975	108,845
Steelhead	66,528	26,832	4,552	62,256	160,168
Total	1,200,520	621,474	298,348	321,671	2,442,013
Reef nets:					
Coho, or silver	75,804				75,804
Chum, or keta	7,312				7,312
Chinook, or spring	33,330				33,330
Humpback, or pink	49,792				49,792
Sockeye, or red	10,180				10,180
Total	176,418				176,418
Fish wheels:					
Coho, or silver				66	66
Chinook, or spring				212,410	212,410
Sockeye, or red				508,915	508,915
Steelhead				53,408	53,408
Total				774,799	774,799
Bag nets:					
Coho, or silver	300				300
Chum, or keta	16,400				16,400
Chinook, or spring	66			2,750	2,816
Steelhead				808	808
Total	16,766			3,558	20,324

SALMON CATCH IN 1918, BY APPARATUS AND SPECIES FOR EACH GEOGRAPHIC DISTRICT OF WASHINGTON—Continued.

Apparatus and species.	Puget Sound.	Grays Harbor.	Willapa Harbor.	Columbia River.	Total.
Hooks and lines:	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Coho, or silver	638,436	34,170	3,036	376,356	1,051,998
Chum, or keta	960	888	.....	160	2,008
Chinook, or spring	391,312	8,160	1,184	933,904	1,334,560
Humpback, or pink	112	.....	.....	.....	112
Sockeye, or red	2,645	.....	.....	5,745	8,390
Steelhead	64	.....	.....	1,597	1,661
Total	1,033,529	43,218	4,220	1,317,762	2,398,729
Total:					
Coho, or silver	9,825,138	840,792	492,110	1,463,664	12,621,704
Chum, or keta	9,252,568	222,000	304,056	374,616	10,153,240
Chinook, or spring	10,352,670	643.432	344,010	9,567,210	20,907,322
Humpback, or pink	311,396	644	.....	41,528	353,568
Sockeye, or red	2,807,155	5,755	485	1,313,885	4,127,280
Steelhead	277,400	31,008	5,008	1,133,317	1,446,733
Grand total	32,826,327	1,743,631	1,145,669	13,894,220	49,609,847

BRISTOL BAY WATERS SALMON CATCH, 1913 TO 1917.

Broadly speaking, about one-third of the yield of salmon from Alaskan waters comes from the important Bristol Bay region. The following table shows the catches made in the more important waters fished in the Bristol Bay district in the period of five years from 1913 to 1917:

SALMON CATCH, BY STREAMS, IN BRISTOL BAY REGION, 1913 TO 1917.[a]

Species and stream.	1913	1914	1915	1916	1917	Total.
Red salmon:	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*
Nushagak	5,236,008	6,174,097	5,676,457	3,592,574	5,679,818	26,358,954
Igushik	173,925	283,718	228,405	223,343	167,421	1,076,812
Kvichak-Naknek	13,691,050	12,584,809	7,156,488	11,551,086	15,762,582	60,746,015
Ugaguk	902,728	897,767	1,216,252	1,578,862	1,856,600	6,452,209
Ugashik	577,615	254,716	509,076	647,422	1,047,111	3,035,940
Total	20,581,326	20,195,107	14,786,678	17,593,287	24,513,532	97,669,930
King salmon:						
Nushagak	67,622	89,599	116,281	81,591	73,839	428,932
Igushik	34	94	106	330	477	1,041
Kvichak-Naknek	5,648	10,657	29,392	20,934	16,155	82,786
Ugaguk	254	405	510	365	143	1,677
Ugashik	691	1,209	1,739	1,904	531	6,074
Total	74,249	101,964	148,028	105,124	91,145	520,510
Coho salmon:						
Nushagak	66,640	81,434	117,172	293,210	62,260	620,716
Kvichak-Naknek	2	17,462	13,271	288	3	31,026
Ugaguk	165	165	.....	.....	.....	330
Total	66,807	99,061	130,443	293,498	62,263	652,072
Pink and chum salmon:						
Nushagak	683,201	932,477	444,146	1,818,566	303,437	4,181,827
Igushik	.....	.....	.....	738	183	921
Kvichak-Naknek	13,940	173,831	232,082	304,117	83,019	806,989
Ugaguk	7,450	7,450	12,004	7,500	5,726	40,130
Ugashik	14,704	14,613	18,212	49,196	879	97,604
Total	719,295	1,128,371	706,444	2,180,117	393,244	5,127,471
Grand total	21,441,677	21,524,503	15,771,593	20,172,026	25,060,184	103,969,983

[a] From "Alaska Fisheries and Fur Industries in 1917," p. 32. By Ward T. Bower and Henry D. Aller. Appendix II, Report, U. S. Commissioner of Fisheries, 1917. Washington, 1918.

PACK OF CANNED SALMON IN 1919.

The following table shows, by species, grades, and sizes, the pack of canned salmon for the Pacific coast of North America in 1919:

PACK OF CANNED SALMON ON THE PACIFIC COAST IN 1919.[a]

Species, grades, and sizes.	Alaska.	Puget Sound.	Hoh River.	Queets River.	Quinault River.	Grays Harbor.	Willapa Harbor.	Columbia River.
Coho, silver, or medium red:	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
½-pound flat	10,087	15,640	.....	175	.....	2,548	.....	14,387
1-pound flat	10,357	32,936	.....	.....	.....	2,167	.....	27,471
1-pound tall	209,694	162,307	233	850	775	7,499	2,927	48,870
Total	230,138	210,883	233	1,025	775	12,214	2,927	90,728
Chinook or king, red:								
Fancy—								
½-pound flat	.....	.....	.....	.....	.....	.....	.....	143,558
1-pound flat	8,323	.....	.....	.....	.....	.....	.....	130,056
1-pound tall	20,259	.....	.....	.....	.....	.....	.....	38,749
Standard—								
½-pound flat	7,422	21,685	.....	450	.....	1,454	.....	24,279
1-pound flat	2,961	8,398	.....	.....	.....	506	.....	25,038
1-pound tall	112,768	35,874	.....	.....	165	2,410	1,152	30,445
Total	151,733	65,957	.....	450	165	4,370	1,152	392,125
Chinook or king, white:								
½-pound flat	.....	172	.....	.....	.....	.....	.....	.....
1-pound tall	.....	2,413	.....	.....	.....	.....	.....	.....
Total	.....	2,585	.....	.....	.....	.....	.....	.....
Chum or keta:								
½-pound flat	3,846	3,403	.....	.....	.....	6	.....	3,018
1-pound flat	.....	3,242	.....	.....	.....	2,739	.....	2,129
1-pound tall	1,344,616	518,896	332	50	650	25,967	9,125	70,346
Total	1,348,462	525,541	332	50	650	28,712	9,125	75,493
Humpback or pink:								
½-pound flat	27,776	17,379	.....	.....	.....	.....	.....	.....
1-pound flat	7,548	41,574	.....	.....	.....	.....	.....	.....
1-pound tall	1,622,110	362,262	18	.....	.....	.....	.....	.....
Total	1,657,434	421,215	18	.....	.....	.....	.....	.....
Sockeye or red:								
½-pound flat	116,205	43,556	.....	100	1,144	.....	.....	7,268
1-pound flat	109,933	13,688	.....	.....	.....	.....	.....	.....
1-pound tall	978,205	7,102	.....	.....	.....	.....	.....	.....
Total	1,204,343	64,346	.....	100	1,144	.....	.....	7,268
Steelhead trout:								
½-pound flat	.....	.....	.....	.....	.....	.....	.....	7,212
1-pound flat	.....	5,099	.....	.....	.....	.....	.....	5,896
1-pound tall	91	.....	.....	.....	.....	.....	.....	1,306
Total	91	5,099	.....	.....	.....	.....	.....	14,414
Grand total	4,592,201	1,295,626	583	1,625	2,734	45,296	13,204	580,028

[a] Reduced to a common basis of forty-eight 1-pound cans to the case.

PACK OF CANNED SALMON ON THE PACIFIC COAST IN 1919—Continued.

Species, grades, and sizes.	Nehalem River.	Tillamook Bay.	Nestucca River.	Alsea Bay and River.	Siletz River.	Siuslaw River.	Umpqua River.	Coquille River.
	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.
Coho, silver, or medium red:								
½-pound flat	.....	4,000	300	1,658	300	.....	.....	1,364
1-pound flat	.....	.....	100	525	200	.....	.....	.....
1-pound tall	8,124	3,150	2,000	424	5,392	3,760	7,500	3,646
Total	8,124	7,150	2,400	2,607	5,892	3,760	7,500	5,010
Chinook or king, red:								
Standard—								
½-pound flat	.....	1,000	1,500	1,157	500	.....	.....	1,027
1-pound flat	.....	.....	100	100	10	.....	.....	.....
1-pound tall	500	500	300	1,255	874	.....	.....	.....
Total	500	1,500	1,900	2,512	1,393	.....	.....	1,027
Chum or keta:								
½-pound flat	.....	3,150	50	50	.....	.....	.....	.....
1-pound tall	1,183	1,200	400	485	472	.....	.....	45
Total	1,183	4,350	450	535	472	.....	.....	45
Grand total	9,807	13,000	4,750	5,654	7,757	3,760	7,500	6,082

Species, grades, and sizes.	Rogue River.	Smith River.	Klamath River.	Sacramento River.	Noyo River.	Monterey Bay.	British Columbia.	Total.
	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.
Coho, silver, or medium red:								
½-pound flat	227	.....	625	.....	.....	.....	92,890	144,201
1-pound flat	444	.....	520	.....	.....	.....	5,201	79,921
1-pound tall	.....	.....	.....	.....	.....	.....	101,902	569,053
Total	671	.....	1,145	.....	.....	.....	199,993	793,175
Chinook or king, red:								
Fancy—								
½-pound flat	4,000	.....	.....	.....	.....	.....	.....	147,558
1-pound flat	3,000	.....	.....	.....	.....	.....	.....	141,379
1-pound tall	1,580	.....	.....	.....	.....	.....	.....	60,588
Standard—								
½-pound flat	4,710	4,271	1,870	.....	4,500	.....	45,726	121,551
1-pound flat	3,947	95	4,421	401	3,000	.....	2,892	51,878
1-pound tall	.....	.....	.....	768	.....	2,000	33,638	222,649
Total	17,237	4,366	6,291	1,169	7,500	2,000	82,256	745,603
Chinook or king, white:								
½-pound flat	.....	.....	.....	.....	.....	.....	4,016	4,188
1-pound flat	.....	.....	.....	.....	.....	.....	346	346
1-pound tall	.....	.....	.....	.....	.....	.....	13,933	16,346
Total	.....	.....	.....	.....	.....	.....	18,295	20,880
Chum or keta:								
½-pound flat	.....	.....	.....	.....	.....	.....	49,257	62,780
1-pound flat	.....	.....	.....	.....	.....	.....	11,984	20,094
1-pound tall	.....	.....	.....	.....	.....	.....	310,794	2,284,561
Total	.....	.....	.....	.....	.....	.....	372,035	2,367,435
Humpback or pink:								
½-pound flat	.....	.....	.....	.....	.....	.....	127,435	172,590
1-pound flat	.....	.....	.....	.....	.....	.....	14,839	63,961
1-pound tall	.....	.....	.....	.....	.....	.....	204,365	2,188,755
Total	.....	.....	.....	.....	.....	.....	346,639	2,425,306
Sockeye or red:								
½-pound flat	.....	.....	.....	.....	.....	.....	293,720	461,993
1-pound flat	.....	.....	.....	.....	.....	.....	13,339	136,960
1-pound tall	.....	.....	.....	.....	.....	.....	59,945	1,045,252
½-pound oval	.....	.....	.....	.....	.....	.....	1,941	1,941
1-pound oval	.....	.....	.....	.....	.....	.....	500	500
Total	.....	.....	.....	.....	.....	.....	369,445	1,646,646
Steelhead trout:								
½-pound flat	.....	.....	145	.....	.....	.....	3,586	10,943
1-pound flat	.....	.....	150	.....	.....	.....	116	11,261
1-pound tall	.....	.....	.....	.....	.....	.....	791	2,188
Total	.....	.....	295	.....	.....	.....	4,493	24,392
Grand total	17,908	4,366	7,731	1,169	7,500	2,000	1,393,156	8,023,437

CANNING INDUSTRY, 1864 TO 1919.

SUMMARY OF CANNING INDUSTRY.

From the beginning of the canning of salmon on this coast it has been the most important branch of the industry, and the following table shows in condensed form the number of cases packed in each year on the Pacific coast of North America from the beginning of the industry in 1864 to 1919, both inclusive.

As British Columbia is a Province of the Dominion of Canada it does not come strictly within the scope of this report, but in order to show the pack of canned salmon on the North American shores of the Pacific Ocean, which would be incomplete without that of the Province, it has been included also.

PACK OF CANNED SALMON ON THE PACIFIC COAST, BY YEARS AND WATERS.

Year.	Puget Sound.	Coastal streams of Washington.	Grays Harbor.	Willapa Harbor.	Columbia River.	Coastal streams of Oregon.	Smith River, Calif.
	Cases.	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
1866	.....	.....	.....	.....	4,000	.....	.....
1867	.....	.....	.....	.....	18,000	.....	.....
1868	.....	.....	.....	.....	28,000	.....	.....
1869	.....	.....	.....	.....	100,000	.....	.....
1870	.....	.....	.....	.....	150,000	.....	.....
1871	.....	.....	.....	.....	200,000	.....	.....
1872	.....	.....	.....	.....	250,000	.....	.....
1873	.....	.....	.....	.....	250,000	.....	.....
1874	.....	.....	.....	.....	350,000	.....	.....
1875	.....	.....	.....	.....	375,000	.....	.....
1876	.....	.....	.....	.....	450,000	.....	.....
1877	5,500	.....	.....	.....	380,000	7,804	.....
1878	238	.....	5,420	.....	460,000	26,934	4,277
1879	1,300	.....	.....	.....	480,000	8,571	.....
1880	5,100	.....	.....	.....	530,000	7,772	7,500
1881	8,500	.....	.....	.....	550,000	12,320	.....
1882	7,900	.....	.....	.....	541,300	19,186	.....
1883	1,500	.....	.....	.....	629,400	23,156	.....
1884	5,560	.....	.....	.....	620,000	27,876	5,500
1885	12,000	.....	8,200	.....	553,800	33,410	1,550
1886	17,000	.....	18,700	13,600	448,500	77,547	.....
1887	22,000	.....	.....	.....	356,000	73,996	.....
1888	21,975	.....	37,000	22,500	372,477	92,863	2,347
1889	11,674	.....	.....	.....	309,885	98,800	.....
1890	8,000	.....	.....	.....	435,774	47,009	.....
1891	20,529	.....	500	8,000	398,953	24,500	.....
1892	26,426	.....	16,500	14,500	487,338	83,600	.....
1893	89,774	.....	22,000	16,195	415,876	52,778	2,000
1894	95,400	.....	21,400	15,100	490,100	54,815	2,000
1895	179,968	.....	11,449	22,600	634,696	77,878	2,250
1896	195,664	.....	21,274	24,941	481,697	91,860	.....
1897	494,026	.....	13,300	29,600	552,721	68,683	.....
1898	400,200	.....	12,100	21,420	487,944	83,209	.....
1899	919,611	.....	24,240	21,314	332,774	82,041	.....
1900	469,450	.....	30,800	26,300	358,772	12,237	.....
1901	1,380,590	.....	41,500	34,000	390,183	58,618	.....
1902	581,659	.....	31,500	39,492	317,143	44,236	.....
1903	478,488	.....	.....	5,890	339,577	54,801	.....
1904	291,488	.....	27,559	26,400	395,104	98,874	.....
1905	1,018,641	.....	22,050	14,950	397,273	89,055	.....
1906	430,602	.....	22,000	14,440	394,898	107,332	.....
1907	698,080	.....	14,000	13,382	324,171	79,712	.....
1908	448,765	.....	14,000	20,457	277,719	83,994	.....
1909	1,678,737	.....	21,436	12,024	274,196	58,169	.....
1910	567,883	.....	55,480	11,508	391,415	104,617	.....
1911	1,551,028	18,431	75,941	25,497	553,331	138,146	.....
1912	416,119	19,914	47,287	28,148	286,026	84,074	.....
1913	2,583,463	13,124	19,895	12,050	266,479	38,492	.....
1914	817,354	21,459	32,434	16,837	454,621	106,617	3,000
1915	1,269,206	31,735	40,992	12,842	558,534	80,499	3,033
1916	1,052,917	15,777	60,336	18,553	547,861	81,924	2,505
1917	1,990,258	13,324	42,896	8,379	553,346	84,475	6,300
1918	622,732	13,732	35,972	8,827	591,381	92,241	4,653
1919	1,295,626	4,942	45,296	13,204	580,028	76,218	4,366
Total	22,192,871	152,438	893,257	572,950	21,376,293	2,750,999	51,281

PACK OF CANNED SALMON ON THE PACIFIC COAST, BY YEARS AND WATERS—Con.

Year.	Klamath River, Calif.	Eel River, Calif.	Noyo River, Calif.	Sacramento River.	Alaska.	British Columbia.	Total.
	Cases.	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*[a]
1864				2,000			2,000
1865				2,000			2,000
1866							4,000
1867							18,000
1868							28,000
1869							100,000
1870							150,000
1871							200,000
1872							250,000
1873							250,000
1874				2,500			352,500
1875				3,000			378,000
1876				10,000		7,247	467,247
1877		8,500		21,500		58,387	481,691
1878		10,500		34,017	8,159	89,946	639,491
1879				13,855	12,530	61,093	577,349
1880		6,250		62,000	6,539	61,849	687,010
1881				181,200	8,977	169,576	930,573
1882				200,000	21,745	240,461	1,030,592
1883		15,000		123,000	48,337	163,438	1,003,831
1884		8,200		81,450	64,886	123,706	937,118
1885		5,750		90,000	83,415	108,517	896,642
1886		12,500		39,300	142,065	152,964	922,176
1887				36,500	206,677	204,083	899,256
1888	4,400			68,075	412,115	184,040	1,217,792
1889				57,300	719,196	417,211	1,614,066
1890				25,065	682,591	411,257	1,609,696
1891				10,353	801,400	314,511	1,578,746
1892	1,047			2,281	474,717	248,721	1,355,130
1893	1,000			23,336	643,654	610,202	1,877,415
1894	1,700			28,463	686,440	492,232	1,887,050
1895	1,000			25,185	626,530	587,692	2,169,848
1896				13,387	966,707	617,782	2,413,312
1897				38,543	909,078	1,027,188	3,133,134
1898				29,731	965,097	492,551	2,492,252
1899	1,000			32,580	1,078,146	765,519	3,257,825
1900				39,304	1,548,139	606,540	3,091,542
1901				17,500	2,016,804	1,247,219	5,186,407
1902	2,500			14,043	2,536,824	627,161	4,194,558
1903				8,200	2,246,210	473,674	3,606,900
1904	3,400			14,407	1,953,756	465,894	3,276,882
1905				2,780	1,894,516	1,167,460	4,606,725
1906					2,219,044	699,460	3,817,776
1907					2,169,878	547,459	3,346,677
1908					2,618,048	542,689	4,005,672
1909	5,033				2,395,477	967,920	5,413,592
1910	8,016	6,000			2,413,054	762,201	4,320,174
1911	7,604	8,400		4,142	2,823,817	948,965	6,155,302
1912	18,000	11,000			4,054,641	996,576	5,961,785
1913	6,376			950	3,739,185	1,383,901	8,033,915
1914	11,000			17,315	4,056,653	1,111,039	6,648,329
1915	12,900			[b] 8,179	4,500,293	1,133,381	7,649,594
1916	8,884			[c] 19,445	4,900,627	995,065	7,703,894
1917	8,030			[d] 11,443	5,947,286	1,557,485	10,223,022
1918	10,200		2,000	4,036	6,605,835	1,616,157	9,607,766
1919	7,731		7,500	[d] 3,109	4,592,201	1,393,156	8,023,437
Total	122,221	92,100	9,500	1,419,534	74,801,284	26,753,563	151,188,291

[a] Reduced to a common basis of forty-eight 1-pound cans to the case.
[b] Includes 950 cases packed at Monterey.
[c] Includes 12,809 cases packed at Monterey.
[d] Includes 2,000 cases packed at Monterey.

CANNING INDUSTRY, BY SPECIES AND WATERS.

The tables which follow show separately, by waters and as far as possible by species, the salmon canned on the Pacific coast from the beginning of the industry until 1919. It is only within recent years that the published statistics have shown the pack of the different species separately. In the early years of canning the chinook, or quinnat, salmon was used exclusively, the other species not being utilized until the chinook had begun to decrease in abundance, or a demand

had arisen for a cheaper product. There is a very great difference in the selling value of the highest and lowest grades, and it is necessary to have complete statistical data now in order intelligently to comprehend the trend of the industry. While every effort has been made to make these tables complete, there are, unfortunately, some gaps which it was found impossible to fill. Such ellipses indicate that either the canneries did not operate or that no data were available for such periods.

Although there are only five species of salmon found on the Pacific coast, each bears several common names which are in general use in one or more of the many fishing districts. Trade names of each species as known in each district follow:

Districts.	1	2	3	4	5
Alaska	Red	King	Coho. Medium Red. Silver.	Pink	Chum.
British Columbia	Sockeye	Spring	Coho	Humpback	Keta.
Puget Sound	do	Tyee Spring	do	do	Chum.
Columbia River	Blueback	Chinook	Silverside	(None packed)	Do.
Outside rivers	Quinault	Quinnat	do	do	Do.

PACK OF CANNED SALMON ON PUGET SOUND IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Sockeye.		Medium red or silver.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1877	1					5,000	
1878	1					238	
1879	1					1,300	$5,090
1880	1						
1881	1						
1882	1						
1883	1						
1884	1						
1888	4						
1889	2	240	$1,200			7,480	37,400
1890	1	1,000	5,000			3,000	15,000
1891	2	382	2,101	5,538	$24,921	5,869	19,308
1892	2	86	473	2,954	11,816	7,236	24,503
1893	3	1,200	6,480	47,852	103,371	11,812	59,000
1894	3			41,781	188,014	22,418	89,672
1895	7	1,542	7,325	65,143	273,108	50,865	154,218
1896	11	13,495	67,475	72,979	350,299	82,640	264,448
1897	12	9,500	39,045	312,048	1,248,192	91,900	282,133
1898	18	11,200	50,624	252,000	1,058,400	98,600	335,240
1899	19	24,304	103,180	499,646	2,368,334	111,387	418,176
1900	19	22,350	134,100	229,800	1,149,000	128,200	512,800
1901				1,220,000			
1902	21	30,049	150,245	372,301	2,047,655	85,817	429,085
1903	22	14,500	72,500	167,211	1,003,260	103,450	413,800
1904	13	14,441	69,352	109,264	653,871	118,127	447,851
1905	24	1,804	9,922	825,453	4,952,718	79,335	337,174
1906	16	8,139	48,834	178,748	1,251,236	94,497	472,485
1907	14	1,814	10,326	93,122	698,416	119,472	476,288
1908	11	95,210	666,470	170,951	1,196,657	128,922	644,922
1909	24	13,019	72,604	1,097,904	6,183,300	143,133	630,446
1910	15	10,064	60,324	248,014	1,673,095	162,755	895,153
1911	21	21,823	172,582	127,769	1,168,145	256,123	1,711,178
1912	21	20,252	101,706	184,680	1,660,173	149,727	761,200
1913	32	1,234	5,247	1,673,089	10,871,178	61,019	235,372
1914	22	27,140	179,532	339,787	2,751,832	158,933	715,995
1915	40	28,466	145,555	64,584	676,769	180,783	902,335
1916	32	45,072	270,432	90,866	817,790	208,967	1,044,835
1917	45	70,918	638,262	454,336	4,543,360	116,860	926,880
1918	33	62,821	505,385	52,587	736,225	235,795	2,004,258
1919	35	68,542	856,775	64,346	1,029,536	a 210,883	2,529,996

a Includes 1,892 cases packed with reds brought from Alaska.

