ce leads to a offender, odly number let these be

unery corpo-

have placed s.

es to land in population, ge extent, in locate some

ed ?" g the expor-

none natives hool teacher

. DUNCAN.

this letter nis suggesnotty proble interest

estion was Wrangell, propagate they had ld visit his not get an d

reath and ed to that acer for all

s successew existed claimants here is his

r 10, 1895. 5 of salmon here was no er, a trusted lecess up to ention until

t hatcheries

te discharglucing from gnificant to isbermen us s located is

es. water, over stream for spawning, they are impounded in a trap below the dam, picked up with a dip net, and carefully placed above the dam, from whence they quickly proceed up to the lake, where they lie in the still, deep water until ripe for spawning, a period of from two to six weeks. They then take to the small clear streams running into the lake, where they are again imponded by means of a weir and trap, and are stripped of their eggs. The eggs are then fertilized by stripping the male over them, placed in baskets, and set in troughs in the way usual in all hatcheries. A peculiarity about this class of salmon, the Oncorhynchus nerka, is that they will not frequent a stream unless it has a lake where they can lie and ripen before spawning, although they never spawn in the lake; all the other species of Alaskan salmon frequent the streams where they can obtain spawning ground indiscriminately whether they have lakes or not.

My object in damining my stream near tide water is to keep back all enemies of the young fry, such as sea tront, bull heads, sculpins, sticklebacks, etc.; by this means I have my lake and streams cleared of these scourges of the young salmon, as they are all salt-water fish, and only go up to the lakes for plunder, returning to salt water when their senson is over. Of course there were many of them in the lake and streams the first year, but when they passed down over the dam they could never return. To protect the young fry from their enemies in the fresh water I believe to be the great secret of successful salmon propagation. There is no bar to the number of young that can be produced at the Government hatcheries, where the spawn in milimited quantities can be obtained. But unless protocted from their enemies while young (and everything large enough to swallow them are their enemies) a large proportion of them are destroyed in fresh water. In my own ease, however, the supply of fish is limited, and all are utilized.

My lake now fairly swarms with young salmon where herctofore scarcely one could be seen. I find, however, that the sea tront and others named are not their only enemies. Their older brothers feed on the young fry. The young salmon remain in the fresh water where they were hatched fourteen to eighteen months, so they have from two to four months to prey on their young brothers. Then, after going to sea, they will return for a short time to their native streams for a ennnibalistic feast, and here again in my case my dam acts as protector to the little ones, as when once they pass down they can not return. I have seen them in vast numbers about the size of sardines, and packed almost as close, below the dam, trying to get up, but they soon disappear and return to salt water. In connection with this matter of protecting the younger from their older brothers, I last year commenced an experimental process, which I feel encouraged to believe will prove successful; that is, by turning out a portion of my young fry in streams, on which there are lakes that fall into the sea by falls, over which up in some analysis. As a consequence, most of these streams and lakes are entirely barren of fish of any kind. There are three streams and lakes of this description contiguous to my hatchery. In the winter of 1894-95 I placed 1,000,000 young fry into one of these lakes, and the present season of 1895-96 will place 2,000,000 in another lake, and so keep on alternating until I prove whether they will return to these streams. At the same time I will keep on stocking my own hatchery lake with as many as I think it will sustain. If my experiment of stocking these heretofore barren lakes and streams proves successful, and I can see no reason why it should not, it will prove of great value to the salmon tisheries of this coast, as these lakes abound all along the Alaskan coast.

I commenced my hatchery in the fall of 1892, but owing to the impure water of the creek, which contains a large amount of impurities, had but indifferent success, turning out only about 600,000. I then moved my hatchery up to the lake, threefourths of a mile, where 1 found streams of pure water and even temperature,  $45^{\circ}$  in summer and never below  $38^{\circ}$  in winter, and then the tish ripened more healthily, as they were in their natural water. In the fall of 1893, however, there was but a small run of salmon, but the eggs hatched much better and I turned out about 1,700,000 young fry. The season of 1894-95 we had a better run and turned out 1,500,000 in one hatchery lake and 1,000,000 in the barren lake before mentioned. The present winter of 1895-96 we will turn out 4,000,000 or over, having had a much larger run than assual, which we will distribute between our hatchery lake and two other barren lakes. These three barren lakes are situated, respectively. 3, 6, and 9 miles from our hatchery, and entails a good deal of labor and expense cutting trails and carrying the young fing in in backets to their nursery. There are a few cohoes (*Oncorhynchus kisuteh*) that frequent our stream, but never more than 400. As they are a good fish, although not as valuable as the sukkesh, we also pass them over the dam and strin them. Their time of running is about siv wask later than the sukkesh

dam and strip them. Their time of running is about six weeks later than the sukkesh. Owing to the smallness of our hatchery stream, we have opportunities of observing the habits of the salmon with greater accuracy than on large streams. From close observation made for a number of years, I am of the opinion that no salmon return to the sea after ascending for propagating purposes, unless their natural habits of copulating are interferred with. I am, however, of the opinion that some of the males will return if they are kept from the spawning beds and from performing the

S. Doc. 137, pt. 1-24