

PRELIMINARY REPORT

OF THE

UNITED STATES GEOLOGICAL SURVEY

OF

MONTANA

AND

PORTIONS OF ADJACENT TERRITORIES;

BEING A

FIFTH ANNUAL REPORT OF PROGRESS.

BY

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Hayden

MONTANA

femora striped with brown. This variety was found near Fort Fetterman, on Platte River.

OXYCORYPHUS, Fisch.

Division I.

Tip of the vertex sub-acute. Pronotum not constricted; posterior extremity obtuse-angled; the transverse sulcus situated behind the middle; lateral carinæ acute, equal throughout. (Sauss., Rev. et Mag. Zool., XIII, 1861, 314.)

Ox. obscurus, nov. sp.

Female.—Head conical; occiput ascending, the vertex ascending in the same line with it, convex with a slight median carina, most distinct in front; the margins of the vertex slightly elevated, obtuse, and terminating behind at the upper canthus of the eyes; the vertex sub-conical, tip glabrous. Face quite oblique, nearly straight; frontal costa sulcate, parallel to ocellus, below which it gradually and regularly expands; lateral carinæ distinct, sharp, curving slightly forward at the top in front of the eyes, nearly straight, and rapidly diverging below. Antennæ ensiform, flattened, a little longer than the head; joints short. Eyes elongate pyriform, acuminate above, oblique. Pronotum a little longer than the head; tricarinate, the carinæ equal, distinct, and parallel; sides compressed, perpendicular; sub-truncate in front; posterior margin obtuse-angled; transverse incision behind the middle; posterior lobe thickly covered with shallow punctures; the posterior lateral angle is a right angle. The elytra narrow, about three-fourths as long as the abdomen. Wings nearly as long as the elytra. The abdomen carined; valves of the ovipositor obtuse, hairy on the margins, the upper ones strongly curved. The legs slender; the femora compressed; posterior femora nearly as long as the abdomen.

Color, (dried after long immersion in alcohol).—Pale rufous. Elytra semi-transparent toward the apex. Wings pellucid, with pale rufous nerves.

Dimensions.—Length, .93 inch; elytra, .5 inch; posterior femora, .5 inch; posterior tibiæ, .42 inch.

Wyoming Territory. I am uncertain as to the exact point where the two specimens collected were found.

LIST OF SPECIES OF BUTTERFLIES COLLECTED BY CAMPBELL CARRINGTON AND WILLIAM B. LOGAN, OF THE EXPEDITION, IN 1871.

By W. H. EDWARDS.

Papilio rutulus, Boisduval.—Junction.

turnus, Linn.—Montana.

Parnassius smintheus, Doubleday.—Junction; Yellowstone.

clodius, Menetus.—Montana.

Pinis protodin, Bois.—Several localities.

Anthocaris ansonoides, Bois.—Hot Springs.

Colias encythena, Bois.—Virginia City and several localities.

philodin, Godart.—Hot Springs.

alexandra, Edwards.—Yellowstone.

Colias astræa, Edwards.—Colorado.

Argynnis edwardsii, Reakirt.—Junction and several localities.

montivaga, Behr.—Yellowstone.

meadii, Edwards.—Colorado.

myrina, Cramer.—Colorado.

Meletæa hoffmanii, Behr.—Junction.

Phyciodes tharos, Bois.

Grapta satyrus, Edw.—Hot Springs.

Pyrameis huntera, Drury.—Montana.

Vanessa antiopa, Linn.—Montana.

melbertii, Godart.—Bozeman City.

Canonympha ochracea, Edw.—Virginia City.

Erebia rhodia, Edw.—Yellowstone.

haydenii, Edw., new species.—Yellowstone.

Satyrus nephele, Kirby.—Yellowstone.

silvestris, Edw.—Virginia City.

sthenela, Bois.—Virginia City.

Chrysophanus rubidus, Edw.—Stinking Creek.

Lycæna anna, Edw.—Pleasant Valley.

acmon, Bois.—Meadow River.

Pyrgus syrichtus, Fab.—Montana.

Herpena comma, Linn.—Virginia City.

In addition to the above were several specimens, especially of *Lycæna*, that were too much injured for recognition.

W. H. EDWARDS,

Coalburgh, West Virginia.

JANUARY, 1872.

EREZIA HAYDENII, Edwards, new species.

Male: expanse, 1.6 inches.