PACK OF CANNED SALMON ON PUGET SOUND IN SPECIFIED YEARS—Continued.

Year.	Canneries operated.	Chum.		Pink.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1877	1	.....	.....	500	.....	5,500	.....
1878	1	.....	.....	.....	.....	238	.....
1879	1	.....	.....	.....	.....	1,300	$5,000
1880	1	.....	.....	.....	.....	5,100	.....
1881	1	.....	.....	.....	.....	8,500	.....
1882	1	.....	.....	.....	.....	7,900	.....
1883	1	.....	.....	.....	.....	1,500	.....
1884	1	.....	.....	.....	.....	5,500	.....
1885	.....	.....	.....	.....	.....	12,000	.....
1886	.....	.....	.....	.....	.....	17,000	.....
1887	.....	.....	.....	.....	.....	22,000	.....
1888	4	.....	.....	.....	.....	21,975	126,356
1889	2	1,145	$3,435	2,809	$7,584	11,674	49,619
1890	1	4,000	12,000	.....	.....	8,000	32,000
1891	2	3,093	10,825	5,647	15,246	20,529	72,461
1892	2	16,180	56,630	.....	.....	26,426	93,419
1893	3	11,380	31,295	17,530	47,331	89,774	247,537
1894	3	22,152	60,918	9,049	24,432	95,400	303,036
1895	7	38,785	94,741	23,633	62,556	179,968	591,948
1896	11	26,550	73,013	.....	.....	195,664	755,235
1897	12	23,310	64,103	57,268	171,804	494,026	1,805,277
1898	18	38,400	105,600	.....	.....	400,200	1,549,864
1899	19	31,481	86,427	252,733	734,241	919,611	3,710,358
1900	19	89,100	245,025	.....	.....	469,450	1,940,925
1901	.....	.....	.....	.....	.....	1,380,590	.....
1902	21	93,492	467,460	.....	.....	581,659	3,094,445
1903	22	12,001	30,002	181,320	407,984	478,488	1,927,546
1904	13	49,656	124,254	.....	.....	291,488	1,295,328
1905	24	41,057	102,643	70,992	212,976	1,018,641	5,615,433
1906	16	149,218	708,781	.....	.....	430,602	2,481,336
1907	14	50,249	150,847	433,423	1,300,269	698,080	2,642,146
1908	11	47,007	142,821	6,075	18,225	448,765	2,069,095
1909	24	53,688	128,916	370,993	902,342	1,678,737	7,917,608
1910	15	146,942	514,297	108	388	567,883	3,143,256
1911	21	98,321	391,123	1,046,992	4,302,344	1,551,028	7,745,372
1912	21	60,760	154,193	700	2,185	416,119	2,079,457
1913	32	56,225	124,970	791,886	2,092,401	2,583,463	13,329,108
1914	22	290,477	903,075	1,017	4,615	817,354	4,555,649
1915	40	411,724	1,155,474	583,649	1,795,285	1,299,206	4,675,418
1916	32	564,194	2,031,098	143,804	575,216	[a] 1,052,917	4,739,455
1917	45	218,977	1,270,067	1,130,103	6,780,978	[b] 1,990,258	14,159,583
1918	33	264,922	1,669,009	6,807	42,946	622,732	5,017,823
1919	35	525,541	3,363,462	421,215	3,369,720	[c] 1,295,626	11,149,489

[a] Includes 14 cases of steelheads, valued at $84. The totals also include large quantities of salmon brought to the sound canneries from other waters, principally in British Columbia, and packed here, these when prepared for market comprising approximately 141,917 cases of humpbacks or pinks, valued at $566,952; 136,316 cases of chums, valued at $538,937, and 53,135 cases of silvers, valued at $87,185; a grand total of 331,368 cases and $1,193,074.

[b] Includes 4 cases of steelheads, valued at $36.

[c] Includes 5,099 cases of steelheads from sound waters.

PACK OF CANNED SALMON ON SOLEDUCK RIVER, WASH., IN SPECIFIED YEARS.[a]

Year.	Canneries operated.	Chinook.		Sockeye.		Silverside.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1912	1	414	$2,484	15	$158	940	$4,324
1913	1	206	1,442	.....	.....	1,040	3,536
1914	1	237	1,185	.....	.....	1,439	5,574
1915	1	388	1,940	.....	.....	1,320	6,072

Year.	Canneries operated.	Pink.[b]		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1912	1	103	$268	76	$182	1,548	$7,414
1913	1	.....	.....	28	61	1,274	5,039
1914	1	189	567	103	291	1,968	7,617
1915	1	826	2,478	192	538	2,726	11,028

[a] None packed since 1915.

[b] These are virtually all light-colored chinooks.

PACK OF CANNED SALMON ON HOH RIVER, WASH., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1917	1	372	$3,348	204	$1,665	110	$715	686	$5,728
1918	1	60	540	294	2,499	17	108	371	3,147
1919	1	18	216	233	2,796	332	2,125	583	5,137

PACK OF CANNED SALMON ON QUEETS RIVER, WASH., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Sockeye.		Silverside.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1912	1	750	$4,500	200	$2,080	2,500	$11,500
1913	1	1,082	7,574	220	1,848	1,680	5,712
1914	1	1,175	5,875	200	2,134	1,800	6,966
1915	1	.....	.....	1,512	9,072	.....	.....
1916	1	1,506	9,036	.....	.....	617	3,085
1917	1	713	6,417	.....	.....	1,196	9,759
1918	1	381	3,429	20	280	1,138	9,673
1919	1	450	5,400	100	1,600	1,025	12,300

Year.	Canneries operated.	Chum.		Steelhead.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1912	1	1,000	$2,400	.....	.....	4,450	$20,480
1913	1	670	1,461	600	$3,300	4,252	19,895
1914	1	1,020	2,887	500	2,750	4,695	20,612
1915	1	.....	.....	.....	.....	1,512	9,072
1916	1	415	1,245	.....	.....	2,538	13,366
1917	1	47	306	129	1,161	2,085	17,643
1918	1	.....	.....	[a] 87	870	1,626	14,252
1919	1	50	320	.....	.....	1,625	19,620

[a] 68 cases of these were smoked.

PACK OF CANNED SALMON ON QUINAULT RIVER, WASH., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Sockeye.		Silverside.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1911[a]	1	5,000	$35,000	2,031	$16,000	6,000	$42,000
1912	2	.....	.....	4,500	40,500	3,916	18,014
1913	1	.....	.....	492	4,133	7,106	24,160
1914	2	51	255	12,074	120,740	1,623	6,281
1915	2	1,144	6,864	22,972	239,989	1,388	6,807
1916	2	1,365	8,190	10,815	92,835	1,093	5,465
1917	2	309	2,781	4,608	55,296	2,609	21,289
1918	2	1,497	13,473	2,470	30,869	6,086	51,731
1919	2	165	2,063	1,144	18,304	775	9,300

Year.	Canneries operated.	Chum.		Total.	
		Cases.	Value.	Cases.	Value.
1911[a]	1	5,400	$27,000	18,431	$120,000
1912	2	5,500	13,200	13,916	71,714
1913	1	.....	.....	7,598	28,293
1914	2	1,048	2,966	14,796	130,242
1915	2	1,993	5,580	27,497	259,240
1916	2	466	1,398	13,239	107,888
1917	2	1,821	11,836	[b] 10,553	98,488
1918	2	1,682	10,874	11,735	100,947
1919	2	650	4,160	2,734	38,827

[a] Previous to this date the fish were transported to the Aberdeen and Hoquiam canneries and prepared there.

[b] Includes 1,206 cases of humpbacks, valued at $7,236.

PACK OF CANNED SALMON ON GRAYS HARBOR IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1878	1	.....	.....	.....	.....	.....	.....	5,420	$29,268
1879	1	.....	.....	.....	.....	.....	.....	.....	.....
1885	.....	.....	.....	.....	.....	.....	.....	8,200	.....
1886	.....	.....	.....	.....	.....	.....	.....	18,700	.....
1888	4	.....	.....	.....	.....	.....	.....	37,000	212,750
1891	1	.....	.....	500	$1,500	.....	.....	500	1,500
1892	1	4,500	$15,390	9,000	30,780	3,000	$9,415	16,500	55,585
1893	1	4,500	22,500	12,000	48,000	5,500	14,850	22,000	85,350
1894	1	12,300	61,500	4,100	16,400	5,000	13,500	21,400	91,400
1895	1	56	202	8,876	28,403	2,517	6,922	11,449	35,527
1896	2	7,816	36,806	9,278	29,089	4,180	11,495	21,274	57,990
1897	1	3,100	11,741	8,300	23,481	1,900	5,000	13,300	40,222
1898	2	5,100	23,052	4,800	16,320	2,200	6,050	12,100	45,422
1899	1	5,000	21,250	15,740	59,025	3,500	8,750	24,240	89,025
1900	2	6,700	33,500	12,900	51,600	11,200	30,800	30,800	115,900
1901	.....	.....	.....	.....	.....	.....	.....	41,500	.....
1902	1	4,000	20,000	10,000	45,000	17,500	70,000	31,500	135,000
1904	2	4,339	20,163	14,904	51,854	8,316	21,022	27,559	93,039
1905	2	2,050	9,225	13,000	52,000	7,000	18,200	22,050	79,425
1906	2	2,500	10,000	11,500	43,900	8,000	21,500	22,000	75,400
1907	1	1,000	7,000	9,500	47,500	3,500	11,500	14,000	66,000
1908	1	1,000	7,000	9,500	47,500	3,500	11,500	14,000	66,000
1909	1	5,721	20,819	9,019	38,146	5,047	11,608	[a] 21,436	79,624
1910	3	15,495	90,718	21,768	108,840	13,867	48,534	[b] 55,480	272,017
1911	4	15,773	110,411	28,991	202,937	[c] 31,177	155,885	75,941	469,233
1912	5	9,080	54,360	26,162	120,345	12,065	28,956	47,287	203,661
1913	4	1,253	8,771	5,723	19,458	12,919	28,163	19,895	56,392
1914	4	11,899	59,495	9,156	35,434	11,379	32,203	32,434	127,132
1915	4	4,219	20,089	14,036	61,707	22,737	63,678	40,992	145,474
1916	5	12,400	74,403	11,580	67,898	32,560	117,744	[d] 60,336	265,229
1917	9	12,124	109,116	9,589	51,246	10,910	70,915	[e] 42,696	291,715
1918	6	8,731	99,912	21,994	201,705	5,247	37,915	35,972	339,532
1919	6	4,370	54,626	12,214	140,608	28,712	183,757	45,296	384,991

[a] Includes 1,649 cases, valued at $9,051, packed with sockeyes brought from Puget Sound.
[b] Includes 4,350 cases of "quinault," or sockeye, salmon, valued at $23,925.
[c] Includes 6,780 cases of humpbacks.
[d] Includes 3,796 cases of humpbacks, valued at $15,184.
[e] Includes 10,073 cases of humpbacks, valued at $60,438.

PACK OF CANNED SALMON ON WILLAPA HARBOR IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook or black.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1886	.....	.....	.....	.....	.....	.....	.....	13,600	.....
1887	4	.....	.....	.....	.....	.....	.....	.....	.....
1888	3	.....	.....	.....	.....	.....	.....	22,500	$129,375
1891	1	.....	.....	8,000	$24,000	.....	.....	8,000	24,000
1892	1	3,000	$10,260	9,000	30,780	2,500	$7,745	14,500	48,785
1893	1	1,700	9,180	7,895	31,580	6,600	18,150	16,195	58,910
1894	1	2,700	14,580	5,600	22,400	6,800	18,700	15,100	55,680
1895	2	4,636	23,180	13,047	41,150	4,917	13,222	22,600	77,552
1896	2	4,551	22,755	11,940	38,208	8,450	21,238	24,941	82,201
1897	1	8,100	33,291	14,600	44,822	6,900	18,975	29,600	97,088
1898	2	5,865	26,510	9,809	33,351	5,746	15,802	21,420	75,663
1899	3	6,650	25,425	10,675	40,031	4,989	13,720	21,314	79,176
1900	3	6,700	33,500	12,400	49,600	7,200	19,800	26,300	102,900
1901	.....	.....	.....	.....	.....	.....	.....	34,000	.....
1902	2	5,836	29,186	9,128	41,076	24,528	97,112	39,492	167,308
1903	1	2,300	13,800	2,390	10,755	1,200	3,300	5,890	27,855
1904	2	3,000	12,000	7,400	28,440	16,000	38,700	26,400	79,140
1905	2	4,650	20,925	4,300	17,200	6,000	15,000	14,950	53,125
1906	2	4,000	16,000	5,340	21,360	5,100	13,260	14,440	50,620
1907	2	3,530	15,354	9,228	36,682	624	2,496	13,382	54,532
1908	2	4,017	20,585	5,923	23,692	10,517	36,809	20,457	81,086
1909	1	1,455	5,869	4,822	17,359	5,747	13,163	12,024	36,391
1910	1	2,923	15,077	5,096	25,480	3,489	22,711	11,508	63,268
1911	2	5,717	40,019	9,298	65,086	10,482	52,410	25,497	157,515
1912	3	6,123	36,738	8,030	36,938	9,533	22,879	[a] 28,148	108,156
1913	2	67	469	3,111	10,577	8,872	19,368	12,050	30,414
1914	3	2,924	14,431	7,179	27,749	6,734	19,077	16,837	61,256
1915	2	3,148	19,380	4,008	18,437	5,686	15,921	12,842	53,738
1916	2	5,115	30,690	3,305	16,825	10,073	36,262	18,553	83,777
1917	2	1,720	18,920	2,143	19,287	4,516	30,708	8,379	68,915
1918	2	921	10,131	5,249	50,390	2,657	18,599	8,827	79,120
1919	2	1,152	13,824	2,927	35,124	9,125	58,400	13,204	107,348

[a] Includes 4,462 cases of humpbacks, valued at $11,601.

PACK OF CANNED SALMON ON THE COLUMBIA RIVER FROM THE INCEPTION OF THE INDUSTRY TO 1919.

Year.	Canneries operated.	Chinook.		Blueback.		Silverside.	
		Cases.	Value.	Cases.	Value	Cases.	Value.
1866	1	4,000	$64,000				
1867	1	18,000	288,000				
1868	2	28,000	392,000				
1869		100,000	1,350,000				
1870		150,000	1,800,000				
1871		200,000	2,100,000				
1872		250,000	2,325,000				
1873		250,000	2,250,000				
1874	13	350,000	2,625,000				
1875	13	375,000	2,250,000				
1876	17	450,000	2,475,000				
1877		380,000	2,052,000				
1878	30	460,000	2,300,000				
1879	30	480,000	2,640,000				
1880	35	530,000	2,650,000				
1881	35	550,000	2,475,000				
1882		541,300	2,600,000				
1883		629,400	3,147,000				
1884		620,000	2,915,000				
1885		553,800	2,500,000				
1886	39	448,500	2,135,000				
1887		356,000	2,124,000				
1888	28	372,477	2,327,981				
1889	21	266,697	1,600,182	17,797	$101,051		
1890	21	335,604	1,946,087	57,345	290,069		
1891	22	353,907	2,038,566	15,482	284,242		
1892	24	344,267	1,996,388	66,547	372,909	4,176	$20,880
1893	24	288,773	1,559,374	30,459	152,295	29,107	116,428
1894	24	351,106	1,895,976	43,814	224,430	42,758	171,032
1895	24	444,909	2,428,658	18,015	86,523	99,601	329,683
1896	24	370,943	1,840,511	16,983	81,518	44,103	141,145
1897	22	432,753	1,804,221	12,972	51,888	60,850	197,762
1898	23	329,566	1,490,394	66,670	300,015	65,431	222,465
1899	17	255,824	1,458,175	23,969	134,723	29,608	112,056
1900	16	262,392	1,821,258	13,162	92,184	44,925	202,163
1902	14	270,580	1,428,743	17,037	86,465	10,532	44,732
1903	16	301,762	1,610,614	8,383	42,867	12,181	49,869
1904	20	320,378	1,944,690	12,911	78,048	31,254	118,357
1905	19	327,106	1,962,636	7,768	46,608	26,826	114,011
1906	19	311,334	1,868,007	7,816	54,712	41,446	124,338
1907	19	258,433	.....	5,504	.....	31,757	.....
1908	14	210,096	.....	8,581	.....	31,432	.....
1909	15	162,131	1,203,546	*27,908	214,561	42,178	185,070
1910	15	244,285	1,882,137	6,234	34,287	68,922	363,688
1911	15	405,862	2,204,185	5,988	47,904	79,416	549,478
1912	15	220,317	1,988,526	8,210	85,384	31,842	177,248
1913	15	192,116	1,664,670	11,152	93,677	40,969	175,412
1914	17	289,464	2,573,502	35,311	376,924	69,769	380,666
1915	19	406,486	3,694,361	5,459	56,707	33,336	173,234
1916	20	395,166	3,572,203	3,790	27,288	52,084	335,114
1917	20	403,637	5,023,529	7,968	111,552	64,299	700,680
1918	20	400,952	5,222,983	37,833	605,328	98,145	1,072,843
1919	21	392,125	5,031,207	7,268	73,116	90,728	1,052,767

* Of these, 2,846 cases, valued at $23,203 were packed with sockeyes brought from Puget Sound.

PACK OF CANNED SALMON ON THE COLUMBIA RIVER FROM THE INCEPTION OF THE INDUSTRY TO 1919—Continued.

Year.	Canneries operated.	Chum.		Steelhead trout.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1866	1	.....	.....	.....	.....	4,000	$64,000
1867	1	.....	.....	.....	.....	18,000	288,000
1868	2	.....	.....	.....	.....	28,000	392,000
1869	.....	.....	.....	.....	.....	100,000	1,350,000
1870	.....	.....	.....	.....	.....	150,000	1,800,000
1871	.....	.....	.....	.....	.....	200,000	2,100,000
1872	.....	.....	.....	.....	.....	250,000	2,325,000
1873	.....	.....	.....	.....	.....	250,000	2,250,000
1874	13	.....	.....	.....	.....	350,000	2,625,000
1875	13	.....	.....	.....	.....	375,000	2,250,000
1876	.....	.....	.....	.....	.....	450,000	2,475,000
1877	.....	.....	.....	.....	.....	380,000	2,052,000
1878	30	.....	.....	.....	.....	460,000	2,300,000
1879	30	.....	.....	.....	.....	480,000	2,640,000
1880	29	.....	.....	.....	.....	530,000	2,650,000
1881	35	.....	.....	.....	.....	550,000	2,475,000
1882	.....	.....	.....	.....	.....	541,300	2,600,000
1883	.....	.....	.....	.....	.....	629,400	3,147,000
1884	.....	.....	.....	.....	.....	620,000	2,915,000
1885	.....	.....	.....	.....	.....	553,800	2,500,000
1886	39	.....	.....	.....	.....	448,500	2,135,000
1887	.....	.....	.....	.....	.....	356,000	2,124,000
1888	28	.....	.....	.....	.....	372,477	2,327,981
1889	21	.....	.....	25,391	$108,587	309,885	1,809,820
1890	21	.....	.....	42,825	171,300	435,774	2,407,456
1891	22	.....	.....	29,564	118,156	398,953	2,440,964
1892	24	.....	.....	72,348	288,892	487,338	2,679,069
1893	24	2,311	$6,933	65,226	260,904	415,876	2,095,934
1894	24	.....	.....	52,422	209,688	490,100	2,501,126
1895	24	22,493	62,591	49,678	203,542	634,696	3,110,997
1896	24	.....	.....	49,663	198,652	481,697	2,261,826
1897	22	.....	.....	46,146	165,440	552,721	2,219,311
1898	23	.....	.....	26,277	60,352	487,944	2,073,226
1899	17	11,379	33,836	11,994	39,186	332,774	1,777,975
1900	16	17,696	63,706	20,597	102,985	358,772	2,282,296
1901	.....	.....	.....	.....	.....	390,183	1,942,660
1902	14	10,401	41,604	8,593	42,965	317,143	1,644,509
1903	16	10,000	37,500	7,251	36,255	339,577	1,777,105
1904	20	20,693	52,691	9,868	48,892	395,104	2,242,678
1905	19	25,751	65,206	9,822	49,110	397,273	2,237,571
1906	19	27,802	69,505	6,500	32,500	394,898	2,149,062
1907	19	22,556	.....	5,921	.....	324,171	1,763,490
1908	14	16,884	.....	10,726	.....	277,719	1,380,708
1909	15	24,542	57,116	17,382	99,796	[a] 274,196	1,760,220
1910	15	66,538	232,883	5,436	31,203	391,415	2,544,198
1911	15	53,471	203,198	8,594	47,399	553,331	3,052,164
1912	15	18,699	46,590	6,958	22,108	286,026	2,319,856
1913	15	13,303	29,486	8,939	49,142	266,479	2,012,387
1914	17	49,285	305,541	10,792	59,356	454,621	3,695,989
1915	19	86,530	251,632	26,723	129,358	558,534	4,305,292
1916	20	77,766	307,483	18,999	118,987	[b] 547,881	4,361,299
1917	20	53,659	386,596	23,783	292,583	553,346	6,514,940
1918	20	29,846	215,669	24,605	350,071	591,381	7,466,894
1919	21	75,493	441,989	14,414	144,140	580,028	6,743,219

[a] Includes 55 cases of humpbacks, valued at $132, packed with humpbacks brought from Puget Sound.
[b] Includes 56 cases of humpbacks, valued at $224.

Pack of Canned Salmon on the Columbia River, by States, 1916–1919.

States and species.	1916		1917		1918		1919	
	Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
Washington:								
Blueback	1,377	$12,389	2,801	$33,612	19,450	$245,070	2,329	$18,632
Chinook	179,083	1,074,495	146,140	1,753,680	145,511	1,715,874	[a] 130,185	1,671,007
Chum	46,012	165,643	14,539	93,050	12,173	85,211	39,279	235,674
Humpback	[b] 56	224						
Silverside	26,788	133,940	15,989	183,874	35,746	343,162	34,927	349,270
Steelhead	14,348	86,091	6,053	66,583	8,699	104,388	7,148	71,480
Total	267,664	1,472,782	185,522	2,130,799	221,579	2,493,705	213,868	2,346,063
Oregon:								
Blueback	2,413	14,899	5,167	77,940	18,383	360,258	4,939	54,484
Chinook	216,083	2,497,708	257,497	3,269,849	255,441	3,507,109	261,940	3,360,200
Chum	31,754	141,840	39,120	293,546	17,673	130,458	36,214	206,315
Silverside	25,296	201,174	48,310	516,806	62,399	729,681	55,801	703,497
Steelhead	4,651	32,896	17,730	225,955	15,906	245,683	7,266	72,660
Total	280,197	2,888,517	367,824	4,384,096	369,802	4,973,189	366,160	4,397,156
Grand total	547,861	4,361,299	553,346	6,514,895	591,381	7,466,894	580,028	6,743,219

[a] Includes 106,328 cases spring chinooks, valued at $1,382,264; 21,740 cases fall chinooks, valued at $273,924; and 2,117 cases light-colored chinooks, valued at $14,819.
[b] Fish brought in from Puget Sound.

