

is very imperfect, and in this case the strength of the preserving fluid used has been excessive and has damaged the internal soft parts of the specimen; but from the small size of the scales, which are twelve to fifteen to the inch, it is probably *O. quinnat*. Although plump in outward appearance, the fish was singularly free from fat in its interior, and the pyloric caeca were hardly developed, so that it must be looked upon as a fish out of condition. The liver is smaller than should be, weighing only $\frac{1}{4}$ oz., testes rudimentary; stomach and gut empty, the former having strong longitudinal folds. The teeth are very small and slender, and are present on the jaws, tongue, and roof of the mouth.

Oncorhynchus quinnat. — Grilse stage, male.—Length, with tail, 20.5 in.; weight, 2 lb. 12 oz.; greatest girth, 10 in.; greatest height, 3.5 in.; greatest width, 2.3 in.; length of head, 4.1 in.; length of snout to orbit, 1.4 in.; length of maxillary, 2 in.; length to dorsal fin, 8 in.; length of base of dorsal, 2 in.; height of dorsal fin, 1.5 in.; length of first dorsal ray, 2.4 in.; space from dorsal to adipose fin, 4.5 in.; length of base of adipose fin, 0.4 in.; height of adipose fin, 0.6 in.; space from adipose fin to caudal fin, 2.4 in.; length of outer caudal rays, 3.7 in.; length of middle caudal rays, 1.4 in.; length of pectoral fin, 2.9 in.; length of base of pectoral fin, 0.8 in.; length of ventral fin, 2 in.; length of axil scale, 1.1 in.; length of base of anal fin, 2.5 in.; length of longest ray of anal fin, 1.8 in.; height of tail at base of caudal fin, 2 in.; height of tail at base in advance of caudal fin, 1.2 in.

Fin-ray formula: B, 14; D, 12; A, 16; R, 15; V, 11; L, lat., 130; L, trans., $\frac{22}{4}$. Note.—B = gill-rays, D = dorsal fin, A = anal fin, P = pectoral fin, V = ventral fin, L, lat. = line of perforated scales along the side of the body, L, trans., = number of scales counted obliquely above and below the lateral line where opposite to the dorsal fin.

The specimen is very interesting from its being, so far as I am aware, the first authentic take of a true salmon after returning from the sea in the Southern Hemisphere. It has been placed in the museum.

Yours, &c.,

JAMES HECTOR.

The Secretary, Marine Department.

SIR,—

Petone, 6th June, 1906.

The fish sent from the Hakataramea is a true Pacific salmon (*Oncorhynchus quinnat*), being a female about 16 lb. weight. It had been so badly mauled about that the viscera could not be examined, the abdomen being full of clotted blood and loose masses of roe. The fish must have been ripe for spawning, but was in very poor condition. It looks like a king salmon from the Sacramento River breed, but it is not in a fit condition for examination. I understand that it is being skinned for Mr. Ayson.

I would like to get one of these fish in a fresh state for examination, and I might give you a full report on the whole subject for future reference.

Yours, &c.,

George Allport, Esq., Secretary for Marine.

JAMES HECTOR.

MEMORANDUM re SALMON.

Petone, 29th June, 1906.

According to your advice of 18th instant a box reached me on 15th instant containing three specimens curled up and packed in grass, but the fish had evidently been treated with some preservative before being packed. All the three fish had the distinctive characteristics of the sub genus *Oncorhynchus*, which includes all the species of salmon that are found in the North Pacific Coasts of America and Asia, and which breed in the rivers of that region. These particular specimens most resemble the *O. quinnat*, but they were not in a good condition for study. Five species of salmon are distinguished on the coast of California and British Columbia.

1. *O. quinnat*, or king salmon, spawns chiefly in Sacramento River and Columbia River. The "run" in these rivers takes place in early spring, and the fish ascend without feeding in some cases for a thousand miles before they spawn. The weight of this salmon in the Columbia averages 22 lb., but often reaches 70 lb.; in the Sacramento it averages 16 lb. After spawning it generally dies; and, in 1854, at the source of the Columbia River, 1,200 miles from the mouth and 2,000 ft. above the sea-level, I have seen the dead fish piled up in heaps for miles along the shores of the upper lakes. In its course that great river has many rocky falls and rapids, but it also passes through extensive lakes. The fish enter the river from the sea early in March, when they are caught in an immense profusion and in prime condition at the "Cascades," forty miles from the sea. I saw them piled up as mentioned at the source of the river on 22nd September, so that about seven months must be occupied in the ascent, at the rate of four to five miles per day. This is the most valuable salmon in Californian waters, but is only in good condition when in the sea or lower parts of the rivers.

2. *O. nerka*, blue back or Fraser River salmon, also known as the Sawqui (Sockeye, of fishermen): This salmon is found in all rivers north of the Columbia to Alaska, and on the Asian Coast south to Japan. In Fraser River the "main run" occurs in spring, and a second, the "fall run," in August and September, but they are taken on the banks in the estuary at other seasons. Their chief spawning-grounds are in small tributary streams to mountain lakes with temperature 45° Fahr. The flesh when in good condition is deep red: at spawning time it is pale and of less value for canning. Their weight is from 3 lb. to 8 lb. The other three species are of inferior importance to the foregoing, and only require mention.

The silver salmon, the dog salmon, the humpback salmon: These are all "fall" salmon, ascending only a short distance from the sea.

I will describe the specimens sent as I, II, III.

I.—A male fish 25 in. long, weighing 6 lb., almost black in colour, with deeply embedded scales in a tumid or spongy skin, two silvery patches on the gill-covers, and several large dull-red blotches on the sides of the body, black spots on the dorsal and upper part of the caudal fins. Head elongate, with