

seal pups taken from the womb of the mother, and swimming as soon as put in the water.

I could get plenty of other reliable persons to testify to the fact of the seal pups being plenty in June and July at Cape Flattery, and that they can swim as soon as born. Enough, however, has been given to substantiate that fact, but what remains to be shown is where these fur-seal pups are born. The very short time I was at Neah Bay was not sufficient to ascertain from personal knowledge or observation. I should have remained there through the season, or till the first of July, and have made frequent excursions on the sealing schooners in order to enable me to examine fully the question.

The supposition of Mr. Elliott, that all the fur seals of the North Pacific go to the Pribloff Islands, is of the same kind of popular assumption that all wild geese go north to breed in the Polar sea; and yet Colonel Goss, the great ornithologist of Kansas, found the nests and eggs of the wild geese in Wyoming Territory, and Mr. Elliott may ascertain, if he will, that all the fur seals in the Pacific Ocean north of the Equator do not visit the Pribloff Islands.

I do not consider this report other than as a preliminary brief, to be followed up and further investigated as occasion may offer. The only point I consider definitely settled is that the pups of the fur seal at Cape Flattery swim as soon as born, or even when taken alive from the womb of the mother seal; and in that respect they essentially differ in their habits from the fur seals of Alaska. This question regarding the natural history of the fur seals of Southern California is one of interest, and I hope it may be fully and thoroughly discussed.

PORT TOWNSEND, WASH., April 29, 1883.

## 32.—REPRODUCTION OF CALIFORNIA SALMON IN THE AQUARIUM OF TROCADERO.\*

By Messrs. RAVERET-WATTEL and BARTET.

On the 25th of October, 1878, the aquarium of Trocadéro received from the National Society of Acclimation 1,000 eggs of the California salmon (*Oncorhynchus quinnat*), being a portion of a consignment made by Prof. Spencer F. Baird, Commissioner of Fisheries of the United States. These eggs, which were already at an advanced stage of development, hatched very soon. The fry were very vigorous, and their growth was quite rapid, at least from the period (January 1, 1879) at which the aquarium was transferred to the municipal administration and intrusted to the care of a superintendent of roads and plantations

\* *Sur la reproduction du saumon de Californie, à l'aquarium du Trocadéro; par MM. Raveret-Wattel et Bartet. In Comptes rendus hebdomadaires des Séances de l'Académie des Sciences. Tome XCVI, No. 12 (19 Mars, 1883). Paris, 1883, pp. 796-797.*—Translated by MARSHALL McDONALD.

in the city of Paris, by whom attention was regularly given to the different fishes which occupied the aquarium.

Being liberally fed with the flesh of fish minced fine, the young salmon attained in the space of a year a mean weight of 250 grams. At this period almost all had lost the markings of their early age, and had taken on the beautiful silvery appearance of smolts; but they did not manifest that anxiety which is generally observed in our common salmon of the same age when kept in captivity. They bore their confinement perfectly well, and the losses were comparatively small.

Two years later these salmon had become very fine fish. Some weighed as much as 2 kilograms. In October, 1881, several of them gave evident signs of maturity. Artificial impregnation was attempted; but the eggs obtained appeared badly developed and did not give any result. Moreover, all, or almost all, both males and females, which had appeared disposed to spawn, died.

The following year, 1882, also in the month of October, the desire of spawning manifested itself anew in these fish, and on the 24th of October several females yielded about 1,500 eggs, which we attempted to fecundate with the milt of the trout, because there were no ripe male salmon at this time. The experiment did not succeed; but a few days afterward, individuals of both sexes being in full spawning condition, there were collected and fecundated in the space of five weeks about 30,000 eggs.\*

Unfortunately, the want of sufficient apparatus for hatching necessitated the crowding of the eggs for several days in a very restricted space. Moreover, the work of repairs in the water conduits which supplied the aquarium permitted the use for some time of only unfiltered water. To these two causes is to be attributed the bad success with a large number of the eggs, which from their fine appearance it is thought should have almost all reached the period of hatching.

About 1,500 very vigorous fry were, however, obtained, and are now in perfect condition. This suffices to demonstrate the possibility of rearing and of effecting the reproduction of the California salmon under conditions of captivity entirely exceptional. This fact is the more interesting as it relates to a foreign species essentially migratory, which has been at the same time transported to a new climate and subjected to a complete change in its habits. It seems, therefore, that we may readily effect the acclimation of this species, and this is particularly desirable with reference to the stocking of the water-courses tributary to the Mediterranean, in which the ordinary salmon is unknown and would not probably succeed. The California salmon extends in America to the thirty-fifth degree of latitude, that is to say, much more to the south than the *Salmo salar*, and could be undoubtedly acclimated in the Rhône, the Aude, the Hérault, &c.

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\* The individuals which spawned died at once.