Pack of Canned Salmon on Nehalem River, Oreg., in Specified Years.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1887	1							5,000	$30,000
1889								6,000	32,000
1890								9,000	45,500
1891	1							3,500	14,000
1892	1			10,000	$40,000			10,000	40,000
1893	1	1,692	$6,768	5,031	20,124			6,723	26,892
1894	1	1,627	6,508	4,866	19,464			6,493	25,972
1895	1	1,752	7,008	5,152	16,486			6,904	23,494
1896	1	2,828	8,484	5,218	15,654			8,046	24,138
1897	2	3,384	10,152	8,366	25,098			11,750	35,250
1898	1	3,808	9,891	5,700	19,380			9,508	29,271
1899	1	1,384	5,536	7,405	26,658	1,288	$3,864	10,077	36,058
1900	1								
1901	1	268	1,139	3,278	13,092	2,669	7,206	6,210	21,437
1902	1	271	1,431	3,169	13,468	2,570	10,280	6,010	25,179
1903	1	686	3,670	4,615	19,614			5,301	22,284
1904	1	500	2,500	5,000	20,000	6,000	12,000	11,500	34,500
1905	1	2,700	16,200	2,900	12,325	6,000	15,000	11,600	43,525
1906	1	3,987	23,922	4,976	14,928	2,057	5,143	11,020	42,993
1907	1	4,000	28,000	6,600	19,800	2,000	6,000	12,600	53,800
1908	1	5,000	35,000	6,100	18,300	2,016	6,048	13,116	59,348
1909	1	1,985	10,542	4,554	20,253	909	2,091	7,448	32,886
1910	1	3,500	24,500	5,400	29,700	1,500	4,500	10,400	58,700
1911	2	5,821	46,568	14,878	81,829	3,439	13,048	24,138	141,445
1912	2			13,331	73,321	1,571	3,927	14,902	77,248
1913	1	300	1,500	764	3,056	5	11	1,069	4,567
1914	2	4,841	33,887	11,800	63,720	1,668	4,150	18,309	101,777
1915	2	400	2,400	5,400	24,840	2,260	6,328	8,060	33,568
1916	2	2,700	21,656	3,474	17,370	833	2,499	7,007	41,525
1917	2	783	7,047	851	6,808	472	3,304	2,106	17,159
1918	2	1,685	18,535	9,200	88,320	519	3,633	11,404	110,488
1919	2	500	6,250	8,124	97,488	1,183	7,571	9,807	111,309

PACK OF CANNED SALMON ON TILLAMOOK BAY, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1884								4,500	
1885								9,800	
1886	2							37,000	
1887	2							21,000	$115,500
1888	2							14,633	84,140
1889								9,500	52,250
1890								14,009	79,049
1891	1								
1892	1			18,000	$72,000			18,000	72,000
1893	1	497	$1,988	4,000	16,000	6,919	$17,297	11,416	35,285
1894	1	700	2,800	7,763	31,052	700	1,750	9,163	35,602
1895	1			6,514	20,845	7,001	19,253	13,515	40,098
1896	1	2,200	6,600	4,860	14,580			7,060	21,180
1897	1	2,000	6,000	9,000	27,000			11,000	33,000
1898	1	5,000	13,000	10,342	35,162			15,342	48,162
1899	1	2,180	8,720	3,889	14,036	5,121	15,363	11,190	38,119
1900	1								
1901	1	848	4,240	2,133	9,598	3,901	10,728	6,882	24,566
1902	1	215	1,135	2,287	9,720	4,093	16,372	6,595	27,227
1903	1			2,727	11,590	2,620	10,480	5,347	22,070
1904	1			4,400	17,600	6,500	13,000	10,900	30,600
1905	1	1,100	6,600	1,700	7,650	8,800	22,000	11,600	36,250
1906	1	1,870	11,220	2,364	7,092	1,270	3,175	5,504	21,487
1907	1	2,000	14,000	3,410	10,230	2,314	6,942	7,724	31,172
1908	1	2,300	16,100	6,000	21,000	4,000	12,000	12,300	49,100
1909	1	2,615	15,663	5,029	21,809	3,712	8,538	11,356	46,010
1910	1	2,900	20,300	4,500	24,750	2,000	6,000	9,400	51,050
1911	2	8,433	67,464	12,663	69,647	5,277	20,053	26,373	157,164
1912	2	3,811	26,677	6,418	32,099	4,550	11,375	14,779	70,142
1913	1	2,600	15,600	1,000	4,000	1,000	2,200	4,600	21,800
1914	2	4,734	33,138	4,131	22,307	6,707	16,867	15,572	72,312
1915	3	5,675	34,300	4,549	20,925	9,099	25,477	19,323	70,702
1916	3	9,465	75,720	4,333	21,665	7,530	22,590	21,328	119,975
1917	3	8,822	79,398	5,522	44,176	6,941	48,587	21,285	172,161
1918	1	107	1,177	3,461	33,226	1,567	10,969	5,135	45,372
1919	2	1,500	18,750	7,150	85,800	4,350	27,840	13,000	132,390

PACK OF CANNED SALMON ON NESTUGGA RIVER, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1887	1							4,300	$23,650
1888	1							5,000	28,750
1889								6,700	36,850
1891	1								
1899	1	1,109	$4,436	3,034	$10,922	513	$1,539	4,656	16,897
1900	1								
1901	1	279	1,116	3,553	13,323	396	1,089	4,228	15,528
1905	1	3,000	18,000	1,000	4,250	400	1,000	4,400	23,250
1906	1	2,622	15,732	2,468	7,404	165	413	5,255	23,549
1907	1	2,100	14,700	3,540	10,620	150	450	5,790	25,770
1908	1	2,000	14,000	3,000	10,500	100	300	5,100	24,800
1910	1	2,000	14,000	3,300	18,150	140	420	5,440	32,570
1911	1	3,562	28,496	7,124	39,182	641	2,436	11,327	70,114
1912	1	3,090	18,540	6,180	30,900	708	1,770	9,978	51,210
1913	1	126	756	243	972			369	1,728
1914	1	3,542	24,794	5,730	30,942	265	662	9,537	56,308
1915	1	200	1,300	3,930	18,078	800	2,240	4,930	21,618
1916	1	2,400	19,200	4,056	20,280	200	600	6,656	40,800
1917	1	2,000	18,000	3,800	30,400	260	1,820	6,060	50,220
1918	1	3,000	33,000	3,206	30,778	215	1,505	6,421	65,283
1919	1	1,900	23,750	2,400	28,800	450	2,880	4,750	55,430

PACK OF CANNED SALMON ON SILETZ RIVER, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1896	1	2,500	$7,500	1,900	$5,700	.....	.....	4,400	$13,200
1897	1	3,510	10,530	5,015	15,045	.....	.....	8,525	25,575
1898	1	3,200	8,360	4,330	14,722	.....	.....	7,530	23,082
1899	1	2,200	9,900	2,319	8,696	200	$550	4,719	19,146
1900	1	.....	.....	.....	.....	.....	.....	.....	.....
1901	1	876	4,380	3,740	16,830	360	1,260	4,976	22,470
1902	1	600	3,168	1,917	8,147	500	2,000	3,017	13,315
1904	1	1,000	5,000	3,300	13,200	1,000	2,000	5,300	20,200
1905	1	1,500	9,000	1,700	7,225	900	2,250	4,100	18,475
1906	1	2,635	15,810	3,192	9,576	167	418	5,994	25,804
1907	1	2,333	16,331	4,300	12,900	200	600	6,833	29,831
1908	1	2,100	14,700	4,700	16,450	300	900	7,100	32,050
1910	1	2,200	15,400	4,600	25,300	250	750	7,050	41,450
1911	1	3,584	28,672	7,164	39,402	237	901	10,985	68,975
1912	1	3,277	19,662	6,554	32,770	283	707	10,114	53,139
1913	1	15	75	354	1,416	17	37	386	1,528
1914	1	3,356	23,492	6,712	36,245	196	490	10,264	60,227
1915	1	100	600	3,000	13,800	100	280	3,200	14,680
1916	1	1,000	8,000	3,000	15,000	210	630	4,210	23,630
1917	1	1,800	16,200	3,400	28,200	222	1,554	5,422	45,954
1918	2	4,301	47,344	7,789	74,774	384	2,688	12,477	124,806
1919	2	1,393	17,413	5,892	70,704	472	3,021	7,757	91,138

PACK OF CANNED SALMON ON YAQUINA BAY AND RIVER, OREG., IN SPECIFIED YEARS.[a]

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1887	2	.....	.....	.....	.....	.....	.....	.....	.....
1888	3	.....	.....	.....	.....	.....	.....	5,088	$29,256
1889	.....	.....	.....	.....	.....	.....	.....	5,000	27,500
1891	1	.....	.....	.....	.....	.....	.....	.....	.....
1896	1	1,714	$5,142	615	$1,845	.....	.....	2,329	6,987
1898	1	170	442	1,530	5,202	.....	.....	1,700	5,644
1899	2	316	1,422	3,234	12,127	1,300	$3,575	4,850	17,124
1900	1	.....	.....	.....	.....	.....	.....	.....	.....
1901	1	96	480	2,848	12,816	549	1,647	3,493	14,943
1903	1	.....	.....	1,238	5,262	315	787	1,553	6,049
1904	1	50	200	2,600	8,840	450	1,080	3,100	10,120
1905	1	200	1,200	2,050	8,613	62	155	2,312	9,968
1906	1	500	3,000	3,100	9,300	60	150	3,660	12,450
1907	1	834	5,838	1,000	3,000	49	147	1,883	8,985
1908	1	.....	.....	4,000	14,000	.....	.....	4,000	14,000
1909	1	.....	.....	1,139	4,556	33	76	1,172	4,632
1910	1	.....	.....	2,669	13,345	.....	.....	2,669	13,345
1911	1	.....	.....	1,009	5,549	51	289	1,060	5,838

[a] Cannery not operated from 1912 to 1916, both years inclusive. In 1917 it was consolidated with Waldport cannery owned by same party.

PACK OF CANNED SALMON ON ALSEA RIVER AND BAY, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1886	1	.....	.....	.....	.....	.....	.....	.....	.....
1887	2	.....	.....	.....	.....	.....	.....	11,180	$64,285
1888	3	.....	.....	.....	.....	.....	.....	9,620	55,315
1889	.....	.....	.....	.....	.....	.....	.....	10,000	55,000
1891	1	.....	.....	.....	.....	.....	.....	.....	.....
1892	1	.....	.....	3,600	$14,400	.....	.....	3,600	14,400
1893	1	1,260	$6,300	3,240	12,960	.....	.....	4,500	19,260
1894	1	440	2,200	4,160	16,640	.....	.....	4,600	18,840
1895	1	1,700	6,375	3,280	11,808	.....	.....	4,980	18,183
1896	1	3,500	10,500	3,400	10,200	.....	.....	6,900	20,700
1897	1	1,800	5,400	3,200	9,600	.....	.....	5,000	15,000
1898	1	4,296	11,170	2,170	7,378	.....	.....	6,466	18,548
1899	1	2,150	9,138	5,010	19,038	.....	.....	7,160	28,176
1900	1	.....	.....	.....	.....	.....	.....	.....	.....
1901	1	695	3,475	4,629	18,790	891	$3,118	6,215	25,383
1902	1	701	3,702	4,530	19,253	670	2,680	5,901	25,635
1903	1	1,031	5,516	4,242	18,029	44	88	5,317	23,633
1904	1	1,000	5,000	6,500	26,000	300	600	7,800	31,600
1905	1	2,500	15,000	1,800	7,650	700	1,750	5,000	24,400
1906	1	3,702	22,212	3,843	11,529	.....	.....	7,545	33,741
1907	1	800	5,600	5,100	15,300	350	1,050	6,250	21,950
1908	1	1,200	8,400	6,000	21,000	400	1,200	7,600	30,600
1909	1	1,119	6,714	5,486	24,027	80	184	6,685	30,925
1910	1	2,500	17,500	5,900	31,950	100	300	8,500	49,750
1911	2	4,161	33,288	9,329	51,309	688	2,614	14,178	87,211
1912	2	3,731	22,386	8,286	41,430	524	1,310	12,541	65,126
1913	2	1,607	8,035	4,304	17,216	160	352	6,071	25,603
1914	2	4,546	31,822	6,728	36,331	73	183	11,347	68,336
1915	2	1,668	10,763	6,966	32,044	178	498	8,812	43,305
1916	2	2,624	20,992	3,864	19,320	292	876	6,780	41,188
1917	2	2,727	24,543	6,621	52,968	418	2,926	9,766	80,437
1918	2	2,000	22,000	7,215	69,264	312	2,178	[a] 10,068	99,934
1919	2	2,512	31,400	2,607	31,200	535	3,718	5,654	66,318

[a] Includes 541 cases of bluebacks, valued at $6,492.

PACK OF CANNED SALMON ON THE SIUSLAW RIVER, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1878	2	.....	.....	.....	.....	.....	.....	10,300	$55,620
1879	2	.....	.....	.....	.....	.....	.....	.....	.....
1886	1	.....	.....	.....	.....	.....	.....	1,500	.....
1888	3	.....	.....	.....	.....	.....	.....	11,960	68,770
1889	1	.....	.....	.....	.....	.....	.....	12,000	66,000
1891	2	.....	.....	.....	.....	.....	.....	.....	.....
1892	2	.....	.....	18,000	$72,000	.....	.....	18,000	72,000
1893	2	1,471	$7,355	11,830	47,320	.....	.....	13,301	54,675
1894	2	1,871	9,355	14,987	59,948	.....	.....	16,858	69,303
1895	2	1,637	6,139	10,465	35,274	.....	.....	12,102	41,413
1896	1	2,700	8,100	9,000	27,000	.....	.....	11,700	35,100
1897	1	1,100	3,300	3,900	11,700	.....	.....	5,000	15,000
1898	1	850	2,210	10,000	34,000	.....	.....	10,850	36,210
1899	1	1,162	4,648	7,323	26,363	115	$345	8,600	31,356
1900	2	.....	.....	.....	.....	.....	.....	.....	.....
1901	1	1,736	8,675	7,488	29,952	.....	.....	9,223	38,627
1902	1	1,288	6,800	4,320	18,260	.....	.....	5,608	25,060
1903	1	1,519	8,127	6,842	29,079	.....	.....	8,361	37,206
1904	1	500	2,500	6,500	26,000	.....	.....	7,000	28,500
1905	1	.....	.....	.....	.....	.....	.....	.....	.....
1906	2	4,500	27,000	15,000	45,000	1,500	3,750	21,000	75,750
1907	1	.....	.....	15,773	47,319	.....	.....	15,773	47,319
1908	1	.....	.....	8,600	30,100	.....	.....	8,600	30,100
1909	2	632	3,792	7,436	32,956	.....	.....	8,068	36,748
1910	2	856	5,992	12,800	70,400	8,502	25,506	22,158	101,898
1911	2	1,120	8,960	10,266	56,463	5,000	19,000	16,386	84,423
1912	2	.....	.....	6,108	30,540	.....	.....	6,108	30,540
1913	[a] 1	.....	.....	4,281	17,124	.....	.....	4,281	17,124
1914	1	.....	.....	9,266	50,036	.....	.....	9,266	50,036
1915	1	.....	.....	1,755	8,073	.....	.....	1,755	8,073
1916	1	875	7,000	3,021	15,105	.....	.....	3,896	22,105
1917	1	.....	.....	350	2,800	.....	.....	350	2,800
1918	1	.....	.....	3,000	28,800	.....	.....	3,000	28,800
1919	1	.....	.....	3,760	43,120	.....	.....	3,760	43,120

[a] The two canneries combined and operated one plant.

PACK OF CANNED SALMON ON THE UMPQUA RIVER, OREG., IN SPECIFIED YEARS.[a]

Year.	Canneries operated.	Chinook.		Silverside.		Chum.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.	Cases.	Value.
1878	2	.....	.....	.....	.....	.....	.....	8,100	$43,740
1879	2	.....	.....	.....	.....	.....	.....	.....	.....
1884	2	.....	.....	.....	.....	.....	.....	3,700	.....
1885	1	.....	.....	.....	.....	.....	.....	10,500	.....
1886	1	.....	.....	.....	.....	.....	.....	18,600	.....
1887	1	.....	.....	.....	.....	.....	.....	4,000	22,000
1888	1	.....	.....	.....	.....	.....	.....	9,000	51,750
1889	1	.....	.....	.....	.....	.....	.....	12,000	66,000
1891	1	.....	.....	.....	.....	.....	.....	.....	.....
1892	1	.....	.....	10,000	$40,000	.....	.....	10,000	40,000
1893	1	809	$4,045	3,204	12,816	.....	.....	4,013	16,861
1894	1	235	1,175	6,875	27,500	.....	.....	7,110	28,675
1895	1	992	3,720	7,697	28,863	.....	.....	8,689	32,583
1896	1	1,300	3,900	8,000	24,000	.....	.....	9,300	27,900
1899	2	925	3,860	7,576	27,006	115	$345	8,616	31,211
1900	2	.....	.....	.....	.....	.....	.....	.....	.....
1903	1	23	123	6,733	28,615	.....	.....	6,756	28,738
1904	1	500	2,500	9,500	38,000	500	1,000	10,500	41,500
1905	1	6,100	36,600	10,500	44,625	.....	.....	16,600	81,225
1906	1	1,143	6,858	5,613	16,839	.....	.....	6,756	23,697
1909	1	500	3,000	7,753	31,012	.....	.....	8,253	34,012
1910	1	2,000	14,000	11,000	60,500	.....	.....	13,000	74,500
1911	1	300	2,400	6,118	33,649	.....	.....	6,418	36,049
1912	1	30	210	3,759	18,795	.....	.....	3,789	19,005
1914	1	1,000	8,000	2,000	10,000	.....	.....	3,000	18,000
1915	2	.....	.....	5,100	23,460	.....	.....	5,100	23,460
1916	2	.....	.....	2,900	14,500	.....	.....	2,900	14,500
1917	1	.....	.....	5,366	42,928	47	329	5,413	43,257
1918	1	1,703	18,733	3,409	32,726	1	7	5,113	51,466
1919	1	.....	.....	7,500	90,000	.....	.....	7,500	90,000

[a] No canning done in 1913.

PACK OF CANNED SALMON ON COOS BAY AND RIVER, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook.		Silverside.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1887	2	.....	.....	.....	.....	11,300	$62,150
1888	1	.....	.....	.....	.....	5,500	31,625
1889	1	.....	.....	.....	.....	7,000	38,500
1891	2	3	.....	.....	.....	.....	.....
1893	1	.....	.....	3,125	$12,500	3,125	12,500
1894	1	163	$815	8,428	33,712	8,591	34,527
1895	1	5,110	19,163	2,332	8,934	7,442	28,097
1896	1	13,000	39,000	2,000	6,000	15,000	45,000
1897	1	6,200	18,600	2,200	6,600	8,400	25,200
1898	2	3,142	8,169	7,180	24,412	10,322	32,581
1898	2	1,273	5,092	5,174	18,626	6,447	23,718
1900	2	.....	.....	.....	.....	.....	.....
1901	1	1,215	6,075	4,082	16,328	5,297	22,403
1902	1	412	2,175	2,640	11,220	3,052	13,395
1904	1	2,033	7,725	7,200	24,480	9,233	32,205
1906	1	2,043	12,258	1,755	5,265	3,798	17,523
1909	1	275	1,475	3,959	17,927	4,234	19,402
1910	1	500	3,500	5,500	30,250	6,000	33,750
1911	2	2,630	21,040	7,260	39,930	9,890	60,970
1912	2	1,457	10,199	3,989	19,945	5,446	30,144
1913	2	.....	.....	7,383	29,532	7,383	29,532
1914	1	.....	.....	9,300	50,220	9,300	50,220
1915	1	.....	.....	3,500	16,100	3,500	16,100
1916	1	.....	.....	2,485	12,425	2,485	12,425
1917	1	.....	.....	.....	.....	.....	.....
1918	1	.....	.....	3,800	36,480	3,800	36,480

PACK OF CANNED SALMON ON COQUILLE RIVER, OREG., IN SPECIFIED YEARS.

Year.	Canneries operated.	Chinook		Silverside.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1883	1	.....	.....	.....	.....	7,000	.....
1884	1	.....	.....	.....	.....	7,300	.....
1885	1	.....	.....	.....	.....	3,800	.....
1886	2	.....	.....	.....	.....	8,300	.....
1887	3	.....	.....	.....	.....	.....	.....
1888	2	.....	.....	.....	.....	11,000	$63,250
1889	.....	.....	.....	.....	.....	8,600	47,300
1891	1	.....	.....	.....	.....	.....	.....
1892	1	.....	.....	5,000	$20,000	5,000	20,000
1893	1	.....	.....	6,500	26,000	6,500	26,000
1894	[a] 1	.....	.....	2,000	8,000	2,000	8,000
1895	2	760	$2,837	8,724	32,615	9,484	35,502
1896	2	1,225	3,675	7,800	23,400	9,025	27,075
1898	2	541	1,407	7,485	25,499	8,026	26,906
1899	2	950	3,800	7,550	28,500	8,500	32,300
1900	1	2,636	13,180	9,601	38,404	12,237	51,584
1901	1	133	665	5,096	20,384	5,229	21,049
1902	1	286	1,510	5,877	24,927	6,163	26,437
1903	1	331	1,771	8,685	36,911	9,016	38,682
1904	2	600	2,400	13,686	54,744	14,286	57,144
1905	2	2,100	12,600	11,343	48,208	13,443	60,808
1906	2	821	4,926	17,979	53,937	18,800	58,863
1907	2	306	2,142	13,220	39,660	13,526	41,802
1908	2	.....	.....	19,174	67,109	19,174	67,109
1909	2	250	1,255	9,818	42,687	10,068	43,942
1910	2	420	2,940	16,637	91,504	17,057	94,444
1911	2	715	5,720	16,676	91,718	17,391	97,438
1912	2	377	2,639	6,040	30,200	6,417	32,839
1913	2	.....	.....	8,910	35,640	8,910	35,640
1914	2	.....	.....	12,097	65,324	12,097	65,324
1915	2	1,079	6,474	5,131	25,515	6,210	31,989
1916	2	869	6,952	2,652	13,260	3,521	20,212
1917	2	694	6,246	8,005	64,040	[b] 8,706	70,335
1918	2	1,318	14,498	10,096	96,922	[c] 11,650	113,129
1919	2	1,027	12,837	5,010	60,120	[d] 6,082	72,957

[a] Burned.
[b] Includes 7 cases of chums, valued at $49.
[c] Includes 217 cases of chums, valued at $1,519, and 19 cases of steelheads, valued at $190.
[d] Includes 45 cases of chums.

PACK OF CANNED SALMON ON ROGUE RIVER, OREG., IN SPECIFIED YEARS.[a]

Year.	Canneries operated.	Chinook.		Silverside.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1877	1	.....	.....	.....	.....	7,804	.....
1878	1	.....	.....	.....	.....	8,534	.....
1879	1	.....	.....	.....	.....	8,571	.....
1880	1	.....	.....	.....	.....	7,772	.....
1881	1	.....	.....	.....	.....	12,320	.....
1882	1	.....	.....	.....	.....	19,186	.....
1883	1	.....	.....	.....	.....	16,156	.....
1884	1	.....	.....	.....	.....	12,376	.....
1885	1	.....	.....	.....	.....	9,310	.....
1886	1	.....	.....	.....	.....	12,147	.....
1887	1	.....	.....	.....	.....	17,216	.....
1888	1	.....	.....	.....	.....	21,062	$121,107
1889	1	.....	.....	.....	.....	22,000	132,000
1890	1	.....	.....	.....	.....	24,000	120,000
1891	1	.....	.....	.....	.....	21,000	105,000
1892	1	10,000	$59,000	9,000	$36,000	19,000	95,000
1893	[b] 1	3,200	16,000	.....	.....	3,200	16,000
1895	1	10,377	41,508	4,385	15,347	14,762	56,855
1896	1	15,000	75,000	3,000	9,000	18,000	84,000
1897	1	15,355	61,420	3,653	10,959	19,008	72,379
1898	1	12,964	51,550	501	1,303	13,465	52,853
1899	1	5,481	30,145	1,745	6,980	7,226	37,125
1900	1	.....	.....	.....	.....	.....	.....