Upper side fuscous, immaculate; under side a shade paler, much irrorated with gray scales; primaries immaculate; secondaries have a complete series of black ocelli along the edge of hind margin, one in each interspace; each ocellus narrowly ringed with ochraceous, and having minute white pupil.

REPORT ON THE RECENT REPTILES AND FISHES OF THE SURVEY, COLLECTED BY CAMPBELL CARRINGTON AND C. M. DAVES.

By EDWARD D. COPE, A. M.

REPTILIA.

OPHIIDIA.

UDISONA CONFLUENTA, Say; var. with transverse spots narrowed. Ogden, Utah.

PLENIA VAGRANS, B. and G., (Catalogue, p. 35.)

Fish Creek, Montana; Yellowstone Basin; between Copenhagen, Utah, and Fort Hall, Idaho; Fort Hall, Idaho; Salt Lake City; Ogden, Utah.

Var. *a*. With colors like *E. sirtalis*; the sides olive, with about fifty spots of black spots, the vertebral band yellow, black-bordered. From Camp Carling.

Preliminary Report of the U.S. Geological Survey of Montana and Portions of Adjacent Territories, Being a 5th Annual Report of Progress by F. V. Hayden. GPO: Wash. D.C., 1872. Binding is striped 1871.

EUTÆNIA PARIETALIS, Say.

Salt Lake City; lake ten miles east of Logan, Utah, (salt;) Fish Creek, Montana.

PITYOPHIS BELLONA, B. and G.

One specimen without the anterior frontal (vertical) shield; from Ogden, Utah.

BASCANIUM FLAVIVENTRIS, Say, (B. and G., Catalogue, p. 96.)

Ogden, Utah.

LACERTILIA.

PHRYNOSOMA DOUGLASSII, Bell.

Var. a.—The usual form; Salt Lake City.

Var. β, exilis.—A small form not more than one-half or two-thirds the usual size, but nearly identical in details of structure and coloration.

The differences observable are: the rather shorter muzzle, which is entirely vertical in profile; the smaller scale above the canthus of the mouth, and the temporal horns; the less prominence of the posterior superciliary angle, and the much reduced size. A geographical variety, Carrington's Lake, Montana; Fort Hall, Idaho.

SCLOPORUS CONSOBRINUS, B. and G.

This species is very abundant and variable. Its varieties are four, as follows:

Var. 1.—Typical; scales large, especially on the sides; crural cross-series, 10-11; rows between interscapular and crural points, 33; 2 prefrontals on each side; lateral and dorsal spots distinct. Localities, Yellowstone Basin; Blackfoot Fork.

Var. 2.—Like the last, but the scales smaller on sides and back; 13 rows on rump. Salt Lake City, Utah; south of Fort Hall, Idaho.

Var. 3.—Scales still smaller; 16-17 interscapular, 14 crural cross-rows; 3 prefrontal plates on each side. Dorsal spots large, their borders touching the lateral spots; both pale-edged behind, forming an angular border in ♀. This form grades into the last. A male has the border color of variety 2. South of Fort Hall, Idaho.

Var. 4.—Like variety 2, but only half the size. South of Fort Hall, Idaho, and Salt Lake City.

SCLOPORUS GRACIOSUS, B. and G.; *S. gracilis*, B. and G.

This species is very near the last, but the scales are still smaller. There are 38 transverse dorsal rows and 20 interscapular. The lateral scales are twice emarginate. From Salt Lake, Utah, to Oregon.

CNEMIDOPHORUS TESSELLATUS, Baird; *Amiva tessellata*, Say, (*vide* Pac. R. R. Surv., vol. X, Beckwith's Report.)

Salt Lake, Utah.

TESTUDINATA.

CHRYSEMYS OREGONENSIS, Harlan; Agass.

The Yellowstone Lake.

BATRACHIA.

ANURA.

BUFO COLUMBIENSIS, B. and G., (United States Exploring Expedition, Herpetology, by Girard, p. 77.)

Pleasant Valley and Yellowstone Basin. Specimen from latter local-

ity like types; that from Montana different in coloration. It is a bright green, with numerous blackish speckles on upper surfaces, and brown interscapular spots; below uniform.

CHOROPHILUS TRISERIATUS, Wied; *Helæcetes*, Baird.

Carrington's Lake, Yellowstone Basin.

SPEA BOMBIFRONS, Cope.

Blackfoot Fork.

RANA HALECINA, Bosc.

Fort Hall, Idaho.

