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NOTE ON MR. GARMAN'S PAPER ON "THE AMERICAN SALMON AND TROUT."

By DAVID S. JORDAN.

In the "Nineteenth Annual Report of the Commissioners on Inland Fisheries of Massachusetts" is a paper on "the American Salmon and Trout, including introduced species," by Mr. Samuel Garman, of the Museum of Comparative Zoölogy. This paper gives a series of brief but excellent and pertinent descriptions of the various species of Salmon and Trout, as also a series of very useful outline figures representing the specimens examined. In general, Mr. Garman's determinations and names agree very closely with those given by Jordan & Gilbert in the "Synopsis of Fishes of North America," and it is very gratifying to us to find our conclusions verified by so careful an observer as Mr. Garman.

There are, however, a few points of difference between his results and ours. These I wish to notice in the present paper.

1. *Genera adopted*.—Mr. Garman refers all the Salmon and Trout to one genus, *Salmo*. I prefer to recognize *Oncorhynchus*, and especially *Salvelinus*, as distinct groups. This is, however, solely a matter of convenience.

2. *Nomenclature of varieties*.—Mr. Garman places under separate headings, under binomial names, forms which are certainly not species, and which at the most are geographical variations of trifling value and scarcely distinguishable. Thus he writes "*Salmo virginalis*," and says below, "a variety of *S. clarkii*." If the *virginalis* be named at all, I prefer *Salmo clarkii* subsp. *virginalis*, or var. *virginalis*, or, still better, in accordance with current American usage, *Salmo clarkii virginalis*. To place such forms in co-ordinate paragraphs with the unquestionable species is productive of confusion. This again, however, is a matter of taste or convenience.

3. *Salmo (Oncorhynchus) hisutch*.—The name "*hisutch*," given by Walbaum, is a simple misprint for "*kisutch*," and the error is corrected by him in the "Emendanda," page 720. I do not think that the law of priority should require the retention of obvious misprints in spelling. The fish is still, as in the time of Steller, called *Kisutch* (Kee-zich) in Alaska.

4. *Salmo irideus* is regarded by Dr. Bean and myself as the inland form of the "Steelhead," *Salmo gairdneri*. This view, however, needs verification.

5. *Salmo clarkii*.—I see no reason for doubting the identity of this species with the one described from Kamtschatka by Pallas, under the

name of *Salmo purpuratus*. I have not Pallas's description at hand, but unless I am mistaken he refers to the crimson blotches under the lower jaw, which are characteristic of *Salmo clarkii* in all its forms and varieties. That *S. clarki* occurs in Kamtschatka admits of little doubt, as, according to Dr. Bean (Proc. U. S. Nat. Mus., 1881, 258), it is abundant all along the coast as far as Northern Alaska. As the species freely enters the sea northward, there is no *a priori* reason for supposing that it does not cross to Kamtschatka. This is perhaps the *Salmo mykiss* of Walbaum, a name still older than *S. purpuratus*.

6. *Salmo virginalis*.—Mr. Garman is probably right in regarding *Salmo spilurus* (with *S. pleuriticus*) as a variety of *S. clarki* rather than as a distinct species, as given in our Synopsis; but I think that he is wrong in regarding the *Salmo virginalis* of Utah Lake as the same form. I have examined the original types of *Salmo virginalis*, and I have collected many specimens of it in Utah Lake. I cannot distinguish this Utah fish from the *S. purpuratus* or *clarki* of the Columbia River. If I could separate it I should call it *Salmo purpuratus virginalis*.

7. *Salmo lewisi*.—Mr. Garman recognizes the Missouri River Trout as another variety of *Salmo clarki*. I have examined the original types of *S. lewisi*, as well as numerous other examples from the Upper Missouri and Yellowstone. When I had only seen a few specimens I thought that I could distinguish the trout of the Missouri from the trout of the Columbia. I cannot do it now. Mr. Garman is certainly wrong in referring the little land-locked trout of Waha Lake to the synonymy of *Salmo lewisi*. It is a color-variety only (a case parallel with that of *Salmo agassizi*), and its coloration is not that of the type of *Salmo lewisi*.

The forms of *Salmo purpuratus* may be arranged as follows:

Salmo purpuratus, Kamtschatka.

Salmo purp. clarki, California to Alaska.

lewisi, Missouri River.

bowleri, Waha Lake, Idaho.

henshawi, Truckee River Basin.

virginalis, Utah Basin.

spilurus, Rio Grande and Colorado Basin.

Of these I would adopt *clarki*, *lewisi*, and *virginalis*, out of deference to Mr. Garman's opinion, but I do not know how to characterize them, nor do I think that I could pick them out if mixed up in an alcohol tank or in the bottom of a boat.

8. *Salmo naresi*.—No specimens of this species have yet been compared with *S. oguassa*, but the figure and description of *S. naresi* fits the latter very perfectly.

9. *Salmo agassizi*.—The trout of Dublin Pond has been known to me for many years. It is obviously a local color-variation of *S. fontinalis*. It may be called, in the current nomenclature, *Salvelinus fontinalis agassizi*.

10. *Salmo hoodi*.—As already noticed by Dr. Günther, part of the specimens called *Salmo hoodi* by Dr. Richardson belong to *S. fontinalis*. The other, a stuffed skin, I have examined in Dr. Günther's presence, and both of us were convinced that it was an ordinary *S. namaycush*. The name *hoodi* should therefore be dropped.

All the above-mentioned discrepancies between Mr. Garman's results and those reached by Dr. Bean, Professor Gilbert, and myself are more in name than in fact. No group in our vertebrate fauna offers such difficulties as the *Salmonidæ*, and it is rather remarkable that with so many different points of view such substantial agreement should exist.

INDIANA UNIVERSITY, *March 17, 1885.*

REPORT UPON THE ECHINI COLLECTED BY THE UNITED STATES FISH COMMISSION STEAMER ALBATROSS, IN THE CARIBBEAN SEA AND GULF OF MEXICO, JANUARY TO MAY, 1884.

By RICHARD RATHBUN.

From January to May, 1884, while temporarily in the service of the Hydrographic Bureau of the Navy Department, the Fish Commission steamer Albatross, Lieut. Commander Z. L. Tanner, U. S. N., in command, made about fifty dredgings in the Caribbean Sea, and in the Gulf of Mexico off the northern side of the island of Cuba, the greatest depth reached in dredging having been 1,701 fathoms. Quite a rich collection of deep water animals was obtained, considering the small amount of time allotted to the natural history work, and at each of the ports visited the naturalists availed themselves of every opportunity to procure as complete a representation as possible of the littoral species. A list of the Echini obtained, accompanied with a few brief notes, is given below.

The shore stations at which Echini were collected, are as follows: Key West, Fla.; the island of St. Thomas; Jamaica; the island of Old Providence, off the coast of Nicaragua; the island of Curaçao, off the coast of Venezuela; the port of Sabanilla, United States of Colombia; and San Antonio, at the west end of Cuba. Only 25 species in all were obtained, and of these two are Spatangoids in very fragmentary condition, and still unidentified. Of the remainder, 9 are littoral species, although a single specimen of *Diadema setosum* was dredged at a depth of 215 fathoms, and 14 were from depths between 25 and 1,639 fathoms.

The identifications have been made by means of the recent publications of Mr. Alexander Agassiz, and a nearly complete series of the Echini supplied to the National Museum by Mr. Agassiz from the collections obtained by the Coast Survey steamer Blake in the region under discussion, from 1877 to 1880. There are but few facts to add to those already published by Mr. Agassiz in his very elaborate reports, and the notes have therefore been made very brief. Many of