Notices of certain new species of North American Salmonidae : chiefly in the collection of the N.W. Boundary Commission, in charge of Archibald Campbell, Esq., Commissioner of the United States, by Doctor C.B.R. Kennerly, naturalist to the commission : read before the New York Lyceum of Natural History, June, 1861 / by George Suckley.

Notices of Certain New Species of North American Salmonidæ, chiefly in the Collection of the N. W. Boundary Commission, in charge of Archibald Campbell, Esq., Commissioner of the United States, by Doctor C. B. R. Kennerly, Naturalist to the Commission.

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Read before the New York Lyceum of Natural History, June, 1861.

OWING to the unfortunate death of Dr. Kennerly on his return from a three years' exploration, the preparation of a report on certain of the material collected by him was assigned to me. In the course of this undertaking I have prepared a copious synopsis of the species of American Salmon and Trout, to appear in the final Report of the Commissioner. It has been thought best to issue in advance brief descriptions of the species hitherto unnamed.

Nothing is more difficult than the naming of different species of the Salmonidæ from individual peculiarities, scarcely one constant character being ever found confined to a single kind, so that in the determination of the species we are obliged to rely upon an aggregation of characters and their modifications. In many instances this difficulty has been got over readily, and in a very satisfactory manner to the author, by applying the names of gentlemen who have directly or indirectly shown their interest in aiding Dr. Kennerly in his pursuits, or the author in his preparation of this report. In this paper,—another published in the Annals of the N.Y. Lyceum,—and a report by the author on the Salmonidæ of the N. W. coast of America, printed in the 12th volume Pacific R. R. Reports, and duplicated in the "Natural History of Washington Territory," nearly everything hitherto printed relating to the species of Salmon and Trout found on the Pacific slope is embodied—with the exception of certain details contained in Sir John Richardson's Fauna Boreali Americana, and in a few other papers to be referred to in the more extended report.

Salmo Kennerlyi, Suckley.

Kennerly's Trout. Chiloweyuk Red Salmon-Trout.

Sp. Ch. *Male.* The head, measured from snout to nape, is contained about seven and a half times in the total length; when measured from the same point to extreme edge of operculum it is contained but four and three quarter times. The point of greatest depth of body corresponds to a line drawn from the back downwards, about midway between the tips of the adducted pectorals and the anterior insertion of the ventrals. The tips of the dorsal and ventrals when flattened backwards reach the same imaginary vertical line. Adipose dorsal commences at a point nearly opposite the origin of the last ray of the anal—the tips of both fins extending backward equally far. Tail strongly forked, its free margin somewhat waved. Snout somewhat turned up, the lower jaw projecting slightly beyond the upper. A single row of teeth along the anterior half of vomer. Teeth on the premaxillaries rather strong. Size of adult rarely exceeds ten or eleven inches. Body compressed laterally; its greatest depth contained four and a quarter times in total length. Dorsal outline strongly arched from the nape, the ridge being somewhat sharp. Curve of belly from origin of ventral fin to that of the last ray of the anal very sharp, from thence to the caudal the upper and lower borders of the peduncle of the tail are almost straight and parallel. General color of body red, dingy along the back, paler on the sides and fading into pure white on the belly. Small irregular black spots above the lateral line. Pectorals bluish, their tips slightly grayish. Dorsal and ventrals red. Tail spotted.

Habitat.—Chiloweyuk Lake, near Fraser River (Dr. Kennerly), Ne-hoi-al-pit-kwu R. (Gibbs.) The species is named in honor of Dr. C. B. R. Kennerly, Naturalist of the N. W. Boundary Commission, who died on his return voyage, after three years' absence exploring the wilderness.

Salmo Warreni, Suckley.

Warren's Trout.

Typical specimens 2070, 2073 in the Smithsonian Coll. Fishes.

Sp. Ch. Dorsal outline strongly arched; its convexity rising suddenly from the nape and attaining its height at a point near a line drawn perpendicular to the lateral line and touching the tips of the pectorals when flattened backwards along the sides. Head rather broad; muzzle somewhat conical; jaws equal and rounded. The eyes beneath plane of lateral line. Opercules and pre-opercules spotted with minute spots of black. Numerous stellate and irregular black spots, many of which are quite faint as if obscured by the thickness of the overlying scales; belly white; back bluish or greenish; dorsal fins and tail spotted. Scales small (but much larger than in S. fontinalis), compact and very adherent; when glistening in certain reflections giving an enamelled appearance to the fish. Tail forked.

Habitat.—Chiloweyuk Depot. Waters of Fraser River, British Columbia, Dr. Kennerly.