RANA PRETIOSA, B. and G., (United States Exploring Expedition; Herpetology, p. 20.)

Pleasant Valley, Montana.

This frog is a near ally of the European *R. temporaria*, and is, as Girard remarks, distinguished from the other west-coast species (*R. aurora*, B. and G.) by its much shorter limbs. The present species was originally found at Puget's Sound, Washington Territory.

RANA SEPTENTRIONALIS, Baird, (Proc. Acad. Nat. Sci., Phila., 1854, 61.)

Abundant; Carrington's Lake, Yellowstone Basin, and Fish Creek, Montana.

PISCES.

ISOSPONDYLI.

COREGONUS WILLIAMSONII, Girard; the Rocky Mountain white fish.

THYMALLUS TRICOLOR, Cope, (Proc. Acad. Nat. Sci., Phila., 1865, p. 80; Gunther, Catalogue Brit. Mus., VI, 201.)

Specimens from Yellow Creek and the Gallatin Fork of the Missouri in Montana. This species was originally discovered in the Grand River, Michigan. It seems to be a rare fish east of the Mississippi; but my friend, J. Dickinson Sergeant, informs me that it has been found abundantly in a stream in the northern part of the peninsula of Michigan. The number of specimens brought by Dr. Hayden from the head-waters of the Yellowstone indicates that this region is its home. They maintain well the characters by which it was originally distinguished from the *T. vulgaris* and *T. signifer*. The muzzle is shorter and the gape of the mouth larger than in the former; the maxillary bone is narrower and longer, reaching to below the middle of the pupil instead of to near the front of the orbit. The length of the head equals the depth of the body and enters the length without caudal fin, 4.5 times. There is some variation in the radial formula as follows: D. 20-22; A. 13-14. Scales, 8-9-86-90-10-12. In the younger specimens the small blue spots tend to form short longitudinal bars.

SALMO, Linn.

The species of this genus, found in the streams rising in the Rocky Mountains, are numerous, and, as elsewhere, nearly allied. Those I have observed in Dr. Hayden's collections number three, while a fourth is described by Dr. C. Girard, which I have not met with. The allied species differ as follows. They all belong to the group *Salax*:

Depth, 5.75 in length; eye, 4.5 times in head; snout obtuse;

caudal fin scarcely emarginate; Br. IX.....*S. virginalis*.

- Depth, 4.75 in total, (to point caudal;) eye, 5 times in head; muzzle acute; scales larger, 26 below dorsal fin; cranium not keeled above; head one-fourth length; dorsal fin nearer muzzle than end caudal scales; caudal fin scarcely emarginate; Br. X *S. spilurus*.
- Head large, broad, flat, not keeled, 4.25 in total, equal depth of body; muzzle obtuse; eye nearly 5 times in head; scales, 42 below dorsal first ray; dorsal fin equidistant; caudal fin not notched *S. stomias*.
- Head smaller, 4 times in length to notch of caudal, (which is well emarginate;) upper surface keeled; muzzle obtuse; eye 4 times in length; depth, 4.5 in length, to end of caudal scales; dorsal midway between latter and end of muzzle; scales small, 40-43 below dorsal first ray; Br. XI *S. pleuriticus*.
- Head acuminate, keeled above, 4.66 times in length to notch of caudal fin, which is well marked; eye, one-fifth head; depth, 5.25 to caudal notch; dorsal nearer muzzle than end of caudal scales; scales large, 33 below dorsal first ray; Br. XII; spots large, distant *S. carinatus*.
- Head one-fourth total length; eye, 5 times in head; dorsal fin equidistant between insertion of caudal and end of muzzle; muzzle rather pointed; Br. X, XI *S. irideus*.

Of the above species *Salmo spilurus* and *S. carinatus* are distinguishable by their large scales and smaller orbits; while in *S. stomias* and *S. pleuriticus* the scales are very small. On the other hand, *S. carinatus* and *S. pleuriticus* agree in the strong median carina on the superior aspect of the cranium. *S. stomias* is readily separated by the large head and mouth. Its habitat, so far as known, is the Kansas River, far to the eastward of the Rocky Mountains.*

SALMO SPILURUS, Cope, *sp. nov.*

This species is represented by six specimens from the Sangre de Christo Pass, in Colorado, from one of the sources of the Rio Grande.

