

NOTES ON SOME WESTERN FLUVIAL FISHES DESCRIBED BY CHARLES GIRARD IN 1856.

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In the course of a recent investigation of the fishes of the Bonneville drainage system of the Great Basin, pursued under the authority of the United States Bureau of Fisheries, it became necessary to attempt an identification of several species found there with those described by early writers on western ichthyology. The greatest difficulty was encountered in the descriptions and names published by Charles Girard. These were based on a small collection<sup>1</sup> made by the naturalists of an exploring party directed by Capt. J. W. Gunnison, United States Army.

An examination of available data associated with the collection has led to certain facts and inferences that appear to be worth recording at this time.

Early in 1853 Capt. Gunnison organized an expedition the purpose of which was to explore certain parts of a proposed route for a railroad from the Mississippi River to the Pacific Ocean. The War Department directed a survey of the pass through the Rocky Mountains in the vicinity of the headwaters of the Rio del Norte, by way of the Huerfano River and Cochetopa, or some other eligible pass, into the region of Grand and Green Rivers and westerly to the Vegas de Santa Clara and Nicolette River of the Great Basin, and thence northward to the vicinity of Lake Utah on a return route. The party was a large one, including members competent to "make researches in those collateral branches of science which effect the solution of the question of location, construction, and support of a railway communication across the continent." Lieut. E. G. Beckwith was second in command, Mr. F. Creutzfeldt was the botanist, while Mr. J. A. Snyder, who is mentioned as a young assistant topographer, collected some specimens.

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<sup>1</sup> What now remains of this collection is preserved in the United States National Museum, and the specimens that were collected west of the continental divide were examined by the writer in 1914.

A rendezvous was effected near Westport, Missouri, and a start made on June 23, 1853. An arduous, interesting, and at times exciting journey was accomplished, the expedition arriving at Salt Lake City on November 8 of the same year. Just after entering the valley of Great Salt Lake Capt. Gunnison, Mr. Creutzfeldt, and several other members of the party lost their lives at the hands of marauding Indians. Lieut. Beckwith then assumed command, and it was he who wrote the journal and prepared or directed the preparation of maps and reports that have since been published. After wintering at Salt Lake and making various observations in the region the party proceeded westward to the Pacific slope.

While the expedition may now be regarded as a mere incident in western exploration and travel, it accomplished something of scientific value, much of which was based upon the work of the naturalist. However, the published narrative shows almost no interest in his activities, while authors of papers relating to his collections accord him no recognition, one of them even being careless about the spelling of his name.

Fishes representing 19 species were collected. Eighteen of these received new names, many of which appeared in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1856. They were redescribed, with additional notes, in the tenth volume of the Pacific Railroad Surveys. For easy reference the more important data recorded by Girard, together with the generally accepted identifications of recent authors, are here tabulated. An examination of the table will serve to show something of the faulty condition of the records relating to the specimens.

Species.	Cat. No.	Locality.	Date.	Collector.	Synonymy (Jordan and Evermann).	Distribution (Jordan and Evermann).
<i>Salar virginialis</i> <sup>1</sup>	539	Utah Creek, tributary to Rio Grande del Norte.	1854	Mr. Creutzfeldt.	<i>Salmo mykiss virginialis</i> (Girard).	Utah Lake, Bonneville.
<i>Siboma atraria</i> <sup>1</sup>	236	Spring, Utah district near the desert.	1853	do.	<i>Leuciscus lineatus</i> (Girard).	Bonneville and Snake River.
<i>Acomus generosus</i> <sup>1</sup>	256	Cottonwood Creek, Utah.	1854	Lieutenant Beckwith.	<i>Pantosteus generosus</i> (Girard).	Bonneville.
<i>Argyreus dulcis</i> <sup>1</sup>	53	do.	1854	Mr. Creutzfeldt.	<i>Rhinichthys cataractae dulcis</i> (Girard).	Mississippi and Rio Grande.
<i>Cyprinella gunnisoni</i> <sup>1</sup>	139	do.	1854	do.	<i>Notropis bubalinus</i> (Baird and Girard).	Mississippi.
<i>Cyprinella luubris</i> <sup>1</sup>	141	do.	1853	do.	<i>Notropis macrostomus</i> (Girard)?	Mississippi and Rio Grande.
<i>Cyprinella ludibunda</i> <sup>1</sup>	132	do.	1853	do.	<i>Notropis ludibundus</i> (Girard).	Unknown; probably Indian Territory.
<i>Bryttus humilis</i> <sup>1</sup>	429	do.	1853	Lieutenant Beckwith.	<i>Lepomis humilis</i> (Girard).	Mississippi.
<i>Pimephales maculosus</i> <sup>1</sup>	153	Sluice of Arkansas River.	1853	do.	<i>Pimephales promelas maculosus</i> (Girard).	Do.
<i>Hypognathus placitus</i> <sup>1</sup>	89	Sluice of Arkansas River near Fort Makee.	1853	do.	<i>Hypognathus nuchalis</i> Agassiz.	Do.
<i>Cyprinella beckwithi</i> <sup>1</sup>	135	do.	1854	Mr. Creutzfeldt.	<i>Notropis bubalinus</i> (Baird and Girard).	Do.
<i>Moniana tristis</i> <sup>1</sup>	93	Unknown.	1854	do.	<i>Notropis proserpina</i> (Girard)?	Rio Grande.
<i>Gila elegans</i> .	249	do.	1853	do.	<i>Gila elegans</i> (Baird and Girard).	Colorado.
<i>Tigoma egregia</i> <sup>1</sup>	226	do.	1854	do.	<i>Leuciscus egregius</i> (Girard).	Lahontan.
<i>Tigoma lineata</i> <sup>1</sup>	229	do.	1854	do.	<i>Leuciscus lineatus</i> (Girard).	Bonneville.
<i>Tigoma gracilis</i> <sup>1</sup>	230	do.	1854	do.	<i>Leuciscus aliciae</i> (Jouy).	Do.
<i>Psychocheilus norax</i> <sup>1</sup>	202	do.	1854	do.	<i>Gila robusta</i> (Baird and Girard).	Colorado.
<i>Algansea obesa</i> <sup>1</sup>	194	do.	1853	do.	<i>Rutilus symmetricus</i> (Baird and Girard).	Bonneville to Sacramento-San Joaquin.
<i>Tigoma humboldti</i> <sup>1</sup>	225	Humboldt River.	.....	Mr. Creutzfeldt (orig. descr.).	<i>Leuciscus humboldti</i> (Girard).	Lahontan.