Named in honor of W. J. Warren, Esq., Secretary N. W. B. Commission.

Note.—The largest specimens examined by the describer were not over ten inches in length. They may have been immature individuals of a larger anadromous species; but were labelled *Trout* by Dr. Kennerly.

Salmo brevicauda, Suckley.

Short-tailed Trout.

Sp. Ch. Body long and slender; its dorsal outline from a point opposite the posterior margin of the opercula being nearly straight. Scales large; quite thin, and glistening with metallic lustre; very loosely adherent. They encroach upon the tail for nearly a third of its length, thus giving it a short appearance. The peduncle of the tail is wide for the depth of the body, and

the caudal itself is somewhat short and narrow. Head long, but not deep. Dorsal and caudal fins freely spotted with oval black spots. Body marked with small stellate and irregular dark spots, their number and size varying greatly in different individuals. There are usually two rows of teeth on the vomer. The head is contained nearly five times in the total length, which rarely exceeds eighteen or twenty inches.

Habitat.—Obtained from the waters of Puget Sound and the streams in that vicinity, by Drs. Kennerly, Cooper, and Suckley.

Salmo Bairdii, Suckley.

Baird's River-Trout. Red-spotted Rocky Mountain Trout.

Sp. Ch. Head contained about five times in the total length. Snout having a deep notch between the extremities of the premaxillaries receiving a conical fleshy protuberance, projecting upwards from the chin. Teeth strong, hooked, and very uniform in size; two rows on the tongue; from two to four on the front of the vomer,—none on its shaft [in one of the specimens examined, a single accidental small tooth was found on the shaft of this bone, on the other none]. Sides of the body beautifully spotted with rose-colored spots of the size of small peas, of which there are numerous rows. Nostrils double. Tail broad, and but moderately lunated. Scales small. Anterior rays of the pectorals, ventrals, and anal broad, and the skin upon them *yellowish red*, being colored differently from the rest of the fin, as in the *S. fontinalis*. Attains a weight of ten or twelve lbs.

Habitat.—Clarke's Fork of the Columbia, and its tributaries.

Salmo Parkei, Suckley.

Parke's River Trout. *Green speckled-backed Trout.*

Aitshst of the Kootenays.

Sp. Ch. Head contained about four and a half times in the total length; its top flat; muzzle pointed. Tail forked; un-

spotted. Back dark-green, spotted with spots of lighter green; sides spotted with red. Scales adherent and about the size of those of *S. Bairdii.* A disposition towards the formation of a fleshy "tit" projecting upwards at the point of lower jaws, with a corresponding notch between the pre-maxillaries. Superior maxillary reaches to a point considerably behind the eye. Branchiostegals 13—14. The anterior rays of the lower fins are covered with a differently colored skin from that of the rest of the fin—as in *S. fontinalis* and *S. Bairdii.* Two teeth on the outer extremity of the vomer, behind which from one to three on the shaft.

Habitat.—Kootenay River, Rocky Mountains.

Named in honor of Lt. John G. Parke, U. S. Topog. Engineers.

Salmo hudsonicus, Suckley.

Hudson's Bay Trout.

Sp. Ch. Head contained five times in the total length of the fish. Dorsal outline strongly arched, its point of greatest height being at the first ray of the dorsal. Head small and conical. Mouth quite small. Teeth small; a few on the head of the vomer; none on its shaft. Two rows of teeth on the tongue. Tail broad, and usually barred. In some specimens the bars appear to have faded out. Upper parts dark (bluish?), sides brighter, belly white. The whole fish quite silvery. Scales small, but larger than in *S. fontinalis.* They are firmly adherent, and quite conspicuous. Flanks of adults above and below the median line covered with light spots about the size of small peas—those in alcohol appearing as if they had been of a cream or orange color during life.

Integument over first ray of pectorals of a light orange or reddish color; that over the next ray dark. Female nearly similar.

Diagnosis.—Would not be easily confounded with any Atlantic species except *S. fontinalis,*—but has smaller head, larger spots, and larger, more adherent, and thicker scales.

Habitat.—Hudson's Bay and vicinity (C. Drexler), Labrador (Elliot Cowes), Newfoundland (T. Gill).

Salmo Richardii, Suckley.

Suk-kégh Salmon.

Sp. Ch. [Based on a skin in alcohol, No. 2005, Smithsonian Cat. Fishes.] Dorsal outline moderately convex, its point of greatest height being at insertion of anterior ray of dorsal—the arch from the snout to the caudal insertion being very uniform.

