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# III.—EXPLORATIONS ON THE COLUMBIA RIVER FROM THE HEAD OF CLARKE'S FORK TO THE PACIFIC OCEAN, MADE IN THE SUMMER OF 1883, WITH REFERENCE TO THE SELECTION OF A SUITABLE PLACE FOR ESTABLISHING A SALMON-BREEDING STATION.

By LIVINGSTON STONE.

In the Territory of Montana, on the great Continental divide which separates the Atlantic slope of North America from the Pacific slope, and near where it is intersected by the forty-sixth parallel of latitude, is a very interesting spot. Here two tiny rivulets, close to each other at their source, set out on a long and widely diverging journey; one, flowing southward and taking a strangely circuitous course, becomes the Missouri River, and finally empties its waters into the Atlantic through the broad delta of the Mississippi, 4,000 miles from where it started; and the other, flowing northward, becomes at last the Columbia River, and enters the Pacific Ocean through an outlet 15 miles wide and fully 1,200 miles from its source. The latter rivulet, which is the one with which this report is concerned, although it is, correctly speaking, Clarke's Fork of the Columbia River, is not generally known by that name until it has become the river which is formed by the junction of the Flathead and Missoula. Looking now for the various sources which have formed this comparatively large river, we find that they all head in that part of the Bitter Root Mountains and the main range of of the Rockies which, roughly speaking, lie between the forty-fifth and forty-eighth parallels of latitude and receive the waters of all the numerous small streams which flow from the southwest slope of the Rocky Mountain range and the northwest slope of the Bitter Root range. Most of the streams rising in the Bitter Root Mountains flow into the Bitter Root River, while the streams rising in the Rocky Mountain range flow into the Big Blackfoot River and the Hellgate River, which latter stream is known a few miles above, and from there to where it heads in the mountains, as the Deer Lodge River. Just above Missoula, Mont., the Big Blackfoot River and the Hellgate River unite and flow together to Missoula, where they receive the waters of the Bitter Root River from the south. Below the junction of these streams, at Missoula, the river is known as the Missoula River, until it receives the waters of the Flathead River from the north, at the southeastern end of the Cœur d'Alêne range of mountains, below which junction it

is called the Clarke's Fork of the Columbia, although the whole course of the river known under the various names of Deer Lodge River, Hellgate River, and Missoula River might be properly considered as Clarke's Fork of the Columbia, these being the original Clarke's Fork and forming one continuous stream as much as the Mississippi does from the Falls of Saint Anthony to Saint Louis. From the junction of the Flathead and Missoula the river flows for about 75 miles to Pend d'Oreille Lake through a magnificent wooded cañon which presents some of the finest scenery on the continent.

Pend d'Oreille Lake is really formed by the widening of the river, and is a large, beautiful sheet of water surrounded by picturesque mountains and navigable over its entire area. At the outlet of Lake Pend d'Oreille the river comes together again, taking here still another appellation, viz., Pend d'Oreille River, and flows smoothly and slowly for a distance variously estimated at from 15 to 30 miles, where it flows over a vertical fall 8 or 10 feet* in height and enters a mountainous cañon through which it rushes with such violence as to be wholly unnavigable, and, finally leaping over a fall of 15 feet in perpendicular height, it empties into the Columbia just north of the United States boundary, in about latitude 49° and longitude 117½°.

The Northern Pacific Railroad crosses the great Continental divide of the Rocky Mountain range just where the little streams and mountain torrents gather together to form the Deer Lodge River, which, as above stated, is the upper portion of Clarke's Fork under another name. After crossing the divide the railroad follows along down the valleys of the Deer Lodge, Hellgate, Missoula, and Clarke's Fork, and passing around the north side of the main body of Lake Pend d'Oreille, crosses the western arm of the lake, which finally narrows again into the river. Here the road permanently leaves the valley of Clarke's Fork nearly at right angles, and does not strike the Columbia River again till it reaches the mouth of Snake River, at Ainsworth, 336 miles from the ocean.

My instructions being to select a point for collecting salmon eggs which would be near the line of the Pacific Railroad, this precaution being necessary both for convenience in operating the station and for facility in distributing the eggs, it follows that any point above Pend d'Oreille Lake would be a perfectly satisfactory place for a collecting and distributing station, provided that a sufficient number of spawning salmon could be secured. This last most essential condition is wanting, however, along this whole line of river channel, for very few, if any, salmon ever reach Pend d'Oreille or the waters above it. This fact was a great surprise to the writer, but it is undeniable.