<sup>1</sup>Types.

In describing *Salmo virginalis* Girard<sup>2</sup> writes:

Specimens collected by the party under Lieut. Beckwith in Utah Creek, and at Sangre de Cristo Pass, upper waters of the Rio Grande del Norte (Rio Bravo).

According to the narrative the party reached Sangre de Cristo Creek, a tributary of the Rio Grande, August 13, 1853, and, passing down the stream, camped for 10 days on Utah Creek ("Ute Cr." of some maps), when trout and perhaps other fishes were collected. Through some oversight Jordan and Evermann<sup>3</sup> have used the name *S. virginalis* for the trout of Utah Lake and the Bonneville basin generally, and also Evermann and Kendall<sup>4</sup> have accepted *S. spilurus* for the Rio Grande trout, not following Cope,<sup>5</sup> however, for they regard *S. virginalis* as synonymous with *S. spilurus*. It now appears that the Rio Grande trout should be known as *S. virginalis* (ignoring Cope's contention that two species inhabit the Sangre de Cristo and Utah creeks), while Suckley's name, *S. utah*, is restored to the Bonneville form.

*Siboma atraria* is said to have been taken from a spring in the desert of Utah. The United States National Museum records the locality as "near 38° latitude." The type specimen, No. 236, is somewhat over 6 inches long, the caudal fin being broken. There are 8 dorsal and 8 anal rays, 56 scales in the lateral series, 30 between occiput and dorsal, 12 above the lateral line. The head measures 0.28 of the length; depth, 0.28; depth caudal peduncle, 0.11; snout to occiput, 0.22; snout to dorsal, 0.54; snout to ventral, 0.56. The gillrakers, numbering 11, are short and pointed. The species represented by this specimen is widely distributed in the Bonneville basin, where it abounds in favorable places, frequently inhabiting springs and spring pools. It is very probable that the type came from Fish Springs in the southern part of Tooele County, Utah, as will appear.

The narrative and maps offer no evidence that Creutzfeldt collected the type of this species, but it seems that it was secured in 1854, when the party again faced the west after wintering at Salt Lake. On May 13 they reached an oasis where were "fine large springs of fresh water, sending out considerable streams on the plain. They were surrounded by large meadows of excellent grass. These springs are filled with small fish, and the Indians therefore give them the name of Pangwitch or Fish Springs." A stop of two or three days was made at this place, providing time for collecting and preserving specimens. These springs with their numerous fishes still remain—the center of an oasis in a forbidding desert—and they may without much doubt be regarded as the type locality of *S. atraria*.

The species has been regarded as synonymous with *Tigoma lineata* Girard, but the present writer finds no facts in support of that iden-

<sup>2</sup> Proc. Acad. Nat. Sci. Phila., 1856, p. 220.

<sup>3</sup> Fishes N. and M. America, p. 495.

<sup>4</sup> Bull. U. S. Fish Com., for 1892, p. 106.

