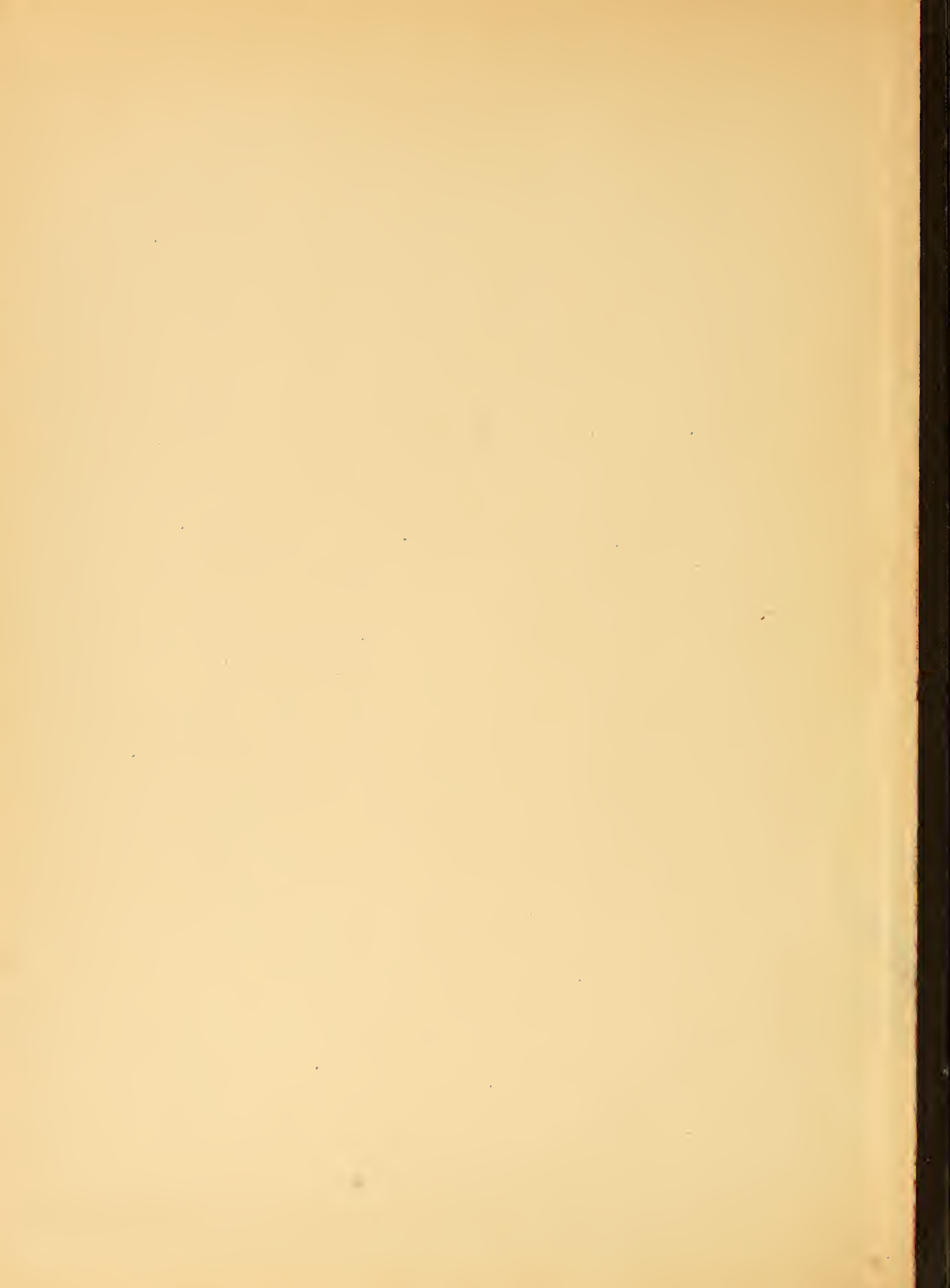


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CONTRIBUTIONS

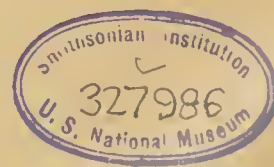
TO THE

FAUNA OF CHILE:

BY

CHARLES GIRARD.

Not listed in ...



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257

858Z

Fishes

The U.S. Naval astronomical Expedition to the Southern Hemisphere
during the years 1849-'50-'51-'52
pp. 205-262 Fishes pp 230-253
1855

CONTRIBUTIONS

TO THE

FAUNA OF CHILE:

BY

CHARLES GIRARD.



REPTILES.

BY CHARLES GIRARD.

BATRACHIA.

FAMILY OF RANIDÆ.

Genus CYSTIGNATHIUS, Wagler.

GEN. CHAR. Vomerine teeth disposed upon a transverse or oblique row more or less interrupted in the middle, and situated either between the inner nares or behind them; tongue circular, subcircular, or subcordiform, posteriorly entire, and either attached by its whole surface or very slightly free behind; tympanum distinct; toes either bordered by a membranous fold or slightly webbed at their base.

SYN. *Cystignathus*, WAGL. Nat. Syst. Amph. 1830, 202.

GRD. Proc. Acad. Nat. Sc. Philad. VI, 1853, 420.

OBS. The genus *Cystignathus* is here admitted within the limits we have recently assigned to it on the occasion of the study which we have made of the species of exotic batrachians brought home by the United States Exploring Expedition, to which we would refer herpetologists.

CYSTIGNATHUS TAENIATUS, Girard.

PLATE XXXIV, Figs. 8—11.

SPEC. CHAR. Vomerine teeth, situated a little behind the inner nares, well separated upon the middle of the palate; tongue subelliptical, free posteriorly, and slightly notched upon the same margin. Greenish yellow, with two dorsal blackish stripes; limbs barred above. A dark vitta upon the sides of the head, extending from the nostril, across the eye, to the shoulder.

SYN. *Cystignathus taeniatus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 226.

DESCR. The general appearance of this species is rather short, the head forming about the third of the entire length—the posterior limbs, of course, excepted. The head is longer than broad. The snout is subacute and rounded; slightly declive from the eyes forwards and sideways. The *canthus rostralis* is depressed; the nostrils, very small, are situated nearer to the tip of the snout than to the anterior rim of the orbit. The eye is well developed and subcircular, its longitudinal diameter being equal to the interocular space above; the upper eyelid is minutely granular. The tympanum is quite small, though conspicuous. The tongue is well developed, in the shape of a subelliptical disk, broadest behind, slightly notched posteriorly, and free upon nearly the posterior third of its length. The inner nares are subelliptical, oblique, and conspicuous. The vomerine teeth are exceedingly minute, and disposed upon two very small and subelliptical distant eminences, situated between and a little behind the inner

nares. The openings for the tubes of eustachii are smaller and less conspicuous than the inner nares. The subgular air-bladders are very much developed. The anterior limbs, when stretched backwards alongside with the body, bring the tip of the inner finger close to the groin, beyond which, consequently, the other fingers extend. The fingers are slender, and their tips slightly swollen. The innermost is stoutish, and shorter than the second, which is shorter than the fourth—the third being the longest. The palm of the hand is provided with quite large tubercles; that at the base of the inner finger is the largest of all. The first phalanges are marked beneath by similar tubercles, though more regularly conical in their shape. The tubercles under the second phalanx of the third and fourth fingers are quite reduced. The posterior limbs are long and slender, measuring nearly two inches from their origin to the tip of the longest toe. The foot is narrow, and likewise slender, as well as the toes, which are free, there being but a rudimentary webbing to be observed between the three middle ones. The sole of the foot is smooth; the inner metatarsal tubercle is rather small and conical, and the outermost still smaller and inconspicuous. Small tubercles exist under the articulation of the first and second phalanges, except under the inner toe. The second toe is shorter than the fifth, whilst the third is longer than the latter. The fourth is much the longest. The inferior surface of the thighs alone is granular or warty; the skin elsewhere is perfectly smooth, save minute pores which may be observed about the tympanum and on the sides of the back, where they constitute a narrow band, extending from the occiput to near the groins. The ground color is olivaceous or greenish yellow. The region between and behind the eyes exhibit traces of black markings which cannot be defined upon the specimen before us. There is a black, narrow vitta along the line of the *canthus rostralis*, terminating anteriorly by an expansion over the nostrils posteriorly; the vitta when reaching the eye sends off a tapering branch along the inferior rim of the orbit, behind which the vitta reappears considerably broader, and passing over the tympanum terminates above the insertion of the anterior limbs. From the upper and posterior part of the orbit, above the tympanum, originates a blackish stripe, which extends to the posterior extremity of the body, covering entirely the series of dorsal pores above alluded to. The bands from either side converge in their extension. The limbs above are barred with greyish black. The inferior surface of head, body, and limbs is of a uniform dull yellow hue.

This species was obtained in the vicinity of Santiago, Chile.

Plate XXXIV, fig. 8 represents the profile of *Cystignathus taeniatus*, of the size of life.

fig. 9 is a view from below.

fig. 10, inferior surface of the hand.

fig. 11, inferior surface of the foot.

Figs. 10 and 11 are slightly magnified.

FAMILY OF HYLIDÆ.

Genus PHYLLOBATES, Dum. & B.

GEN. CHAR. Snout protruding over the lower jaw; tongue free posteriorly upon a considerable portion of its length; no teeth on the palate; tympanum visible; tubes of eustachii small; fingers and toes slightly depressed, entirely free, dilated upon their extremity into a disk slightly convex below and above, the latter surface being provided upon its middle with a small groove. Protrusion of the first cuneiform bone very little developed; transverse apophysis of the sacral vertebræ not dilated.

SYN. *Phyllobates*, DUM. & B. Erp. Gén. VIII, 1841, 637.

OBS. The shape of the snout reminds us of *Elosia*, but the latter is provided with palatine teeth.

PHYLLOBATES AURATUS, Girard.

PLATE XXXIV, Figs. 12—15.

SPEC. CHAR. Tongue narrow and elongated, free for about the half or two-thirds of its length; anterior limbs, when stretched backwards, reaching the vent with the tip of longest finger; inferior surface of thighs granular; color uniform bluish brown.

SYN. *Phyllobates auratus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 226.

DESCR. The body is elongated and depressed, as well as the head, which constitutes a little less than the third of the whole length; seen from above, the head is subtriangular, subtruncated anteriorly, and sloping inwardly. The nostrils are small, situated on the sides and towards the tip of the snout, and not to be seen from above; the sides of the head are declivous. The eyes are well developed, subelliptical in form, their horizontal diameter being equal to the distance between the anterior rim of the orbit and the tip of the snout, and comprised a little over twice upon the distance between the external margins of the upper eyelids. The tympanum is well developed, oblong in shape, and vertically situated close to the orbit. The angle of the mouth extends as far back as the posterior rim of the orbit. The tongue is narrow and elongated, posteriorly obtuse, and free for about the half or two-thirds of its length. The inner nares are very large and subcircular, situated far apart on the sides of the roof of the mouth, which is concave and perfectly smooth, there being no teeth on either the vomer or palatine bones. The openings for the tubes of eustachii are small, and not conspicuous. The anterior limbs are slender, the fingers stretching beyond the groin. The fingers are free, slender, depressed, and dilated upon their tips; upper surface of the dilation divided by a medial groove or furrow. There is a large metacarpal tubercle; smaller tubercles are observed under the first phalanx, and under the second of the two external fingers. The palm of the hand is smooth. The first finger is longer than the second; the fourth is the shortest, and the most slender of all. The hind limbs are stoutish, one-fourth longer than the body and head together—the tibia being more developed than the femur. The toes are free, slender, depressed and dilated upon their extremities, and grooved above in the same manner as the fingers. The sole of the foot is smooth, and the inferior surface of all the phalanges provided with very small tubercles. The internal metatarsal tubercle is elongated, the external one rounded; both of moderate development. The inferior surface of the thighs is granular; the skin is otherwise perfectly smooth; its surface, under the magnifying glass, exhibits very minute pores, scarcely more developed under the belly than on the back. The color above is metallic golden, whilst beneath a uniform bluish brown predominates.

Collected by the late Professor C. B. Adams, on the island of Taboga, in the bay of Panama.

Plate XXXIV, fig. 12, represents *Phyllobates auratus* in a profile view, size of life.

fig. 13, is a view from beneath.

fig. 14, a hand, seen from below.

fig. 15, a foot, also from below.

Figs. 14 and 15 are slightly magnified.

 OPHIDIA.

