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THE COLUMBIA RIVER SALMON FISHERIES.

Among the many remarkable panoramas of natural scenery which unfold themselves to the traveler through the great Northwest, there is nothing to surpass that which is seen from the overland train as it winds its way through the great gorge of the Columbia River. The first view of this noble river—the Rhine of America—as it rolls onward between beetling cliffs, whose height is measured by the thousand feet, is stamped upon the memory with an impression of mingled awe and beauty which can never be effaced. At a point some one hundred miles from the mouth of the river the train turns sharply to the left and runs into

the city of Portland. This, the capital of the Northwest, is situated on the banks of the Willamette, a tributary stream which drains the fertile and famous valley of that name. To reach the Pacific Ocean the traveler will take one of the fleet stern wheel steamers, which will carry him down the last one hundred miles of the Columbia, and land him at the thriving city of Astoria, the headquarters of the justly celebrated salmon fisheries. Astoria owes its existence to the enterprise of John Jacob Astor, who, early in the century, dispatched a double expedition, one by ship round Cape Horn and the other overland from St. Louis, across the then unexplored deserts and mountains, to found a

trading post at the mouth of the Columbia River, for the collection of furs, pelts, etc. The place was named after the famous merchant; and in spite of the fact that even to this day it is without any railroad connection with the rest of the world (though one is now under construction), its advantageous location at the mouth of a great waterway, coupled with the rich natural resources of the surrounding country, have caused it to grow to a city of 10,000 inhabitants.

Astoria owes much of its importance to the fact that it is the meeting place of river and ocean traffic, being the port of call for the fleet of ships which carry the

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A COLUMBIA RIVER SALMON CANNERY—DAILY CAPACITY, 60,000 CANS.



A 65 POUND ROYAL CHINOOK SALMON.



SEINING—THE HAUL.

THE COLUMBIA RIVER SALMON FISHERIES.

THE COLUMBIA RIVER SALMON FISHERIES.

(Continued from first page.)

wheat crop of Oregon and a part of Washington to Liverpool, and it has also a considerable trade in lumber. Its chief importance, however, is derived from the extensive and world-renowned salmon fisheries of which it forms the headquarters. The fishing grounds extend through the whole length of the lower Columbia, whose shores are studded with the wharves and white buildings of the canneries or packing houses, the largest of which are located along the water front at Astoria, where there are sixteen in all.

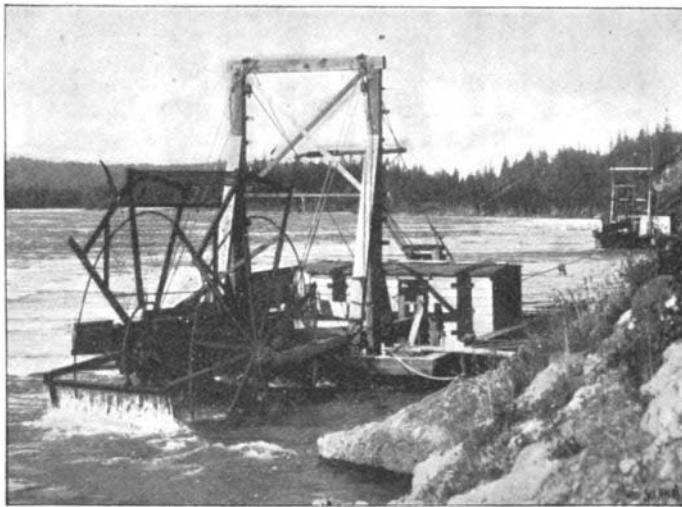
The most famous variety of fish taken in the Columbia River is that known as the Royal Chinook salmon. Its excellence is due to the firmness of the flesh, its delicate flavor, and its large proportion of oil. It varies greatly in size and weight, ranging from 20 to 80 pounds, the latter being an exceptionally large fish. In addition to the Chinook, three other varieties are common: the Blue-back, the Steel-head and the Silver-side. But, though they command a good price, they do not equal the Royal Chinook, which is the distinctive fish of the Columbia River, and the one upon which the reputation of the canned salmon has been built up.