[a] Shut down in 1911 and 1912 through the closing of the river to all fishing.
[b] Burned down during season. Not opened the next year.

PACK OF CANNED SALMON ON ROGUE RIVER, OREG., IN SPECIFIED YEARS—Contd.

Year.	Canneries operated.	Chinook.		Silverside.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1901	1	2,681	$13,405	4,184	$17,736	6,865	$31,141
1902	1	3,799	20,058	4,091	17,387	7,890	37,445
1903	1	8,418	45,036	4,792	20,366	13,210	65,402
1904	1	16,000	64,000	3,255	11,392	19,255	75,392
1905	1	18,500	111,000	1,500	6,375	20,000	117,375
1906	1	12,000	72,000	6,000	18,000	18,000	90,000
1907	1	7,537	56,528	1,796	8,980	9,333	65,508
1908	1	4,354	32,655	2,650	13,250	7,004	45,905
1909	1	186	1,300	699	2,977	885	4,277
1910	1	232	1,786	2,711	16,266	2,943	18,052
1913	1	3,020	27,180	2,403	11,857	5,423	39,017
1914	1	6,938	62,060	987	5,453	7,925	67,513
1915	2	19,094	135,301	515	2,369	19,609	137,670
1916	2	22,640	181,120	501	2,505	23,141	183,625
1917	2	24,707	271,777	660	5,280	25,367	277,057
1918	2	20,469	225,159	2,704	24,336	23,173	249,495
1919	3	17,237	215,463	671	8,052	17,908	223,515

PACK OF CANNED SALMON ON SMITH RIVER, CALIF., IN SPECIFIED YEARS.

Year.	Canneries operated.	Quinnat.		Silverside.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1878	1	4,277	$23,096	.....	.....	4,277	$23,096
1880	1	7,500	41,250	.....	.....	7,500	41,250
1884	1	5,500	33,000	.....	.....	5,500	33,000
1885	1	1,550	9,300	.....	.....	1,550	9,300
1888	1	2,347	14,082	.....	.....	2,347	14,082
1893	1	1,500	7,500	500	$1,500	2,000	9,000
1894	1	1,500	7,500	500	1,500	2,000	9,000
1895	1	2,250	9,990	.....	.....	2,250	9,990
1914	1	.....	.....	3,000	18,000	3,000	18,000
1915	1	1,955	13,685	1,078	6,220	3,033	19,905
1916	1	1,515	12,120	990	4,950	2,505	17,070
1917	1	6,300	69,300	.....	.....	6,300	69,300
1918	1	4,041	44,451	612	5,508	4,653	49,959
1919	1	4,366	56,758	.....	.....	4,366	56,758

PACK OF CANNED SALMON ON KLAMATH RIVER, CALIF., IN SPECIFIED YEARS.

Year.	Canneries operated.	Quinnat.		Silverside.		Total.	
		Cases.	Value.	Cases.	Value.	Cases.	Value.
1888	1	4,400	$26,400	.....	.....	4,400	$26,400
1892	1	1,047	4,188	.....	.....	1,047	.....
1893	1	1,600	6,400	.....	.....	1,600	6,400
1894	1	1,700	6,800	.....	.....	1,700	6,800
1895	1	1,200	5,321	400	$1,500	1,600	6,821
1899	1	1,600	8,800	.....	.....	1,600	8,800
1902	1	2,500	13,500	.....	.....	2,500	13,500
1904	1	3,400	20,800	.....	.....	3,400	20,800
1909	1	5,633	33,000	.....	.....	5,633	33,000
1910	1	8,016	52,000	.....	.....	8,016	52,000
1911	1	7,400	46,000	204	816	7,604	48,816
1912	2	18,000	117,000	.....	.....	18,000	117,000
1913	2	6,376	40,500	.....	.....	6,376	40,500
1914	1	7,500	48,500	3,500	14,000	11,000	62,500
1915	1	10,400	72,800	2,500	13,000	12,900	85,800
1916	1	6,484	51,872	2,400	12,000	8,884	63,872
1917	1	5,130	56,430	2,900	23,200	8,030	79,630
1918	1	5,555	61,105	4,292	38,628	[a] 10,200	102,557
1919	1	6,291	81,783	1,145	13,740	[b] 7,731	95,523

[a] Includes 353 cases of steelheads, valued at $2,824.

[b] Includes 295 cases of steelheads.

PACK OF CANNED SALMON ON EEL RIVER, CALIF., IN SPECIFIED YEARS.[a]

Year.	Canneries operated.	Quinnat.		Year.	Canneries operated.	Quinnat.	
		Cases.	Value.			Cases.	Value.
1877	1	8,500	$51,000	1885	1	5,750	.....
1878	1	10,500	56,700	1886	1	12,500	$75,000
1880	1	6,250	.....	1910	1	6,000	42,000
1883	1	15,000	.....	1911	1	8,400	52,500
1884	1	8,200	.....	1912	1	11,000	71,500

[a] Shut down since 1912.

PACK OF CANNED SALMON ON NOYO RIVER, CALIF., IN SPECIFIED YEARS.

Year.	Canneries operated.	Quinnat.	
		Cases.	Value.
1918	1	2,000	$22,000
1919	1	7,500	97,500

PACK OF CANNED SALMON ON THE SACRAMENTO RIVER IN SPECIFIED YEARS.

Year.	Canneries operated.	Quinnat.		Year.	Canneries operated.	Quinnat.	
		Cases.	Value.			Cases.	Value.
1864	1	2,000	.....	1893	3	23,336	.....
1866	1	2,000	.....	1894	2	28,463	.....
1874	.....	2,500	.....	1895	3	25,185	$111,821
1875	.....	3,000	.....	1896	.....	13,387	.....
1876	2	10,000	.....	1897	.....	38,543	.....
1877	.....	21,500	.....	1898	.....	29,731	.....
1878	6	34,017	$183,692	1899	.....	32,580	150,688
1879	4	13,855	59,577	1900	.....	39,304	.....
1880	9	62,000	.....	1901	.....	17,500	.....
1881	20	181,200	.....	1902	.....	14,043	.....
1882	19	200,000	.....	1903	.....	8,200	.....
1883	21	123,000	.....	1904	2	14,407	66,936
1884	.....	81,450	.....	1905	1	2,780	.....
1885	6	90,000	.....	1911	1	4,142	28,994
1886	9	39,300	.....	1913	1	950	6,650
1887	.....	36,500	.....	1914	2	17,315	95,232
1888	6	68,075	423,750	1915	2	5,229	35,453
1889	3	57,300	.....	1916	1	6,636	53,088
1890	.....	25,005	.....	1917	3	9,443	94,430
1891	.....	10,353	.....	1918	2	4,036	44,396
1892	.....	2,281	.....	1919	2	1,169	15,197

PACK OF CANNED SALMON AT MONTEREY BAY IN SPECIFIED YEARS.

Year.	Canneries operated.	Quinnat.		Year.	Canneries operated.	Quinnat.	
		Cases.	Value.			Cases.	Value.
1915	1	950	$7,300	1918	.....	.....	.....
1916	1	12,809	102,472	1919	1	2,000	$26,000
1917	1	2,000	20,000				

PACK OF CANNED SALMON IN ALASKA, BY DISTRICTS, SINCE THE INCEPTION OF THE INDUSTRY.

Year.	Southeast Alaska.		Central Alaska.		Western Alaska.		Total.	
	Canneries operated.	Pack.	Canneries operated.	Pack.	Canneries operated.	Pack.	Canneries operated.	Pack.
		Cases.		*Cases.*		*Cases.*		*Cases.*
1878	2	8,159	.....	.....	.....	.....	2	8,159
1879	2	12,530	.....	.....	.....	.....	2	12,530
1880	1	6,539	.....	.....	.....	.....	1	6,539
1881	1	8,977	.....	.....	.....	.....	1	8,977
1882	1	11,501	2	10,244	.....	.....	3	21,745
1883	4	20,040	2	28,297	.....	.....	6	48,337
1884	4	22,189	2	42,297	1	*a* 400	7	64,886
1885	3	16,728	2	52,687	1	14,000	6	83,415
1886	4	18,660	2	74,583	3	48,822	9	142,065
1887	5	31,462	2	102,515	3	72,700	10	206,677
1888	6	81,128	6	241,101	4	89,886	16	412,115
1889	12	141,760	21	461,451	4	115,985	37	719,196
1890	12	142,901	19	421,300	4	118,390	35	682,591
1891	11	156,615	14	511,367	5	133,418	30	801,400
1892	7	115,722	6	295,496	2	63,499	15	474,717
1893	8	136,053	11	399,815	3	107,786	22	643,654
1894	7	142,544	10	435,052	4	108,844	21	686,440
1895	7	148,476	10	327,919	6	150,135	23	626,530
1896	9	262,381	12	485,990	8	218,336	29	966,707
1897	9	271,867	13	382,899	7	254,312	29	909,078
1898	9	251,385	14	395,009	7	318,703	30	965,097
1899	9	310,219	14	356,095	9	411,832	32	1,078,146
1900	16	456,639	14	492,223	12	599,277	42	1,548,139
1901	21	735,449	18	562,142	21	719,213	55	2,016,804
1902	26	906,676	12	583,690	26	1,046,458	64	2,536,824
1903	21	642,305	12	417,175	27	1,186,730	60	2,246,210
1904	12	569,003	11	499,485	32	885,268	55	1,953,756
1905	13	433,607	9	371,755	25	1,089,154	47	1,894,516
1906	20	767,285	8	473,024	19	978,735	47	2,219,044
1907	22	887,503	8	522,836	18	759,534	48	2,169,873
1908	23	1,022,723	8	425,721	19	1,169,604	50	2,618,048
1909	19	852,870	8	391,054	18	1,151,553	45	2,395,477
1910	23	1,066,399	10	432,517	19	914,138	52	2,413,054
1911	32	1,580,868	11	499,743	21	743,206	64	2,823,817
1912	51	2,033,648	14	625,062	22	1,395,931	87	4,054,641
1913	42	1,782,898	14	447,249	23	1,509,038	79	3,739,185
1914	44	1,776,075	14	658,791	23	1,621,787	81	4,056,653
1915	46	2,549,212	17	632,848	24	1,318,233	87	4,500,293
1916	54	2,214,280	19	1,075,913	27	1,610,434	100	4,900,627
1917	62	3,294,845	27	1,017,206	29	1,635,235	118	5,947,286
1918	76	3,375,445	29	1,391,951	30	1,838,439	135	6,605,835
1919	75	3,108,364	30	775,557	28	708,280	133	4,592,201
Total	.....	32,373,930	.....	17,320,059	.....	25,107,295	.....	74,801,284

a Experimental pack.

PACK OF CANNED SALMON IN ALASKA FROM 1898 TO 1919, BY SPECIES.

Year.	Coho, or silver.		Chum, or keta.		Humpback, or pink.	
	Cases.	Value.	Cases.	Value.	Cases.	Value.
1898	54,711	.....	5,184	.....	109,399	.....
1899	39,402	.....	1,931	.....	149,159	.....
1900	50,984	.....	30,012	.....	232,022	.....
1901	65,509	.....	47,464	.....	541,427	.....
1902	82,723	.....	159,849	.....	549,602	.....
1903	120,506	.....	35,052	.....	355,799	.....
1904	85,741	.....	21,178	.....	299,333	.....
1905	67,394	$215,875	41,972	$113,056	168,597	$498,194
1906	109,141	382,109	254,812	730,235	348,297	1,046,951
1907	85,190	337,384	184,173	547,757	561,973	1,799,280
1908	68,932	274,089	218,513	554,197	644,133	1,733,379
1909	56,556	231,029	120,712	274,110	464,873	1,114,839
1910	114,026	559,666	254,218	773,409	554,322	1,764,055
1911	133,908	762,647	323,795	1,199,563	1,005,278	3,972,706
1912	166,198	741,377	664,633	1,584,180	1,280,138	3,296,598
1913	75,779	261,654	290,918	643,948	1,372,881	3,550,587
1914	157,063	690,086	603,859	2,240,765	986,049	3,459,116
1915	124,268	536,124	479,946	1,243,321	1,875,516	5,217,203
1916	261,909	1,399,491	724,115	2,420,600	1,737,793	6,330,185
1917	193,231	1,682,745	906,747	5,572,047	2,296,976	14,794,062
1918	218,958	2,004,979	1,364,960	8,562,872	2,438,954	16,068,456
1919	230,138	2,761,656	1,348,462	8,630,157	1,657,434	13,259,472

Year.	King, or spring.		Red, or sockeye.		Total.	
	Cases.	Value.	Cases.	Value.	Cases.	Value.
1898	12,862	.....	782,941	.....	965,097	.....
1899	23,400	.....	864,254	.....	1,078,146	.....
1900	37,715	.....	1,197,406	.....	1,548,139	.....
1901	43,069	.....	1,319,335	.....	2,016,804	.....
1902	59,104	.....	1,685,546	.....	2,536,824	.....
1903	47,609	.....	1,687,244	.....	2,246,210	.....
1904	41,956	.....	1,505,548	.....	1,953,756	.....
1905	42,125	$141,999	1,574,428	$5,335,547	1,894,516	$6,304,671
1906	30,834	116,222	1,475,960	5,020,875	2,219,044	7,896,392
1907	43,424	181,718	1,295,113	5,915,227	2,169,873	8,781,366
1908	23,792	99,867	1,662,678	7,524,251	2,618,048	10,185,783
1909	48,034	207,624	1,705,302	7,610,550	2,895,477	9,438,152
1910	40,221	214,802	1,450,267	7,774,390	2,413,054	11,086,322
1911	45,518	295,088	1,315,318	8,363,233	2,823,817	14,593,237
1912	43,317	243,331	1,900,355	10,426,481	4,054,641	16,291,917
1913	34,370	139,053	1,965,237	8,936,362	3,739,185	13,531,604
1914	48,039	241,105	2,201,643	12,289,517	4,056,653	18,920,589
1915	88,251	408,266	1,932,312	11,248,101	4,500,293	18,653,015
1916	65,873	353,420	2,110,937	12,765,733	4,900,627	23,269,429
1917	61,951	644,447	2,488,381	23,610,789	5,947,286	46,304,090
1918	49,226	485,295	2,533,737	23,920,347	6,605,885	51,041,949
1919	151,733	1,820,796	1,204,343	15,656,459	[a] 4,592,201	42,128,540

[a] Includes 91 cases of steelheads; value not given.

OUTPUT [a] OF CANNED SALMON IN ALASKA, 1912 TO 1918.[b]

Product.	1912	1913	1914	1915	1916	1917	1918	Total.
Coho, or silver:	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
½-pound flat	2,719	3,587	4,579	2,050	13,145	30,412	26,238	82,730
1-pound flat	17	266	285	2,338	8,191	362	12,786	24,245
1-pound tall	163,462	71,926	152,199	119,880	240,573	162,457	179,934	1,090,431
Total	166,198	75,779	157,063	124,268	261,909	193,231	218,958	1,197,406
Chum, or keta:								
½-pound flat	2,795	985	373	.....	1,423	26,760	3,559	35,895
1-pound flat	.....	2,619	5,568	317	.....	2,530	2,996	14,030
1-pound tall	661,838	287,314	657,918	479,629	722,692	877,457	1,358,405	5,045,253
Total	664,633	290,918	663,859	479,946	724,115	906,747	1,364,960	5,095,178
Humpback, or pink:								
½-pound flat	13,712	20,822	2,103	4,325	41,491	91,403	63,557	237,413
1-pound flat	.....	3,258	9,286	3,508	14,796	6,014	20,215	57,077
1-pound tall	1,266,426	1,348,801	974,660	1,807,685	1,681,506	2,199,559	2,355,182	11,693,817
Total	1,280,138	1,372,881	986,049	1,875,516	1,737,793	2,296,976	2,438,954	11,988,307
King, or spring:								
½-pound flat	5,151	1,585	3,143	2,404	2,617	12,973	6,000	33,873
1-pound flat	.....	.....	4,804	3,755	3,804	5,133	5,267	22,763
1-pound tall	38,166	32,785	40,092	82,092	59,452	43,845	37,959	334,391
Total	43,317	34,370	48,039	88,251	65,873	61,951	49,226	391,027
Red, or sockeye:								
½-pound flat	28,024	29,041	53,825	52,033	81,565	124,309	137,008	505,805
1-pound flat	16,242	11,735	64,671	112,847	86,395	89,612	151,864	533,366
1-pound tall	1,856,089	1,924,461	2,083,147	1,765,139	1,936,971	2,274,460	2,244,865	14,085,132
1½-pound nominals	.....	.....	.....	2,293	.....	.....	.....	2,293
2-pound nominals	.....	.....	.....	.....	6,006	.....	.....	6,006
Total	1,900,355	1,965,237	2,201,643	1,932,312	2,110,937	2,488,381	2,533,737	15,132,602
Grand total	4,054,641	3,739,185	4,056,653	4,500,293	4,900,627	5,947,286	6,605,835	33,804,520

AVERAGE ANNUAL PRICE PER CASE OF FORTY-EIGHT 1-POUND CANS OF ALASKA SALMON, 1908 TO 1918.[b]

Product.	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Coho, or silver	$3.98	$4.07	$4.89	$5.67	$4.44	$3.45	$4.39	$4.31	$5.34	$8.76	$9.15
Chum, or keta	2.53	2.28	3.04	3.72	2.37	2.21	3.37	2.59	3.34	6.14	6.27
Humpback, or pink	2.69	2.40	3.15	3.94	2.55	2.58	3.50	2.78	3.64	6.44	6.58
King, or spring	4.20	4.32	5.34	6.48	5.37	4.04	5.01	4.63	5.36	10.40	9.85
Red, or sockeye	4.52	4.53	5.30	6.33	5.45	4.54	5.58	5.82	6.04	9.48	9.44

[a] The number of cases shown has been put upon the common basis of forty-eight 1-pound cans per case.
[b] From "Alaska Fisheries and Fur Industries in 1918," p. 49, by Ward T. Bower. Appendix VII, Report, U. S. Commissioner of Fisheries, 1918. Washington, 1919.

PACK OF CANNED SALMON IN BRITISH COLUMBIA SINCE THE INCEPTION OF THE INDUSTRY, BY WATERS.

Year.	Canneries operated.	Fraser River.	Skeena River.	Rivers Inlet.	Naas River.	Outlying districts.	Total.
		Cases.	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
1876	2	7,247	.....	.....	.....	.....	7,247
1877	5	55,387	3,000	.....	.....	.....	58,387
1878	8	81,446	8,500	.....	.....	.....	89,946
1879	9	50,490	10,603	.....	.....	.....	61,093
1880	9	42,155	19,694	.....	.....	.....	61,849
1881	11	142,516	21,560	.....	.....	5,500	169,576
1882	16	199,204	24,522	5,635	6,500	4,600	240,461
1883	20	105,701	31,157	10,780	9,400	6,400	163,438
1884	14	34,037	53,786	20,383	8,500	7,000	123,706
1885	9	89,617	12,900	.....	.....	6,000	108,517
1886	16	99,177	37,587	15,000	.....	1,200	152,964
1887	20	130,088	58,592	11,203	.....	4,200	204,083
1888	21	76,616	70,106	20,000	12,318	5,000	184,040
1889	28	310,122	58,405	21,722	19,800	7,162	417,211
1890	33	244,352	91,645	33,600	24,700	17,060	411,257
1891	38	177,989	77,057	36,500	11,058	11,907	314,511
1892	36	98,491	90,750	14,955	26,100	18,425	248,721
1893	44	474,237	59,021	35,416	15,680	25,848	610,202
1894	42	363,566	61,005	40,161	20,000	7,500	492,232
1895	49	432,920	69,356	58,575	20,541	6,300	587,692
1896	56	375,344	97,863	107,473	14,649	22,453	617,782
1897	65	879,776	61,310	40,090	20,000	26,007	1,027,183
1898	67	264,225	80,102	105,362	20,000	22,862	492,551
1899	68	527,396	112,562	76,428	19,442	29,691	765,519
1900	69	331,371	135,424	74,196	20,200	45,349	606,540
1901	78	998,913	125,845	66,794	15,004	40,656	1,247,212
1902	69	327,197	155,936	70,298	23,212	50,518	627,161
1903	61	237,125	98,609	69,390	12,100	56,390	473,674
1904	51	128,903	154,869	94,292	19,085	68,745	465,894
1905	64	877,136	114,085	83,122	32,725	60,392	1,167,460
1906	59	240,486	162,420	122,878	32,534	71,142	629,460
1907	42	163,116	159,255	94,064	31,832	99,192	547,459
1908	50	89,184	209,177	75,090	46,908	122,330	542,689
1909	86	567,203	140,739	91,014	40,990	127,974	967,920
1910	58	223,148	222,035	129,398	39,720	147,900	762,201
1911	59	301,344	254,410	101,066	65,684	226,461	948,965
1912	57	173,921	254,258	137,697	71,162	359,538	996,576
1913	78	732,059	164,055	68,096	53,423	336,268	1,353,901
1914	63	328,390	237,634	109,052	94,890	341,073	1,111,039
1915	63	289,199	279,161	146,838	104,289	313,894	1,133,381
1916	73	106,440	223,158	85,383	126,686	453,398	995,065
1917	90	377,988	292,219	95,302	119,495	672,481	1,557,485
1918	83	206,003	374,216	103,155	143,908	788,875	1,616,157
1919	74	158,718	398,877	80,367	97,512	657,682	1,393,156
Total	.....	12,119,943	5,367,525	2,550,675	1,440,047	5,275,373	26,753,563

NUMBER OF SALMON CANNERIES OPERATED IN VARIOUS SECTIONS OF BRITISH COLUMBIA IN RECENT YEARS.

Year.	Fraser River.	Naas River.	Skeena River.	Rivers Inlet.	Outlying districts.	Total.
1910	23	4	12	7	12	58
1911	22	4	12	7	14	59
1912	18	4	12	7	16	57
1913	36	4	13	7	18	78
1914	21	5	13	7	17	63
1915	22	5	13	7	16	63
1916	23	5	14	8	23	73
1917	29	6	14	9	32	90
1918	16	7	15	9	36	83
1919	11	7	15	9	32	74

PACK, BY DISTRICTS AND SPECIES, OF CANNED SALMON IN BRITISH COLUMBIA FROM 1903 [a] TO 1919.

Districts and species.	1903	1904	1905	1906	1907	1908
Fraser River district:	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
Chums		1,066				
Cohos	25,728	45,667	30,836	34,413	35,766	24,108
Pinks	4,504		3,304	15,543	63,530	415
Sockeyes	204,809	72,688	837,489	183,007	59,815	63,120
Springs, red	2,084	9,482	5,507	6,503	3,448	1,427
Springs, white				1,020	557	18
Total	237,125	128,903	877,136	240,486	163,116	89,184
Skeena River district:						
Chums		35,329				
Cohos	9,648	5,515	7,247	16,897	15,247	10,085
Pinks	20,045		7,523	38,991	25,217	45,404
Sockeyes	50,968	93,404	84,717	86,394	108,413	139,846
Springs, red	18,008	20,621	14,598	20,138	10,378	13,374
Springs, white						468
Total	98,669	154,869	114,085	162,420	159,255	209,177
Rivers Inlet district:						
Chums		61				
Cohos	219	358		66	5,040	9,505
Pinks	180				700	479
Sockeyes	68,119	93,862	82,771	122,631	87,874	64,652
Springs, red	872	11	351	181	450	454
Total	69,390	94,292	83,122	122,878	94,064	75,090
Naas River district:						
Chums		31				
Cohos	2,187	1,697	3,083	5,097	6,093	8,348
Pinks			1,840	3,450	5,957	6,612
Sockeyes	8,438	15,000	24,462	22,166	17,813	27,584
Springs, red	1,475	2,357	3,340	858	1,288	3,263
Springs, white				63		
Steelheads					681	1,101
Total	12,100	19,085	32,725	32,534	31,832	46,908
Outlying districts:						
Chums		1,155				
Cohos	14,136	13,114	3,292	11,759	25,754	29,781
Pinks	2,653		1,303	10,321	23,300	23,538
Sockeyes	36,383	48,272	51,234	45,481	40,159	59,815
Springs, red	3,218	6,204	4,563	3,581	7,595	6,915
Springs, white					2,382	2,245
Steelheads					2	36
Total	56,390	68,745	60,392	71,142	99,192	122,330
TOTAL BY SPECIES.						
Chums		37,642				
Cohos	51,918	66,351	44,458	69,132	87,900	81,917
Pinks	27,382		13,970	[b] 68,305	[b] 118,704	[b] 76,448
Sockeyes	368,717	323,226	1,080,673	459,679	314,074	355,023
Springs, red	25,657	38,675	28,359	31,261	23,159	25,433
Springs, white				1,083	2,939	2,731
Steelheads					683	1,137
Grand total	473,674	465,894	1,167,460	629,460	547,459	542,689

[a] In 1901 in the Fraser River district 920,313 cases of sockeyes were packed, and in 1902 sockeyes were packed as follows: 293,477 cases in Fraser River district, 117,677 cases in Skeena River district, 68,819 cases in Rivers Inlet district, 20,953 cases in Naas River district, and 30,510 cases in outlying districts.