FAMILY OF VIPERIDÆ.

Genus ELAPS, Schn.

GEN. CHAR. Body slender and cylindrical; tail short and conical; head somewhat depressed—in most cases continuous with the body, subelliptical when viewed from above, tapering for-

wards, and covered above with plates, generally nine in number; no pit between the eye and nostril; loreal plate present; mouth moderately cleft, not dilatible; upper jaw furnished on either side and quite posteriorly with a poisonous fang; scales smooth; preanal sentella bifid; subcaudal sentellæ divided.

SYN. *Elaps*, SCHN. Hist. Amph. Nat. and Lit. 1801, 289.

FITZ. N. Class. Rept. 1826, 33.

B. & G. Cat. Rept. N. Amer. I, 1853, 21.

OBS. The characteristic of the genus *Elaps*, as given above, we wish it to be understood, is merely provisional, not having had at our command a sufficient number of the species described by the different authors. We reserve it for another occasion to revise its diagnosis in a manner satisfactory both to our mind and to the actual state of herpetology.

ELAPS NIGROCINCTUS, Girard.

PLATE XXXV, Figs. 1—6.

SPEC. CHAR. Head subelliptical, broader than the body, which is long and cylindrical; tail conical, abruptly tapering from its base; scales smooth, disposed upon fifteen rows; color reddish, annulated with jet black; tip of scales blackish; anterior portion of head black; an occipito-temporal yellowish ring; tip of tail black.

SYN. *Elaps nigrocinctus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 226.

DESCR. The head is slightly detached from the body by a somewhat contracted neck. The eyes are very small, situated near the upper surface of the head, their diameter being equal to the width of the suroculary plate. The snout is obtusely rounded. The vertical plate is moderately elongated and subpentagonal, pointed posteriorly; its anterior margin is sometimes perfectly straight, at others subconvex, so as to assume a subhexagonal shape. The occipitals are large, broad, and elongated, subrounded exteriorly, truncated anteriorly, permitting the posterior angle of the vertical to engage between them. The suroculary is short, a little longer than broad, and irregular in its outline, which is five-sided; the side limiting the orbit above being slightly concave, the others nearly straight. The postfrontals are well developed, broader than long, and irregularly six-sided, sending an angular projection towards the sides of the head, where it engages between the ante-orbital and postnasal plates, without, however, reaching the labials. The prefrontals are subquadrangular, broader than long, their external margin reaching the upper edge of the nostrils. The rostral is broadly developed, rather short, subpyramidal in form, and concave beneath. The nasals are well developed, the posterior one being nearly as long as the anterior is high. The nostrils are small and circular, intermediate between the two nasal plates. The anteorbital is irregularly triangular, rather elongated, and similar in shape to the postnasal, the anterior angle of which meets its own posterior angle a little in advance of the commissure between the second and third labials. The postorbitals, two in number, are nearly equal in size, and subpentagonal in shape. There are three temporal shields well developed, the posterior one being the largest. We observe seven upper labials, increasing in size from the first or anterior to the sixth inclusive; the seventh is a little smaller than the sixth; the third and fourth forming part of the orbit. There are six lower labials, of which the fourth is the largest, and much expanded beneath; the fifth is nearly equal to the third; the sixth is a little smaller than the latter; the second is the smallest. The symphyseal plate is triangular. The mental shields constitute three pairs; the anterior two being parallel to one another; the third is obliquely situated along the margin of the

fourth, fifth, and sixth lower labials. The body is subcylindrical, a little more slender anteriorly than posteriorly. The tail is short, subconical, and tapering to a point; it forms but the two-twenty-first part of the whole length. The scales are perfectly smooth, constituting fifteen longitudinal rows, larger in the outermost row, and smallest upon the dorsal line or middle row. The scales themselves are acuminate posteriorly. On the tail they are shorter, and truncated posteriorly, constituting seven rows upon its origin, and three only towards its tip. The abdominal scutellæ are two hundred and eighteen in number: the preanal is bifid. The subcaudal scutellæ are all bifid, and constitute thirty-six pairs. The tip of the tail is conical in the adult state, and somewhat acute in young specimens.

Abd. sc. 217 + 1. Subc. sc. 18. Dors. rows 15. Total length 29 inches; tail $2\frac{7}{10}$.

The body is reddish, annulated with jet black. The anterior part of the head from behind the eye is black, then follows a yellow ring, embracing in its width almost the whole length of the occipital plate, and just behind it the first black ring, embracing the posterior part of the head and neck, covering about six scales. There are fifteen more black rings hence to the tail, each covering about three scales. The intermediate red spaces embrace anteriorly fourteen scales, ten upon the middle region of the body, and eight towards the tail. There is an obsolete indication of a yellow margin to the anterior two black rings. The scales in the red spaces are tipped with black on the tail; the black rings are much wider than the red ones, there being three of each kind; the tip is black. The inferior surface is reddish-yellow sparsely spread over with small and irregular black spots.

Specimens of this species were collected at Taboga, on the bay of Panama, Central America.

Plate XXXV, fig. 1, represents *Elaps nigrocinctus*, of the size of life.

fig. 2, a view of the head, seen from above.

fig. 3, a side view of the head.

fig. 4, the head, seen from below.

fig. 5, shows the vent and the bifid preanal scutella.

fig. 6, is a portion of the left side of the body, showing the shape and number of rows of scales.

Figs. 2—5 are slightly magnified.

FAMILY OF OXYCEPHALIDÆ.

Genus DRYOPHIS, Fitz.

GEN. CHAR. Body and tail long and slender. Cephalic plates normal. Eyes large. One anteorbital plate; several postorbitals. No loreal. One nasal, with nostril in its middle. Rostral situated under the snout, which protrudes over the lower jaw. Several labials constituting the inferior rim of orbit. Dorsal scales smooth. The last two abdominal scutellæ bifid; subcaudals all bifid.

SYN. *Dryophis*, FITZ. N. Class. Rept. 1826, 29 and 60.

DRYOPHIS VITTATUS, Girard.

PLATE XXXVI, Figs. 1—6.

SPEC. CHAR. Three postorbital plates, two of which constituting the posterior rim of the orbit, the third being placed behind them. Fifth, sixth, and seventh, or fourth, fifth, and sixth labials

constructing the inferior rim of the orbit. A black vitta along the upper margin of upper maxillary plates extending posteriorly along a portion of the neck.

SYN. *Dryophis vittatus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 226.

DESCR. The entire length of the specimen figured is forty-seven inches, of which eleven belong to the tail. The head measures about one inch and an eighth. Its upper surface is flattened; the inferior one subconvex, and the sides perpendicular. The eye is large and circular, and its diameter is comprised about six times in the length of the head. The snout is tapering, the upper jaw protruding considerably over the lower. The rostral plate is rather small, subrescentic, convex anteriorly, and depressed upon its middle surface. It is obliquely situated at the inferior surface of the snout, showing but a very narrow edge in a view from above (fig. 2). The prefrontals are twice as long as broad upon the middle of their length; they belong exclusively to the upper surface of the head. The postfrontals are much larger than the latter, one-third longer upon their upper surface, and extend upon the sides of the head until they reach the upper labials. The vertical is elongated and slender, subtruncated anteriorly, and subacute posteriorly, engaging between the inner margins of the occipitals. The latter are as long as the vertical, but broader anteriorly; their external margin being defined by an undulating line. The superciliaries are a little longer than the postfrontals, subtriangular in shape; the summit of the triangle directed forwards. There is a long and narrow nasal, in which, and rather in advance of the middle of its length, the nostril opens subangular in shape. There is no loreal; but the lateral expansion of the postfrontals fills up the space between the nasal plate and a large anteorbital, much broader upwards than downwards, slightly visible in a view from above (fig. 2). Its anterior angle fits a notch in the posterior margin of the postfrontals, upon the line of demarcation between the sides and upper part of the head. The postorbitals are rather small, and three in number; two upon an anterior line, the lowermost being much the smallest of the two. A third, very small, is situated immediately behind the latter. Three large and subequal temporals terminate the series of cephalic plates and shields. The upper labials are nine in number; the posterior one being the longest and largest of all, and the anterior one the most slender. The fifth, sixth, and seventh constitute on the right side the inferior rim of the orbit, though the fifth and seventh only in part. On the left (fig. 3) there is one labial less. The lower labials are likewise nine in number; the fifth and sixth, situated beneath the eye, are the largest; the others diminishing gradually in size towards the anterior and posterior regions. The symphyseal or anterior odd lower labial is small, and rounded exteriorly. There are three pairs of elongated mental shields, the anterior pair reaching the margin of the jaw between the symphyseal and the first lower labial. The subgular scales are well developed and elongated.

The body is subcylindrical, much thinner anteriorly than posteriorly, the neck having about the thickness of the tail upon its anterior third. The scales are smooth, elongated, and acute posteriorly, constituting seventeen longitudinal rows upon the middle of the body, and twelve towards its posterior extremity. The external row, nearest to the abdominal scutellæ, is composed of the largest scales. The abdominal scutellæ, one hundred and ninety-five in number, are rather wide, convex upon their posterior margin; the posterior two are bifid. The tail is very slender, and tapering to a point; there are six rows of scales upon its anterior portion, near its origin; they are, moreover, broader and shorter than those on the body. The subcaudal scutellæ constitute a double row to nearly the tip of the tail, where scutellæ and scales assume a uniform aspect. One hundred and sixty-five pairs of the latter may distinctly be enumerated. Beyond that number verticils of scales surround the remaining portion of the tail.

Abd. sc. 193 + 2. Subc. sc. 165. Dors. rows 17 and 12. Total length, 47 inches; tail, 18 inches.

The coloration must be much altered by the action of the alcoholic liquor in which the specimen

is preserved. The upper surface and sides of heads are olivaceous brown, and the body and tail above purplish grey. Beneath and anteriorly the hue is of a soiled white, whilst posteriorly it is greyish yellow. The upper labials have the same hue as the lower surface of head. A black line may be traced along the upper margin of the upper labials, from the snout to about an inch and a half along the sides of the neck. Along the back and sides of the anterior part of the body there are oblique series of jet black elongated spots. The lower and inner margin of the scales is whitish, and apparent only when the skin is extended and the whole surface of the scales exposed. The posterior portion of the body is sparsely dotted with black; the tail is unicolor.

This species figured was collected on the island of Taboga, bay of Panama.

Plate XXXVI, fig. 1, represents *Dryophis vittatus*, of the size of life.

fig. 2, view of the head, seen from above.

fig. 3, side view of the head.

fig. 4, under view of the head.

fig. 5, vent and post-abdominal scutella.

fig. 6, a portion of the left side of the body, showing the form and number of longitudinal rows of scales.

FAMILY OF COLUBRIDÆ.

Genus TACHYMENIS, Wiegman.

GEN. CHAR. Body subcylindrical, of moderate length; tail short, subconical, tapering. Head colubrine slightly detached from the body. Cephalic plates normal. Eyes of medium size. One or two anteorbitals and two postorbitals. One loreal. Two nasals, with nostril between them. Jaws subequal. Dorsal scales smooth. Preanal scutella bifid. Subcaudal scutellæ all divided.

SYN. *Tachymenis*, WIEGM. in Nov. Act. Phys. Med. Acad. Nat. Cur. XVII. 1. 1835, 251.

OBS. The genus *Tachymenis* is, so far, composed of two species, one from Peru figured and described by Wiegmann in the work cited above, and another from Chile, described below.

TACHYMENIS CHILENSIS, Girard.

PLATE XXXVII, Figs. 1—6.

SPEC. CHAR. Two anteorbitals. Third and fourth labials constituting the inferior rim of the orbit. Dorsal scales in nineteen rows. Olivaceous brown above, with crossing lines of black. Beneath yellowish, with anterior margin of scutellæ black. Two postocular black vittæ.

SYN. *Coronella chilensis*, SCHL. Ess. Phys. Serp. Part. descr. 1800, 30.

GUICH. in Gay, Hist. de Chile, Zool. II, 1848, 79. Erpet. Plate iv, fig. 1, a, b, c, d.
Dipsas chilensis, DUM. Mém. Acad. des Sc. XXIII, 1853, 112.

DUM. & B. Erp. gén. VII. 1, 1854, 608.

Tachymenis chilensis, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 226.

GEN. REM. Of the three specimens that were collected, the one which is figured is the largest, and yet not fully grown. Though immature, we propose to describe them carefully, since the figure in the Historia de Chile is not as accurate as might be desired. We have seen upon specimens of others species, the zoological characters entirely developed when they bore the same relations towards their adult as those now before us.