It is rather a fusiform fish, with small head and acuminate muzzle, which is very little decurved at the end to the lip margin. The eye enters the muzzle 1.33 times, the inner border of the adipose eyelid being regarded as the dividing line. The top of the head is slightly convex, but entirely without keel. The maxillary bone extends to a little beyond the posterior margin of the orbit, and is flat and considerably wider distally than it is proximally. In this it differs from the *S. stomias*, Cope, where that bone maintains an almost equal width throughout. All the teeth are well developed, including both rows of vomerines. Scales in about 33 rows between the base of the first dorsal ray and the lateral line, or 26 rows between the middle of the dorsal fin and the same.

Radii, Br. X; D. II. 11, (10 in one;) A. II. 10, (in two, 11.)

Ground color, pale in spirits; the caudal peduncle from the middle of the anal fin, with the caudal and dorsal fins, thickly spotted with large, irregularly disposed black spots. Those on the caudal peduncle are darkest between the scales; each one having, therefore, a reticulated appearance. Above the lateral line they extend to the dorsal fin, continually contracting their distribution from the lateral line upward.

* In Hayden's Report, Geology of Wyoming, 1871, p. 433, this is erroneously stated to be the Platte, a very different river.

A few scattered spots are found all the way to the head, and four or five mark the side of the latter. Adipose fin spotted; others unicolor. The largest specimen obtained measures 13 inches in length.

The affinities of this species to the *S. virginalis* appeared to be close, and Girard cites specimens from the locality from which it was procured as belonging to the latter. Its description cannot, however, be reconciled with the *S. spilurus*, especially in the relations of the depth to the length, by which it would appear that *S. virginalis* is a much more slender fish. The figure also agrees with the description.

SALMO PLEURITICUS, Cope, *sp. nov.*; *Salmo (Salar) virginalis*, Cope, not Girard, (Hayden's Survey Wyoming, 1871, 433.)

This is the abundant mountain trout of the head-waters of the Green and Platte Rivers, and even of the Yellowstone. It is rather a stout species, with obtusely descending muzzle, and large eye entering the head only four times. The cranial keel is a marked character; its elevation is greater between the orbits than on the posterior part of the frontal bones. The interorbital width is 1.33 times the long diameter of the interpallpebral opening of the eye. The dorsal fin is nearer the origin of the marginal rays of the caudal fin than to the end of the muzzle, but is midway between the latter and the termination of the scales on the sides of the fin. Radii, D. II. 11-12 and 13; A. II. 11. Br. XI. The scales range from 40 to 45 below the first dorsal ray to the lateral line. The maxillary bone extends to a little beyond the orbit, and is not expanded.

This is a spotted species, and the spots are chiefly found above the lateral line and on the whole caudal peduncle, and on the dorsal and caudal fins. They are usually rather scattered, less numerous on the peduncle than in *S. spilurus*, and more so anteriorly; those on the fins are smaller and less numerous. There is, however, variation in the size and number of the spots. The sides are ornamented with short, broad longitudinal bars of crimson; a band of the same color occupies the fissure within each ramus of the mandible and skin on the median side of it. The fins are all more or less crimson; but none of these are black-bordered. The largest specimens are 10-12 inches long.

Seven specimens of this species are in the collections from the heads of Green River; from Medicine Lodge Creek, Idaho, (two specimens;) four from the Junction, Montana. A specimen each from Yellow Creek and the Gallatin Fork of the Missouri, Montana, represent at least a color variety of this fish. The spots are much smaller and much more numerous, though distributed over the same regions; they are less numerous on the caudal fin. In the Gallatin specimen there are 51 scales above the lateral line; in the other 44. Another variety from the Yellowstone Basin is only represented by young specimens. They have no spots on the caudal fin.

A number of dried specimens from the Yellowstone Lake, of larger size than the specimens above described, probably belong to this species. They are rather more closely spotted on the caudal peduncle and fin, but are similar in all important respects. The only discrepancy which I find is the relatively smaller eye, (not orbit,) which enters the head five times, and the greater prolongation of the maxillary bone. These characters are, perhaps, due to the larger size attained by the individuals. They are from a foot to eighteen inches in length.

SALMO CARINATUS, Cope, *sp. nov.*

The characters of this species, pointed out in the table, show its marked

distinction. It is a more slender fish than any here described, approaching more nearly the proportions assigned by Girard to the *S. virginialis*. From this species the numerous branchiostegals, more distinctly forked tail, &c., distinguish it.