[b] Pinks and chums combined.

PACK, BY DISTRICTS AND SPECIES, OF CANNED SALMON IN BRITISH COLUMBIA FROM 1903 TO 1919—Continued.

District and species.	1909	1910	1911	1912	1913	1914
Fraser River district:	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*	*Cases.*
Chums	.....	52,177	47,237	12,961	22,220	74,726
Cohos	21,540	27,855	39,740	28,574	11,648	38,639
Pinks	1,987	128	142,101	574	9,973	6,057
Sockeyes	542,248	133,045	58,487	108,784	684,596	185,483
Springs, red	1,428	1,018	7,028	14,655	3,573	9,485
Springs, white	.....	8,925	6,751	8,373	49	14,000
Total	567,203	223,148	301,344	173,921	732,059	328,390
Skeena River district:						
Chums	.....	.....	70	504	.....	8,329
Cohos	12,249	11,531	23,376	39,628	18,647	16,378
Pinks	28,120	13,473	81,956	97,588	66,045	71,021
Sockeyes	87,901	187,246	131,066	92,498	52,927	130,166
Springs, red	11,727	9,546	15,514	19,332	23,250	11,529
Springs, white	742	239	2,428	4,501	3,186	211
Steelheads	.....	.....	.....	207	.....	.....
Total	140,739	222,035	254,410	254,258	164,055	237,634
Rivers Inlet district:						
Chums	.....	.....	288	3,845	.....	5,023
Cohos	1,400	2,075	6,287	11,010	3,660	7,789
Pinks	.....	19	5,411	8,809	2,097	5,784
Sockeyes	89,027	126,921	88,763	112,884	61,745	89,890
Springs, red	587	383	317	681	594	566
Springs, white	.....	.....	.....	468	.....	.....
Total	91,014	129,398	101,066	137,697	68,096	109,052
Naas River district:						
Chums	.....	351	5,189	3,245	2,987	25,569
Cohos	6,818	6,285	7,842	12,468	8,172	9,276
Pinks	3,589	895	11,467	12,476	20,539	25,333
Sockeyes	28,246	30,810	37,327	36,037	23,574	31,327
Springs, red	2,280	1,228	3,434	5,710	2,999	2,660
Springs, white	57	11	325	1,226	152	725
Steelheads	.....	140	100	.....	.....	.....
Total	40,990	39,720	65,684	71,162	53,423	94,890
Outlying districts:						
Chums	.....	5,834	39,167	37,770	52,758	70,827
Cohos	19,911	26,636	42,457	73,422	32,695	48,119
Pinks	12,848	20,098	64,312	128,296	94,233	112,145
Sockeyes	93,019	87,893	67,866	94,559	149,336	99,830
Springs, red	2,196	7,138	12,458	21,967	7,017	8,668
Springs, white	.....	301	201	3,524	229	1,484
Total	127,974	147,900	226,461	359,538	336,268	341,073
TOTAL BY SPECIES.						
Chums	.....	58,362	91,951	58,325	77,965	184,474
Cohos	61,918	74,382	119,702	165,102	69,822	120,201
Pinks	[a] 46,544	34,613	305,247	247,743	192,887	220,340
Sockeyes	840,441	565,915	383,509	444,762	972,178	536,696
Springs, red	18,218	19,313	38,751	62,345	37,433	32,908
Springs, white	799	9,476	9,705	18,092	3,616	16,420
Steelheads	.....	140	100	207	.....	.....
Grand total	967,920	762,201	948,965	996,576	1,353,901	1,111,039

[a] Pinks and chums combined.

PACK, BY DISTRICTS AND SPECIES, OF CANNED SALMON IN BRITISH COLUMBIA FROM 1903 TO 1919—Continued.

District and species.	1915	1916	1917	1918	1919
	Cases.	*Cases.*	*Cases.*	*Cases.*	*Cases.*
Fraser River district:					
Chums	18,539	30,184	59,973	80,215	15,718
Cohos	34,114	27,676	30,735	43,871	54,866
Pinks	128,555	840	134,442	18,388	39,363
Sockeyes	89,040	27,394	123,614	16,849	29,628
Springs, red	15,388	11,096	10,197	15,192	15,223
Springs, white	3,532	9,217	18,916	24,853	3,592
Steelheads	31	33	111	635	328
Total	289,199	106,440	377,988	206,003	158,718
Skeena River district:					
Chums	5,769	17,121	21,516	22,573	31,457
Cohos	32,190	47,409	38,456	38,759	36,559
Pinks	107,578	73,029	148,319	161,727	117,303
Sockeyes	116,553	60,923	65,760	123,322	184,945
Springs, red	15,069	18,372	13,586	16,013	23,285
Springs, white	204	2,561	2,699	6,828	2,656
Steelheads	1,798	3,743	1,883	4,994	2,672
Total	279,161	223,158	292,219	374,216	398,877
Rivers Inlet district:					
Chums	5,387	20,144	16,101	6,729	7,089
Cohos	7,115	15,314	9,124	12,074	9,038
Pinks	2,964	3,567	8,065	29,542	6,538
Sockeyes	130,350	44,936	61,195	53,401	56,258
Springs, red	1,022	1,033	715	957	1,201
Springs, white		389	102	452	241
Steelheads					2
Total	146,838	85,383	95,302	103,155	80,367
Naas River district:					
Chums	11,076	11,200	24,938	40,368	24,041
Cohos	15,171	19,139	22,180	17,061	10,900
Pinks	34,879	59,593	44,568	59,206	29,949
Sockeyes	39,349	31,411	22,188	21,816	28,259
Springs, red	3,053	3,061	3,170	2,332	2,993
Springs, white	648	784	1,326	1,820	581
Steelheads	113	1,498	1,125	1,305	789
Total	104,289	126,686	119,495	143,908	97,512
Outlying districts:					
Chums	41,229	161,552	352,745	341,730	293,730
Cohos	58,366	77,181	64,814	87,359	88,630
Pinks	93,376	143,615	161,365	258,882	153,486
Sockeyes	100,750	50,125	67,091	61,071	70,355
Springs, red	17,202	17,669	20,902	31,041	39,554
Springs, white	1,986	2,544	4,603	7,866	11,225
Steelheads	985	712	901	926	702
Total	313,894	453,398	672,481	788,875	657,682
TOTAL BY SPECIES.					
Chums	82,000	240,201	475,273	497,615	372,035
Cohos	146,956	186,719	165,309	199,124	199,993
Pinks	367,352	280,644	496,759	527,745	346,639
Sockeyes	476,042	214,789	339,848	276,459	369,445
Springs, red	51,734	51,231	48,630	65,535	82,256
Springs, white	6,370	15,495	27,646	41,819	18,295
Steelheads	2,927	5,986	4,020	7,860	4,493
Grand total	1,133,381	995,065	1,557,485	1,616,157	1,393,156

MARKET PRICES FOR CANNED SALMON.

The manner of fixing the selling price at which the canner is willing to dispose of his canned product varies slightly in certain regions. In May or June, when the spring-packing season has sufficiently advanced so that a line can be gotten on the probable pack of chinook, the highest priced of the pack, the Columbia River canners agree upon a price, this usually being high or low, as the pack is small or large.

Since the Alaska Packers Association was formed, through a combination of a number of canneries operating in the Territory of Alaska, it has packed annually in recent years about one-fourth of the salmon canned. It also owns several canneries on Puget Sound, thus being quite a factor in that region also.

In the early days of the association the custom grew up amongst the smaller packers of Alaska and Puget Sound of waiting until the association fixed the prices on its own pack, when the others would generally fall into line with the same prices for their packs. This custom is still in vogue. At no time has it ever been compulsory on the part of any packer to adopt the same prices as the association. In fact, it has sometimes been the case that, while the small packer publicly quoted the association's opening prices, yet in secret he was shading it by 2½ to 5 cents per dozen on certain grades. In recent years this has frequently been the case and the big packers, who adhered to the opening prices, have had to sit idly by and watch their small competitors underselling them and getting the bulk of the business until they had finally disposed of their goods, when, necessarily, they would have to drop out of the market until the next season.

Occasionally the other packers do not like a certain quotation of the association and make one more nearly in consonance with their own views. This happened in 1913, when the association quoted 60 cents for chums, while the Puget Sound canners quoted 55 cents for this grade, and in 1915 when the association quoted 65 cents for chums and the Puget Sound interests 70 cents for the same grade, thus showing clearly the independence of the smaller packers.

Owing to a peculiar feature of the salmon marketing business, more depends upon the opening prices than appears on the surface to the uninitiated.

Shortly after the first of the year buyers throughout the world begin to take stock of their salmon supplies and shortly thereafter begin placing their "future" orders. These cover the quantity required of each grade, and when the buyer orders through a broker the orders are placed subject to a contract similar to the following:

The undersigned hereby authorizes ——— to book the number of cases of canned salmon specified below; said booking to be filed with packers for delivery from ——— (naming year) pack, subject to buyers' approval of opening prices when named; *the option being granted buyers of confirming the total number* of cases specified below; *confirming a smaller quantity*, or *declining any confirmation*.

——— furthermore agrees that *buyers shall have the option of increasing quantities* listed below, when he names opening prices for his packers, contingent upon his ability to secure at that time an increased allotment from his packers. In event ——— secures an increased allotment from his packers insufficient to meet all increases requested by his patrons, he will distribute such increase as he can secure among the dealers who have filed conditional contracts with him, according to the date order that said contracts have been received in his office.

Under this form of contract the packer is expected to be ready to fulfill the terms of same, except in case of a short pack, when the orders are generally prorated; i. e., all orders are proportionately reduced until they come within the compass of the pack. Should the buyer dislike the opening price he has the privilege of canceling the order. While this latter privilege may not, at first glance, look just to the packer, yet it is doubtful if any buyer would place a "futuro" order unless he was assured of a chance to cancel it should he feel that too high a sum was fixed in the opening prices.

Some canneries contract to sell their entire output to one buyer, and the price fixed is usually the opening prices for the year in question. In such cases the buyer and seller are both compelled to abide by the price, no matter how unjust one or the other may consider it.

The association does not announce its opening prices until late in August or early in September, when the greater part of the packing is over with and a good line on the total pack has been obtained, and it speaks well for the discernment of the officials of the association that their judgment as to prices should meet with the general approval as often as it does.

AMERICAN OPENING PRICES.

Below are shown the yearly opening prices on the various grades and sizes from 1890 to 1919. The most interesting part of this is the increase shown in the value of high-grade salmon. Columbia River chinook was quoted at $1.05 for 1-pound talls in 1897, and it gradually advances until in 1919 it is quoted at $3.15. Alaska red 1-pound talls in 1897 sold for 90 cents, the lowest during the period in question, advancing, with occasional recessions, until in 1919 it reached high-water mark of $3.25. In 1897 Puget Sound 1-pound tall sockeye sold for 80 cents, 10 cents below Alaska red. In 1898 it sold for 20 cents less than reds. In 1902 it sold for $1 as compared with 95 cents for Alaska red, and from that time on brought a higher price, being quoted at $3.15 in 1919 as compared with $2.35 for Alaska red. No sockeye 1-pound talls were packed in 1919.

Medium red or coho does not figure in the opening prices until 1908, when Puget Sound coho sold for 5 cents a dozen more than Alaska coho. Very shortly thereafter, however, both were classed together and sold for the same price. This grade has not had the wide fluctuations of the others, due mainly to the generally small pack made annually.

Pink salmon has been the football of the salmon market ever since the pack became of sufficient size to become a feature in it. The size of the pack has been steadily increasing, as the fish became better known, and while the price obtained has been excellent in certain years (in 1911 it sold at $1 per dozen, the highest point reached up to that time, usually the price has been low. In 1897 it was quoted at 65 cents. In 1915 the opening price was 75 cents, but as a matter of fact a large part of the pack really sold for 65 cents. The lowest point it reached was in 1903, when it was quoted at 50 cents a dozen. As a result of the demand created by the war pink salmon opened at 90 cents in 1916, $1.65 in 1917 and 1918, and $2.25 in 1919. The market collapsed under the last-named price, however, and is now (1920) not more than one-half of it.

It is only of recent years that chum salmon has become a factor in the market. Although sold for some time before then, chum salmon appears first in the regular opening prices in 1908, when it was quoted at 70 cents a dozen. In 1913 it was quoted at 55 cents while the opening price in 1915 was 70 cents on Puget Sound and 65 cents at San Francisco. During the war the opening prices on chums were materially increased, being 85 cents in 1916, $1.60 in 1917, $1.75 in 1918, and $2.15 in 1919. As in the case of chums the market collapsed under the 1919 price, and some sales under $1 were made in 1920.

The pack of Alaska and Puget Sound kings or springs has always been small, and while they have always been quoted at $1 per dozen or better (in 1919 they were quoted at $3.12½) they have always been slow sellers. It is extremely improbable that the canned pack will increase much in the future, as this fish is the best for mild curing, and as the mild curers are able to offer better prices for the raw fish than the canneries, they will always get the fish when desired.

AMERICAN OPENING PRICES PER DOZEN CANS SINCE 1890.

1890 to 1902.

Year and species.	Talls.	Year and species.	Talls.	Year and species.	Talls.
1890.		1895.		1899.	
Columbia River chinook	$1.40	Columbia River chinook	$1.32½	Columbia River chinook	$1.25
Alaska red	1.20	Alaska red	1.15	Alaska red	1.10
Alaska pink	.75	Alaska pink	.80	Puget Sound sockeye	1.10
1891.		1896.		Alaska pink	.67½
Columbia River chinook	1.35			1900.	
Alaska red	1.20	Columbia River chinook	1.25	Columbia River chinook	1.60
Alaska pink	.75	Alaska red	1.10	Alaska red	1.25
1892.		Alaska pink	.75	Puget Sound sockeye	1.10
Columbia River chinook	1.35	1897.		Alaska pink	.75
Alaska red	1.15			1901.	
Alaska pink	.75	Columbia River chinook	1.05	Columbia River chinook	1.50
1893.		Alaska red	.95	Alaska red	1.25
Columbia River chinook	1.32½	Puget Sound sockeye	.80	Puget Sound sockeye	.95
Alaska red	1.17½	Alaska pink	.65	Alaska pink	.75
Alaska pink	.65	1898.		1902.	
1894.		Columbia River chinook	1.05	Columbia River chinook	1.35
Columbia River chinook	1.35	Alaska red	.97½	Alaska red	1.00
Alaska red	1.10	Puget Sound sockeye	.80	Puget Sound sockeye	1.00
Alaska pink	.60	Alaska pink	.65	Alaska pink	.65

1903 to 1919.

Year and species.	Talls.	Flats.	Halves.	Year and species.	Talls.	Flats.	Halves
1903.				1905.			
Puget Sound sockeye	$1.50	$1.60	$0.90	Columbia River chinook	$1.45	$1.55	$0.90
Columbia River chinook	1.35	1.45	.85	Puget Sound sockeye	1.35	1.50	4.00
Alaska red	1.30	.....	.....	Alaska red	1.00	.....	.....
Alaska pink	.50	.....	.....	Alaska pink	.70	.....	.....
1904.				1906.			
Columbia River chinook	1.45	1.15	.90	Columbia River chinook	1.50	1.60	1.00
Puget Sound sockeye	1.55	1.65	.95	Puget Sound sockeye	1.45	1.60	1.00
Alaska red	1.30	.....	.....	Alaska red	.95	.....	.....
Alaska pink	.70	.....	.....	Alaska pink	.75	.....	.....

AMERICAN OPENING PRICES PER DOZEN CANS SINCE 1890—Continued.

1903 to 1919—Continued.

Year and species.	Tails.	Flats.	Halves.
1907.			
Columbia River chinook	$1.65	$1.75	$1.05
Puget Sound sockeye	1.60	1.75	1.10
Alaska red	1.15	.....	.....
Alaska pink	.80	.....	.....
1908.			
Columbia River chinook	1.65	1.75	1.05
Puget Sound sockeye	1.60	1.75	1.05
Puget Sound pink	.75	.80	.....
Puget Sound coho	1.05	1.15	.75
Alaska red	1.15	.....	.....
Alaska king	1.05	.....	.....
Alaska coho	1.00	.....	.....
Alaska pink	.70	.....	.....
Alaska chum	.70	.....	.....
1909.			
Columbia River chinook, fancy	1.65	1.75	1.05
Puget Sound sockeye	1.35	1.50	1.00
Alaska red	1.15	1.35	.85
Alaska king	1.10	.....	.....
Alaska coho	1.05	1.20	.70
Alaska pink	.60	.....	.....
Alaska chum	.67½	.....	.....
1910.			
Columbia River chinook, fancy	1.75	1.90	1.10
Puget Sound sockeye	1.65	1.80	1.10
Alaska red	1.35	1.50	1.00
Alaska king	1.35	.....	.....
Alaska pink	.80	.....	.....
Alaska chum	.77½	.....	.....
Medium red and coho	1.25	1.40	.80
1911.			
Columbia River chinook, fancy	1.95	2.00	1.30
Puget Sound sockeye	1.95	2.00	1.30
Alaska red	1.60	1.75	1.12½
Alaska medium red	1.45	1.65	1.00
Alaska king	1.80	2.00	1.12½
Pink	1.00	1.15	.80
Chum	.95	1.05	.75
1912.			
Chinook	1.95	2.00	1.25
Sockeye	1.95	2.00	1.30
Alaska red	1.40	1.60	1.15
Alaska medium red	1.15	1.25	.80
Alaska king	1.40	1.60	1.15
Pink	.65	.65	.55
Chum	.62½	.....	.50
1913.			
Chinook	1.95	2.00	1.25
Sockeye	1.50	1.65	1.05
Alaska red	1.15	1.35	.95
Alaska medium red	.85	1.00	.70
Alaska king	1.00	1.15	.90

Year and species.	Tails.	Flats.	Halves.
1918.			
Pink	$0.65	$0.80	$0.55
Chum	[a].55	.70	.50
1914.			
Chinook	1.95	2.10	1.25
Sockeye	1.95	2.15	1.35
Alaska red	1.45	1.80	1.10
Medium red	1.15	1.35	.82½
Alaska king	1.40	.....	1.10
Pink	.90	1.00	.70
Keta, or chum	.85	.95	.65
1915.			
Chinook	1.90	2.00	1.25
Sockeye	1.95	2.15	1.35
Alaska red	1.50	1.85	1.15
Medium red	1.15	1.30	.75
Alaska king	1.25	.....	.....
Pink	.75	.85	.57½
Keta, or chum	[b].70	.80	.52½
1916.[c]			
Chinook	1.90	2.00	1.25
Sockeye	2.05	2.25	1.40
Alaska red	1.50	1.75	1.20
Medium red	1.30	1.45	.90
Alaska king	1.35	.....	.....
Pink	.90	1.10	.75
Chum	.85	.....	.67½
1917.			
Chinook	2.90	3.00	1.75
Sockeye	2.90	3.00	1.75
Alaska red	2.35	2.60	1.65
Medium red	2.00	2.15	1.35
Alaska king	2.25	.....	.....
Pink	1.65	1.80	1.15
Chum	1.60	1.75	.....
1918.[d]			
Chinook:			
Fancy	3.15	3.25	2.00
Standard	2.75	2.85	1.75
Bluebacks	.....	.....	2.00
Sockeye	[e]3.15	[e]3.25	2.00
Alaska red	2.35	2.50	1.65
Medium red:			
Alaska	2.25	2.40	1.60
Puget Sound, etc.	2.40	2.50	1.60
Pink	1.65	1.80	1.15
Chum:			
Alaska	1.60	1.75	1.10
Puget Sound, etc.	1.75	1.85	1.10
Steelhead	3.00	3.10	1.90
1919.			
Chinook	3.15	3.25	2.00
Sockeye	.....	.....	[f]2.50
Alaska red	[g]3.35	3.50	2.25
Tips and tails	3.10	.....	.....
Alaska king	[h]3.12½	.....	.....
Medium red	3.00	3.15	2.00
Pink	2.25	2.40	1.40
Chum	[i]2.15	2.30	1.25

[a] The opening price in San Francisco was 60 cents.
[b] The opening price in San Francisco was 65 cents.
[c] The Kelley-Clarke prices differed from these in the following particulars: Red talls, $1.60; red halves, $1.25; medium red talls, $1.35; medium red flats, $1.50; medium red halves, $1.00; pink talls, $1.00; Chum talls, 95c.; and King talls, $1.40.
[d] Maximum prices set by U. S. Food Administration.
[e] Pack of 1-pound talls and 1-pound flats taken for British Government at these prices.
[f] No price named by Alaska Packers Association or Deming & Gould Co.
[g] Alaska Packers Association and Northwestern Fisheries Co. quoted $3.25; others reduced to conform.
[h] Quoted by Alaska Packers Association only.
[i] Alaska Packers Association quoted $2.10.

BRITISH COLUMBIA OPENING PRICES.

The packers of British Columbia and the United States both sell a considerable portion of their high-grade salmon abroad, and the competition thus engendered compels a fairly close conformity in prices. On salmon sold in the domestic markets, however, the competition is not so keen; hence there is room for a considerable diversity of opinion as to values. Unlike the United States, there is a very small market in Canada for chum salmon, and it has only been in recent years that opening prices have been fixed on this grade.

BRITISH COLUMBIA OPENING PRICES SINCE 1902.[a]

[Prices are for full cases.]