<sup>5</sup> Hayden's Geological Survey Montana, 1871, p. 470.

tification. The type of *T. lineata* is lost and the locality in which it was found is unknown. One pharyngeal arch is preserved (Cat. No. 2783, U.S.N.M.). The teeth are in two rows, 2-4, and they closely resemble those of *R. hydrophlox*. Girard writes of *T. lineata*: "The general aspect is elongated, the body being subfusiform, anteriorly thickish, and quite tapering posteriorly." Also the same author remarks of his *T. egregia*: "By its general aspect this species resembles *T. lineata*." It is quite clear, therefore, that *T. lineata* was a fish of slender, graceful form like *R. egregius* or *R. hydrophlox*, while *S. atraria* is a deep-bodied, thick-tailed form, with a comparatively arge head. The name *Richardsonius atrarius* should, therefore, stand for the common chub of the Bonneville basin, where it is very generally distributed, inhabiting both lakes and streams, and where it is the species which was apparently able to hold out longest in bodies of water which have dwindled during the slow desiccation which followed the Quaternary period.

*Acomus generosus* was said to have been taken in the Bonneville basin, and the writer of the present paper unwittingly accepted the statement in a recent brief review <sup>6</sup> of the genus to which it is supposed to belong. In the description of the species, Girard <sup>6</sup> gives the locality "Cottonwood Creek, an affluent of the Great Salt Lake of Utah." In the table presented on a previous page it will be noted that other species from the same locality have been identified with Mississippi basin forms, and no one would now presume to assign species of *Notropis* or *Lepomis* to the Great Basin. Clearly, then, in the case of at least four or possibly five nominal species a mistake was made in the locality. There is evidence that at four places in Beckwith's travels a Cottonwood Creek was approached. Two of these creeks are named and located in his maps of the route and two were apparently unknown by that name. The banks of the first one encountered furnished a camp site for two nights and a day early in July. This creek is a tributary of the Arkansas, and at the point crossed by the old Sante Fe trail is no doubt the type locality of *A. dulcis*, *C. gunnisoni*, *C. lugubris*, and *C. ludibunda*. At this place it would also be possible to collect specimens of *B. humilis* and *A. dulcis*. The second Cottonwood Creek noted by Beckwith was passed on the 8th of November, 1853, after camping there on the previous night. The party was then without a naturalist, and it was quite probable that no collecting was done. This stream is Girard's affluent of the Great Salt Lake of Utah, and, as is now evident, an impossible locality for the species which he assigned to it. Returning to *Acomus generosus*, the types are two specimens measuring about 3½ inches (Cat. No. 256, U.S.N.M.). The head is short, the body robust, the lips small and not very pendent. The skull is thick; the fontanelle completely obliterated. There are 79-81 scales in the

<sup>6</sup> Proc. U. S. Nat. Mus., vol. 49, 1915, p. 575.

lateral series, 16-17 above lateral line, 41-42 before the dorsal. On comparing the types of *A. generosus* and *C. plebeius* (Baird and Girard) it became evident to the writer that both belonged to a very closely related species, if indeed they were not identical. It now seems probable that the fishes called *A. generosus* were collected in the Rio Grande basin, perhaps in Utah Creek, along with the trout *S. virginalis*.

No question has arisen as to what river system *Gila elegans* and *Ptychocheilus vorax* belong. The exact locality of capture is not known, but ample opportunity was offered to fish in the waters of the Colorado from Coochetopa Creek to Green River, and fishes of both species readily take a baited hook.

Girard does not indicate where specimens of *Tigoma egregia* were collected. The United States National Museum register records it from Humboldt River, the entry having been made in February, 1857, and the type is in all respects like fishes of the species living in that river. The Humboldt was reached June 8, 1855, at a point not far from Imlay, where the river passes through the gap between the Eugene and Humboldt mountains. "There are no fish in this part of it larger than minnows," writes Lieutenant Beckwith, and those which they apparently caught, *Richardsonius egregius* and *Siphateles obesus*, are the only species there which take the hook readily.

*Algansea obesa* was described from two specimens—one collected by J. S. Bowman, the other by Lieutenant Beckwith. Girard was apparently satisfied as to the correctness of the locality assigned to the first, and it (Cat. No. 193 U.S.N.M.) is regarded by the present writer as typical of a Lahontan species, *Siphateles obesus*. The second example (Cat. No. 194 U.S.N.M.) apparently belongs to the same species as the first, but it is not given a locality in the museum register. Girard at first refers it to the Humboldt River and later records it as doubtful.

*Tigoma humboldti* is included in Girard's general report, but no specimens are there accredited to Beckwith, as in the original description. One example (Cat. No. 225 U.S.N.M.) is preserved. The catalogue records two collected by J. S. Bowman. The species represented by the single specimen has not since been found in the Humboldt River. It differs from *R. egregius* in having 11 rays in the anal fin, a deeper body, larger head, and larger eyes. There are 54 scales in the lateral series, 13 above the lateral line, 7 below, and 27 between occiput and dorsal fin.

The type of *Tigoma gracilis* is lost, the locality unknown, and the description too brief and general to admit of the name being applied without doubt to any particular species.

It now remains to compare some of the other types with specimens which a future collector may be fortunate enough to secure from Cottonwood and Utah creeks near the crossings of the old Sante Fe trail.