The head is elongate, but not wide, and the muzzle descends regularly, but not abruptly, to the lip margin. The eye is contained in it 1.5 times and enters the head five times in a specimen of the size of those of *S. pleuriticus*, where it enters four times, as well as in larger animals. The interorbital region contracts at the front part of the orbits so as to be little wider than the long diameter of the latter. The frontal keel extends the whole length of the vertex, and is very conspicuous; it is most elevated posteriorly. The maxillary extends to beyond the orbit. The dorsal fin is equidistant between the end of the muzzle and the base of the marginal radii of the caudal fin, therefore nearer the former than to the termination of the lateral caudal scales.

Radii, Br. XII, XI; D. II-11; A. II-11.

The ground is light, perhaps rosy in life, and is marked with round, black spots, sparsely but equidistantly distributed over the whole body. The dorsal and caudal fins are spotted, but rather sparsely; those of the former being arranged in two or more longitudinal series. There are indications that the fins and sides of the head were crimson, and that there were large spots of the same color on the middle of the sides.

Two specimens of uncertain locality; fragments of, perhaps, a third from the Yellowstone Geyser Basin.

Another species of trout was obtained from Carrington's Lake, Montana, but the specimens are in too bad a state for determination.

PLECTOSPONDYLI.

SEMOTILUS CORPORALIS, Mitch.

Crow Creek, at Camp Carling.

CERATICHTHYS NUBILUS, G.; *Argyreus nubilus*, G., (U. S. Pac. R. R. Surv., X, p. 244.)

This species has the physiognomy of the genus to which Girard referred it, but the premaxillary is projectile and the upper lip separated from the muzzle by a fold. This is the only point of distinction yet stated by which the two genera may be separated. Teeth, 4.2-2.4; barbels inconspicuous. Axils of the fins crimson.

Grass Creek, Idaho. Collection No. 4.

APOCOPE, Cope, *gen. nov.*

Teeth of the raptorial type, 4.1-1.4, without grinding surface. Barbels present; upper lip separated from muzzle by a fold. Anterior part of the lateral line only present.

APOCOPE CARRINGTONII, Cope, *sp. nov.*

This is a small species allied to the last, but the muzzle is broader and less prominent, and the mouth larger. The muzzle is quite obtuse in profile and overhangs the mouth very little, and the end of the maxillary bone does not quite reach the line of the margin of the orbit. Barbels minute; teeth, 4.1-1.4; isthmus wide; eye a little smaller than one-fourth the length of the head, and 1.5 times in interorbital width. Scales, 10-60-11. Dorsal fin originating behind the point above the ventrals, and markedly nearer the basis of the caudal than the end of the

muzzle. Caudal well forked. Radii, D. 8; A. 7; length of head a little more than four times in length to basis of caudal; depth five times in the same; length, 20 lines.

Color olivaceous, with a dark lateral band from end of muzzle, and dark shades on the back.

Four specimens from the Warm Springs, Utah. The species is named in honor of Campbell Carrington, zoologist of Dr. Hayden's expedition, to whose zeal in the cause of science we are indebted for the materials analyzed in this report, and that on the same subject in the Survey of Wyoming, 1871. Collection No. 9.

APOCOPE VULNERATA, Cope, *sp. nov.*

The head is broad and the muzzle wide and obtuse, not projecting over the mouth. Barbels minute. The end of the maxillary bone does not quite reach the marginal line of the orbit; orbit five times in head, one and a half times in the interorbital space. Length of head one-fourth, depth of body one-fifth length without caudal fin. Dorsal a little behind line of origin of ventrals, nearer caudal fin than muzzle. Radii, D. 8; A. 7. Length, 24 lines. Scales small, 15-72-10.

Color olive, with a broad dark band from end of muzzle to caudal fin, paler above and below it; belly yellow; a crimson spot on the chin.

This species differs from *A. carringtonii* in the wider muzzle, smaller scales, and greater development of the lateral line. In this species it is continued to the end of the anal fin; in the type of the genus it scarcely extends to the dorsal. Collection No. 1.

From Logan, Utah; discovered by Cam. Carrington.

RHINICHTHYS MAXILLOSUS, Cope, (Proc. Acad. Nat. Sci., Phila., 1864, 278.)

Crow Creek; Grass Creek, Idaho.