Year and species.	Talls.	Flats.	Halves.
1902.			
Sockeye	$4.75	$4.90	.....
Red spring	4.00	.....	.....
Coho	3.75	.....	.....
Pink	2.50	2.50	.....
1903.			
Sockeye	4.65	.....	.....
Red spring	4.00	.....	.....
Coho	3.75	.....	.....
Pink	2.60	2.50	.....
1904.			
Sockeye	5.75	6.25	.....
Red spring	5.25	.....	.....
Coho	4.25	.....	.....
Pink	2.75	.....	.....
1905.			
Sockeye	5.00	5.30	.....
Red spring	4.50	5.00	.....
Coho	4.00	.....	.....
Pink	2.60	.....	.....
1906.			
Sockeye	5.50	.....	.....
Red spring	5.25	.....	.....
Coho	4.50	4.75	.....
Pink	.....	3.00	.....
1907.			
Sockeye	5.50	.....	.....
Red spring	5.50	5.50	.....
Coho	4.50	4.50	.....
Pink	3.00	3.00	.....
1908.			
Sockeye	6.10	.....	.....
Red spring	5.75	5.75	.....
Coho	4.75	5.00	.....
Pink	3.25	3.25	.....
1909.			
Sockeye	5.25	.....	$6.75
Red spring	5.10	5.60	.....
Coho	4.25	.....	.....
Pink	2.75	.....	.....
1910.			
Sockeye	6.50	7.00	8.25
Red spring	5.75	6.00	.....
Coho	5.00	5.50	6.50
Pink	3.25	.....	.....
1911.			
Sockeye	7.75	8.00	10.00
Red spring	6.50	.....	.....
Coho	6.00	6.25	7.50
1911.			
Pink	$4.00	$4.25	$5.50
Chum	3.75	.....	.....
1912.			
Sockeye	9.00	9.25	10.75
Red spring	7.75	.....	9.25
Coho	7.25	7.25	7.50
Pink	3.00	3.00	4.50
Chum	2.75	.....	.....
1913.			
Sockeye	6.00	6.25	7.75
Red spring	5.75	5.75	.....
Coho	4.25	4.50	.....
Pink	2.50	2.50	.....
1914.			
Sockeye	7.50	8.75	9.25
Red spring	6.75	.....	.....
Coho	4.75	.....	5.50
Pink	3.50	.....	.....
1915.			
Sockeye	8.25	8.25	10.25
Red spring	6.75	.....	.....
Coho	4.50	5.00	.....
Pink	3.25	3.50	4.75
Chum	2.75	.....	.....
1916.			
Sockeye	9.00	.....	11.00
Red spring	8.00	.....	9.50
Coho	6.50	.....	9.00
Pink	3.75	.....	5.25
Chum	3.00	4.00	.....
1917.			
Sockeye	13.00	.....	16.00
Red spring	.....	12.00	13.00
Coho	10.00	11.00	12.50
Pink	8.00	.....	9.25
Chum	6.65	.....	.....
1918.			
Sockeye	14.50	15.00	16.00
Red spring	13.00	13.25	14.00
Coho	11.50	12.00	13.00
Pink	8.50	8.75	10.00
Chum	6.75	.....	7.75
1919.			
Sockeye	16.00	16.50	17.50
Red spring	.....	.....	16.00
Coho	12.00	12.50	13.50
Pink	.....	9.00	10.00
Chum	6.75	.....	.....

[a] These opening prices have been furnished by H. Bell-Irving & Co. (Ltd.), of Vancouver, British Columbia, Canada, well known packers and handlers of canned salmon.

PICKLING INDUSTRY.

The salmon-pickling industry was so overshadowed by its giant brother, the canning industry, that statistical data, except for Alaska, were found in extremely fragmentary shape, and only that portion is shown relating to Alaska from the time of annexation to and including 1919.

PACK OF SALTED SALMON IN ALASKA, 1868 TO 1919.

Year.	Salmon.		Salmon bellies.		Dry-salted salmon.	
	Barrels.	Value.	Barrels.	Value.	Pounds.	Value.
1868	2,000	$16,000				
1869	1,700	13,600				
1870	1,800	14,400				
1871	700	6,300				
1872	1,000	9,000				
1873	900	7,200				
1874	1,400	11,200				
1875	1,200	9,600				
1876	1,800	14,400				
1877	1,950	15,700				
1878	2,100	16,800				
1879	3,500	28,000				
1880	3,700	29,600	300	$3,300		
1881	1,760	15,840				
1882	5,890	53,010				
1883	7,251	65,259				
1884	6,106	54,954				
1885	3,230	29,070				
1886	4,861	43,749				
1887	3,978	35,802				
1888	9,500	85,500				
1889	6,457	58,013				
1890	18,039	162,351				
1891	8,913	71,304				
1892	17,374	140,057	53	815		
1893	24,005	120,083				
1894	32,011	176,060				
1895	14,234	85,404				
1896	9,314	65,198	150	1,200		
1897	15,848	110,936	2,846	28,460		
1898	22,670	181,360	580	5,800		
1899	22,382	167,865	235	2,350		
1900	31,852	238,890	2,353	23,530	511,400	$10,228
1901	24,477	171,339	652	3,816		
1902	30,384	212,688	328	2,052		
1903	27,921	223,368	3,667	32,973	300,000	5,500
1904	13,674	89,209	208	1,950	966,812	16,180
1905	19,071	143,811	1,360	11,355	7,280,234	115,643
1906	17,283	126,194	1,338	13,644	1,107,680	16,969
1907	22,307	203,127	2,965	37,422	107,580	1,505
1908	34,337	293,377	4,736	59,330	20,800	416
1909	28,915	183,400	1,970	25,358	71,600	1,038
1910	12,779	111,634	1,626	19,007	22,178	554
1911	8,483	102,477	1,337	15,561	33,285	1,340
1912	34,602	305,928	37	606		
1913	37,881	272,726	451	6,523	21,282	1,235
1914	25,954	247,195	408	5,467	12,200	810
1915	12,058	157,457	571	13,610		
1916	17,259	205,706	475	6,961	44,552	2,408
1917	36,165	584,962	225	5,535	371,600	33,044
1918	56,837	1,078,456	53	1,425		
1919	8,110	195,447			212,244	17,601
Total	757,927	7,058,006	28,924	328,950	11,083,447	224,471

ALASKA PICKLED-SALMON PACK, 1906 TO 1918, BY SPECIES, QUANTITY,[a] AND VALUE.

Species.	1906		1907		1908		1909		1910	
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.
Whole salmon:										
Coho	539	$5,642	1,665	$16,406	692	$5,648	318	$2,485	160	$1,504
Chum	231	1,550	233	1,521	122	707	35	190	.....	.....
Humpback	2,446	13,852	4,248	29,374	2,346	17,935	1,557	9,405	330	1,998
King	1,007	8,058	964	10,684	660	6,813	441	3,798	352	3,399
Red	13,060	97,092	15,197	145,142	30,517	262,274	26,508	167,298	11,931	104,649
Total	17,283	126,194	22,307	203,127	34,337	293,377	28,859	183,176	12,773	111,550
Bellies:										
Coho	.....	.....	191	2,696	229	3,535	255	3,843	126	1,135
Chum	30	150	.....	.....	117	699	.....	.....	70	770
Humpback	1,273	13,188	1,800	21,080	2,447	28,140	738	7,438	616	6,135
King	22	185	84	1,002	48	720	35	175	6	128
Red	13	121	890	12,644	1,895	26,236	942	13,902	808	10,839
Total	1,338	13,644	2,965	37,422	4,736	59,330	1,970	25,358	1,626	19,007
Backs, etc.:										
Humpback	.....	.....	.....	.....	.....	.....	56	224	.....	.....
King	.....	.....	.....	.....	.....	.....	.....	.....	2	24
Red	.....	.....	.....	.....	.....	.....	.....	.....	4	60
Total	.....	.....	.....	.....	.....	.....	56	224	6	84
Grand total	18,621	139,838	25,272	240,549	39,073	352,707	30,885	208,758	14,405	130,641

Species.	1911		1912		1913		1914	
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.
Whole salmon:								
Coho	223	$2,149	1,165	$9,505	1,006	$6,452	365	$2,767
Chum	133	666	93	652	100	778	53	293
Humpback	1,122	11,238	4,236	28,304	2,724	18,181	482	2,954
King	600	8,095	225	2,442	135	1,410	269	2,588
Red	6,239	79,578	28,883	264,965	33,916	245,905	24,785	238,593
Total	8,317	101,726	34,602	305,928	37,881	272,726	25,954	247,195
Bellies:								
Coho	38	489	.....	.....	54	946	67	982
Chum	7	77	.....	.....	67	941	18	180
Humpback	676	5,122	37	606	324	4,546	229	2,620
King	2	30	.....	.....	.....	.....	2	13
Red	614	9,843	.....	.....	6	90	92	1,672
Total	1,337	15,561	37	606	451	6,523	408	5,467
Backs, etc.:								
Humpback	150	600	.....	.....	.....	.....	.....	.....
King	1	15	.....	.....	.....	.....	.....	.....
Red	15	136	.....	.....	.....	.....	.....	.....
Total	166	751	.....	.....	.....	.....	.....	.....
Grand total	9,820	118,038	34,639	306,534	38,332	279,249	26,362	252,662

[a] Barrels hold 200 pounds of fish; when of a different size they have been reduced to conform to this weight.

ALASKA PICKLED-SALMON PACK, 1906 TO 1918, BY SPECIES, QUANTITY, AND VALUE—Continued.

Species.	1915		1916		1917		1918	
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.
Whole salmon:								
Coho	1,763	$19,393	2,076	$22,287	1,798	$29,631	2,501	$47,152
Chum	325	2,925	495	4,057	1,722	21,899	6,080	84,878
Humpback	662	5,958	503	3,624	5,576	73,857	11,973	182,490
King	377	4,147	636	7,956	359	6,556	297	7,645
Red	8,931	125,034	13,549	167,782	26,710	453,019	35,977	756,191
Total	12,058	157,457	17,259	205,706	36,165	584,962	56,828	1,078,356
Bellies:								
Coho	.....	.....	27	500	11	326	10	180
Chum	.....	.....	285	3,556	73	1,362	.....	.....
Humpback	133	2,660	61	882	110	2,885	26	650
King	.....	.....	2	23	7	150	.....	.....
Red	438	10,950	100	2,000	24	812	17	595
Total	571	13,610	475	6,961	225	5,535	53	1,425
Backs, etc: Coho	.....	.....	.....	.....	.....	.....	9	100
Grand total	12,629	171,067	17,734	212,667	36,390	590,497	56,890	1,079,881

PACK OF SALTED SALMON IN ALASKA IN 1919.[a]

Products.[b]	Southeast Alaska.		Central Alaska.		Western Alaska.		Total.	
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.
Coho, or silver	706	$13,206	204	$3,024	292	$5,918	1,202	$22,148
Chum, or keta	70	2,080	27	135	41	555	138	2,770
Humpback, or pink	26	260	50	700	45	548	121	1,508
King, or spring	241	4,542	8	232	618	16,267	867	21,041
Red, or sockeye	12	355	587	12,380	5,183	135,245	5,782	147,980
Total	1,055	20,443	876	16,471	6,179	158,533	8,110	195,447

[a] From "Alaska Fisheries and Fur Industries in 1919," p. 50. By Ward T. Bower. Appendix IX, Report, U. S. Commissioner of Fisheries, 1919. Washington, 1920.
[b] Each barrel holds 200 pounds of fish.

MILD-CURING INDUSTRY.

The beginning of this industry on the Pacific coast is of comparatively recent date, and the following table is complete, with the possible exception of a few tierces, which may not have been reported for the coastal rivers of Oregon:

TIERCES OF MILD-CURED SALMON PACKED ON PACIFIC COAST FROM 1897 TO1919.[a]

Year.	Alaska.	British Columbia.	Puget Sound, Wash.	Grays Harbor, Wash.	Willapa Harbor, Wash.	Columbia River (both sides).	Coastal rivers, Oreg.	Eel River, Calif.	Sacramento River, Calif.	Monterey Bay, Calif.	Total.
1897	.....	.....	.....	.....	.....	400	.....	.....	.....	.....	400
1898	70	.....	.....	.....	.....	700	.....	.....	.....	.....	770
1899	130	.....	.....	375	.....	1,250	.....	.....	.....	.....	1,755
1900	.....	.....	.....	.....	.....	1,275	.....	.....	950	.....	2,225
1901	67	.....	600	.....	.....	3,000	.....	.....	3,100	.....	6,767
1902	67	.....	425	.....	.....	4,213	188	.....	2,325	504	7,722
1903	8	.....	824	.....	.....	6,725	.....	.....	3,600	354	11,511
1904	34	.....	1,250	.....	.....	9,088	.....	200	4,719	248	15,539
1905	189	1,175	3,000	.....	.....	9,805	415	.....	2,979	310	17,873
1906	1,126	957	.....	.....	.....	8,000	740	175	2,177	510	13,685
1907	1,657	1,993	2,060	20	100	6,070	740	140	4,102	582	17,464
1908	1,378	1,060	.....	.....	.....	4,960	.....	.....	3,243	252	10,893
1909	2,292	1,560	2,109	75	29	5,540	560	80	5,111	911	18,267
1910	3,357	1,638	2,435	67	.....	7,922	1,398	.....	5,516	75	22,408
1911	3,164	1,965	2,745	100	30	8,185	1,247	110	2,011	160	19,717
1912	5,245	1,489	3,013	357	40	5,824	3,082	100	3,274	.....	22,424
1913	7,443	3,150	3,923	250	50	5,746	2,381	.....	4,789	550	28,282
1914	4,091	3,182	1,934	.....	.....	5,205	457	.....	1,829	1,476	18,174
1915	2,966	1,119	2,235	.....	.....	4,078	338	3	1,830	942	13,306
1916	4,898	1,848	1,755	.....	.....	4,656	194	.....	650	1,069	15,070
1917	3,563	429	1,063	.....	.....	1,886	.....	.....	1,508	300	8,749
1918	3,948	729	1,093	.....	.....	1,804	275	455	1,913	266	10,483
1919	5,370	1,173	2,423	.....	.....	3,328	148	[b] 1,326	2,355	1,055	17,184
Total	51,069	23,467	32,887	1,244	249	109,660	12,158	2,589	57,781	9,564	300,668

[a] The net weight of fish in a tierce is about 800 pounds. King, chinook, or spring salmon were used almost exclusively. From most places the data are complete from the time of the inception of the industry, but from a few minor places the data are somewhat fragmentary.
[b] Includes Fort Bragg, on Noyo River.

YUKON TERRITORY, CANADA.

Some salmon fishing is carried on in that section of the upper Yukon River which lies in Yukon Territory, Dominion of Canada. The species taken are principally king and dog, and these are sold mainly in a fresh condition. The following table shows the quantity taken and the value of same in certain years:

CATCH OF SALMON IN YUKON TERRITORY, CANADA, IN SPECIFIED YEARS.

Year.	Salmon.		Year.	Salmon.	
	Pounds.	Value.		Pounds.	Value.
1903	70,000	$5,600	1914	188,600	$18,860
1909	138,574	17,566	1915	157,000	15,700
1910	169,900	18,689	1916	143,500	14,350
1911	229,000	22,900	1917	.....	.....
1912	224,100	22,410	1918	.....	.....
1913	182,000	18,200	1919	.....	.....

TRADE WITH OUTLYING POSSESSIONS.

As a result of the war with Spain the United States in 1898 acquired possession of Porto Rico, Guam, and the Philippine Islands, while in the same year Hawaii became a part of this country at its own request, and in 1900 two islands of the Samoan group were acquired by a partition agreement with Great Britain and Germany. The trade with the Philippine Islands is shown to date in the tables

of exports and imports to foreign countries, but the trade with the other possessions has been eliminated from these tables and shown separately ever since their annexation to the United States.

HAWAII.

The islands constituting this Territory, owing to their reciprocity treaty with this country for a number of years before annexation, purchased their supplies of salmon from the United States almost exclusively. In recent years the Territory has imported the following quantities of salmon from the mainland:

Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.	Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.
	Pounds.	Value.			Pounds.	Value.	
			Value.				*Value.*
1907	1,126,217	$89,286	$64,232	1914	1,418,941	$97,532	(a)
1908	965,029	89,025	67,143	1915	1,005,848	90,705	(a)
1909	1,440,410	121,716	73,848	1916	1,582,528	132,597	(a)
1910	1,381,398	113,526	72,194	1917	1,463,729	145,531	(a)
1911	1,231,264	119,872	76,572	1918	1,168,528	174,777	(a)
1912	1,850,567	194,385	57,495	1919	979,895	159,577	(a)
1913	1,841,874	173,202	(a)				

a Not shown separately.

PORTO RICO.

Of recent years the following shipments of domestic salmon have been made to this island:

Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.	Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.
	Pounds.	Value.			Pounds.	Value.	
			Value.				*Value.*
1907	604,627	$53,916	$2,893	1914	416,414	$41,726	(a)
1908	512,038	48,195	1,428	1915	588,889	56,527	(a)
1909	381,171	34,777	3,810	1916	860,873	60,453	(a)
1910	511,055	43,494	6,243	1917	881,360	70,427	(a)
1911	357,382	30,699	3,868	1918	378,266	52,737	(a)
1912	710,721	65,354	1,208	1919	468,501	68,532	(a)
1913	666,602	66,811	(a)				

a Not shown separately.

PHILIPPINE ISLANDS.

Of recent years the following shipments of domestic salmon have been made to these islands:

Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.	Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.
	Pounds.	Value.			Pounds.	Value.	
			Value.				*Value.*
1909	1,126,470	$74,792	$712	1915	4,159,580	$288,548	(a)
1910	5,425,404	396,604	2,089	1916	5,640,858	356,366	(a)
1911	3,069,118	225,885	3,542	1917	4,202,574	351,633	(a)
1912	5,096,810	422,001	2,437	1918	5,558,796	618,697	(a)
1913	10,122,820	590,128	(a)	1919	3,880,425	431,616	(a)
1914	5,034,252	266,369	(a)				

a Not shown separately.

ALASKA.

It seems like "carrying coals to Newcastle" to ship canned salmon to Alaska, from which Territory more than half the canned salmon of the world is produced, and yet a small business is done each year in this line, most of the product going to the mining camps and towns somewhat removed from the fishing sections.

The table below shows the shipments of such fish in recent years. After 1914 the shipments were lumped together with all other kinds of fish and thus prevented the listing of salmon separately.

Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.	Year ending June 30—	Canned salmon.		All other salmon, fresh or cured.
	Pounds.	Value.			Pounds.	Value.	
			Value.				*Value.*
1909	67,132	$7,123	$3,966	1912	134,320	$15,022	$4,218
1910	67,658	7,204	3,558	1913	43,346	5,074	(a)
1911	38,265	4,513	1,061	1914	42,945	5,278	(a)

a Not shown separately.

GUAM.

Since annexation, this country and Japan have been competing for the trade of this island, which, in earlier years, Japan controlled quite largely. During the last two years shown in the statement, however, the United States has secured the advantage. The table below shows the extent of the trade, which is made up almost entirely of salted or pickled salmon, only 900 pounds of fresh salmon, valued at $92, having been shipped by this country to Guam in 1908. Since 1909 all the fishery products imported have been lumped under one heading and it has been impossible to distinguish the salmon from the other species.

Year and country.	Pickled salmon.		Year and country.	Pickled salmon.	
	Pounds.	Value.		Pounds.	Value.
1905.			1908.		
United States	1,415	$71	United States	7,406	$623
Japan	16,526	1,221	Japan	6,130	465
1907.			1909.		
United States	13,604	1,086	United States	10,779	740
Japan	19,862	1,601	Japan	4,295	344

TUTUILA, SAMOA.

The customs statistics lump the imports of fish under one general heading, thus making it impossible to show separately the imports of salmon.

FOREIGN TRADE IN SALMON.

As we do not consume all of the salmon produced by our fisheries, it is necessary to find a foreign market for the surplus each season, but, as canned salmon has become one of the staples of the world, there

is not much difficulty in this respect, especially since our only competitors are Canada, Siberia, and Japan. The two last named have not yet become important factors in the canned-salmon market, though they will as their fishing operations are extended. There is more competition in the pickled, fresh, and frozen markets, several European and Asiatic countries being large producers of these goods, as is Canada also, for a considerable proportion of which she is compelled to find an outside market.

The World War greatly disturbed the usual course of our foreign trade. Because of the need for foodstuffs a tremendous demand arose in Europe for our salmon, resulting in a decided increase in the quantities shipped there and, for a while, in a reduction of our exports in other directions. In time, however, the markets adjusted themselves to the changed conditions of trade.

EXPORTS OF DOMESTIC CANNED SALMON.

From the beginning of the industry a considerable proportion of the salmon canned has been exported, especially of the higher grades. In Europe the chief customer is Great Britain, followed closely in the closing years of the war by Italy. Great Britain does not, however, consume this quantity, for a considerable part of her importations are reexported. On the North American Continent and adjacent islands the best customers are Mexico, Cuba, Panama, and the British West Indies, in the order named. The heavy shipments to Canada since 1916 are mainly in transit shipments to Europe by Canadian steamship lines as our lines were overburdened with war shipments. In South America, Chile, Peru, Argentina, and Ecuador were the leading markets in 1918. In Asia, Hongkong and China import canned salmon, although neither buys great quantities. The islands of the Pacific and Indian Oceans are large consumers. British Australasia took 7,811,387 pounds, valued at $1,407,561 in 1918, and other good customers were the British East Indies and British, French, and German Oceania. In Africa the British and Portuguese possessions are the largest importers.

The movements of these products are naturally often influenced favorably or adversely as the tariffs of the various countries in which they are marketed are raised or lowered.

Some countries maintain excessively high tariffs, among these being Brazil, 30 cents per pound; Colombia, 8½ cents; Mexico, 4 cents; Guatemala, 6½ cents; Paraguay, 7 cents; Uruguay, 6 cents; Austria-Hungary, 8 cents, and Germany, 7 cents. Norway levies 6 cents a pound duty, but this is undoubtedly to protect her own salmon industry.

In but few of the tariff acts is canned salmon distinguished by name, being usually classed as "preserved fish," and as these are usually luxuries in many countries they bear an extra high duty as a result.

In addition to these high duties in some countries, especially in South America, there are various other charges, fees, etc., which materially enhance the value of the goods before they reach the consumer. C. H. Clarke, of the salmon brokerage firm of Kelley-Clarke Co., of Seattle, Wash., prepared and published a statement [a]

[a] Pacific Fisherman, Vol. 13, No. 5, p. 11, 1915.

showing the comparative charges on 100 cases each of red Alaska and pink canned salmon from the time they leave Seattle up to the time they reach the hands of wholesalers in South America. This shows that the f. o. b. Seattle value of the red salmon was $500 and of the pink salmon $280. By the time these goods reached the hands of the Rio de Janeiro wholesalers the red salmon were worth $1,900.07, while the pink salmon were worth $1,677.87. At Montevideo, Uruguay, the red salmon were worth $1,436.01 and the pink salmon $1,213.81. The table is so interesting and instructive that it is reproduced entire herewith.

COMPARATIVE CHARGES ON 100 CASES EACH OF RED ALASKA AND PINK CANNED SALMON FROM SEATTLE, WASH., TO HANDS OF WHOLESALERS IN SOUTH AMERICA.

