

## XXIII.—CORRESPONDENCE RELATING TO THE SAN JOAQUIN RIVER AND ITS FISHES.

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SAN FRANCISCO, CAL., *April 14, 1875.*

DEAR SIR: Your letter 39449, addressed to Dr. Thomas M. Logan, has been handed to me.

I have made the request of Mr. S. S. Montague, chief engineer, and he has issued the orders for the temperature of the San Joaquin River to be taken at the railroad-crossing from this on. It will be taken and returned to you as it has been in the case of the Sacramento River.

I have not much information as to the run of salmon in the San Joaquin. Some salmon go up the San Joaquin, and, it is said, spawn in the headwaters of the main stream, and some in the Merced, near the Yosemite Valley. This is not from personal knowledge, but report.

Formerly there was considerable work done in the catching of salmon in the San Joaquin, but of late years it has been abandoned, as it has been partially in the Sacramento, above Sacramento City. The fishermen here have found by experience, what had been previously ascertained in Scotland, that the fish, after they come in from the ocean, remain for a time, and run back and forth from fresh and salt water, probably to get rid of parasites, and then start for the spawning-grounds; therefore, they fish for them with more profit in the vicinity of where the fresh and salt water meet, than they do above in the fresh water, where they do not remain, but continue as rapidly as possible on their journey to the spawning-grounds.

I suppose that the fish are still going up the San Joaquin to spawn, but, if taken at all, are only now taken by Indians on the Merced, the Chowchilla, the Fresno, and the other branches of the San Joaquin, and I have no doubt they continue to do so. Many branches of the San Joaquin take their rise in the highest mountains of the continent, and as the streams are unvexed by miners, they are admirably adapted for spawning purposes.

Our commission will probably, in another year, put some McCloud River salmon into the Kern River, which empties into Kern Lake and Buena Vista slough, and, so on, into Tulare Lake. We may also put some salmon into the main San Joaquin and its branches.

I will attempt to obtain positive and definite information as to the present condition of the salmon in the San Joaquin and its branches. I think that the evidence, when obtained, will show that the San Joaquin is very much warmer than the Sacramento, for if you will look at the

map you will see that although it drains a higher range of mountains, yet, that it runs one hundred fifty and miles, at least, through the center of an almost tropical valley.

Very respectfully, &c.,

B. B. REDDING.

Prof. SPENCER F. BAIRD,

*Smithsonian Institution, Washington, D. C.*

P. S.—We hatched out about 20,000 white-fish of those you so kindly forwarded, and on the 28th ultimo I turned them out in Tulare Lake. I have no doubt they will thrive, as there is abundance of food. Tulare is a peculiar lake. On its entire eastern shore its bottom has a descent of only about a foot in a mile; it is quite deep on the western shore; the evaporation is so great on the eastern shore that the water becomes slightly alkaline, and is always warm, while in the center and on the western shore it is cold and pure. For two miles or more wide and thirty miles long, the water on the eastern shore is filled with minute animal life. Its fish are as yet, I believe, undescribed. I have seen a perch and some very coarse-scaled suckers (*Catostomus*.) There is a fine large white-fleshed fish, about 2 feet 6 inches long, which the people call "lake trout." It is not a "salmon." It is excellent food, quite abundant, and in constant demand. It looks to me to be a carp, and of finer flavor than any I ate in Europe.

B. B. R.

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FRESNO, April 25, 1875.

DEAR SIR: In regard to catching fish and the different kinds that are in the San Joaquin River, as far as I have been able to find out, is as follows:

During the summer there is no fish of any consequence, except a large kind of what is called sucker, but in the fall the salmon and salmon-trout find their way up here in large quantities. Last fall I helped to spear quite a number, as that is about the only way of fishing in this part of the country; but below the San Joaquin bridge I understand they were trapped in a wire corral by ranchers and fed to hogs; they were so plentiful. Besides the two kinds mentioned there are small rock-bass, and I have seen something resembling black bass, but in rather scant numbers.

If I can furnish you with any more information on this subject, please let me know.

Yours,

WALTER NETHERLIFT.

Mr. B. B. REDDING.

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SAN FRANCISCO, CAL., May 11, 1875.

DEAR SIR: Your letter of April 29 just received. I am making inquiries and gathering information relative to the salmon in the San

Joaquin, and as the general result of this information, am satisfied they make their annual immigrations to the headwaters for spawning in large quantities. A few years since, they spawned near the Yosemite Valley. A dam built for mining purposes, some four or five years since, prevented them from reaching this spawning-ground. Last year the dam was removed and the fish have again free access to the headwaters of the Merced, but whether they have returned to their former spawning-grounds on this river, which is a branch of the San Joaquin, I have not learned. I will write to Millerton, near the headwaters of the San Joaquin, so as to have information as soon as they reach that point this spring, and I will again communicate with you.