The salmon is a deep sea fish which spawns in fresh water. The spawning grounds are located far inland, at the head waters of the rivers, and it is while they are entering or making their way up the river that the fish are caught. On the Columbia River the "running" commences in April and continues until October. As the salmon passes up the river it deteriorates in quality, as the result of its abstinence from food and the exertion of running the rapids. At the spawning time the fish becomes quite unfit for food, and after the eggs are laid it dies on the spawning ground. The eggs are deposited in the sand or gravel at the head waters of the river in which the parent fish were hatched, the young salmon invariably returning to what might be called their home waters. In spawning, the salmon makes a hole with its tail in the sand, where pure running water is to be found, and, after depositing the eggs, covers them up. The young fish do not make their way out of the sand until they are perfectly formed. They remain in fresh water until they are about as large as a smelt, when they are able to protect themselves against natural enemies; and then they go to the ocean, returning in four years' time to spawn. Authorities claim that the great difference in the size of the fully developed fish is due to the difference in the food they may happen to secure. The young salmon, when they encounter a school of smelt, will follow the latter continually, seizing the smelt at will when hungry. It is estimated that not more than five per cent of the fish which are hatched at the spawning grounds return to the ocean full grown. The loss is due mainly to the voracity of the various varieties of fish, including the young salmon that have not yet returned to the ocean. The latter live almost entirely upon their kind, the newly hatched fish being an easy prey to the older salmon's attack.

It is now believed that artificial hatching, and a further limitation of the open fishing season, are the only means of perpetuating the fishing industry; and two hatcheries have been established in the States of Washington and Oregon. In artificial hatching the loss is relatively small, not over ten per cent, as the young fish can be preserved until it is large enough to protect itself from the enemy by flight.

On the lower Columbia the fish are taken by means of fixed nets known as fish traps, by movable or seine nets, and by floating or gill nets. The fish trap consists of a row of piles which is driven in line from the shore or shoals out to the deep water in which the fish are accustomed to run. Here the piles are driven in a circle forming a pound, and the whole trap is covered with netting. The fish strike the netting and follow the trap until they reach the pound, where they are readily taken. The seine net is about 1,500 feet long, contains 650 pounds of twine, 200 pounds of rope and 150 pounds of lead, and costs fully \$1,000. It is handled from the shore, being paid out from the boat on which it is loaded, in a wide semicircle, and horses are used to haul it in. Seining is most profitable in those years when the river is low. Most of the season's catch, however, is taken with the gill net, which varies in length and depth according to the means of the owner. They are frequently 1,800 feet long and

from 20 to 25 feet deep, the material alone costing from \$275 to \$300. The size of the mesh varies from 7 to 10 inches, the latter size being used from June to August, when the fish are uniformly large. Lead sinkers are attached to the bottom; and cork or cedar floats to the top line of the net. Gill net fishing is carried out in specially constructed boats which have been built to meet the requirements of these fishing grounds. The boats are usually owned by the canneries and loaned to the fishermen, who are paid so much a pound (about 5 cents) for their catch. The fishing is done almost entirely at night. The net is "cast" across the stream, with a wooden buoy at one end and the fishing boat at the other. It is held in a perpendicular position by the lead sinkers, and slowly floats down the stream. The fish are caught by the gills in attempting to pass through, and are drawn up and thrown into the boat,



A FISH WHEEL IN OPERATION.

which is rowed up and down the line for this purpose.

On the upper Columbia a truly remarkable contrivance known as the fish wheel is used. To the rear end of a scow a large wheel is attached in such a manner that it can revolve under the impulse of the running water. Upon it are fixed several large net-covered scoops or pockets, whose mouths open down stream, or in the opposite direction to the run of the salmon. The scow is moored in the path followed by the fish, which, as they run into the scoops, are lifted up and automatically dumped into the scow.

The bulk of the salmon catch is cleaned, cut up, boiled, and canned by extensive establishments called canneries, one of the largest and most celebrated of which is shown in the accompanying illustration. The canning is done by Chinese labor, and the fishing is largely carried on by fine, stalwart men from the stormy coasts of Scandinavia and Northern Russia.