Female.—Head conical: jaws apparently equal—the thick fleshy tip on the point of the lower jaw of the fresh-run fish aiding much to give this appearance. Maxillary extends back to a point immediately below the posterior margin of orbit. Teeth extremely small, and but few. Tail deeply lunated—almost forked. Caudal and other fins unspotted. Does not often attain a greater weight than fifteen pounds. Br. rays usually 14.

Habitat.—N. W. Pacific coast. Enters Fraser and Skagit Rivers.

The species is named in honor of Mr. J. H. Richard, the clever artist who has so handsomely and correctly drawn the Ichthyological illustrations of the Pacific R. R. Reports.

Salmo Cooperi, Suckley.

Sp. Ch. *Male.* Head enters nearly four and one quarter times in the total length. Back much arched, having a tendency to hump. Scales rather coarse and large. Skin thick and strong. Tail deeply lunate, profusely sprinkled with oval spots of black. Snout (premaxillaries) somewhat elongated. Dental development much like that of *S. proteus*, Pallas, but the fish differs in lacking the exaggerated hump, and in the lapping of the scales on the body. The adults rarely exceed twenty-two inches. Female of similar size. Mouth sym-

metrical. Back less arched; and with little tendency to "humping." Teeth developed as in the female *S. Scouleri.*

Habitat.—Anadromous, ascending the Columbia in autumn. Found extensively abundant in the Okanakani River, where it is known to the whites as the "Little Red-Salmon," and to the natives as the *Ta-ah-nia.*

Named after Dr. James G. Cooper, who has done so much towards elucidating the Natural History of the North West Coast.

Notes on Species of Salmon heretofore described.

The *Salmo canis* Suckley imperfectly described in the Annals N. Y. Lyceum, Dec. 1858, from memory, has the following additional characteristics not then given, which appear on the examination of specimens recently added to the Smithsonian Collection. A broad dilated knob on the extremity of the lower jaw upon which there are usually at least three large curved teeth on each side—the anterior being the larger. Large curved teeth on the premaxillaries: arms of the lower jaw studded with teeth of nearly uniform size and appearance. Tongue with a diverging row of four teeth on each side. Skin unspotted with speckles, but when the fish has been a few days in fresh water, blotched with large patches of dingy green and purplish red. Caudal somewhat forked, unspotted. Other fins unspotted. The mouth of the female is, as usual with this group of the salmon, more symmetrical than that of the male. Skin thick and fleshy; fin membranes, ditto. Scales quite adherent, overlapping each other about one third. The head is large, its dorsal outline nearly straight from the snout to nape. It is contained about four and a half times in the total length of the fish.

I have proposed a distinct sub-genus for the group of salmon embracing this species, the *S. Scouleri*, *S. proteus*, and *S. Cooperi*, in which the adult males have the premaxillaries con-

siderably elongated, and the tip decurved, extending considerably beyond the extremity of the lower jaws. Upon the tip of the lower jaws there exists a knob, more or less broad, and heavily armed with strong curved teeth, as are the premaxillaries above. The type of this sub-genus (which I designate as *Oncorhynchus*) is the *Salmo Scouleri*, of Richardson.

If my separation of this group from the other salmon is considered as based on sufficiently good anatomical differences, the species above mentioned will hereafter be known as *Oncorhynchus Scouleri; Oncorhynchus Cooperi; Oncorhynchus proteus; Oncorhynchus dermatinus; Oncorhynchus consuetus;* and *Oncorhynchus canis.* In the latter species the projection of the intermaxillaries beyond the lower jaw is not so strongly marked —but the broad knob, and the heavy armature of strong teeth on both that and the premaxillaries exists.

The species of salmon described by Dr. Girard as the *Salmo spectabilis*, I am obliged to present under a new name. This is because there had already been described by Valenciennes in his *Hist. Nat. des Poissons* a species under the name of *Salar spectabilis.* I cannot recognise the genera *Salar* or *Fario*, for reasons which will be given in detail in a forthcoming monograph on the Salmonidæ. Therefore, according to my understanding of the subject, the *Salar spectabilis* Val. will become *Salmo spectabilis*, and Dr. Girard's *Salmo* will have to receive a new name, which I have accordingly imposed in honor of Archibald Campbell, Esq., the accomplished Chief of the U. S. N. W. Boundary Commission. *Salmo Campbelli*, Nob.

This species is the beautiful red-spotted salmon-trout of the North Western waters, known to the Skagit and Nisqually Indians as the *che-wah* or *che-wagh.*

For further remarks concerning this species and the *S. canis*, those interested are referred to the "Natural History of Washington Territory," published in 1860 by Baillière Brothers, New York, and to the same text appearing in the Pacific R. R. Reports, vol. xii., part 2.