TIGOMA RHINICHTHYOIDES, Cope, *sp. nov.*

Size small; form elongate. Head 4.3 times in length without caudal fin; depth, 5.2 times in same. Muzzle obtuse, not projecting; mouth inferior horizontal, maxillary not reaching line of orbit. Head nearly four times longer than diameter of orbit, which equals length of muzzle, and is 1.5 times interorbital space. Teeth, 4.2-2.4. Scales, 12-67-12, lateral line with occasional interruptions at the posterior part. Dorsal fin behind line of ventrals, nearer basis of caudal fin than end of muzzle. Length, 24 lines.

Olive-brown above, yellow below; a broad brown lateral band and longitudinal blackish line on the thoracic region on each side. The median band is darker spotted, and there are blackish spots on the dorsal region. Head black above; chin red.

The upper lip of this species is separated by a fold, but the species has a general resemblance to those of *Rhinichthys*.

From Logan, Utah. Collection No. 2.

PROTOPORUS, Cope, *gen. nov.*

Teeth raptorial; outer row, 4-4; no grinding surface; no barbels; upper lip separated by a fold. Lateral line represented only by a short anterior series of pores.

This genus is related to *Tigoma*, as *Apocope* is to *Ceratichthys*.

PROTOPORUS DOMINUS, Cope, *sp. nov.*

Form rather stout, front convex, muzzle obtuse, mouth horizontal, end of maxillary not quite attaining orbit. Scales, 9-56-6. Lateral line not

attaining the point opposite to the origin of the ventral fins. Length of head, 4.33; depth of body five times into length without caudal fin; diameter of eye four times in head; once in muzzle, 1.3 times in interorbital width. Fin radii, D. I. 8; A. I. 7. Rays of pectoral thickened, not reaching ventral; ventral reaching anal. Length, 24 lines; teeth, 4.2-1.4, somewhat hooked.

Color silver-gray, with a broad dark lateral band, which is darker spotted; back and sides of thorax dark shaded; top of head dark.

Numerous specimens from Fort Hall, Idaho, collection No. 3.

HYBOPSIS BIVITTATUS, Cope, *sp. nov.*

Muzzle narrow, very obtusely descending, not projecting; mouth horizontal, end of maxilla reaching the line of the orbit. Orbit four times in length of head, 1.5 times in the rather flat interorbital width. Length of head, 4.66 times; depth of body four times in length minus caudal fin. Dorsal region arched; basis of dorsal fin descending posteriorly, and originating very little behind origin of ventrals. Pectorals only reaching half-way to ventrals; latter about half-way to anal. Radii, D. I. 8; A. I. 7. Teeth, 4.2-2.4, with grinding surface. Scales, 12-53-11. Lateral line complete. Dorsal fin nearer muzzle than origin; caudal fin midway between former and notch of latter. Length, 3 inches.

Color silvery; the scales blackish punctulate; dorsal region blackish; a dark band from epiclavicular region to basis of caudal fin; another from end muzzle, across operculum, to basis of anal.

From Warm Springs, Utah; Campbell Carrington, collector. Collection No. 10.

It is interesting to note that in the distribution of color, especially in the two lateral bands, this species is identical with *Protoporus dominus*, *Tigoma rhinichthoides*, and *Apocope carringtonii*, a well-marked case of mimetic analogy. Another case of this kind is exhibited by two species of eels of different genera from Costa Rica. The species are undescribed.

MURÆNA AQUÆDULCIS, Cope, *sp. nov.*

Branchial fissure small; posterior nostril not tubular, situated half-way between eye and anterior nostril. Eye contained nearly twice in the muzzle. Maxillary teeth in two rows, ethmoids in a single one. Former, 4 long in the inner, 17 in the outer row, counting from the front margin of the orbit. Vomerine teeth well developed; dentaries in two rows.

Form stout; dorsal fin extending two-thirds the total length, the anal 2.33 times in the length. Color brownish-black, with rather distant yellow spots, which are accompanied by a darker shade on same side, and which become confluent into yellow marblings on the gular and pectoral regions.

From the Rio Grande, near the city of San José, Costa Rica, Central America.

PECILOPHIS NOCTURNUS, Cope, *sp. nov.*

Branchial fissure small; posterior nostril just above the orbit at the anterior margin. Muzzle rather obtuse, twice as long as the small eye. Maxillary teeth in a single row; the vomerines obtuse, continued in line to the ethmoids. Latter in three rows, with interspaces. Dentaries one-rowed. Form moderately stout; dorsal fin extending nearly to nape. Anal fin a little over one-third total length.

Color deep purplish-brown, with rather scattered, irregular, yellow spots with black margins; rather paler below.