DESCR. The head is subovoid, being depressed upon its upper surface; the snout is rounded, and the eye, subcircular in shape, is of moderate development, its diameter being equal to the width of the vertical plate upon the middle of its length. The vertical plate is large and sub-pentagonal, either slightly concave upon its sides or linear; its posterior extremity being moderately angular. The occipitals are a little shorter than the vertical, but anteriorly nearly as broad. The postfrontals are broader than long, extending but little to the sides of the head, being posteriorly rounded. The prefrontals are subtriangular, irregularly rounded off, and do not reach the nostrils. The rostral is subconical, concave beneath. The nostrils are small and subelliptical, situated between two plates the sutures of which are sometimes obliterated either above or below these apertures. The loreal is quadrangular and larger than either the post or prenasals, which have the same general shape. There are two anteorbitals; the uppermost is longer than high, and a little longer than the lower one, which is rather narrow and elongated; also two postorbitals nearly equal in size and similar in shape. The temporal shields, seven or eight in number, are so small and so much like the scales, that there are only two that may readily be distinguished from the latter by their shape. The upper labials are seven in number: the fifth being the largest, the sixth is the next in size, then the fourth, the third, and the second; the seventh is a little larger than the first, which is the smallest of all. The third and fourth constitute the inferior rim of the orbit; their suture being situated beneath the pupil. The symphyseal is triangular; the lower labials, being nine in number, diminish in size both forwards and backwards from the fifth, which is the largest of all; the seventh, eighth, and ninth are rather narrow and elongated, whilst the four anterior are higher than long. The first one in particular is nearly twice the height of the second, and separates entirely the symphyseal from the anterior mental shields, of which it assumes the general feature. There are two pairs of mental shields of about the same length, but the posterior pair is more slender and posteriorly subacute.

The body is subcylindrical, thickest upon its middle, tapering both posteriorly and anteriorly where a somewhat contracted neck separates it from the head. The tail is subconical, pointed posteriorly, rather short, constituting about the sixth part of the entire length. The scales are smooth, disposed upon nineteen longitudinal series; they are subacute posteriorly, and largest upon the external series, gradually diminishing hence to the central or dorsal series. On the nape and under the head they are the smallest. The abdominal region is rather narrow. There are one hundred and fifty-five abdominal scutellæ, the posterior one being bifid, and forty-three subcaudal scutellæ, all of which bifid.

Abd. sc. 154 + 1. Subc. sc. 43. Dors. rows 19. Total length 15 inches and $\frac{3}{10}$; tail $2\frac{1}{2}$ inches.

The ground-color appears now olivaceous brown above, yellowish beneath. The anterior margin of the abdominal scutellæ being jet black with a subtriangular blotch upon their middle region, and occasionally also upon their extremities, the lower surface of the body may assume quite a maculated appearance. The anterior margin of all the scales is black, but when in their normal and imbricated state, the black is not seen externally except upon the fourth and eighth series on either side, thus constituting two pair of obsolete vittæ. The middle dorsal series exhibits likewise the black margin of its scales, though in a less conspicuous manner as the specimens grow to a larger size. In the very immature condition almost every scale shows its black edge, constituting irregular zigzag lines. The dorsal vittæ sometimes assume the appearance of a series of double crescents contiguous upon their convexity: this is owing to the fact of the black extending along the sides of the scales. The lateral vittæ, from the neck ascend to the occipital region of the head, the sides of which are marked by two narrow black stripes, the upper one slightly arched, extending from the posterior rim of the orbit to the angle of the mouth; the other runs obliquely from the lower rim of the orbit, across the fourth and fifth labials to the edge of the mouth.

This species was collected in the vicinity of Santiago, Chile.

Plate XXXVI, fig. 1, represents *Tachymenis chilensis*, size of life.

fig. 2, the head viewed from above.

fig. 3, a side view of same.

fig. 4, a view of its inferior surface.

fig. 5, exhibits the vent and post-abdominal scutella.

fig. 6, is a portion of the left side showing the form of the scales and the number of their series.

Figs. 2—5 are slightly magnified.

Genus TAENIOPHIS, Girard.

GEN. CHAR. Head depressed and detached from the body, which is slender and subcylindrical. Tail tapering to a point, and comparatively short. Cephalic plates normal. One anteorbital, and two postorbitals. An elongated, quadrangular loreal. Two nasals, nostril between them. Eyes above the median size, situated above the fourth and fifth labials; pupil circular. Mouth deeply cleft. Scales smooth, disposed upon nineteen longitudinal series. Post-abdominal scutella bifid; subcaudal scutellæ all divided. Colors disposed upon uniform longitudinal bands.

SYN. *Taeniophis*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 226.

OBS. This genus is closely related to *Diadophis*, and may be distinguished from it by the presence of one anteorbital plate only, a larger number of longitudinal rows of scales, and the distribution of its colors.

It includes, so far, two species, both of which are new to science. One, an inhabitant of Chile, is described below; the other (*T. imperialis*, B. & G.) is Mexican: a specimen in the Smithsonian museum having been found at Matamoras.

TAENIOPHIS TANTILLUS, Girard.

PLATE XXXVII, Figs. 7—12.

SPEC. CHAR. Body and tail very slender. Head elongated, and very distinct from the body. Eyes proportionally large. A deep chestnut-brown band along the dorsal region; light brown on the sides. Beneath greenish or yellowish grey. Upper labials yellowish-white. A superciliary yellowish filet.

SYN. *Taeniophis tantillus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 227.

DESCR. The body is small, slender, and elongated; the tail conical and tapering, forming about the two sevenths of the total length. The head is small, well detached from the body by a contracted neck, depressed above, and declive upon the region anterior to the eye. The snout is obtuse. The eye is very large, and subcircular; its horizontal diameter being comprised once and a half across the ocular region of the head, embracing the vertical and superciliary plates; the pupil is circular. The nostrils are quite small, subcircular in shape, and situated between two nasal plates, though encroaching more upon the prenasal than upon the postnasal, which is slightly the largest of the two. The vertical plate is large, broadest anteriorly, rounded or subconvex upon its margin, subconcave upon the sides, and triangularly acute posteriorly. The occipital plates are larger than the vertical, and are externally rounded. The postfrontals are irregularly five-sided, and extend slightly to the sides of the head. The prefrontals are subtriangular, externally rounded. The rostral is broad but rather low, convex

upon its upper margin, and very concave below. The postnasal is slightly larger than the prenasal. The loreal is elongated and subtrapezoid. There is but one anteorbital, very narrow upon its lower portion, quite broad across the superciliary line, and extending to the upper surface of the head under the shape of a small triangle, the summit of which being contiguous to the lateral anterior edge of the vertical, thus preventing a contact between the postfrontals and the superciliaries. The latter are well developed, narrowest anteriorly. There are two postorbitals, the uppermost being twice the size of the lower. Two temporal shields only can be distinguished by their form from the occipital scales. The upper labials are eight in number, the fourth and fifth forming the inferior rim of the orbit; the fifth, sixth, and seventh are the largest; the fourth is a little larger than the eighth, the anterior three being the smallest. There are ten inferior labials, and a symphyseal, quite small and triangular. The first extends to the anterior pair of mental shields; the second and third are the smallest of the three; the fourth, seventh, eighth, ninth, and tenth are nearly equal; the sixth is the largest, and the fifth somewhat smaller than the sixth. The posterior pair of mental shields is more slender than the anterior pair, but nearly of the same length. The abdominal scutellæ are a hundred and ninety-five in number; the posterior is bifid. There are about a hundred and ten subcaudal scutellæ, all of which are subdivided. The scales are elongated and posteriorly subacute, smooth and disposed upon nineteen longitudinal series, the two outermost of which being the largest; the others diminishing slightly towards the dorsal region.

Abd. sc. 194+1. Subc. sc. 110. Dors. rows 19. Total length, 12 inches; tail, 3 inches and $\frac{3}{10}$.

The ground-color of the sides of the body is light brown, minutely dotted with black. On the back there is a band of deep chestnut-brown margined with black, covering three longitudinal rows of scales. The two adjoining rows are partly (internally) brown and partly (externally) black. Along the neck and anterior fourth of the body each scale of the external series, covered by the dark dorsal band, has a white spot upon its middle, thus interrupting the black border. Towards the posterior part of the body the dorsal brown band covers but three series of scales, the internal margin of the adjoining series being black. Along the tail, where that band may be traced tapering towards its top, the black margin has immersed into the brown. The inferior surface of the body is uniform greenish or yellowish grey. The upper surface of the head is dark brown. A yellowish white filet or stripe extends from the rostral plate, along the superciliary ridge, to the posterior extremity of the superciliary plates. A subelliptical spot of the same hue, but margined with black, may be seen on the upper part of the upper post-orbital plate, interrupting the vitta just alluded to, and which can be traced along the external edge of the occipital plate, more conspicuous, and margined with black. The vitta extends along the neck, and eventually immerses into the dorsal band. The sides of the head are brown, and of a deeper hue than the sides of the body; the upper labial plates being also yellowish-white. A vitta of that same hue may be traced from near the top of the jaw along the neck. The inferior labials, the mental shields, and the subgular scales, exhibit each a central light spot margined with black. Two light vittæ may be followed, one on the two external rows of scales, another along the edge of the abdominal scutellæ, from beneath the throat to a considerable length backwards. The hue of the sides of the head likewise tapers along the sides of the neck for about the same distance.

Specimens of this species were obtained from the vicinity of Santiago, Chile.

Plate XXXVII, fig. 7, represents *Taeniophis tantillus*, size of life.

fig. 8, is the head, seen from above.

fig. 9, a side view of the head.

fig. 10, the head, seen from below.

fig. 11, exhibits the vent and post-abdominal scutella.

fig. 12, a portion of the left side of the body, showing the shape of the scales, their relative size, and disposition in series.

SAURIA.

FAMILY OF STELLIONIDÆ.

Genus PROCTOTRETUS, Dum. & B.

GEN. CHAR. Body rounded or slightly depressed, covered with imbricated scales; the upper ones carinated, the inferior ones generally smooth; neither a dorsal nor a caudal crest; head subpyramido-quadrangular, more or less depressed; cephalic plates moderate, polygonal; occipital generally not very conspicuous; teeth on the palate; sides of neck either folded or smooth; no subgular fold; an ear opening; membrane of tympanum but little depressed; fingers simple; tail either long or conical, or moderate and slightly depressed; no femoral pores; anal pores in the males.

SYN. *Proctotretus*, DUM. & B. Erp. gén. IV, 1837, 266.

GUICH. in GAY, Hist. de Chile, Zool. II, 1848, 23.

PROCTOTRETUS TENUIS, Dum and B.

PLATE XL, Figs. 1—4.

SPEC. CHAR. Cephalic plates usually smooth, occasionally covered with very minute granules. Auricular aperture large; its anterior margin subtubercular. One series of supralabials. Temporal plates irregularly rounded, subimbricated, subtuberculous, and of moderate development. Sides of neck folded and granular. Dorsal scales small, carinated, and posteriorly obtuse; lateral scales smaller, not imbricated, provided with a rudimentary carina; abdominal scutellæ smooth and mostly entire. Posterior surface of thighs minutely granular. Tail long and slender. Brownish-black, with transverse subrescentic black bands.

SYN. *Proctotretus tenuis*, DUM. & B. Erp. gén. IV, 1837, 279.

BELL, Zool. of the Beagle, V, Rept. 1843, 7, Plate iii, fig. 2.

GUICH. in GAY, Hist. Chile, II, 1848, 32, Erp. Plate i, fig. 1.

HOMER. and JACQ. Voy. au Pole Sud et dans l'Océanie, Plate ii, fig. 2.

DESCR. The form, although slender in its general aspect, is less a characteristic of this species than it really is for several others of its congenere. The body is depressed; swollen upon its middle region; the limbs being of moderate development. The anterior, when stretched alongside the body, are far from attaining the groins; and the tip of the longest toe of the posterior, when the latter are brought forwards, reaches the middle region of the neck. The tail is elongated, conical, tapering to a point, and nearly twice as long as the body and head together.

The tongue is large and fleshy; elongated in shape and depressed, subanceolated, occupying the entire space between the two branches of the lower jaw. The teeth are of moderate development, smallest anteriorly, and subcylindrical; whilst posteriorly these are somewhat flattened, or else stouter upon their base.