I think it would be advisable for you to instruct Mr. Stone to send one or more of his assistants to the San Joaquin for the purpose of observing the salmon on their way to the spawning-ground and having some caught and forwarded to you. I think, from all I can learn, that they differ somewhat from the McCloud River salmon, and that they remain for weeks and months in the rivers, in a climate much warmer than Florida or Mississippi. In fact I have no doubt that you will find in the San Joaquin a salmon which might be successfully introduced into rivers emptying into the Gulf of Mexico.

I will try and procure for you some of the carp brought by Mr. Poppy from Hamburg, and which he is now successfully raising in Sonoma County, and sending to market here.

We have done nothing about introducing the Gourami from China. We find it very difficult to make business connection with people in China in relation to these matters. All Americans in business in that country appear to be entirely absorbed in other matters, and have no knowledge or take no interest in fish-culture, or of obtaining new varieties of fish.

I gave Mr. Stone a letter of introduction to United States Minister Avery, who formerly resided here. He is a man of culture, and alive to every interest that would benefit the United States or, especially, this State. When Mr. Stone shall have received a reply, I will then open a correspondence with Minister Avery and see what we can do in relation to this matter. By-the-by, Ex-United States Minister F. F. Low informs me that there are in the rivers of China a much larger and finer-flavored shad\* than that of the Atlantic States. It is largely consumed in China, and it is considered a great delicacy. He is convinced that it would be a valuable acquisition. I also learn that there is on the coast of Japan a shrimp, averaging from four to six inches long, and very delicate in flavor, but how we are to get either the shad from China or the shrimp from Japan here, I do not know.

I will send you by express soon a box containing two of the Idaho red-fish, which you will see are a new variety of lake-trout, or land-locked salmon, as yet undescribed.

The gentleman from whom I procured them writes me that when alive in the water they are all of a beautiful vermilion, very nearly the color of gold-fish, and that they are considered excellent eating. I would be pleased, if after their receipt and examination, you will give me your views in relation to these fish. Unfortunately, instead of being placed in alcohol, they were packed in a box of salt, but still I think they are not so shrunk but that you can determine their class.

I trust that when your carp come from Germany we may receive a few for propagation. We have any quantity of lakes, surrounded by tule and other vegetable growth, admirably adapted to carp, filled now with only very poor and coarse suckers and chubs, except in the case of Tulare Lake, where there is a large, fine fish, locally called lake-trout, but which I believe to be of the carp kind. I will try and procure one of them and forward to you.

Very respectfully, &c.,

B. B. REDDING,  
*Secretary California Fish Commission.*

Prof. S. F. BAIRD,  
*Smithsonian Institution, Washington, D. C.*

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SAN FRANCISCO, CAL., *August 25, 1875.*

SIR: I have received some further information relative to salmon in the San Joaquin River. Mr. O'Neil, who has charge of the railroad-bridge crossing the San Joaquin River, in latitude  $36^{\circ} 30'$  north and longitude  $120^{\circ}$  west, writes me, on the 13th August, that the salmon have commenced running up and are passing by the bridge in quantities. He states that they do not appear to be any different from the Sacramento salmon.

The run of salmon in this river, at this particular season of the year, seems somewhat extraordinary, from the fact that it is in the midst of the summer, and to reach this point they have passed for one hundred and fifty miles through the San Joaquin Valley, where the temperature of the air at noon is, at this season of the year, never less than  $80^{\circ}$ , and is often as high as  $110^{\circ}$ .

The record of temperature of air and water is kept at that point and forwarded regularly to you. I find, on examination, that the mean from the 16th to the 31st, was, for the air,  $104\frac{3}{4}^{\circ}$ , water at the surface,  $80^{\circ}$ , water at the bottom,  $79^{\circ}$ , mean of the depth of the river, 4 feet  $7\frac{3}{4}$  inches. The record, when received, will show that the mean of both air and water in July was higher.

It seems very extraordinary to me that there should be a run of salmon at this season of the year come in from the ocean for the purpose of spawning, and passing up a river for more than one hundred and fifty miles, where the temperature of the air and water are so high as these figures show. It but confirms Mr. Livingston Stone's theory, in his report to you, that somewhere in California the salmon are spawn-

ing about every month in the year, but until the receipt of this report from O'Neil, I did not suppose that there were any salmon that pass through the hottest portion of the State for the purpose of spawning during the hottest season of the year. It appears to me that these salmon might be introduced into any of the southern rivers of the United States and possibly into the Rio Grande.

Should I receive further information I will forward it to you.

I would like to know if you received the box, containing two red-fish, from Idaho, packed in salt and sent to your address, at the Smithsonian Institute.

Very respectfully, &c.,

B. B. REDDING.

Prof. S. F. BAIRD,

*Smithsonian Institution, Washington, D. C.*