From the Rio Grande, at San José, Costa Rica. Dr. Van Patten.

This species, in general proportions, is a little more slender than the last, but in general appearance, as size and coloration, can scarcely be distinguished from it. It is a curious case of mimetic analogy.

SIBOMA ATRARIA, G., (U. S. Pac. R. R., Rep. X, 297.)

Abundant in Grass Creek, Idaho. *Siboma* differs from *Clinostomus* in the anterior position of the dorsal fin. Collection No. 7.

MYLOLEUCUS, Cope, *gen. nov.*

Teeth raptorial, but with well-developed masticatory surface, 5-4 in outer row. No barbels; lateral line well developed. Dorsal fin above or in front of line of ventrals.

This genus is *Siboma*, with developed grinding surfaces of the teeth.

MYLOLEUCUS PULVERULENTUS, Cope, *sp. nov.*

Form stout; head short, muzzle not decurved; mouth terminal, slightly descending, the maxillary bone nearly attaining the anterior line of the orbit. Head 3.75 times in length, exclusive of caudal; depth three and a half times. Eye 4.2 times in head, once in muzzle. Pre-orbital bone deeper than long. Scales, 13-58-9. Radii, D. I. 9; A. II. 7. Caudal well forked. Length, 3½ inches.

A dark plumbeous band extends from the origin of the lateral line above to the caudal peduncle, and on it to the caudal fin. Below this the color is silvery, thickly dusted with black dots; above it is an olive-yellow band; then a dark dorsal region, all dusted. Sides of head silvery, dusted. Fins unspotted.

Numerous specimens from the Warm Springs, Utah; type No. 6.

CLINOSTOMUS PANDORA Cope, *sp. nov.*

This species is nearly a *Siboma*, in consequence of the position of the dorsal fin being so little removed from the vertical above the ventrals. Dentition refers it to *Clinostomus*, while its appearance is that of a *Ceratichthys* or *Semotilus*. I adhere to the technical characters until others are found which will give us the clew to the truer affinities.

Shape fusiform, head small, one-fifth of total length, (or fourth without caudal fin,) broad, and rather flat at the muzzle. The latter does not project, and the lips are equal. Maxilla not attaining the line of the orbit by some distance. Eye small, 6.25 times in length of head, twice interorbital width. Scales, 17-61-9, small in front of dorsal fin. Radii, D. I. 8; A. II. 8. Isthmus moderately wide; depth of body 4.2 times in length without caudal. Dorsal fin nearer basis caudal than end of muzzle.

General color silvery, above (in spirits) brownish. A broad, ill-defined, lateral band, from epiclavicular region to basis of caudal fin, above the lateral line. Length of type specimen, 8 inches. Collection No. 11.

From Sangre de Christo Pass, from a tributary of the Rio Grande.

CLINOSTOMUS HYDROPHLOX, Cope, *sp. nov.*

This species and the following are typical forms of the genus, and interesting as the first that have been detected west of the Mississippi River. Length of head 4.75 times in total, exclusive of caudal fin; depth of body 4.5 times in same. Eye 5 times in head, one and a half times in interorbital width. Front straight; lower jaw projecting

beyond upper; mouth descending; end of maxillary just reaching line of orbit. Isthmus narrow. Teeth, 5.2-2.4. Scales, 15-58-7. Radii, D. I. 8; A. I. 11. Ventrals not reaching anal. Length, 6 inches.

Color above olive, with a blackish inferior border, extending from the superior margin of the orbit. Below this, a crimson band, and still lower, a blackish band, passing from the epiclavicular region above the lateral line to the basis of the caudal fin. Below this, crimson in front, silvery behind. Fins unspotted. Suborbital bones crimson; cheek golden.

Blackfoot Creek, Idaho. Collection No. 13.

CLINOSTOMUS MONTANUS, Cope, *sp. nov.*

Muzzle decurved, obtuse; jaws equal; end of maxillary extending beyond margin of orbit. Orbit large, entering the head 3.5 times and the interorbital region once. Length of head, one-fourth length to caudal fin; depth nearly equal. Scales, 11-12-56-6. Radii, D. I. 9; A. II-12. Length, 3.5 inches.

Olive above, a dark band extending from epiclavicular region above caudal line to caudal fin. Sides crimson as high as the lateral line.

Numerous specimens (No. 8) from Grass Creek, Idaho. This brightly colored species differs from the last in the obtuse muzzle, large eye, and smaller scales above the lateral line.