This profitable industry was established in 1866,



FISHING WITH THE GILL NET.

some thirty years ago. The first year's product consisted of 4,000 cases, with a total value of \$64,000. In ten years time the annual output had increased to 450,000 cases, valued at \$2,475,000; and last year's pack amounted to 600,000 cases, valued at \$3,000,000; the gross weight of the salmon utilized being nearly 20,000 tons. The total weight of salmon utilized in canning during these thirty years was 365,000 tons; and this was shipped in 11,000,000 cases, and represented a money value of \$64,500,000—a truly remarkable record.

We are indebted to the courtesy of Mr. M. J. Kinney and Mr. Robert Gibson, of Astoria, Oregon, for photographs and particulars.

In the various alphabets of the world the number of letters varies from 12 to 202. The shortest alphabet is that of the Sandwich Islanders, which has 12 letters, the Tartarian, the longest, containing 202 letters.

Balloon Experiences in War Time.

Die Vedette, a paper published in Vienna, and devoted to military literature, gives an account of the use of balloons by the French army during the investment of Paris by the Germans in 1870, together with a most interesting sketch of the experience of two of the aeronauts, says the Army and Navy Journal. During that period there were 65 balloons used, which carried out of Paris 150 persons and over 4,000,000 letters. Five of these balloons were captured by the Germans, two were lost and never heard of, and one, after a journey of fourteen hours, landed on top of Mount Lifjeld, in Norway. The occupants of this balloon were Paul Rolier, an engineer of the army, and L. Dechamps, an officer of Franc-Tireurs. They ascended from Paris on the night of November 24, 1870, with dispatches from Gen. Varchu for the commander of the Army of the Loire; in addition they carried 500 pounds of mail, six sacks of ballast, and six carrier pigeons. The wind blew from the southeast, and all was well until six o'clock the next morning, when the balloonists found themselves out of sight of land, with nothing but the ocean under them. Dechamps collapsed, while Rolier remained cool under the critical situation in which they found themselves. About eleven in the forenoon a ship was sighted, and in the hope of being discovered and rescued by it, the balloon was lowered to within a few yards of the surface of the water. The ship suddenly altered its course, and the aeronauts were compelled to ascend again, which they accomplished by throwing out all of their ballast and one sack of mail. Finding themselves in an altitude of over 2,200 yards, and in an atmosphere of almost unbearable fridity, they lost all hope and determined to end their sufferings by setting fire to the balloon. Fortunately the matches in their possession would not ignite, on account of the frost which covered their clothing and every-

thing else in their surroundings. About 2:30 in the afternoon a mountain top became visible. When near it the aeronauts succeeded in lowering the balloon; the boat caught in the top of a tree. Rolier promptly disembarked, but Dechamps became fastened in the rope attached to the anchor; in a moment he was suspended in the air by his feet, the balloon began instantly to rise again, but Rolier succeeded in freeing his companion from the entanglement and the balloon vanished from their sight. Although miraculously saved, yet standing in an unknown country, hungry, without proper clothing, and suffering from the intense cold, the aeronauts were still in a dangerous plight. It was their good fortune to select a westerly direction for their march, but Rolier soon broke down from exhaustion. His companion took him to an underground near by, where the exhausted traveler fell asleep. Dechamps continued his journey and soon found a hut filled with hay, to which he carried his companion. They buried themselves in the hay and slept until the following morning. Continuing their journey on foot, they found traces of a sleigh, which led them to a hut of wood choppers. Although unable to converse with them, the aeronauts ascertained that they were near Christiania, to which place they were brought the following day. The news of their adventure spread with rapidity, and soon after it was ascertained that the balloon had landed near Trammen, in Norway, and was secure with its freight.

Russia's Purchases of Machinery.

The Russian government has been negotiating for some time with the Delaware Iron Company, at New

Castle, Delaware, to secure a large amount of its machinery, and the bargain has been consummated finally. The contract entered into involves the delivery of all the material of the tube and pipe mill connected with the iron company's big plant. It also involves the sending to Russia of a large force of workmen, who will be engaged abroad to put the machinery together and start it in good running order. To transport the property thus purchased the British tramp steamer Henley has been chartered by Hagar & Company, Philadelphia. Besides taking out the material furnished by the iron company, the vessel will carry additional machinery bought in this country to Mariapole, on the Sea of Azov. The sale by the iron company of its tube and pipe plant does not in any way affect the future conduct of its works. As soon as the cargo is shipped the Delaware Iron Company will go ahead replacing all that it has sold to the Czar's government.