The head is depressed, subtriangular in a view from above, and rounded upon the snout. The plates which cover its surface are generally smooth, but exhibit sometimes a very minute granulation, apparent only through a magnifying glass. The cephalic plates vary as regards both their size and number, being smallest when most numerous. In the specimen figured, there are three pairs of frontals: one pair of post-occipitals, an odd occipital, a vertical, and an odd frontal, which are somewhat larger than the rest, and nearly equal among themselves. An inner series of surocularies may be noticed as the next in size; they are separated from

the vertical or interocular, and the occipitals, by a concentric series of small plates. There is but one and a rather small nasal, in the midst of which the nostril opens, leaving but a narrow rim. The loreal region is occupied by several small plates. The anterior suborbitals are more developed than the posterior, all of which being provided with a keel along their inner margin. The surciliary ridge is composed of about six elongated, narrow, and obliquely superposed plates. The lids are covered with very small plates, the marginal series being somewhat more developed than the rest, except on the periphery of these organs, and yet may still be distinguished from the latter by their regular shape and disposition. The rostral is transversally elongated and very low. The upper labials are very elongated and very narrow, six or seven in number, increasing in length from the first to the fourth inclusive, then diminish considerably backwards. The supralabials have the same general appearance as the labials themselves, save in being a little smaller. Occasionally two or more minute plates may be observed upon the loreal region between the loreal plates proper and the supralabials. The temporal plates are of moderate development, and of nearly equal size with the post-occipitals. They are irregularly rounded, slightly imbricated, and provided either with a rudimentary tubercle or an obsolete carina. The symphyseal is larger than the rostral, and especially broader upon its middle region. The inferior labials (five or six in number) are broader than the upper, more conspicuous therefore, and diminishing gradually backwards. There are four or five pairs of mental shields: the anterior pair being the largest and contiguous upon their inner margin, whilst the other pairs diverge, and gradually diminish in size backwards. Between the mental shields and lower labial plates there exists a complete series, and part of a second, of small infralabials. The inferior surface of the head, the throat, the belly, the pre-anal region, thighs, and legs, are covered with smooth, posteriorly obtuse, and generally entire scales or scutellæ of moderate development, a little smaller under the head and larger under the hind limbs; some few on the sides of the belly exhibiting a small notch posteriorly. The sides of the neck, the insertion of the limbs, the interior surface of the forearm, and the posterior surface of the thighs, are granular. On the sides of the abdomen the scales are irregularly rounded, subtuberculous, or subcarinated, and smaller than those on the dorsal region, which are distinctly, though moderately, carinated, and posteriorly obtuse. The upper surface of the limbs and the inferior surface of the arm are covered with scales similar in shape and structure to those on the back; on the palm of the hands and the sole of the feet they are much smaller, acute posteriorly, and distinctly carinated; around the fingers and toes they constitute irregular verticils—the superior ones being more irregular in size than the inferior, and less distinctly carinated. The inner or first finger is the smallest; the outermost is the next in length; then the second; then the third, which is nearly as long as the fourth, which is the longest. The nails are rather short, compressed, acerated upon their extremity, and gently curved. The first toe is the smallest; the second is the next in length; then the fifth; then the third; the fourth is the longest. Their nails do not differ materially from those of the fingers. The scales which cover the tail are the most conspicuous of all; they constitute oblique series upon the base of that organ, and annular rows further backwards. The oblique series have the same shape as those of the back. Those constituting the annular rows are superiorly subquadrangular and elongated, with their carina oblique; whilst beneath, they become much narrower, posteriorly acute, with a straight carina along their middle region.

The ground-color is blackish brown in the male, and greenish brown in the female; in either sex there are two parallel series of transverse black bands, convex anteriorly, margined with a whitish, or else a lighter tint along their concavity. These bands, however, are more conspicuous in the female than in the male. They may be traced from the head, on each side of the dorsal region, to the posterior extremity of the body, where the series, from either side, combine more or less into one, which extends along the upper surface of the tail. The limbs, as well as the tail, are transversally barred with black. In the female, the dorsal region and the flanks are either dotted with black or spotted with whitish; whilst in the male, these spots

are either bluish, reddish, or else of a metallic green, especially on the neck. The upper surface and sides of the head are spotted with different shades of black, or dotted with yellow and black. The occipital region and the back, in the male, occasionally exhibit sinuating black lines upon a brownish ground, which itself bears bluish, greenish, or slate-colored spots. Beneath, the ground-color is whitish, vermiculated, maculated or clouded with greyish lines, spots, or dots. That region sometimes is unicolor in the female.

This species appears to be quite abundant in the vicinity of Santiago, Chile, whence numerous specimens were obtained and preserved.

Plate XXXVIII, fig. 1, represents a profile view of the female sex of *Proctotretus tenuis*, size of life.

fig. 2, is an under view, showing the structure of that region.

fig. 3, is an upper view of the head.

fig. 4, a side view of the head.

Figs. 2, 3, and 4, are slightly magnified.

PROCTOTRETUS FEMORATUS, Girard.

PLATE XL, Figs. 5--12.

SPEC. CHAR. Cephalic plates rugose. Auricular aperture moderate, provided with an arched plate upon its supero-anterior margin, and one or two conical scales beneath and upon the same anterior margin. One series of supralabials. Temporal shields well developed, imbricated and carinated. Sides of neck with but one inconspicuous fold, and covered with small carinated scales. Dorsal scales large, carinated, posteriorly acute, and diminishing in size towards the sides. Abdominal scutellæ smooth and entire. Posterior surface of thighs granular. Tail elongated and slender. Brownish, with two parallel light vittæ on either side, and two series of black spots. Abdomen whitish, unicolor; inferior surface of head with greyish, irregularly broken lines.

SYN. *Proctotretus femoratus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 227.

DESCR. This species has the same slender aspect as *P. tenuis*, the limbs and tail being developed nearly in the same proportions. The body, mayhap, is a little shorter, and more slender still. The tongue and teeth present the same general shape and structure. The head is depressed, and quite declive from the frontal region towards the snout. Viewed from above, it is subtriangular, subtruncated anteriorly. The cephalic plates are of moderate development; exhibiting upon their surface sinuating, subtubercular ridges, which give to that region a rugose appearance. The vertical, a pair of post-occipitals, and two pairs of postfrontals may be distinguished, amid their number, as the largest. Three postinternal surocularies hold the same relations towards their analogues as the former; a concentric chain being observed upon the inner margin of the surface of the upper lid. The perforation of the nostrils takes place through one single plate more towards its posterior or inferior edge than the anterior. The loreal region being considerably reduced by the declivity of the frontal region, there are but one or two loreal plates. The suborbital chain is composed of three narrow and elongated plates, provided internally with a conspicuous and sharp ridge or crest; the longest occupying the inferior rim of the orbit and the other two its anterior rim; whilst the posterior rim is formed by the anterior temporal plates. The surciliary ridge is composed of five or six obliquely superposed plates, smallest posteriorly. The surface of the lids is granular; their margins being provided with a series of very small plates. The rostral is transversally elongated and

very low. The upper labials are elongated and narrow, six in number, increasing in size from the first to the fourth, which is the longest, then diminishing again posteriorly. The supra-labial series is composed of about an equal number of similar plates but narrower still. The symphyseal is larger than the rostral, and especially broader upon its middle region. The inferior labials, six or seven in number, are broader than the upper, diminishing gradually backwards. There are four pairs of mental shields; the anterior pair is the largest, contiguous upon the inner margins, whilst the other pairs diverge in diminishing in size posteriorly. A series of infra-labials may be traced from the angle of the mouth to between a portion of the first inferior labial plate and anterior mental shield. The temporal plates are well developed, particularly towards the upper region; they are posteriorly obtuse, imbricated, and distinctly carinated. The side of the neck, which exhibits a very obsolete fold, is covered with small, acute, and carinated scales. The posterior margin of the auricular aperture and region of the shoulder are minutely granular. The dorsal scales are rather large upon the back, diminishing in size towards the middle of the flank, being carinated and acute posteriorly. The inferior half of the flanks are covered with scales or scutellæ similar to those which exist upon the belly, being only a little smaller and obsoletely carinated upwards. The abdominal scutellæ or scales are smooth, obtuse posteriorly, and rather smaller than the dorsal scales. Under the head and throat they do not differ materially from those on the abdomen, but are a little larger under the head than under the throat: their posterior margin is entire. If an obsolete notch is to be observed at all, it is in those occupying the flanks, but that notch may be owing to the fact that the carinæ do not always extend to the posterior margin. The upper surface of the anterior limbs is covered with scales similar to, but smaller than those on the back, obtuse and smooth upon the anterior region and the carpus. Under the forearm they are very small and smooth, increasing in size under the arm, and again diminishing towards the palm of the hand, which is entirely covered with them, and not only carinated and posteriorly acerated, but provided also with a lateral acute processus, particularly developed upon the metacarpal region. The fingers above are plated and smooth; beneath they are provided with small scales, carinated, acerated posteriorly and disposed upon regular transverse rows. The fingers have the same relative length, and the nails the same form as in *P. tenuis*. The hind limbs and the tarsi are covered above with scales similar, but smaller than those on the back, and larger than on the fore limbs, carinated even on the tarsi. The anterior tibio-metatarsal region is distinguished by very small scales, almost passing to the granular aspect. The posterior surface of the thighs is granular; whilst their inferior surface is covered anteriorly with scutellæ similar to those of the abdomen, and posteriorly with three or four series of scales, somewhat acute and projecting beyond the surface of that organ, the external series being the most developed. On the inferior surface of the femoral region the scutellæ or scales are subcarinated and well developed, the external series projecting a little beyond the surface of the organ. On the sole of the feet the scales are quite small, acute, and more distinctly carinated. The toes are surrounded with small subverticillated scales, more uniform and more distinctly carinated beneath than above. The proportional length of the toes and the form of the nails is the same as in *P. tenuis*. The caudal scales have likewise the same general structure; there being, however, no contrast in size between them and those of the back, though a little larger on the base of that organ. The ground-color is brown, olivaceous, or blackish. The upper surface of the head is either unicolor or dotted with blackish; its sides generally exhibit two or three oblique and black lines extending from beneath the orbit towards either the margin or the angle of the mouth. The suborbital ridge may be black also. There are two parallel light vittæ on the sides of the body, the uppermost extending from the surciliary ridge to a portion of the tail; the lower one extends from the temporal region across the upper edge of the auricular aperture, and above the insertion of fore limbs to the groin. The dorsal region sometimes is lighter than the sides, and appears like another broad vitta. There are two series of black, transversally elongated spots, with a light or bluish margin; the intermediate space

being dark brown. The first series stretches immediately along the inner margin of the upper vitta; the second is enclosed between the two vittæ. The lower half of the flanks, beneath the inferior vitta, is covered with irregularly vertical or rounded black spots. The inferior surface of the body is unicolor whitish or greyish; numerous interrupted series of linear spots are observed under the head and inferior portion of its sides. The vittæ upon the latter regions are margined with black. There is an irregular black spot at the shoulder close to the insertion of the fore limbs. The series of dorsal spots extends along the upper surface and sides of the tail; the latter is maculated with greyish below. The limbs above are transversally barred, and beneath they are of the same hue as the abdomen.

In some, probably male specimens, the vittæ and spots are less distinct, and immerge into the ground-color. The sides of the abdomen are of a reddish metallic hue, with black and bluish small spots.

Specimens of this species were collected in the vicinity of Santiago, Chile.

Plate XXXVIII, fig. 5, represents the profile of *Proctotretus femoratus*, size of life.

fig. 6, is the head, seen from above.

fig. 7, a side view of the head.

fig. 8, the head, from below.

fig. 9, shows the inferior surface of the anterior limb.

fig. 10, the inferior surface of the posterior limb and the vent also.

fig. 11, some dorsal scales.

fig. 12, some abdominal scutellæ.

Figs. 6—12 are slightly magnified, in order to show readily the structures they are intended to represent.

PROCTOTRETUS STANTONI, Girard.

PLATE XL, Figs. 13—20.

SPEC. CHAR. Cephalic plates rugose. Auricular aperture moderate, margined anteriorly with very small scales, one of which is larger than the rest. One series of supralabials. Temporal shields well developed, subrounded, imbricated, and carinated. Sides of neck with one indistinct fold, and covered with acute and carinated scales, a little smaller than those of the back, which are large, posteriorly subacute, and strongly carinated. Abdominal scutellæ rounded posteriorly and slightly carinated. Posterior surface of thighs granular. Tail elongated and slender. Ground-color deep brown, with a reddish tint posteriorly; two parallel vittæ on the sides. Abdomen unicolor, with metallic reflections.