CATOSTOMUS GENEROSUS, G., (Proc. Acad. Nat. Sci. Phila., 1856, 174;)
Acomus generosus, G., (U. S. Pac. R. R. Surv., X, p. 221.)

This species is closely allied to the eastern *C. teres*, Mitch.: from Utah Lake.

PERCOMORPHI

URANIDEA PUNCTULATA, Gill, (Proc. Boston Soc. N. H., 1862, p. 41.)

Gallatin Fork of the Missouri and Warm Springs, Utah.

COTTOPSIS SEMISCABER, Cope, *sp. nov.*

Radii, D. VII-18; A. 13; V. I-4; first ray of anal below third of second dorsal. Skin prickly above the lateral line, smooth below it posteriorly. Body compressed, profile rising rather steeply to the basis of first dorsal fin. Eye 4.5 times in head, .75 time in interorbital space. Muzzle contracted, maxillary bone reaching to below middle of pupil. Two spines on preoperculum. On an inferior anterior angle of operculum. Lateral line discontinued on last fourth of caudal peduncle. Head one-third length without caudal fin.

Below yellow; dorsal line with a series of dark spots; sides with large, dark clouds.

Three specimens from Fort Hall, Idaho.

CATALOGUE OF PLANTS.

By Prof. THOMAS C. PORTER.

All the plants comprised in this catalogue were collected during the expedition of Dr. F. V. Hayden to the head-waters of the Yellowstone River in the summer of 1871, with the exception of a small number gathered by Dr. George Smith, in the month of August, on Gray's Peak and near Georgetown, Colorado Territory.

Prof. G. N. Allen acted as botanist, and Robert Adams, jr., as assistant, as far as Fort Ellis. After that time Mr. Adams took charge of the collections until his departure, about September 1.

Thanks are due to Doctors Torrey and Gray for valuable aid in difficult cases, and to Messrs. Engelmann, Olney, Thurber, Lesquereux, and Tuckerman for the determination of species in those orders to which they have devoted special attention.

RANUNCULACEÆ.

Clematis Douglasii, Hook.—Stinking Water Creek; Fort Ellis to the Yellowstone; Hot Sulphur Springs.

Clematis alpina, Mill., var. *Ochotensis*, Gray.—Gray's Peak, Colorado Territory, Dr. Smith.

Clematis ligusticifolia, Nutt.—Madison Valley; Fort Ellis to the Yellowstone.

Clematis verticillaris, D. C., (*C. Columbiana*, T. and G.)—Fort Ellis to the Yellowstone.

Anemone multifida, D. C.—Mountains south of Virginia City.

Thalictrum Fendleri, Engelm.—Mountains south of Virginia City; Fort Ellis to the Yellowstone.

Ranunculus aquatilis, L., var. *trichophyllus*, Chaix.—Salt Lake City, June 1.

Ranunculus aquatilis, L., var. *stagnalis*, D. C.—Stinking Water Creek; between Madison and Jefferson Rivers.

Ranunculus Flammula, L., var. *reptans*, Gray.—Mud Springs.

Ranunculus Cymbalaria, Pursh.—Weber River Valley and Salt Lake, Utah Territory, June; Stinking Water Creek, July 3.

Ranunculus multifidus, Pursh, var. *repens*, Hook.—Medicine Lodge.

Ranunculus nivalis, R. Br., var. *Eschscholtzii*, S. Watson.—Upper Falls of the Yellowstone.

Ranunculus repens, L.—Pleasant Valley; Upper Falls of the Yellowstone.

Caltha leptosepala, D. C.—Great Falls and Upper Falls of the Yellowstone.

Trollius larius, Salisb.—Great Falls of the Yellowstone.

Aquilegia cærulea, Torr.—Mountains south of Virginia City; Yellowstone Lake.

Aquilegia flavescens, S. Watson, (Clarence King's Rep., vol. V, p. 10.)—Fort Ellis to the Yellowstone; Hot Sulphur Springs; Lower Falls of the Yellowstone.

Delphinium elatum, L., var. (?) *occidentale*, S. Watson, (*loc. cit.*)—Stinking Water Creek; Madison Valley; Fort Ellis to the Yellowstone.

Delphinium Menziesii, D. C.—Mountains south of Virginia City; Stinking Water Creek.

Aconitum nasutum, Fisch.—Yellowstone Lake.

Actæa spicata, L., var. *arguta*, Torr.—Yellowstone Lake.