The testimony of all the persons consulted on the subject at Deer Lodge, Missoula, Sand Point, and at various smaller stations on the railroad was unanimous to the effect that no salmon were ever caught in Clarke's Fork or above. One man who was interrogated said that

*Dr. Suckley, in 1853, estimated the height of this fall at 6½ feet.



he had caught salmon in Lake Pend d'Oreille, but finally admitted that he had caught but one salmon, and the admission was made in such a way as to make the catching of the one salmon appear doubtful. At all events it is certain that no point on or above Lake Pend d'Oreille would furnish salmon enough for obtaining any considerable number of eggs.

The cause of the absence of salmon from a lake which flows directly into one of the greatest salmon rivers of the world is supposed by the local inhabitants to be the falls, mentioned above, which occur on the river about 15 miles below the outlet of the lake commonly known as the Falls of Seniakwoteen. I will add here that these falls are not properly called Seniakwoteen Falls, for the word means "a crossing," and, although there is a crossing a few miles below the mouth of the lake, the falls are much farther and are neither near nor in any way connected with the crossing or "Seniakwoteen" proper. The residents on the lake think that these falls prevent the salmon from coming up the river, but the writer thinks that it is quite as likely that the salmon are all or nearly all stopped by the falls at the mouth of the Pend d'Oreille River (Clarke's Fork) where it empties into the Columbia. A white ("squaw man") fur-trader lives at the crossing (Seniakwoteen), but I am informed that there is not another white settler along the whole course of the river from this point to its mouth. It is consequently very difficult to get any information concerning the run of salmon in the river, but the few persons that know anything about that region, who were consulted, could not remember having seen or heard of any salmon there, and the probability appears to be that very few, if any, salmon get past the falls at the mouth of Clarke's Fork and the intervening cascades between there and the falls below Lake Pend d'Oreille.

However this may be, the falls of Seniakwoteen (so-called) would not be a suitable place for a salmon-hatchery station, for three reasons:

1. It is too far from the railroad, being 30 or 40 miles by the nearest trail to a railroad station.

2. The region through which the railroad passes was one of the wildest portions of the United States till the railroad was built through it, and is now only very sparsely settled and very poorly furnished with supplies. The expense and inconvenience of building and carrying on a salmon-hatching station anywhere in this region would consequently be very great; so great, indeed, as to render the undertaking virtually impracticable.

3. The Indians on the Pend d'Oreille River, or, more properly speaking, the Pend d'Oreille "division" of Clarke's Fork, have always held undisputed possession of their wild and rugged cañon, and are extremely jealous of the intrusion of white men.

I am informed that they have driven out all white men who have come in there to settle, a *prima facie* evidence of which is found in the fact that there are no white settlers there at this day except the fur-trader just mentioned. I need not say that this would be a serious objection

to the establishment of a station there, as no one could tell what these high-spirited northern Indians might do at any moment in a remote and uninhabited place like the cañon of the Pend d'Oreille, provided they resented the advent of white men, as they undoubtedly would. I wish to say, by way of explanation, that I do not consider the country in question unsafe for white men to travel through, nor is there any likelihood of an outbreak by the native inhabitants along the river. I do not mean that either of these things is probable. What I mean to say is that, if a small body of white men should go into the cañon to stay and their presence should be objectionable to the savage residents of the country, they would probably find some means of getting rid of the obnoxious intruders.

Below the falls, near Seniakwoteen, to the mouth of Clarke's Fork, and from there on the Columbia to the mouth of Snake River, any place, however favorable on other accounts, would be out of the question as a collecting and distributing point for salmon eggs, on account of its distance from the railroad and its general inaccessibility. I will add that there is scarcely a white man to be found in that whole region of nearly 10,000 square miles, embraced between the Pend d'Oreille River on the north and east, the Columbia on the west, and the forty-eighth parallel on the south, except the very few settlers directly on the Columbia and Colville Rivers.