SYN. *Proctotretus stantoni*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 227.

DESCR. The specimen figured—the only one in our possession—is of a rather small size, and, in all likelihood, not fully grown. It resembles, in general appearance, *P. gracilis*, particularly in its system of coloration, differing, however, in too many peculiarities of structure to dwell at all upon that external resemblance.

The head is very depressed and sloping upon the frontal distance. Seen from above, its shape is subovoid, rather narrow anteriorly. The cephalic plates, the surface of which is slightly rugose, are well developed, and the frontals symmetrically arranged; thus we find two pairs of small prefrontals and three pairs of considerably larger postfrontals, separated by a transverse series of three plates, the middle one of which is much larger than the adjoining two, though itself equal to the smallest postfrontals. There is a vertical of medium size, a

small, odd occipital, on each side of which, and immediately in advance of a large pair of post-occipitals, is seen a pair of small plates. Two more pairs, equal in size to the last, may be observed on either side of the large post-occipitals, and finally, behind the latter a series or two of quite small plates, limiting the occipital region. The nostrils open in one single plate; there are three lorals, one forming the continuation of the surciliary ridge, above which and the nasal, between these and the frontals, there are four minute, elongated plates irregularly disposed. The surciliary ridge is composed of six obliquely superposed laminae. The surocularies are nearly as large as the prefrontals, and surrounded by a series of small plates. The suborbital series consists of two plates only, a very long one beneath the orbit, and another rather small anteriorly, their inner crest or ridge being well marked. The posterior rim of the orbit is margined by small plates alike the temporal group. The surface of the lids is minutely granular; their margin is provided with a double series of very narrow, elongated, and very small plates. The rostral is transversally elongated, but quite low, or else narrow. The upper labials, five in number, are very narrow and elongated, increasing in length from the first to the fourth inclusive; the fifth is equal to the first. The supralabials are very exiguous; the middle ones being the longest. The symphyseal is larger than the rostral. The inferior labials, four in number, gradually lose their width posteriorly; the third is the longest; the fourth is the smallest of all. There are five pairs of mental shields, diminishing in size posteriorly; the shields of the anterior pair being contiguous upon their inner margin. Between the inferior labials and the mentals a triple series of elongated scutellæ or shields may be observed, one series only extending to the posterior half of the anterior inferior labial and anterior mental shield. The temporal shields are well developed, slightly imbricated, rounded posteriorly, and carinated. The neck exhibits but a slight loose elevation of the skin, and is protected by acute and carinated scales, somewhat smaller than those of the back and sides. A small space immediately behind the ear is granular, though not as minutely as about the axillæ.

The dorsal scales are large, subrhomboid, subacute posteriorly, and strongly carinated; they are smaller upon the neck, and diminish gradually in size towards the sides of the body and along the tail, where they constitute longitudinal series, instead of being arranged in verticiles or else concentrically. Upon the origin of tail their posterior margin is rounded and subacute; farther behind they gradually elongate, and the carina, instead of occupying the middle line of the scale, becomes oblique. Along the inferior surface of that organ they are more uniform and more slender.

The limbs are very slender, and, when stretched alongside with the body, the anterior do not reach the setting on of the thighs, and the posterior the ear opening, in which respects, as in many others, this species may be distinguished from *P. gracilis*. The upper surface of these organs, from their origin to the tip of the fingers, is covered with carinated scales, similar in shape, though a little smaller than those of the sides of the back. They are plate-like on the upper surface of the fingers, and obsolete carinated. On the palm of the hands and sole of the feet they are the smallest of all, except on the interior surface of the arm and the anterior tibio-metatarsal region, where they approximate the granular aspect of the posterior surface of the thighs.

The inferior surface of the head, neck, and abdomen, is covered with uniform scutellæ, somewhat smaller under the neck, and likewise diminishing in size towards the sides of the abdomen. The average size of these scutellæ is smaller than the dorsal scales. Their posterior margin is rounded, and their surface slightly carinated from the chin to the preanal region, on the margin of which there are very small plates. The postanal region is granulated like the posterior surface of the thighs.

The ground-color is uniform deep brown, with a reddish tint from the posterior third of the body to half the length of the tail. The sides bear two parallel light vittæ, the uppermost extending from the occiput to the base of the tail, the other from the auditive aperture to the setting on of the hind legs. The inferior surface is unicolor, whitish or yellowish, with a me-

tallic tint of purplish under the head, greenish under the chest, and coppery under the belly and tail.

Collected near Santiago, Chile, where the species must be scarce, judging of it by the fact that only one specimen was found amongst the numerous of the other species.

Plate XXXVIII, fig. 13, represents *Proctotretus stantoni*, in profile and of the size of life.

fig. 14, the head seen from above.

fig. 15, side view of the head.

fig. 16, under view of the head.

fig. 17, anterior limb from beneath.

fig. 18, posterior limb from beneath.

fig. 19, dorsal scales.

fig. 20, abdominal scutellæ.

Figs. 14—20 are slightly magnified.

We would not have concluded the history of the new members thus added to the "Fauna of Chile," by the exertions of the United States Naval Astronomical Expedition, without inscribing the name of one who was its father and its promoter, Hon. Fred. P. Stanton, of Tennessee. Science owes a debt of gratitude to all the enlightened men, who, by the position they hold in the councils of nations, declare themselves the patrons of scientific researches.

FAMILY OF LACERTIDÆ.

Genus APOROMERA, DUM. & B.

GEN. CHAR. Base of tongue not sheathed, bifurcated upon its extremity, covered with sub-rhomboid and subimbricated papillæ. Teeth on the palate. Intermaxillary teeth conical and simple. Maxillary teeth compressed, apart, acute, and curved; the anterior ones simple, the following notched at the summit of their anterior margin. Perforation of nostrils from behind forwards, situated on the sides of the snout, near its extremity and between three or four plates. Eyelids present. A tympanic membrane stretched inside the auditive orifice. Transverse and simple folds under the neck. Ventral scutellæ small, quadrilateral, smooth, and disposed alternately. No femoral pores. Hands terminated each by five, a little compressed, fingers, not carinated beneath. Five toes, with internal edge tubercular. Tail cyclo-tetragonal.

SYN. *Aporomera*, DUM. & B., *Erp. gén.* V. 1839, 69.

GUICH. in GAY, *Hist. de Chile, Zool.* II, 1848, 58.

OBS. This genus embraces, as yet, but two species, both South American.

APOROMERA ORNATA, Dum. & B.

PLATE XXXIX, Figs. 1—4.

SPEC. CHAR. Cephalic plates subconvex and smooth. Auricular orifice subrescentic, convex posteriorly and folded upon the latter margin. A double series of supralabial plates. Temporal shields small, polygonal, and rugose. Sides of neck folded and covered with small

subcircular scales. Dorsal scales subangular and moderate in size. Abdominal scutellæ quadrangularly elongated, disposed upon transverse series, and smooth. Tail longer than the body and head together. Above olivaceous, with four rows of black spots margined with white. Beneath yellowish white, spotted with black.

SYN. *Aporomera ornata*, DUM. & B. Erp. gén. V, 1839, 76.

GUICH. in GAY, Hist. de Chile, Zool. II, 1848, 58, Plate iii, fig. 1.

Ameiva oculata, D'ORB. Voy. Amér. mérid. Rept. Plate v, figs. 6—9.

OBS. Finding that the iconography of this species might be considerably improved, under the circumstances, we have thought that such an opportunity ought not be allowed to pass without avail. The figures detailing its external structures are such as will throw a considerable light upon what is already known of that animal by those given in *Gay's Historia de Chile*, which, when compared to ours, cannot but attract the attention of herpetologists, as exhibiting some dissimilarities in the plates which protect the head.

DESCR. The latter is subquadrangular or rather subconical, flattened upon its upper surface, and more or less swollen upon the temporal regions. The vertical plate is irregularly six-sided and broadest anteriorly. The occipitals are very numerous, most of them small and polygonal, irregularly disposed, save eight of them, occupying the middle of said region immediately behind the vertical. The foremost is very small and odd, situated in a notch of the posterior margin of the vertical. On its sides but a little behind, and obliquely disposed, are two larger plates as one pair. Immediately behind these first three, the largest of the occipitals may be observed, elongated, irregular, varying in shape, almost as large as the vertical, and having on either side a smaller plate as a second pair, exteriorly and behind which is a third pair still smaller. On some specimens two or three other pairs are observed, scarce larger than those covering the rest of the occipital region, and constituting two parallel series posteriorly to the third pair above mentioned. On the frontal region the plates are small and numerous, varying in absolute number as well as in form, and disposed without any marked regularity, save a somewhat concentric arrangement amongst the external ones; but this may not be constant in all the specimens. The rostral is broad and low, six-sided, the three upper sides concave or subconcave, the uppermost sometimes so small as to give to that plate a conico-pentagonal shape. There are three or four—one or two anterior, and two posterior—nasals. Between the nasals and the rostral is situated a conspicuous phrenic plate, exhibiting a large portion of its surface in an upper view of the head. The posterior prenasal (or prenasals) forms an oblique arch from the first upper labial to the upper portion of the nostril. The postnasals are the smallest, subquadrangular in shape, placed one above the other so as to limit equally the posterior edge of the nostrils, which is large and approximates the labials. The loreal region is occupied by three rather large plates, much higher than broad, and increasing in size from forwards backwards. The inferior orbitals, nine or ten in number, form a continuous chain from the postero-inferior part of the eye to the surciliaries, increasing in size from backwards forwards, and provided with a carina from about beneath the pupil anteriorly. Thirteen or fourteen surciliaries constitute the upper edge of the orbit; these plates are small, subequal in size, a little larger anteriorly than posteriorly, and transversely elongated upon the middle of the chain. The upper and lower lids are densely covered with a pavement of irregular and small plates, disposed in series next to the inferior orbitals, where they are somewhat larger as well as anteriorly. Upon the edge of the lids they are likewise disposed in series, but not otherwise different from those on the middle region of these organs. Upon the upper lid they assume a granular aspect owing to their much reduced size. There are from five to seven surocular plates transversely elongated, the middle one being the largest, and surrounded with small plates constituting one single series upon the region adjoining the vertex, and a double series exteriorly where these plates are the smallest of the group. The upper labials,

eleven or twelve in number, are of medium development, decreasing gradually in size posteriorly. The inferior labials, with nearly the same size, form, structure, and number as the upper, extend posteriorly to the same distance, which corresponds to a vertical line which would fall back of the eye. There is one row of small supralabials, largest anteriorly, extending from behind the first labial and beneath the nostril, to beneath the posterior half of the orbit. A second row may be traced from the second loreal to the third or fourth suborbitals; and above there are a few more, as an indication, mayhap, of a third row, at all events very obsolete. The symphyseal is transversely elongated and obtusely angular upon the line of its contact with the labials and mental shields. There are four pairs of mental shields and an odd anterior one. The posterior pair is the smallest; the next to it or third pair is the largest in some specimens, whilst in others it is the second which has the pre-eminence in that respect. The odd plate is generally equal in size to those of the largest pair. The first, second, and anterior portion of the third pair come into close contact upon their inner margin, leaving no space for smaller plates to intervene. On the lower half of the temporal region, the plate or scales, whatever called, are quite small, and very minute on the upper half. On the sides of the neck which is folded, behind the ear opening and beneath it, they assume a granular aspect; they increase somewhat in size below, being uniform under the throat and subgular folds, which are considerably developed. They are large upon an area back of the mental shields, between which and the inferior labials a series of them intervene; also sensibly larger upon the middle and posterior part of the hooid region.

The dorsal scales are uniform, moderate in size, and subcircular, disposed upon transverse irregular series from the head to the origin of tail, diminishing in size and uniformity towards the lower portion of the flanks. About the insertion of the limbs, and upon the thoracic region behind the arm, their appearance is granular.