	Argentina (Buenos Aires).		Brazil (Rio de Janeiro).		Chile (Valparaiso).		Ecuador (Guayaquil)	
	Red.	Pink.	Red.	Pink.	Red.	Pink.	Red.	Pink.
F. o. b. Seattle value	$500.00	$280.00	$500.00	$280.00	$500.00	$280.00	$500.00	$280.00
Strapping	5.00	5.00	5.00	5.00	.....	.....	.....	.....
Freight	104.75	104.75	114.50	114.50	45.00	45.00	45.00	45.00
Marine insurance, 5 per cent f. p. a	6.10	3.90	6.20	4.00	5.50	3.25	5.50	3.25
C. i. f. value	615.85	393.65	625.70	403.50	550.50	328.25	550.50	328.25
Consular fees in United States	2.00	2.00	3.25	3.25	5.25	4.25	22.35	14.00
Customs duty	519.56	519.56	1,138.78	1,138.78	160.46	160.46	345.37	234.37
Analysis	2.12	2.12	6.47	6.47	.....	.....	.....	.....
Storage in customhouse	2.41	2.41	33.90	33.90	5.35	5.35	.....	.....
Handling in customhouse	7.24	7.24	.....	.....	2.51	2.51	.....	.....
Stamps and entry blanks	1.49	1.49	.....	.....	1.43	1.43	.....	.....
Statistics	.....	.....	.10	.10	.....	.....	.....	.....
Internal-revenue tax	.....	.....	7.77	7.77	.....	.....	.....	.....
Port tax	.....	.....	57.20	57.20	.....	.....	.....	.....
Customs brokerage	12.74	12.74	.....	.....	7.15	7.15	.....	.....
Wharfage, lighterage, cartage	7.64	7.64	26.90	26.90	3.65	3.65	19.30	19.30
Value ex customhouse	1,171.05	948.85	1,900.07	1,677.87	736.30	513.05	937.52	706.92

	Paraguay (Asuncion).		Peru (Callao).		Uruguay (Montevideo).		Venezuela (La Guayra).	
	Red.	Pink.	Red.	Pink.	Red.	Pink.	Red.	Pink.
F. o. b. Seattle value	$500.00	$280.00	$500.00	$280.00	$500.00	$280.00	$500.00	$280.00
Strapping	5.00	5.00	.....	.....	5.00	5.00	5.00	5.00
Freight	134.75	134.75	37.50	37.50	104.75	104.75	54.60	54.60
Marine insurance, 5 per cent f. p. a	9.60	6.30	5.40	3.20	6.10	3.90	5.60	3.40
C. i. f. value	649.35	426.05	542.90	320.70	615.85	393.65	565.20	343.00
Consular fees in United States	2.00	2.00	5.75	3.45	1.05	1.05	12.85	12.85
Customs duty	308.25	308.25	275.86	275.86	779.30	779.30	238.96	238.06
Analysis	.....	.....	.....	.....	.....	.....	.....	.....
Storage in customhouse	.....	.....	.....	.....	.....	.....	.....	.....
Handling in customhouse	.....	.....	.....	.....	16.15	16.15	.....	.....
Stamps and entry blanks	.....	.....	.58	.58	1.55	1.55	1.35	.97
Statistics	.37	.37	.....	.....	.....	.....	.....	.....
Internal-revenue tax	.....	.....	.....	.....	.....	.....	.....	.....
Port tax	.....	.....	.....	.....	.....	.....	.....	.....
Customs brokerage	.....	.....	4.86	4.86	15.50	15.50	5.00	2.80
Wharfage, lighterage, cartage	6.33	6.33	15.69	15.69	6.61	6.61	12.82	12.82
Value ex customhouse	966.30	743.00	845.64	621.14	1,436.01	1,213.81	836.18	611.40

The following table shows in summarized form the yearly exports of domestic canned salmon and the countries to which exported for the years 1900 to 1915, inclusive, and in detailed form for the years 1916 to 1918, inclusive:

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC CANNED SALMON.

SUMMARY, 1900–1915.[a]

Country receiving.	1900		1901		1902		1903	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Europe	18,941,109	$1,881,725	31,877,663	$3,234,862	30,683,551	$2,625,284	35,410,768	$3,125,197
North America	1,051,808	98,064	2,443,561	297,440	2,780,844	242,029	4,285,406	378,655
South America	1,868,225	192,918	1,577,013	160,862	1,291,998	107,907	1,756,214	121,918
Asia	654,126	67,941	853,434	86,571	1,597,346	120,674	1,759,294	134,783
Oceania	3,882,646	390,466	3,681,276	367,533	8,179,161	670,741	5,511,514	444,505
Africa	684,456	62,534	856,553	83,003	2,640,214	224,767	1,630,138	145,733

Country receiving.	1904		1905		1906	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Europe	33,591,896	$3,508,818	21,071,263	$1,877,509	32,061,402	$2,753,643
North America	2,446,023	204,363	1,565,773	132,134	2,069,357	171,946
South America	2,055,859	147,333	1,708,828	134,941	3,499,603	249,052
Asia	12,995,768	930,054	3,994,862	280,704	779,415	60,173
Oceania	3,898,606	341,849	5,257,446	467,928	6,340,346	509,257
Africa	936,126	92,181	1,468,383	142,253	1,194,291	103,872

Country receiving.	1907		1908		1909	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Europe	7,756,780	$791,436	13,321,086	$1,205,375	23,028,476	$2,207,194
North America	3,052,658	261,138	2,654,175	242,879	2,209,405	198,043
South America	5,659,690	414,774	5,571,000	410,743	1,461,662	123,502
Asia	1,419,391	105,364	1,004,571	86,908	1,386,702	119,582
Oceania	6,719,157	552,205	5,131,554	439,017	7,383,494	705,201
Africa	610,429	58,132	543,659	52,696	647,370	62,911

Country receiving.	1910		1911		1912	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Europe	44,765,898	$4,712,182	22,134,328	$2,408,708	19,545,720	$2,183,982
North America	2,224,516	191,551	1,979,950	190,037	3,411,176	332,692
South America	3,193,812	226,197	3,006,927	266,903	6,756,440	609,383
Asia	1,596,775	133,516	1,489,282	148,721	1,702,426	160,119
Oceania	11,568,824	998,219	9,699,624	991,540	11,220,515	1,255,149
Africa	510,871	52,593	290,688	30,633	787,479	79,238

Country receiving.	1913		1914		1915	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Europe	25,408,154	$2,705,254	62,862,328	$6,026,170	63,760,758	$7,110,728
North America	4,271,710	370,823	6,907,615	511,545	4,328,246	370,444
South America	4,134,771	292,367	3,472,438	233,675	1,301,962	107,783
Asia	3,503,538	254,209	2,875,995	180,402	1,135,793	97,602
Oceania	17,419,390	1,441,270	12,089,003	1,017,994	12,100,414	1,309,376
Africa	463,403	39,417	353,541	29,507	818,943	76,450

[a] Detailed statistics for 1900 to 1915, inclusive, may be found in "Pacific Salmon Fisheries," by John N. Cobb, Appendix III, Report, U. S. Commissioner of Fisheries, 1916, pp. 187–194. Washington, 1917.

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC CANNED SALMON—Continued.

DETAILS, 1916 TO 1918.a

Country receiving.	1916		1917		1918	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
EUROPE.						
Belgium			1,115,792	$8,546	18,000	$2,525
Denmark	366,948	$29,255	89,405	9,650		
France	3,447,022	377,597	985,582	153,927	7,937,490	1,167,737
Gibraltar					1,156,864	167,157
Greece	70,560	6,059	190,736	14,486	173,400	24,035
Iceland, and Faroe Islands	136	16	2,820	297	96	16
Italy	34,184	3,170	4,169,250	436,576	13,540,046	1,752,163
Malta, Gozo, etc	9,120	702	5,520	525		
Netherlands	21,868	2,865	20,450	2,709		
Norway	41,280	4,383	54,440	6,164		
Portugal	20	2	60	7	794	178
Russia in Europe			240	18		
Serbia and Montenegro	170	17				
Spain	4,995	382	37,481	3,389	1,315	274
Sweden	60,122	6,666	14,100	1,800		
United Kingdom:						
England	109,039,707	11,105,506	74,941,169	8,536,248	46,415,026	7,447,389
Scotland	1,067,590	111,381	1,131,832	139,718	848,295	129,652
Ireland					900	220
NORTH AMERICA.						
Bermuda	89,599	8,741	93,523	22,066	87,832	16,028
British Honduras	32,021	3,228	30,057	3,072	25,178	3,410
Canada	7,994,185	677,655	9,158,079	838,734	12,184,077	1,755,690
Central American States;						
Costa Rica	118,002	8,878	95,435	8,065	10,750	1,643
Guatemala	58,528	4,084	45,484	4,708	19,026	2,584
Honduras	37,695	3,651	26,168	3,080	10,536	1,612
Nicaragua	36,644	3,064	50,719	6,029	33,421	5,115
Panama	633,645	57,042	454,064	50,793	306,765	49,031
Salvador	21,404	1,826	18,368	2,134	6,691	1,144
Mexico	1,611,929	132,406	3,707,225	342,564	1,800,185	246,830
Miquelon, Langley, etc	957	100	3,026	377	60	8
Newfoundland and Labrador	700	37	2,640	286		
West Indies:						
British—						
Barbados	60,361	5,767	73,610	8,643	97,722	18,121
Jamaica	228,973	19,017	180,965	18,347	86,503	14,170
Trinidad and Tobago	267,548	26,060	134,832	18,230	372,420	61,443
Other British	75,578	7,097	103,004	12,001	32,116	5,760
Cuba	927,129	87,479	1,619,236	149,492	1,632,073	210,167
Danish	11,582	1,063	34,508	4,100	23,629	4,633
Dutch	21,599	2,122	24,673	2,782	8,370	1,683
French	4,772	477	4,770	543	548	80
Haiti	3,586	361	4,297	486	1,793	349
Santo Domingo	85,722	7,048	231,413	22,859	100,417	14,148
SOUTH AMERICA.						
Argentina	273,000	23,429	191,618	19,043	353,103	61,428
Bolivia	14,579	1,466	122,092	11,724	211,978	24,478
Brazil	40,732	3,921	64,657	7,599	187,615	26,245
Chile	2,812,537	192,581	1,452,155	121,019	2,304,499	330,244
Colombia	136,254	11,514	126,861	22,575	75,477	11,479
Ecuador	245,149	16,009	276,654	25,302	215,456	28,360
Guiana—						
British	184,654	18,249	196,261	26,637	151,719	27,749
Dutch	87,398	8,048	39,050	3,888	35,143	5,812
French	26,128	2,371	17,909	1,910	26,560	3,825
Peru	523,580	36,361	434,329	37,447	1,150,276	158,794
Uruguay	23,464	1,841	5,258	590	6,830	1,509
Venezuela	195,618	16,234	297,125	28,158	181,236	26,834
ASIA.						
Aden	27,716	2,817			2,832	472
China			42,017	5,177	68,949	13,872
China, leased territory:						
Japanese	96	16	192	32	144	30
Chosen	1,632	172	2,520	456	1,062	207

a From Pacific Fisherman Yearbook for 1919, p. 93. Customs returns are for the fiscal year ending June 30 of the year noted.

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC CANNED SALMON—Continued.

DETAILS, 1916 TO 1918—Continued.

Country receiving.	1916		1917		1918	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
ASIA—continued.						
East Indies:						
British—						
British India	1,117,839	$91,767	601,935	$62,264	1,349,057	$222,947
Straits Settlements	1,215,214	71,585	106,896	9,081	232,755	34,468
Other British	166,144	12,787	101,286	10,355	41,818	6,944
Dutch	727,006	81,121	374,832	42,693	405,326	66,240
French	4,712	615	6,816	1,340	240	69
Hongkong	47,558	5,170	74,585	9,570	86,203	14,678
Japan	1,348	141	2,604	340	4,590	883
Persia	24,960	1,892	9,600	800	.....	.....
Russia in Asia	48	4	.....	.....	.....	.....
Siam	1,392	219	2,880	533	6,048	1,012
OCEANIA.						
British:						
Australia and Tasmania	11,035,294	1,204,354	6,990,835	865,865	7,397,009	1,337,231
New Zealand	216,292	24,684	96,912	10,332	240,240	45,409
Other British	30,878	2,923	141,735	14,749	174,138	24,921
French	290,854	29,201	248,415	32,643	186,574	31,160
German	448,860	29,434	357,386	37,172	285,605	39,071
Philippine Islands	5,640,858	356,366	4,202,574	351,633	5,558,796	618,697
AFRICA.						
British Africa:						
West	100,310	7,860	613,545	62,925	480,414	72,960
South	620,555	56,255	1,421,021	157,853	1,293,714	161,423
East	.....	.....	25,608	2,543	57,275	8,938
Belgian Congo	.....	.....	1,750	331	2,293	463
Canary Islands	10,480	1,071	7,200	432	836	115
Egypt	105,800	9,534	.....	.....	261,673	42,335
French Africa	.....	.....	2,250	235	20,268	4,255
Italian Africa	110	10	.....	.....	.....	.....
Liberia	3,624	366	2,810	258	9,448	1,499
Portuguese Africa	37,508	3,231	138,580	13,291	52,298	7,207
Spanish Africa	9,700	911	138,580	13,291	8,845	1,175
Total	152,943,962	15,032,497	117,962,807	12,963,425	110,060,480	16,570,834
RECAPITULATION.						
Europe	114,163,722	11,648,003	82,758,877	9,390,858	70,092,226	10,692,246
North America	12,322,259	1,056,904	16,196,177	1,565,409	16,840,112	2,413,649
South America	4,563,993	332,024	3,314,969	305,964	4,899,692	706,757
Asia	3,336,665	268,306	1,326,163	142,641	2,199,024	361,322
Oceania	17,659,036	1,646,962	12,037,357	1,312,394	13,842,362	2,096,439
Africa	898,298	80,298	2,328,764	246,159	2,187,064	300,371

In 1918 the practice of publishing customs figures for the calendar year instead of the fiscal year, as had prevailed previously, was inaugurated. The following tables show the exports of canned salmon, by countries, for the calendar years 1918 and 1919:

EXPORTS, BY COUNTRIES RECEIVING, OF CANNED SALMON, CALENDAR YEARS 1918 AND 1919.

Country receiving.	1918		1919	
	Pounds.	Value.	Pounds.	Value.
EUROPE.				
Austria-Hungary			157,396	$33,394
Azores, and Madeira Islands			432	71
Belgium	18,072	$2,539	5,179,022	970,696
Denmark			1,082,434	181,178
Finland			68,000	13,010
France	11,458,346	1,270,675	15,947,105	2,525,449
Germany			833,793	147,783
Gibraltar	273,540	44,593	370,890	85,860
Greece			2,722,686	471,555
Iceland, and Faroe Islands			12,025	2,557
Italy	19,654,988	2,785,844	36,925,190	4,801,911
Malta, Gozo, etc			1,892	262
Netherlands			231,710	46,356
Norway			441,776	87,668
Portugal	662	193	200	38
Rumania			9,720	1,538
Russia in Europe			19,500	2,795
Serbia, Montenegro, and Albania			480	96
Spain			79,457	16,253
Sweden	164	40	88,012	17,158
Switzerland			12,184	2,414
Turkey in Europe			100,040	17,072
United Kingdom:				
England	43,515,880	6,742,494	66,524,438	12,788,932
Scotland	154,495	22,672	1,460,082	219,951
Ireland	1,320	286	1,459,360	197,677
NORTH AMERICA.				
Bermuda	35,144	6,288	53,429	6,940
British Honduras	8,560	1,181	68,194	9,409
Canada	4,077,166	620,195	9,587,861	1,467,611
Central American States:				
Costa Rica	5,310	818	98,155	16,049
Guatemala	10,492	1,374	74,407	12,599
Honduras	3,459	488	50,936	8,693
Nicaragua	11,586	1,866	125,179	21,095
Panama	172,206	30,485	141,733	25,441
Salvador	4,290	741	20,783	5,173
Mexico	347,384	54,709	4,917,900	703,262
Miquelon, Langley, etc			3,090	751
Newfoundland and Labrador			108	21
West Indies:				
British—				
Barbados	33,074	6,305	65,114	12,947
Jamaica	77,002	12,225	367,119	51,537
Trinidad and Tobago	153,207	24,023	143,694	27,023
Other British	10,148	1,993	37,935	7,717
Cuba	428,208	60,432	1,646,913	238,858
Dominican Republic	50,887	7,973	238,502	36,503
Dutch	3,206	701	17,678	4,603
French	184	24	10,456	2,422
Haiti	1,036	190	6,199	1,393
Virgin Islands of United States	20,059	4,221	22,498	4,447
SOUTH AMERICA.				
Argentina	255,950	51,437	403,019	76,052
Bolivia	94,076	8,765	84,559	13,087
Brazil	161,529	21,625	31,113	7,273
Chile	1,316,148	195,478	1,331,484	214,284
Colombia	31,816	5,493	275,050	47,078
Ecuador	40,358	5,895	368,939	55,947
Guiana:				
British	38,595	7,765	122,715	25,974
Dutch	13,769	2,380	68,581	14,336
French	5,456	778	36,562	7,007
Paraguay			240	55
Peru	290,337	41,262	1,180,989	185,839
Uruguay	6,240	1,441	47,412	9,932
Venezuela	129,457	19,907	383,120	63,321
ASIA.				
Aden	2,400	394	2,880	480
China	41,980	8,579	90,232	19,088

EXPORTS, BY COUNTRIES RECEIVING, OF CANNED SALMON, CALENDAR YEARS 1918 AND 1919—Continued.

Country receiving.	1918		1919	
	Pounds.	Value.	Pounds.	Value.
ASIA—continued.				
China, leased territory: Japanese	48	$10	168	$43
Chosen	42	8	5,274	1,246
East Indies:				
British—				
British India	367,273	67,256	984,672	193,089
Straits Settlements	111,440	16,021	223,168	42,403
Other British	26,890	4,495	61,814	13,402
Dutch	124,502	17,692	427,298	71,132
French	240	69	2,412	692
Hongkong	41,424	7,839	116,912	22,628
Japan	25,968	3,259	12,038	1,940
Russia in Asia			192	52
Siam	4,800	760	2,122	558
Turkey in Asia			20,504	3,646
OCEANIA.				
British:				
Australia	1,149,888	215,715	5,777,713	1,293,194
New Zealand	26,592	4,835	61,533	13,919
Other British	67,674	9,872	93,423	16,115
French	116,535	19,203	225,429	42,303
German	153,840	20,394	80,577	12,966
Philippine Islands	5,291,182	579,410	2,371,736	279,408
AFRICA.				
Abyssinia			92	18
Belgian Kongo	2,354	477	14,990	3,251
British Africa:				
West	192,376	33,051	976,463	172,258
South	121,990	18,255	1,269,317	284,633
East	34,260	6,098	5,996	1,417
Canary Islands			59,790	8,025
Egypt	261,673	42,335	939,895	133,358
French Africa	17,136	3,572	32,989	7,208
German Africa			50,465	9,332
Liberia	2,633	539	8,218	1,761
Madagascar			48	8
Morocco			5,688	932
Portuguese Africa	2,788	485	31,868	6,839
Spanish Africa			36,266	7,009
Total	91,101,734	13,149,307	169,750,672	28,644,706

The following table shows in summarized form the customs districts from which canned salmon was exported for the years 1900 to 1915, inclusive, and in detailed form for the years 1916 to 1919, inclusive. Up to 1910 about two-thirds of the total exports have gone from the port of San Francisco, while about one-fifth of the total passed through the port of Puget Sound, Wash. In 1910 the exports from Puget Sound exceeded those from San Francisco. In 1918, however, San Francisco assumed first place once more. The only other port through which any considerable quantity is shipped is New York City. It is usual now to load the salmon on steamers and sailing vessels at San Francisco and the Puget Sound cities to go direct to Europe.

EXPORTS, BY CUSTOMS DISTRICTS, OF CANNED SALMON.

SUMMARY, 1900 TO 1915.[a]

Customs district from which exported.	1900		1901		1902		1903	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Atlantic ports	3,820,656	$370,302	8,834,322	$947,729	4,538,073	$427,335	5,734,469	$611,868
Gulf ports	38,868	3,430	55,425	5,426	50,116	4,965	54,016	5,085
Mexican border ports	30,264	2,861	20,140	2,082	188,346	15,498	130,363	11,741
Pacific ports	23,168,445	2,314,541	32,337,112	3,270,524	42,357,217	3,539,231	44,391,379	3,716,926
Northern border and Lake ports	24,137	2,514	42,501	4,510	39,362	4,373	43,107	5,171

Customs district from which exported.	1904		1905		1906	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Atlantic ports	2,133,121	$214,332	2,693,503	$267,263	3,277,571	$318,321
Gulf ports	72,792	6,455	97,561	8,425	127,255	10,910
Mexican border ports	355,248	24,183	289,439	23,148	455,413	36,130
Pacific ports	53,362,492	4,979,565	31,957,252	2,734,269	41,906,406	3,469,472
Northern border and Lake ports	625	63	28,800	2,364	177,769	13,110

Customs district from which exported.	1907		1908		1909	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Atlantic ports	2,314,535	$227,779	2,334,663	$227,113	4,043,807	$409,933
Gulf ports	165,050	14,450	206,120	19,245	107,018	8,954
Mexican border ports	570,343	47,776	723,689	65,119	219,128	21,574
Pacific ports	22,160,349	1,892,398	24,961,173	2,126,995	31,705,144	2,971,984
Northern border and Lake ports	7,828	646	400	46	42,012	3,991

Customs district from which exported.	1910		1911		1912	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Atlantic ports	3,003,430	306,122	1,564,485	$166,971	2,506,989	$257,792
Gulf ports	118,559	9,554	159,359	15,194	109,045	12,029
Mexican border ports	254,717	21,503	213,226	20,393	415,259	38,455
Pacific ports	60,450,190	5,974,196	36,663,729	3,834,584	40,391,058	4,312,116
Northern border and Lake ports	33,800	2,883	.....	.....	1,405	171

Customs district from which exported.	1913		1914		1915	
	Pounds.	Value	Pounds.	Value.	Pounds.	Value.
New York	1,935,881	$189,959	2,404,220	$207,924	5,316,456	$512,549
New Orleans	.....	.....	182,717	19,787	261,709	28,682
El Paso	.....	.....	120,140	9,045	176,390	12,348
San Francisco	31,687,774	3,277,841	38,844,912	3,600,636	35,321,058	4,209,914
Oregon	624,000	83,000	124,512	9,391	671,452	64,517
Washington	19,827,745	1,434,451	45,876,703	4,138,449	41,064,868	4,183,410
All other districts	1,215,566	118,089	197,716	14,061	634,183	60,663

[a] Detailed statistics for 1900 to 1915, inclusive, may be found in "Pacific Salmon Fisheries," by John N. Cobb, Appendix III, Report U. S. Commissioner of Fisheries, 1916, pp. 194-198. Washington, 1917.

EXPORTS, BY CUSTOMS DISTRICTS, OF CANNED SALMON—Continued.

DETAILS, 1916 TO 1918.

Customs district from which exported.	1916		1917		1918	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Georgia			156,000	$37,052	96	$24
Maine and New Hampshire	2,583,306	$274,432	1,186,871	160,399	3,336	621
Maryland	517,800	47,603	1,884,672	165,537	1,208,142	149,080
Massachusetts	1,314,778	130,701	2,447,156	279,184	789,629	159,052
New York	24,257,388	2,339,629	23,993,032	2,607,602	49,034,077	7,690,025
Philadelphia	111,578	8,680	2,445,373	237,540	302,740	40,431
Porto Rico	9,813	578	3,060	384	6,106	839
Virginia	2,589,040	211,848	5,969,268	551,269	489,242	82,563
Florida	4,252	350	9,971	672	7,262	1,623
Galveston	3,211	159	30,096	3,467	16,457,201	2,124,530
Mobile	7,635	851	7,055	686	6,505	838
New Orleans	1,125,031	109,238	8,003,488	967,410	1,720,839	223,676
Sabine	4,867	428	8,244	1,233	5,411	1,325
Arizona	134,358	10,263	170,372	15,005	97,046	12,228
Eagle Pass	37,922	3,496	95,077	7,783		
El Paso	117,715	8,876	196,331	15,878	105,630	12,547
San Antonio					401,640	47,445
Laredo	252,826	16,637	367,324	33,159		
Alaska	87,371	6,319	3,094,290	267,489	5,396,783	691,837
Hawaii	78	15	137,328	13,959	56,044	8,195
Oregon	657,121	60,257	303,888	36,105		
San Francisco	53,221,608	5,845,811	32,390,693	3,910,592	18,278,622	3,153,508
Southern California	33,455	2,463	35,133	3,758	30,009	4,327
Washington	60,520,904	5,461,097	30,549,747	3,034,487	13,783,070	1,874,726
Buffalo	850	107	5,437	722	250	25
Dakota			66,825	5,906	2,630	437
Duluth and Superior			171	39	15	1
Michigan	1,949,086	207,808	3,354,350	427,810	1,814,899	284,746
Montana and Idaho	3,389,969	283,727	987,925	166,323	1,248	222
St. Lawrence			100	28	61,990	5,961
Vermont	12,000	1,124	63,530	8,957	18	2
Total	152,943,962	15,032,497	117,962,807	12,963,425	110,060,480	16,570,834

In 1918 was inaugurated the practice of publishing customs figures for calendar years instead of, as previously, for the fiscal year ending June 30. The following tables show the exports of canned salmon by customs districts for the calendar years 1918 and 1919:

EXPORTS, BY CUSTOMS DISTRICTS, OF CANNED SALMON, CALENDAR YEARS 1918 AND 1919.