It might be thought that if a station was established on the Columbia, supplies could be brought up the river by steamer. This, however, could not be depended on at present, because from Priest Rapids to Grand Rapids, inclusive, the river is unnavigable at the following places, viz.: At Priest Rapids, 409 miles from the mouth of the Columbia; at Cabinet Rapids and Rock Island Rapids, 463 miles; at Foster Creek Rapids, Whirlpool Rapids, and Mahkin Rapids, 559 to 582 miles; at Spokane Rapids, 646 miles; and at Grand Rapids, 704 miles.

But as navigation could be opened through these rapids at a reasonable expense, and as this will probably be done sometime, because it would open up a navigable river distance of 302 miles to Kettle Falls, the time may come when it will be found desirable to establish a hatching station somewhere on the Columbia River between the mouth of Snake River and Kettle Falls, which latter place itself seems to present many conditions favorable to such an undertaking.

It was remarked above that the Northern Pacific Railroad leaves the valley of Clarke's Fork quite abruptly just below Lake Pend d'Oreille From here it pursues a general southwesterly course, crossing the great plain of the Columbia and not reaching the river again till it gets to Ainsworth, a railroad station on the Columbia at the mouth of the Snake River. On its way, however, it crosses an important river. This river is the Spokane, a stream flowing out of Cœur d'Alêne Lake and emptying into the Columbia 309 miles above the mouth of Snake River and 645 miles from the ocean. The Spokane has always been



famous as a great salmon river. Dr. Suckley often mentions it in that connection, and ever since the country has been opened up by white men it has been known that the Indians from all quarters assemble in the fall on this river and at the mouth of the Little Spokane, 8 miles to the northwest, to get their winter's stock of salmon. When I arrived at Spokane Falls, which is the point at which the railroad touches the Spokane River, and which is 70 miles from its mouth, I heard that Indians were fishing for salmon at the mouth of the Little Spokane, 8 miles distant. On driving over to the Little Spokane we found a large camp of Indians there, several of whom were industriously engaged in putting a salmon trap across the river. These traps consist of a dam of poles firmly bound together by withes and extending entirely across the river, with holes or traps at intervals into which the salmon can enter, but from which they cannot return. Having brought an interpreter with us we soon learned from the Indians that great numbers of spawning salmon came up to the mouth of the Little Spokane about the 1st of September. It was impossible to learn from the Indians how many salmon could be caught there in the spawning season, owing, I presume, to a trait which I have often observed among Indians, viz., an inability to fix with any precision upon exact numbers. For instance, when the interpreter asked the Indian he was talking with if twenty-five was the number that they caught in a day, the Indian answered yes; and when he asked him if they caught a hundred a day, he also said yes; and his other replies in regard to the numbers of the salmon caught were of the same character. However, the general impression left on our minds was that a great many salmon were caught here during the entire spawning season, possibly enough to warrant the establishing of a hatching station at the mouth of the Little Spokane.

Leaving the subject of the Spokane River here, I will remark upon the other streams flowing into the Columbia below the mouth of Snake River, and will return to discuss more fully the expediency of operating on the Spokane.

As before mentioned, the transcontinental railroad, after leaving the Spokane River, crosses the great plain of the Columbia and the dry bed of the ancient Lake Lewis, and does not strike the Columbia or any of its tributaries until it reaches the mouth of Snake River. From the mouth of Snake River it follows the Columbia down past The Dalles* and through the Cascade range of mountains almost to its terminus at Portland.

Of course the Columbia itself below Snake River, and Snake River anywhere near its mouth, are not to be thought of in connection with

* To avoid giving a wrong impression, perhaps I had better state here that the Northern Pacific Railroad proper terminates at Wallula Junction, Wash., at the mouth of the Walla Walla River, and that thence to Portland the railroad is owned and operated by the Oregon Railroad and Navigation Company.