The limbs are stoutish and well proportioned; the fore might be termed rather short, inasmuch as they do not extend much beyond the middle region of the body when stretched along its sides. But the apparent shortness of these limbs in that respect is owing to the fact that the body in this genus is proportionally much more elongated than in *Proctotretus*. The scales on the upper surface of the forearm and arm are larger than on the body; on the arm and carpus they assume the shape of scutellæ or plates, one row of which, transversely elongated, may be traced to the tips of the fingers. On the lower surface and palm of the hand they are again granular. There is a row of plates at the base of the metacarpus. The three external fingers are provided beneath with a double row of tuberculous plates, the two others with but one row, and all of them laterally with a series of small plates. The inner finger is the shortest, the external is the next in size, then the second; the third and fourth are equal in length. The nails are strong, of moderate development, compressed, acerated anteriorly, and curved: the plate, the upper and the lower, situated at their base, is the most developed of the digital series. On the upper surface of the hind legs and external half of the foot, the scales are nearly of the size of those on the back; the posterior surface is granular, as well as the sole of the foot, whilst the inferior surface and inner half of the foot are covered with scutellæ, larger under the tibial than under the femoral region; smallest on the foot. The toes are protected above with a series of transversally elongated and irregular scutellæ, and beneath with a series of tubercular plates. Their inner sides are granular, whilst on the outer sides the scutellæ of their upper surface meet the plates of the lower. The abdominal scutellæ are well developed, elongated, irregularly subquadrangular, and disposed upon transverse series. On the anterior portion of the chest these scutellæ are quite small, and irregularly disposed in advance of the arms. They diminish, likewise, in size towards the posterior region of the abdomen, preserving, however, their disposition upon transverse series. The preanal scutellæ are very irregular in their form, of moderate development, the central being the largest. The anal folds are granular. The tail is very long, sub or cyclo-tetragonal, tapering to a point, and covered with circular rows of elongated scales, increasing in size from the base

of that organ to the last fifth of its length. They are smooth upon the anterior fifth, hence to the tip conspicuously carinated, particularly upon the middle region; at the base of the tail the scales are but slightly larger than on the posterior portion of the body; they are smooth everywhere else except, as mentioned, upon the tail. The carination is gradually appearing under the shape of a blunt and small protuberance which may be seen upon the posterior extremity of the scales. Every other or every third row subdivides as it ascends from the sides of the tail towards its upper surface, from the base to about the third of the length, the subdivision gradually diminishing in extent until reduced to a few scales upon the middle of the upper region; hence backwards they constitute regular annular rows. The ground-color is olivaceous, varying in shade. From the occipital region to the base of the tail there are four longitudinal series of rather large black patches. The latter are subcircular or subquadrangular, transversally elongated, and provided laterally with a white line or spots, exteriorly again margined with a black file; sometimes the black and central part of the blotch is wanting, in which case we have two independent white subrounded spots, margined with black. The occipital region is maculated with black. The inferior region of the flanks is vermiculated or spotted with brownish black, upon a whitish ground. The upper surface of the anterior limbs exhibits confluent lines or spots—some brownish, others whitish; the posterior limbs are maculated or else vermiculated with blackish. The upper surface of the tail presents intermingled black, brown, and olivaceous spots* of various shades. The inferior regions are white; the throat, the belly, the thighs, and base of the tail are spotted with blackish brown.

Collected in the neighborhood of Santiago, Chile.

It is worthy of remark that *Ameiva oculata*, mentioned by d'Orbigny in his Travels to South America, was erroneously introduced in that work. The specimen from which his figure is made, is one of those collected by Claude Gay, in Chile, supposed for a time by the naturalists of the Garden of Plants in Paris to have been brought home by Alcide d'Orbigny, whose collections were deposited in that establishment, where Claude Gay had likewise sent his.

The shapes of the dorsal black spots, as described above, agree in the two specimens brought home by Lieut. Gilliss. They are at variance with those described and figured by Claude Gay.

Plate XXXIX, fig. 1, represents *Aporomera ornata*, in profile and size of life.

fig. 2, is an under view of the same specimen.

fig. 3, the head seen from above.

fig. 4, a side view of the head.

Genus CNEMIDOPHORUS, Wagl.

GEN. CHAR. Base of tongue not sheathed, moderately long, divided upon its anterior extremity into two smooth filets, covered with scaly, rhomboid, and subimbricated papillæ. Palate toothed. Intermaxillary teeth conical and simple; maxillary teeth compressed; the anterior simple; the posterior tricuspid. External opening of nostrils situated either exclusively in a single naso-rostral plate, or between several nasals. Eyelids present. Tympanic membrane distinct, stretched inside the rim of the auditive aperture; a double transversal fold under the neck. Ventral scutellæ quadrilateral, flat, smooth, not, or little imbricated, disposed in alternate rows. Large scutellæ-like plates under the legs. Femoral pores present. Five fingers a little compressed, not carinated beneath. Five toes similar in structure to the fingers. Tail cyclo-tetragonal.

SYN. *Cnemidophorus*, WAGL. Nat. Syst. Amph. 1830, 154.

DUM. & BIBR. Erp. Gén. V, 1839, 123.

OBS. The species of this genus may be arranged into two groups, according to the number of longitudinal series of abdominal scutellæ, some having eight, the others ten of such series: the species described below belonging to the latter group.

CNEMIDOPHORUS PRÆSIGNIS, B. & G.

PLATE XXXVIII, Figs. 1—5.

SPEC. CHAR. Abdominal scutellæ disposed upon ten longitudinal rows; dorsal scales very minute. Postsubgular fold provided with small plates upon its edge. Ground-color greenish, blotched with black, and exhibiting laterally two narrow, light vitta.

SYN. *Cnemidophorus præsignis*, B. & G. Proc. Acad. Nat. Sc. Philad. VI, 1852, 129.

DESCR. The head, which is contained twice and three-fourths of a time in the combined length of the neck and body, is subpyramidal in shape, slightly arched upon the occiput. The plates which cover its upper surface are well developed. The vertical is hexagonal, broadest anteriorly; it is preceded by a pair of postfrontals, narrowest upon the line of their junction, dilated exteriorly and rounded upon the latter margin. A large and unique prefrontal occupies nearly the whole width of the snout, being irregularly octagonal in its outline, touching posteriorly the postfrontals, exteriorly the loreal and postnasal, and anteriorly the prenasals. The rostral occupies the entire width of the snout, advancing in a conical form towards the prefrontal, which, however, it does not reach. The prenasal is elongated and subquadrangular, being slightly curved backwards owing to its oblique situation on the sides of the snout, extending from the margins of the labials to the upper surface of the snout, where it meets its fellow from the opposite side, separating entirely the rostral from the prefrontal. The postnasal is not quite as high, though a little broader than the prenasal. It is anteriorly subconvex, and posteriorly concave, exhibiting a portion of its surface in an upper view of the head. The nostrils are large, situated at the inferior margin of the nasal plates, close to the labials, encroaching more upon the prenasal than upon the postnasal. The loreal is very large, its convex anterior margin fitting the concave one of the postnasal. It is broadest anteriorly, and three-sided, offering points of contact to a surciliary and two anteorbitals, the lowermost being the largest, angular, and five-sided, whilst the upper one is elongated and narrow. There are two suborbitals, the anterior being twice as large as the posterior one. The postorbitals are numerous, small, and polygonal. Four surocularies and six surciliaries constitute the upper roof of the eye, the surciliaries forming a prominent ridge, between which and the surocularies a series of small scales may be observed, extending from the anterior margin of the second suroculary and posterior margin of the second surciliary backwards, enclosing the posterior outline of the surocularies half way between the third of the latter group and the anterior occipitals. The anterior three surciliaries are much longer than the posterior three. The eyelids, upper and lower, are densely covered with small scales, the largest of which constituting a row along the inner margin of the orbitals. On the edge of the lids is another series more conspicuous than upon the intervening space. The middle surface of the lower eyelid is provided with a horizontal series of five or six quadrangular plates; the latter being higher than long. The occipitals are seven in number, the anterior two being somewhat larger than the others, broadest upon their posterior half, and in contact anteriorly with the vertical. The posterior five are disposed upon a sublinear and transverse row, the central one being placed immediately behind the middle line of the anterior two; the adjoining two, the largest of the five, are in contact anteriorly with the first pair of occipitals; the exterior two occupy a somewhat retreated situation along the external margin of the internal pair. An area of small plates surrounds posteriorly and exteriorly the postoccipitals. From the posterior extremity of the surciliary ridge to the upper mar-

gin of the auditive aperture may be seen a series of small polygonal plates, a continuation of the postorbitals. There are six upper labials; the two middle ones are much the largest, and longer than high. The anterior two are subquadrangular; the posterior two elongated, narrow, subtriangular; the last of the series is very small, with its acutest angle directed forwards, the reverse of the fifth. The inferior labials are seven in number, the posterior ones being very small and narrow; the third and fourth are very large; the second is nearly equal in size with the fourth upper labial, and the first nearly equal to the fifth of its own series. The symphiseal is semi-elliptical, and well developed. The submaxillaries or mental shields are very large; the anterior odd one is broadest; the second, on either side, are in contact for almost their whole length; the third and fourth diverge. Six or seven smaller plates, disposed upon a double row, terminate the submaxillary series at the angle of the mouth, and close to the anterior and lower rim of the auditive aperture. The latter is large and sub-circular, margined anteriorly with scales somewhat larger than those covering the middle of the temporal region. The extreme margin of the angle of the mouth is provided with small scales or else minute plates. The mental region, enclosed by the submaxillary plates, is covered with irregular and small scales, a narrow area of which may be seen extending to the lower edge of the auditive aperture. The anterior portion of the throat is provided with small polygonal plates, whilst the posterior portion of that region is covered laterally with minute, and upon its middle with rather small plates. The plates on the middle region of the posterior subgular fold are nearly equal in size to those of the anterior portion of the throat. On the margin of that fold they are again very small.

The anterior and upper surface of the forearm is provided with a series of five large polygonal and transversely elongated plates, surrounded with smaller ones, and beneath, posteriorly, towards the elbow, may be seen an area covered with about a dozen plates of a much smaller size, and rather subcircular than polygonal in their outline. The anterior and upper surface of the arm exhibits a series of transversely elongated plates, still larger and more numerous than on the forearm, surrounded likewise by smaller ones. The remaining portion of the surface of that limb is densely covered with small scales, assuming a plate-like aspect upon the middle region beneath and towards the elbow. The palm of the hand is covered with minute scales, and the metacarpus, opposite the external finger, is marked by a few small plates. The hand above is plated; the plates being a little smaller on the metacarpus than on the carpus. The fingers are protected above and below by a series of transversely elongated and uniform plates, extending to the very base of the nails. There is a lateral series of small scales separating the upper from the lower digital plates. The internal and external fingers are shorter than the others, and nearly equal in length. The middle one is a little longer than the adjoining two. The nails are well developed, compressed posteriorly, conical, acerated, and curved anteriorly. The anterior surface of the thigh is covered with plates of medium size, diminishing very much in size towards the inferior surface. The femoral pores, seventeen in number, limit the plated surface of that organ. They issue forth between an anterior subcrescentic small plate and two minute posterior ones. The inferior surface of the leg is covered with four longitudinal series of plates, very large upon the anterior series, and diminishing gradually in size upon the remaining series. The inferior surface of the metatarsus is protected by rather conspicuous and imbricated plates, whilst on the upper surface there exist minute scales. The tarsus exhibits four series of well-developed plates, which may be traced along the upper surface of the toes narrower upon the articulation of the phalanges than upon their middle region. The inferior surface of the toes is provided externally with a conspicuous series of small plates, and internally with two much smaller and irregular series placed along the thumb, the first (longest) and second toes, whilst these latter series are replaced by scales upon the fourth and fifth toes. The posterior surface of the tarsus is covered with minute scales, somewhat larger on the sole of the foot, between the thumb and the first (longest) and second finger. The plates on the upper surface of the tarsus and those on the inferior surface of the leg are contiguous upon the

external edge of the metatarsus behind the small toe. The nails are less developed than upon the anterior extremities, compressed at their base, acerated upon their extremity, and but slightly curved.