Customs district from which exported.	1918		1919	
	Pounds.	Value.	Pounds.	Value.
Georgia	99	$25		
Maine and New Hampshire	96	24	130,994	$27,831
Maryland	1,705,877	220,669	2,385,585	411,895
Massachusetts	517,456	84,118	331,296	58,267
New York	46,490,264	7,500,562	85,463,019	13,977,432
Philadelphia	305,414	42,261	2,593,197	322,858
Porto Rico	1,711	394	7,458	1,282
Virginia	303,650	44,586	1,203,496	211,701
Florida			171,653	20,678
Galveston	15,169,801	1,942,094	11,156,255	1,857,799
Mobile	3,567,735	482,945	1,654,115	219,879
New Orleans	542,161	80,586	10,060,979	1,613,503
Sabine	3,033	833	16,439	3,354
Arizona	30,063	4,319	118,946	17,726
El Paso	21,290	2,891	320,836	41,491
San Antonio	46,914	7,373	855,588	110,612
Alaska	72	12	1,594,476	188,038
Hawaii	48,428	7,052	49,232	7,718
Oregon			244,600	56,080

EXPORTS, BY CUSTOMS DISTRICTS, OF CANNED SALMON, CALENDAR YEARS 1918 AND 1919—Continued.

Customs district from which exported.	1918		1919	
	Pounds.	Value.	Pounds.	Value.
San Francisco	4,490,375	$749,095	19,596,548	$4,359,336
Southern California	34,045	5,159	125,793	21,856
Washington	16,422,108	1,764,105	27,911,740	4,930,335
Buffalo	501	75	863,795	140,568
Dakota	2,541	437	90,206	19,841
Duluth and Superior			13,460	2,996
Michigan	1,345,300	200,878	1,057,458	199,096
Montana and Idaho			1,527,576	281,707
St. Lawrence	52,800	8,819	163,063	26,108
Vermont			42,869	8,144
Total	91,101,734	13,149,307	169,750,672	28,644,706

EXPORTS OF DOMESTIC FRESH AND CURED SALMON.

The following table shows in summarized form the value of the exports of fresh and cured salmon, by countries to which exported, for the period 1900 to 1915, inclusive, and in detailed form for the years 1916 to 1919, inclusive. As with the canned salmon, the greater part of these exports go to European countries, Germany, under ordinary conditions, taking by far the largest quantity. A small portion of this is salmon caught in Atlantic waters.

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC PICKLED, FRESH, ETC., SALMON.

SUMMARY, FISCAL YEARS 1900 TO 1915.[a]

Country receiving.	1900	1901	1902	1903	1904	1905
Europe	$340,643	$344,368	$496,637	$760,197	$1,094,050	$1,748,039
North America	87,964	60,416	132,704	67,225	36,408	25,809
South America	1,702	901	3,063	1,690	1,822	3,438
Asia	3,324	15,037	25,843	5,393	1,382	30,170
Oceania	101,388	5,982	35,863	34,835	28,063	25,085
Africa	255	24	325	12	864	114

Country receiving.	1906	1907	1908	1909	1910
Europe	$1,776,086	$1,794,885	$1,587,535	$1,225,948	$1,468,015
North America	36,943	23,204	27,263	28,383	29,688
South America	2,600	2,351	517	1,365	5,242
Asia	92,861	19,384	3,962	3,640	848
Oceania	18,914	38,721	28,767	28,935	28,079
Africa	60	198		289	1,268

Country receiving.	1911	1912	1913	1914	1915
Europe	$1,511,184	$1,587,973	$2,055,109	$2,074,499	$1,375,123
North America	24,880	20,350	34,741	86,087	20,836
South America	384	142	3,409	933	618
Asia	3,933	107	1,398	2,428	1,362
Oceania	32,334	21,575	25,699	31,330	27,420
Africa	424	4	2,210	32	

[a] Detailed statistics for 1900 to 1915, inclusive, may be found in "Pacific Salmon Fisheries," by John N Cobb, Appendix III, Report, U. S. Commissioner of Fisheries, 1916, pp. 198-201. Washington, 1917.

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC PICKLED, FRESH, ETC., SALMON—Continued.

DETAILS, FISCAL YEARS 1916 TO 1918.

Country receiving.	1916	1917	1918
EUROPE.			
Denmark	$193,124	$33,874	.....
France	2	.....	$3,900
Greece	2,898	1,844	.....
Iceland, and Faroe Islands	365	237	.....
Italy	.....	6,418	10
Netherlands	10,961	4,614	.....
Norway	194,868	134,676	.....
Spain	316	.....	.....
Sweden	145,613	27,346	.....
United Kingdom—England	147,955	155,089	130,747
NORTH AMERICA.			
Bermuda	688	1,002	600
British Honduras	115	1	5
Canada	12,872	79,676	55,976
Central American States:			
Costa Rica	169	14	.....
Guatemala	75	61	18
Honduras	149	112	5
Nicaragua	249	97	81
Panama	6,364	2,973	2,308
Salvador	117	76	3
Mexico	9,909	3,388	3,186
Newfoundland and Labrador	15	.....	.....
West Indies:			
British—			
Barbados	944	564	12
Jamaica	3,689	806	122
Trinidad and Tobago	102	1,635	.....
Other British	1,352	801	26
Cuba	6,563	2,274	2,578
Danish	257	902	379
Dominican Republic	967	1,875	448
Dutch	574	382	52
French	61	65	.....
Haiti	525	435	290
SOUTH AMERICA.			
Argentina	111	140	9
Bolivia	87	129	35
Brazil	424	537	112
Chile	735	39	243
Colombia	1,164	435	869
Ecuador	263	45	31
Guiana:			
British	940	158	.....
Dutch	380	817	6
French	407	230	25
Peru	929	742	.....
Uruguay	95	.....	.....
Venezuela	2,998	779	362
ASIA.			
China	23	111	95
China, leased territory—Japanese	.....	100	.....
Chosen	7	.....	4
East Indies:			
British—			
British India	102	22	22
Straits Settlements	.....	.....	50
Other British	9	.....	.....
Dutch	1,735	.....	438
French	.....	35	.....
Hongkong	43	9	.....
Japan	22	56	286
Russia in Asia	243	.....	.....
OCEANIA.			
British:			
Australia	31,815	21,058	155
New Zealand	81	23	.....
Other British	61	86	73
French	1,285	1,039	235
German	442	1,062	1,363
Philippine Islands	252	1,071	135

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC PICKLED, FRESH, ETC., SALMON—Continued.

DETAILS, FISCAL YEARS 1916 TO 1918—Continued.

Country receiving.	1916	1917	1918
AFRICA.			
British Africa:			
West	.....	$376	$152
South	$1,642	877	.....
Canary Islands	87	1,140	.....
Egypt	.....	479	.....
Liberia	6	.....	.....
Portuguese Africa	1,251	47	.....
Spanish Africa	701	.....	.....
Total	790,198	492,879	205,446
RECAPITULATION.			
Europe	696,102	364,098	134,657
North America	45,756	97,139	66,089
South America	8,533	4,051	1,092
Asia	2,184	333	895
Oceania	33,936	24,339	1,961
Africa	3,687	2,919	152

DOMESTIC PICKLED SALMON, CALENDAR YEARS 1918 AND 1919.[a]

Country receiving.	1918		1919	
	Barrels.[b]	Value.	Barrels.[b]	Value.
EUROPE.				
Azores, and Madeira Islands	.....	.....	2	$62
Belgium	.....	.....	1	35
Denmark	.....	.....	10,044	466,359
Germany	.....	.....	2,307	41,538
Greece	.....	.....	109	3,879
Netherlands	.....	.....	270	15,995
Norway	.....	.....	2,514	123,069
Spain	.....	.....	1	29
Sweden	.....	.....	2,178	105,010
United Kingdom:				
England	419	$17,800	2,210	124,152
Scotland	.....	.....	101	2,830
NORTH AMERICA.				
Bermuda	.....	.....	37	662
British Honduras	.....	.....	1	20
Canada	66	1,300	272	5,031
Central American States:				
Costa Rica	.....	.....	3	66
Guatemala	5	138	5	199
Honduras	1	6	.....	.....
Nicaragua	.....	.....	3	59
Panama	31	817	28	846
Mexico	5	104	2	36
West Indies:				
British—				
Barbados	7	176	301	11,380
Jamaica	1	17	18	390
Trinidad and Tobago	6	115	659	18,148
Other British	3	59	9	243
Cuba	17	452	31	1,008
Danish	18	350	.....	.....
Dominican Republic	54	1,180	35	1,004
Dutch	2	20	13	213
French	2	46	19	547
Haiti	24	497	20	652
Virgin Islands of United States	.....	.....	20	454

[a] Included in "All others" in previous years.

[b] Barrel holds 200 pounds of fish.

EXPORTS, BY COUNTRIES RECEIVING, OF DOMESTIC PICKLED, FRESH, ETC., SALMON—Continued.

DOMESTIC PICKLED SALMON, CALENDAR YEARS 1918 AND 1919—Continued.

Country receiving.	1918		1919	
	Barrels.	Value.	Barrels.	Value.
SOUTH AMERICA.				
Colombia	1	$20	2	$36
Guiana:				
British	14	369	10	270
Dutch	15	386	101	2,726
French	35	865	35	1,186
Peru			3	72
Venezuela	2	42	1	50
ASIA.				
China	9	210	3	86
Japan			93	1,864
OCEANIA.				
British:				
Australia	1,058	23,704	736	16,292
New Zealand	1	28		
Other British	2	35	3	70
French	44	937	29	692
German	75	1,645	19	413
Philippine Islands	3	63		
AFRICA.				
British South Africa			1	32
Liberia	2	20	7	69
Total	1,922	51,401	22,256	947,694
RECAPITULATION.				
Europe	419	17,800	19,737	882,958
North America	242	5,277	1,476	40,878
South America	67	1,682	152	4,340
Asia	9	210	96	1,950
Oceania	1,183	26,412	787	17,467
Africa	2	20	8	101

The following table gives a summary, by customs districts, of the exports of domestic fresh and cured salmon from 1900 to 1915, inclusive, and a detailed statement of the same for the years 1916 to 1919, inclusive. The greater part of the shipments pass through the New York City customs district.

EXPORTS, BY CUSTOMS DISTRICTS, OF DOMESTIC PICKLED, FRESH, ETC., SALMON.

SUMMARY, FISCAL YEARS 1900 TO 1915.[a]

Customs district from which exported.	1900	1901	1902	1903	1904	1905
Atlantic ports	$346,924	$330,890	$503,439	$767,397	$1,103,034	$1,757,832
Gulf ports	.....	5	143	30	124	159
Mexican border ports	1,192	535	1,857	1,227	1,160	997
Pacific ports	185,644	92,698	188,177	99,018	56,167	66,772
Northern border and Lake ports	1,516	2,610	819	1,680	3,004	6,895

Customs district from which exported.	1906	1907	1908	1909	1910	1911	1912
Atlantic ports	$1,781,476	$1,797,411	$1,590,778	$1,230,542	$1,479,656	$1,514,599	$1,586,319
Gulf ports	14	276	7,226	49	74	1,542	.....
Mexican border ports	788	424	167	25	202	18	202
Pacific ports	139,606	73,927	44,313	50,834	50,521	46,167	33,190
Northern border and Lake ports	5,580	6,705	5,560	7,110	2,187	10,818	10,440

Customs district from which exported.	1913	1914	1915	Customs district from which exported.	1913	1914	1915
New York	$2,060,068	$2,067,366	$1,377,840	San Francisco	$26,030	$29,880	$28,777
Alaska	20,995	16,932	6,630	All other districts	8,119	21,418	9,592
Puget Sound	7,354	59,713	2,020				

DETAILS, FISCAL YEARS 1916 TO 1918.

Customs district from which exported.	1916	1917	1918
Maine and New Hampshire	$16	$22,480	$37
Massachusetts	2,925	14,764	32,002
New York	732,782	360,348	106,636
Porto Rico	47	635	57
Florida	60	.....	210
Mobile	48	5	5
New Orleans	610	166	408
Sabine	33	.....	950
Arizona	1,736	374	501
Eagle Pass	.....	454	.....
El Paso	.....	276	24
San Antonio	.....	.....	1,123
Laredo	16	100	.....
Alaska	5,203	29,348	14,529
Hawaii	16	15	7
San Francisco	33,648	23,804	6,907
Southern California	80	255	191
Washington	1,155	4,779	19,825
Buffalo	394	2,939	6,150
Dakota	706	2,233	1,942
Duluth and Superior	13	42	251
Michigan	8,845	12,695	11,910
Montana and Idaho	.....	5,567	49
St. Lawrence	1,800	7,167	1,258
Vermont	565	4,433	174
Total	790,198	492,879	205,446

[a] A more detailed statement for 1900 to 1912 may be found in "Pacific Salmon Fisheries," by John N. Cobb, Appendix III, Report U. S. Commissioner of Fisheries, 1916, pp. 202–203. Washington, 1917.

EXPORTS, BY CUSTOMS DISTICTS, OF DOMESTIC PICKLED, FRESH, ETC., SALMON—Continued.

DOMESTIC PICKLED SALMON, CALENDAR YEARS 1918 AND 1919.

Customs district from which exported.	1918		1919	
	Barrels.	Value.	Barrels.	Value.
Maine and New Hampshire			120	$2,220
Massachusetts			2	65
New York	657	$23,346	21,041	919,375
Porto Rico	1	23		
Philadelphia			44	3,500
New Orleans	2	39	7	163
Alaska	40	770	4	100
San Francisco	1,185	26,443	797	17,724
Southern California	3	58	2	36
Washington	20	458	100	2,017
Dakota	6	91	125	2,112
Duluth and Superior	2	60		
Michigan	3	53	4	168
Montana and Idaho			1	34
St. Lawrence	3	60	9	180
Total	1,922	51,401	22,256	947,694

EXPORTS, BY COUNTRIES RECEIVING, OF ALL OTHER SALMON, CALENDAR YEAR 1919.

Country receiving.	Value.	Country receiving.	Value.
Belgium	$1,230	Virgin Islands of United States	$241
Denmark	75,095	Bolivia	2
France	6,444	Brazil	2,194
Iceland, and Faroe Islands	200	Chile	190
Netherlands	617	Colombia	182
Norway	43,840	Dutch Guiana	238
Spain	16	French Guiana	135
Sweden	2,430	Peru	10
United Kingdom—England	251,730	Venezuela	49
Bermuda	25	China	286
Canada	421,498	British Straits Settlements	29
Guatemala	96	Other British East Indies	3
Honduras	5	Dutch East Indies	749
Nicaragua	21	French East Indies	5
Panama	646	Japan	6,214
Salvador	26	Russia in Asia	67
Mexico	13,884	Siam	3
Barbados	4,000	Australia	4,840
Jamaica	103	French Oceania	134
Trinidad and Tobago	16	German Oceania	36
Other British West Indies	15	Philippine Islands	1,513
Cuba	1,643	British West Africa	381
Dominican Republic	525	French Africa	450
Dutch West Indies	110		
French West Indies	255	Total	842,464
Haiti	38		

EXPORTS, BY CUSTOMS DISTRICTS, OF ALL OTHER SALMON, CALENDAR YEAR 1919.

Customs district.	Value.	Customs district.	Value.
Maine and New Hampshire	$72,305	Southern California	$315
Massachusetts	18,986	Washington	13,861
New York	218,204	Buffalo	5,964
Philadelphia	44,625	Dakota	4,250
Porto Rico	199	Duluth and Superior	44
Florida	4	Michigan	13,591
New Orleans	4,049	Montana and Idaho	12,283
Sabine	29	Ohio	123
Arizona	65	St. Lawrence	29,252
El Paso	5	Vermont	2,831
San Antonio	13,365		
Alaska	347,068	Total	842,464
San Francisco	41,046		

IMPORTS OF FRESH SALMON.

For some years it was the custom of the canneries on Puget Sound, when fish were scarce on the American side and abundant on the Canadian side, to import fresh salmon to fill out the domestic supply and the Canadian canneries would do the same when the conditions were reversed. In 1904 the Canadian Government prohibited the export of fresh sockeye salmon to Puget Sound for packing purposes, and in 1910 an effort was made to have Congress retaliate by enacting a similar law for this side of the line, but the bill failed of passage.

The table below shows the yearly imports of fresh salmon from British Columbia:

IMPORTS OF FRESH SALMON FROM BRITISH COLUMBIA, CANADA, FOR A SERIES OF YEARS.[a]

Year.	Pounds.	Value.	Year.	Pounds.	Value.	Year.	Pounds.	Value.
1890	4,660	$241	1897	93,454	$2,681	1904	40,010	$1,025
1891	4,950	170	1898	11,580	278	1905	1,015	35
1892	6,288	301	1899	58,002	4,101	1906	3,457,738	64,408
1893	64,811	3,639	1900	19,404	855	1907	113,224	4,131
1894	3,872	219	1901	27,072	2,050	1908	8,880	795
1895	14,000	1,403	1902	22,353	739	1909	41,073	2,346
1896	11,799	419	1903	6,860	343	1910	198,251	10,116

[a] After 1909 all imports of fresh salmon are listed under "Fish, fresh."

After 1911 the imports of fresh salmon from both coasts of Canada and from Newfoundland were lumped together, and are shown in the table below. Fully nine-tenths, if not more, of this salmon came from the Province of British Columbia in Canada, and the greater part of this was canned in the canneries on Puget Sound, Wash.

Fiscal year ending June 30—	Pounds.	Value.	Fiscal year ending June 30—	Pounds.	Value.	Fiscal year ending June 30—	Pounds.	Value.
1911	1,122,286	$114,123	1914	3,262,828	$245,791	1917	19,769,660	$599,442
1912	1,520,687	135,416	1915	10,676,206	383,697	1918	14,408,294	957,169
1913	2,089,781	180,513	1916	24,026,481	501,115	1919	15,571,451	928,552

The following table shows, by customs districts, the imports of fresh salmon during the calendar year 1918:

IMPORTS, BY CUSTOMS DISTRICTS, OF FRESH SALMON, CALENDAR YEAR 1918.

Customs district.	Pounds.	Value.	Customs district.	Pounds.	Value.
Maine and New Hampshire	449,244	$82,721	Dakota	532,772	$56,472
Massachusetts	4,965	318	Duluth and Superior	18,100	1,728
New York	12,400	3,536	St. Lawrence	247,833	26,918
Philadelphia	4,500	495	Vermont	336,806	37,216
Washington	11,479,858	421,713			
Buffalo	20	2	Total	13,085,998	631,119

During the calendar year 1919, imports of fresh salmon amounted to 752,480 pounds, valued at $101,121, and during the calendar year 1920, to 676,359 pounds, valued at $125,863.

IMPORTS OF CURED SALMON.

Below are shown the imports into this country of foreign-cured salmon, the product of the Pacific salmon fisheries, from 1886 to 1909, inclusive.

IMPORTS OF FOREIGN PICKLED PACIFIC SALMON, 1886 TO 1909.[a]

Year.	British Columbia.		Japan.		Hongkong.		Russia, Asiatic.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1886	5,600	$224							5,600	$224
1887	200	4							200	4
1888	86,000	4,031							86,000	4,031
1889	18,200	860							18,200	860
1890	600	36							600	36
1891	200	5							200	5
1893	5,478	291							5,478	291
1894	149,410	17,592			1,200	$29	11,875	$298	162,485	17,919
1895	6,550	250			600	13			7,150	263
1896	6,530	474							6,530	474
1897	6,890	156							6,890	156
1898	4,145	188			30	2	9,870	266	14,045	456
1899	15,875	1,554							[b] 16,032	[b] 1,560
1900	162,558	11,061	600	$41					163,158	11,102
1901	165,243	11,225							165,243	11,225
1902	175,411	13,794	606	28					176,017	13,822
1903	161,549	11,756	360	18					161,909	11,774
1904	282,210	23,319	1,400	52					283,610	23,371
1905	282,027	25,584	3,015	133					285,042	25,717
1906	35,475	1,730	5,510	175					40,985	1,905
1907	6,393	322	680	31					7,073	353
1908	13,230	631	4,185	174					17,415	805
1909	30,710	1,523	3,537	148					34,247	1,617
1910	111,645	5,505								

[a] After 1909 all imports of salmon, pickled or salted, are included under "All other cured or preserved."
[b] Includes 157 pounds, valued at $8, from China.

Since 1910 all imports of pickled salmon have been lumped together and it has been impossible to distinguish the imports of Pacific salmon from those imported from Atlantic districts. The table below shows the total imports, almost all of which comprise salmon from the Province of British Columbia in the Dominion of Canada.

Fiscal year ending June 30—	Pounds.	Value.	Fiscal year ending June 30—	Pounds.	Value.	Fiscal year ending June 30—	Pounds.	Value.
1911	695,878	$62,769	1914	1,114,927	$84,503	1917	945,394	$81,776
1912	417,938	33,901	1915	1,162,341	104,451	1918	739,759	74,042
1913	344,530	28,650	1916	1,010,844	70,837	1919	859,276	117,352

EXPORTS OF CANADIAN CANNED SALMON.

EXPORTS OF CANNED SALMON FROM CANADA, 1916–1919.

[Fiscal year ended Mar. 31.]

Destination.	1916	1917	1918	1919
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
Australia	4,789,094	3,365,149	2,236,742	3,750,194
Barbados				1,642
Bermuda	11,480	10,934	9,132	25,884
Bolivia		9,600		120,000
British Guiana		48		96
British India	298,200	101,344	2,400	55,950
British South Africa	52,800			48,000
British West Indies	28,643	116,112	48,238	
Chile		14,400		614,016
China	11,976	1,440	101	2,540
Cuba				1,048,800
Dutch East Indies	343,632	319,344	47,768	28,800
Ecuador				2,400
Fiji	928,752	860,400	736,616	354,196
France	3,905,461	5,521,100	13,529,569	2,869,658
French Oceania		14,400	48,000	
Greenland, Iceland, etc			200	
Hongkong	18,240		7,300	15,550
Italy		60	3,109,694	5,454,070
Jamaica				576
Japan				192
Newfoundland			120	48,000
New Zealand	1,338,050	1,339,282	1,689,652	1,623,496
Other British East Indies				36,000
Other British Oceania	91,056	105,360	6,000	12,000
Other British West Indies				8,646
Panama		4,700		
Peru		21,600		
Russia in Europe				48,000
Siam	14,400	124,848		24,096
St. Pierre and Miquelon	2,394	1,351	1,869	4,784
Straits Settlements	2,064,736	1,060,018	292,800	412,810
Switzerland	192			
Trinidad and Tobago				240
United Kingdom	35,225,051	34,772,879	21,117,314	29,265,108
United States	18,725	567,758	893,639	1,936,753
Total	49,142,882	48,332,127	43,777,154	47,813,697

SALMON CULTURE.[a]

The artificial culture of salmon on the Pacific coast has developed into a large and constantly expanding industry. The United States Bureau of Fisheries operates a number of large and well-equipped hatcheries, while the State governments of California, Oregon, and Washington, the Dominion of Canada and the Province of British Columbia, and certain private companies have built and maintain a large number of hatcheries, some of these being among the largest in the world.

OBTAINING THE SPAWNING FISH.

The eggs used for artifical propagation are obtained from salmon taken on their way upstream to the natural spawning grounds. In order to arrest the ascent of the fish a rack is usually built across the stream. Where this is not feasible a trap is sometimes constructed for the purpose of catching the fish. Sometimes the racks have slat traps attached in which some fish are caught.

[a] Since this revision was completed there has appeared an excellent work on this subject, entitled "Artificial Propagation of the Salmons of the Pacific Coast," revised and enlarged by Henry O'Malley. Appendix II, Report, U. S. Commissioner of Fisheries, 1919, 32 pp., 9 pls. Washington, 1920.