wide, rising in high mountains, flowing with a swift current, and finally emerging from its deep-sided cañon with great force, where it plunges into the Columbia River. It may not be generally known that a strong, rapid current of cold water is the most effective agent there is for inducing breeding salmon to turn from their course up a large river. It is very much a matter of chance whether they enter a river, even a large one, which is still and deep at its mouth. Such tributaries will certainly not attract the salmon into them from any great distance out in the main river. The Umatilla is a stream of this character; also the Willamette, and to some extent the Cowlitz. Many of the Columbia River salmon that are pursuing their upward course near the south bank of the river will very likely, when they reach these streams, be following the shore line, and in that way may be led into these rivers; but the salmon that are coming up on the other side of the Columbia, or are pursuing a middle course, will keep their course and disregard these streams that make so little impression on the main river. But such rivers as the Deschutes, which pour a cold, vigorous, swift-running volume of water into the main river, that makes itself felt to the further shore and for many rods below its mouth—such rivers call salmon up their channels by shoals, not only from their own side of the river but also from the opposite shore. These rivers always have a great run of salmon, and the Deschutes on this account would be a favorable stream to operate upon for collecting salmon eggs were it not for one drawback, and that a serious one, viz., It is unmanageable, for it is too large and violent a stream to control. As, I think, I have previously explained, the mere fact that the conditions for drawing a net in a salmon river are favorable does not by any means make it a favorable place for a large salmon-breeding station. To secure the necessary conditions of success, the river must be of such a character that the salmon can be stopped in some good seining place by erecting a temporary obstruction across the river. This could not be done on the Deschutes except at a very great expense. About 30 miles up the river, however, at a place called the "crossing" of the Deschutes, or sometimes simply Deschutes, there is a high fall which, except at very high water, keeps the salmon from going up any higher. Here the conditions are reversed. If now the river below was quiet enough to allow the successful drawing of the seine, this would be a good place for a breeding station, but the river here passes through a high rocky cañon with such violence as to render the drawing of a net impracticable. There are some other objections of less importance, but the one mentioned is enough. This point might, nevertheless, be a favorable one, if the falls themselves and the land around the falls could be secured, but this spot has been taken up by a settler who moved there many years ago and who now holds the premises at so high a figure as to make it very desirable to find a place somewhere else if possible.

The next large stream down the Columbia is the Big Sandy, which is a good salmon river, and probably has towards its headwaters some favorable places for collecting salmon eggs, but at present they are not easily accessible. About 20 miles below the Big Sandy, the Willamette* slowly discharges its immense volume of water into the Columbia, which here seems not much larger than itself. If the slow Willamette poured its great stream into the Columbia as rapidly and forcibly as the Deschutes does, probably more than half of the Columbia River salmon would turn aside into the Willamette, but the Willamette is so still and apparently so almost motionless where its waters join those of the Columbia that but few salmon, relatively speaking, ascend the Willamette. Most of those entering the river find their way up past the city of Portland, and on 12 miles further to the Clackamas. This is a cold, swiftly-running river that empties into the Willamette just below Oregon City; its cold, swift current, which heads in the snow-covered flank of Mount Hood, attracts a large proportion of the salmon from the larger but warmer river, and even those that go by go only half a mile further, where their course is abruptly checked by the Oregon City Falls, which, at most stages of water in the river, entirely prevent the salmon from going any farther up. The salmon thus arrested in their upward progress along the Willamette, after making ineffectual attempts to jump the falls, after awhile drop back discouraged as far as the mouth of the Clackamas, and as soon as they feel again the cold vigorous rush of the Clackamas, immediately shoot up this river and join the great army of salmon that have preceded them up the same river. It will be inferred from this description that most of the salmon coming up the Columbia finally find their way into the Clackamas. This inference is entirely true. It was this which led to the establishment of a salmon-breeding station on this river in 1877 by the Oregon and Washington Fish Propagating Company. This station, which a series of misfortunes caused to be finally abandoned, is undoubtedly well situated for the taking of a great many salmon eggs. It is, however, somewhat difficult to operate it, and perhaps it will be found that some other point farther up the basin of the Columbia will combine many of its advantages without being subject to its disadvantages.

From the mouth of the Willamette to the sea all the streams emptying into the Columbia are short and small, and there are none which would command a moment's attention as a suitable place for a large salmon-breeding station.

From what has been stated above, it will be seen that from the head of the North or Clarke's Fork, which forms one of the two great arteries that combine to form the Columbia—the Snake River being the other—and which rises in the Continental divide of the Rocky Mountains between Deer Lodge and Helena, Mont., to the Pacific Ocean, there is not a place lying near the line of the Northern Pacific which unites all the conditions required for the carrying on of a salmon-breeding station on a large scale, except possibly the one referred to on the Little Spokane

*One hundred and eight miles from the mouth of the Columbia.

# INDEX.

[NOTE.—The references are to page-figures, in brackets.]

# IV.—THE BRITISH SEA FISHERIES ACT, 1883.

## TABLE OF CONTENTS.