The dorsal and lateral regions of the body and upper surface of the hind legs are covered with very small and irregular scales. The inferior surface of the body is plated all over with quadrangular scutellæ, disposed upon ten longitudinal rows, the outermost of which is but imperfectly developed, upon the middle region of the abdomen. The second row, proceeding from the sides inwardly, is composed of scutellæ, nearly quadrangular, whilst on the three remaining rows the scutellæ are transversally longer, in the shape of an elongated quadrangle. Upon the anterior portion of the chest the series are interrupted and composed of smaller and irregularly-shaped scutellæ. The preanal region exhibits three rather large polygonal scutellæ surrounded by small plates, diminishing in size as they recede from the central group. The postanal region is densely covered with small plates or scales. The tail is long, subcylindrical, and tapering to a point. The scales which cover its surface are elongated and narrow, keeled upon their middle line, and disposed in verticiles or circular rows. On the upper part and sides of that organ the scales maintain the same width throughout their length, whilst inferiorly some of them may be seen slightly tapering posteriorly. The ground-color is greenish, the head, the locomotory members, and the tail, marmorated with black. Two lighter stripes may be seen running along the sides, the uppermost starting from the surciliary ridge, the lower one from behind the eye across the auditive aperture, and parallel towards the posterior extremity of the body. Hence, along the sides of the tail to a considerable distance, the uppermost uninterruptedly above the hind limbs, the lower one with a break near the origin of the thighs. The area enclosed by these two vittæ or stripes is black, provided upon its middle region with a series of greenish subrounded spots. The region of the flanks beneath the lower vitta is either entirely black, with two or three irregular series of greenish spots, or else the green and the black mingle, and assume a meandric aspect. The external three series of abdominal scutellæ are provided with a black spot upon their middle. The dorsal region enclosed between the uppermost vitta presents a medial, light-greenish band, edged with transverse blotches of black, enclosing a quadrangular space of deeper green, occasionally mottled with black. Upon the occiput and neck most of the space is greenish. It is not improbable that the young will be found to possess a more defined dorsal vitta, mayhap, similar altogether to those now to be observed on the sides. The inferior surface of the head, the chest, the middle region of the abdomen, and the preanal region, are uniformly yellowish-green. The inferior surface of the fore-limbs is yellowish, the inferior surface of the hind limbs and tail whitish, obsoletely blotched with blackish.

Specimens of this species were collected at Chagres, isthmus of Panama, by the late Prof. C. B. Adams, of Amherst College, Massachusetts.

Plate XXXVIII, fig. 1, represents the profile of *Cnemidophorus præsignis*, size of life.

fig. 2, is an under view of the same specimen, showing the varied structure of the plates, scales, and scutellæ, referred to in the above description; *a* is an enlarged view of one from a femoral pore.

fig. 3, exhibits the head from above.

fig. 4, an enlarged toe.

fig. 5, an enlarged finger.

FISHES.

BY CHARLES GIRARD.

FAMILY OF PERCIDÆ.

Genus PERCICHTHYS, Girard.

GEN. CHAR. Body oblong or elongated, compressed, covered with scales of medium development, finely ciliated upon their posterior margin. Snout rather thick and blunt, overlapping slightly the lower jaw. Two dorsal fins contiguous at their base. Insertion of ventral fins immediately beneath the base of pectorals. Anal fin provided with three spiny rays. Tongue smooth. Upper surface of head, suborbitals and posterior dilatation of maxillary, covered with scales, as well as the cheeks and opercular apparatus. Suborbital and preopercle serrated. Opercle provided with a spine. Branchiostegals six or seven in number. Card-like teeth on the jaws; velvet-like teeth disposed upon a transverse band in front of the vomer and upon a narrow band along the palatines, sometimes only towards the anterior extremity of the latter bones.

SYN. *Percichthys*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 197.

OBS. This genus, closely allied to *Perca*, is to be distinguished from it by the shape of the snout and the structure of the mouth; the presence of small scales on the top of the head, on the suborbital bones and (upper) maxillary; the position of the ventral fins, and by the presence of three spiny rays, instead of two, at the anterior margin of the anal fin. Moreover, the head, as a whole, has something of a sciænoid touch about it.

Perca trucha, of Cuv. and Val.* which, according to M. d'Orbigny, is an inhabitant of the Rio Negro of Patagonia, is a species of this genus.

I am led to consider *Perca ciliata*, K. and V. H., from the island of Java, *Perca marginata*, Cuv. and Val., brought to France from the austral hemisphere by the navigator Péron, and *Perca trutta*, Cuv. and Val., from Cook's straight (New Zealand), as properly referable to the genus *Percichthys*.

Should this be true, the hitherto cosmopolite genus *Perca* would thus be restricted to the boreal hemisphere; the analogous species of the austral hemisphere constituting an allied genus or several allied genera, since one of the species of this group has led us to the establishment of another genus equally distinct from both *Perca* and *Percichthys*.

Perca lacvis, Jen.,† an inhabitant of the Rio Santa Cruz, Patagonia, belongs also to the genus *Percichthys*, being closely allied to *P. trucha*, if at all distinct from it.

The following is the formula of its fins and branchiostegals:

Br. 7; D. 9—1/11; A. 3/9; C. 17; P. 15; V. 1/5.

Again, *Perca trucha* of Cuv. and Val. is not identical with the *Perca trucha* of the "Historia de Chile." The latter we propose to call *Percichthys chilensis*. The distinctive marks between

* Histoire Naturelle des Poissons. Tome IX, 1833, 429.

† Zool. of Beagle, IV. Fish. 1842, 1, Pl. i.

the two are to be found in the structure of the anal, dorsal, and pectoral fins, the shape of the caudal, the size of the scales, and the course of the lateral line. In *Perca trucha* the anal is said to be short, the caudal slightly rounded, the scales small, and the lateral line nearly straight. Now, in *Percichthys chilensis* the anal is long and deep, the caudal is emarginated, the scales are rather above than below the middle size, and the lateral line forms quite a conspicuous curve along the dorsal region of the body, being straight only along the peduncle of the tail. The formula of the fins of *Percha trucha*, given by Cuvier and Valenciennes, is as follows:

$$D. 9 - 1/13; A. 3/10; C. 17; P. 14; V. 1/5.$$

which, according to our method, will read thus:

$$D X. 13; A III. 10; C O. I. 8. 7. I. O; V I. 5; P 14.$$

and compares better with the formula of *Percichthys chilensis* given further on. The rudimentary rays of the upper and lower lobe of the caudal are not enumerated by the French ichthyologists. It is to be regretted that their formula passed into the "Historia de Chile" without verification upon the specimens collected by Mr. Gay, on the ground merely that Cuvier pronounced both species identical. It is true, they are called *trucha* both in Patagonia and Chile; but this is one instance in many of vernacular names similarly applied to more than one zoological species.

None of the specimens which came under my observation did exhibit roundish black spots as figured in the "Historia de Chile," which may after all become another distinguishing feature between the *trucha* of Patagonia and the *trucha* of Chile. To this, however, I attach no greater importance than it is worth.

PERCICHTHYS CHILENSIS, Girard.

PLATE XXIX, Figs. 1—4.

SPEC. CHAR. Snout subconical, obtuse anteriorly, and slightly overlapping the lower jaw. Mouth well developed. Posterior extremity of upper maxillary fetching the vertical of centre of pupil. Limb of preopercle conspicuously serrated; exterior margin of sub and interopercle inconspicuously so. Soft portion of anal deeper than the height of second dorsal. Caudal moderately emarginated posteriorly. Branchiostegals seven. Ground-color yellowish; upper regions covered with brownish or blackish diffused spots.

SYN. *Percha trucha*, GUICH, in Gay, Hist. de Chile, Zool. II, 1848, 146; Ictiol. Lam. I bis, fig. 1.

Percichthys chilensis, GRD, Proc. Acad. Nat. Sc. Philad. VI, 1854, 197.

Trucha, vernacular.

DESCR. The body is subfusiform, compressed, and more elongated than in the common perch of the United States. The greatest depth, which corresponds to the origin of the first dorsal fin, is contained four times and a half in the total length; whilst the least depth, taken on the peduncle of the tail, enters in the same length nearly ten times. The back is uniformly arched from the nape to the termination of the second dorsal. The peduncle of the tail constitutes almost the fifth of the whole length. The abdominal outline is convex from the throat to the end of the anal fins. The greatest thickness is a little more than half of the depth; the thickness of the peduncle of the tail is exactly the half of its depth. The head, which is subconical, is continuous with both the dorsal and abdominal outlines, if we except a very slight depression upon the vertex. It forms about the fourth of the entire length. The

snout, which is rounded and obtuse, slightly overlaps the lower jaw, which is thus entirely concealed when the fish is viewed from above. The mouth is of medium size; its angles do not reach the anterior margin of the orbit. The posterior extremity of the upper maxillary extends to a vertical line, which would intersect the pupil. The teeth on both of the jaws, as well as those on the front of the vomer and on the palatines, are small and more card than velvet-like. They cover an elongated and narrow area along the palatines. The posterior nostril is the largest, subtriangular in shape, and situated close to the anterior rim of the orbit; the anterior nostril is circular, and opens a little in advance of the latter. The eye is subcircular, approximating the upper outline of the profile; its horizontal diameter enters five times in the length of the side of the head. The inferior edge of the suborbitals is minutely serrated; these bones overlap considerably the upper maxillary when the mouth is shut. The limb of the preopercle exhibits small and closely set serratures upon its ascending branch, whilst the inferior and horizontal branch is provided with fewer spines directed downwards and slightly forwards. Minute serratures may be observed upon the exterior edge of both the inter and subopercles. The opercle is trapezoid, and obliquely traversed by a flattened spine in close union with that bone, allowing its extremity only to project beyond its margin just above the upper extremity of the subopercle. The interopercle is a well developed piece of the apparatus of which it constitutes a part. The thoracic belt is robust; the serratures of the suprascapular are conspicuous, and the coracoid sends off quite a broad expansion above the base of the pectoral fins, the margin of which expansion is provided with minute spines. The branchial aperture is wide; there being no isthmus under the throat. The branchiostegals, seven in number, are slender and flattened upon the posterior half.

The distance between the origin of the first dorsal fin and the tip of the snout is equal to the combined base of both dorsals. There are eleven spiny rays, eight of which constituting what may properly be considered as the first dorsal fin; the ninth and tenth seem rather to fill up the space between the two fins, and the eleventh occupies the anterior margin of the second dorsal. The first ray is short and equal in height to the eighth, but more slender; the second is a little higher than the sixth; the seventh being intermediate between the sixth and eighth; the third is the highest of all, and thrice as high as the first; the fourth is slightly shorter than the third, and the fifth intermediate between the fourth and sixth. The upper outline of that fin is consequently very convex. The membrane between the rays is deeply indentated. There is no vacant area between the first and second dorsals; as already observed, there are two slender spines, shorter than the eighth, which connect these two fins; their direction or inclination seems more alike the rays of the second dorsal than those of the first. The eleventh spine, that which forms the anterior margin of the soft dorsal, is about the same height as the eighth. The second dorsal is higher than its base is long, though not quite as high as the highest spine of the anterior dorsal. Its upper margin is slightly convex; its soft rays are twice bifurcated, except the anterior one, which is simple; the anterior branch of the second ray remains also simple. The last ray being double, its posterior branch divides but once; whilst its anterior portion divides once upon its posterior division, and twice upon its anterior, alike the other rays. The anal is preceded by three spines; the anterior one being the shortest, is immediately opposite the anterior margin of second dorsal; the second spine is nearly twice as long as the first, whilst the third is a little shorter than the second; the membrane which unites them is deeply indentated. The soft portion of the anal is deeper than the second dorsal is high, and deeper than its own base, equal, however, in depth to the base of the whole fin, its spiny rays included. The tips of its soft rays project a little further posteriorly than those of the second dorsal. The bifurcation of the soft rays is similar to what is observed in the second dorsal. The caudal is broad and moderately long, being contained about six times and a half in the total length. Its posterior margin is suberescenscentic or else moderately emarginated, the lobes being rather obtuse. The central rays bifurcate thrice upon their length. The insertion of the ventrals corresponds to the base of the pectorals. The spine which occupies

their exterior margin is long and acute, though shorter than any of their soft rays, which bifurcate thrice, save the posterior one, which divides but twice, and the anterior only once. Their external margin is broad and rounded. The pectorals are a little longer than the ventrals, broad exteriorly when expanded, and composed of soft and slender rays, which bifurcate but twice upon their length.

Br. VII; D XI. 10+1; A III. 10; C 4. I. 8. 7. I. 3; V I. 5; P 16.

The scales are well developed, minutely serrated upon their posterior margin, which is convex or rounded. Their anterior margin is subtruncated, whilst their upper and lower margins are almost rectilinear. Eight distinct rows may be counted between the anterior margin of the first dorsal and the lateral line, and from twenty-two to twenty-five beneath it and the ventral line. They diminish considerably in size upon the sides and belly, becoming very minute under the throat. The upper surface of the head and the cheeks, the suborbitals and maxillary are covered with them, smaller, however, on the cephalic region proper than on the cheeks, and quite minute on the maxillary. Those covering the opercular apparatus are again large and conspicuous, being nearly as large as those of the trunk. The lateral line is very conspicuous; there are in it from sixty-eight to seventy scales. From the upper part of the opercular apparatus it constitutes a gradually raised curve to nearly opposite the posterior portion of spiny dorsal; hence the curve is continued, gradually descending to nearly opposite the posterior margin of the soft dorsal by a series of undulations; then runs almost straightway to the base of caudal, along the middle of the peduncle of the tail.

The coloration is of a golden yellow; the upper part of the flanks and dorsal region being brownish or blackish owing to the presence of diffused spots and maculæ. The fins are unicolor, greyish yellow. The inferior surface of the head is whitish.

This fish is said to inhabit most of the rivers of the republic of Chile. The specimen figured, together with several others, was caught in a tributary of the Rio de Maypu, near Santiago.

Plate XXIX, fig. 1, represents, size of life, *Percichthys chilensis*, seen in profile.

fig. 2, is a scale of the dorsal region.

fig. 3, a scale from the lateral line.

fig. 4, a scale of the abdominal region.

Figs. 2, 3, and 4 are magnified.

PERCICHTHYS MELANOPS, Girard.

PLATE XXX, Figs. 1—5.

SPEC. CHAR. Mouth of moderate size, posterior extremity of upper maxillary reaching the vertical of the anterior rim of orbit. Palatine teeth occupying but a small area towards the anterior extremity of these bones. Opercular spine not very conspicuous. Branchiostegals, six. Ground-color whitish, minutely and densely dotted with black; dots crowding upon the middle of the scales under the shape of a central blotch, giving to the whole fish quite a dark hue.

SYN. *Percichthys melanops*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 197.

DESCR. This species does not apparently attain a very large size, judging of it from the fact that the specimen figured is the largest of the lot collected. It bears a general resemblance to *P. chilensis* above described, having the same general shape of the head and body; but the peduncle of the tail being less developed, its aspect is rather more contracted. The greatest depth of the body, which corresponds to the anterior margin of the first dorsal fin, is equal to the length of head, and is contained about three times and three-fourths in the total length; whilst the least depth, taken on the middle of the peduncle of the tail, enters in that same

length about nine times, or a little over. The greatest thickness stands, in regard to the length, as one to six or two to thirteen. The dorsal outline is more convex than in *Percichthys chilensis*, and mayhap also the belly, which contributes not in a small degree to give to this fish that more contracted appearance already alluded to above. The head is sub-conical, and participates in the short aspect of the body. Its upper surface continues, towards the tip of the snout, the declivity of the nape with scarcely any inflexion upon either the occiput or the ocular region. The snout itself is blunt and rounded, slightly overlapping the lower jaw when the mouth is shut. The upper arcade of the mouth is but little protractile, and, when in the latter state, causes the maxillaries to move more downwards than forwards. There are minute card-like teeth on both the upper and lower jaws, and closely set together. Velvet-like teeth may be observed on the front of the vomer, disposed upon a small triangle. The palatines exhibit a few rudimentary teeth upon their anterior extremity in contact with the vomer. The palate is otherwise smooth. The pharyngobranchials are large, elongated, and convex, and closely set with prickly teeth; the inferior pharyngobranchials are smaller, subtriangular, and slightly concave, likewise set with similar teeth. The tongue is smooth, flattened, tapering anteriorly. The mouth is moderate, the posterior extremity of the upper maxillary reaching a vertical which would pass in advance of the orbit only. The eye is subcircular, and well developed; its horizontal diameter being contained a little over four times in the length of the side of the head. The anterior suborbital is broadly developed, overlapping considerably the upper jaw. Its external edge is minutely crenated. The serratures of the ascending branch of the preopercle are rather more developed than in *P. chilensis*, though the spines on the lower branch are proportionally of the same size. The opercular apparatus, as a whole, is constructed upon the same pattern in both *P. chilensis* and *P. melanops*. The inferior margin of the sub and interopercle are similarly crenated, and a flattened spine may be seen across the middle of the opercle, extending its point beyond the edge of that bone, mayhap a little more acute and more conspicuous in *P. melanops* than in *P. chilensis*. The suprascapular is likewise crenated, and the coracoid expansion above the base of pectoral fins, wanting, however, the minute spines observed in *P. chilensis*. The branchiostegals, six in number, are flattened and curved. The gill openings communicate together under the throat, being shaped exactly as in *P. chilensis*.

The distance between the tip of the snout and the origin of the first dorsal is a little greater than the base of both dorsals. The general structure of these fins is the same as in *P. chilensis*, with the exception that the third spine is the longest instead of the fourth. The membrane between the spines is deeply emarginated. Eight rays constitute, properly speaking, the anterior fin: two are intermediate between the eighth and the eleventh, which is situated at the anterior margin of the second or posterior fin. The central rays of the latter bifurcate also twice, and their tips extend evenly with those of the anal. The anal is preceded by three spines, and its soft rays are bifurcated in the same manner as those of the second dorsal. The posterior margin of the caudal is subemarginated with its central rays thrice bifurcated; it constitutes a little less than the sixth of the entire length of the fish. The origin of the ventrals corresponds to a vertical line which would pass immediately behind the base of the pectorals. They are broad and rounded exteriorly; their central rays being bifurcated three times, with the anterior spine longer than in *P. chilensis*. The pectorals are rather short, and broad when expanded; their tips do not extend as far backwards as those of the ventrals; the rays are slender and bifurcate twice.

Br. VI; D XI. 10; A III. 9; C 6. I. 8. 7. I. 5; V I. 5; P 15.

The scales are of medium development, and very minutely, if at all, crenated upon their posterior margin, which is irregularly rounded. Their anterior margin is straight, and the upper and lower edges linear and parallel, the scales being much longer than broad. There are ten distinct rows between the lateral line and the anterior margin of the first dorsal, besides some few irregularly disposed near the base of that fin; twenty rows and more may be counted

between the lateral line and the medial region of the belly. The scales decrease in size towards the occiput and the middle of the back, as well as towards the belly and throat. They are quite small on the cheeks, and so are those that are observed on the upper surface of the skull, on the suborbitals and maxillary. On the opercular pieces they are nearly as large as those on the flanks. The lateral line, in which fifty-eight to sixty scales may be counted, forms an arch from the upper part of the opercular apparatus to nearly opposite the anterior margin of the second dorsal, where it reaches the middle of the flanks, hence straight to the base of the caudal.

A dark blackish hue seems to pervade all the body and head, and yet the ground-color is whitish, mayhap sometimes yellowish. Innumerable black dots thickly spread over all the regions contribute to give to this fish its dark appearance. These dots being more particularly crowded upon the posterior third of the scales, it seems as if each scale bore a small spot or blotch. The upper surface of the head is uniformly dark brown or blackish. The sides of the head and opercular apparatus appear absolutely maculated. The inferior surface of the head, the throat, and the belly, exhibit more of the ground-color. The fins are all more or less yellowish, intensely dotted with blackish, so as to assume the general dark hue of the body itself, particularly the dorsals and caudal.

This species inhabits the hydrographic basin of the Rio de Maypu. Specimens were procured from the neighborhood of Santiago.

Plate XXX, fig. 1, represents *Percichthys melanops*, size of life.

fig. 2 is an outline, viewed from above.

fig. 3, a scale from the dorsal region.

fig. 4, a scale from the lateral line.

fig. 5, a scale from the abdominal region.

Figs. 3, 4, and 5 are magnified.

Genus PERCILIA, Girard.

GEN. CHAR. General physiognomy percoid; body compressed. Two dorsal fins, contiguous at their base, broadly separated in their outline. Mouth rather small, or else of medium size; jaws subequal. Small conical teeth upon the maxillaries, and a few card-like ones on the front of vomer; none on the palatines. Tongue smooth. A few minute spines along the limb of preopercle. Opercle without any spines. External edge of suborbitals, sub and interopercle not crenated. Branchial aperture of either side continuous under the throat. Branchiostegals 5 to 6 in number. Scales quite large and posteriorly ciliated. Cheeks and opercular apparatus scaly; top of head nearly smooth and naked. Suborbitals and maxillary scaleless. Insertion of ventrals behind the base of pectorals. Caudal posteriorly subrescentie.

SYN. *Percilia*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 197.

OBS. The genus *Percilia* is a diminutive percoid, essentially characterized by a small mouth, the absence of palatine teeth, and an opercular apparatus nearly smooth, there being but a few minute needle-like spines along the limb of the preopercle. The maxillary teeth differ widely from those of *Perca* and *Percichthys*. The anal has three spiny rays, as in *Percichthys*, but the position of the ventrals takes place as in *Perca*. Its general physiognomy resembles more that of *Percichthys melanops* than any other member of the family. The shape of the head and structure of the mouth denote an affinity with *Percichthys*, whilst the absence of scales on the upper surface of the head, the suborbitals, and the (upper) maxillary, remind us of similar traits in true *Perca*.

PERCILIA GILLISSII, Girard.

PLATE XXIX, Figs. 5—9.

SPEC. CHAR. Snout short and rounded; mouth small; posterior extremity of upper maxillary corresponding to the vertical of the anterior rim of the eye. A few minute spines upon the angle of preopercle. Scales large, conspicuously ciliated posteriorly. Ground-color light reddish, or reddish brown, maculated with black.

SYN. *Percilia Gillissii*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 197.

DESCR. This is a comparatively small species, and in all probability the specimens before us are full-grown ones. The largest we have seen measure about three inches and a half in total length, of which the head constitutes the fourth part. The dorsal and abdominal outlines are convex, giving to the whole profile a fusiform aspect. The peduncle of the tail is moderately developed, and rather narrow. The greatest depth, measured in advance of the first dorsal, is contained three times in the length, the caudal fin excluded; the least depth, taken on the peduncle of the tail, enters seven times in the same dimension. The greatest thickness equals half the greatest depth. The body, therefore, is much compressed. The occipital region is slightly depressed. The snout is short and rounded, and the upper jaw, which is slightly protractile, overlaps a little the lower one. The mouth is quite small, the posterior extremity of the upper maxillary extending to a vertical line, which would pass immediately in advance of the anterior rim of the orbit. The maxillary teeth are small, subcylindrical, slightly tapering towards their point, and disposed upon several rows. The front of the vomer is provided with a subtransverse narrow band of card-like teeth, and not very conspicuous. The palatine bones are smooth. The pharyngobranchials are well developed, and densely covered with minute prickles. The tongue is smooth, small, semi-elliptical in shape, and very much flattened, mayhap more swollen in a living state. The eye is of medium size, and subcircular; its horizontal diameter being contained nearly four times and a half in the length of the side of the head. The preopercle exhibits but a few minute spines upon its limb; the opercle has no spine at all; and the inferior edge of both the sub and interopercle is entire, or else not crenated. The gill openings are continuous under the throat, but there is a membranous expansion between the adjoining branchiostegals, thus filling up a space which is open in the species of *Percichthys*, above described. The branchiostegals are five or six in number, flattened, and recurved. The suprascapular is not visible externally; the coracoid expands much less above the base of pectorals than in *Percichthys*; and, moreover, these bones are neither provided with spines nor crenated upon their edges.

The dorsal fins are similar in general appearance to those of the foregoing percoids; the membrane which unites the spines is deeply emarginated; but the two intermediate spines between these two fins do not exist in this species. There are, consequently, nine dorsal spiny rays. The ninth, which is closely connected with the posterior fin, is the smallest of all; the eighth comes next, and is but very little higher than the latter; the others increase in height, as follows: first, seventh, sixth, second, fifth, third, and fourth. There are instances where the third is slightly higher than the fourth, as is also the case in *Percichthys chilensis*. The second dorsal is not quite as high as the first, though a little higher than its own base; on the other hand, the base of the first dorsal is longer than its height. The middle rays bifurcate twice upon their length, and their tips extend a little further backwards than those of the anal. The latter is preceded by three spines similar to those in *Percichthys chilensis* and allied species. A few of the central soft rays exhibit traces of a bifurcation of the third order; the others are as in the second dorsal, the external margin of which fin is rounded or subconvex, as is the case in the anal. The caudal is broad and subcrescentic upon its posterior edge, the central rays bifurcating three times. The insertion of ventrals is situated behind the base of the

pectorals, and their tips extend further backwards. Their spiny ray is well developed, and the central soft ones bifurcate three times upon their length. The pectorals are short, and rounded when expanded, composed of slender rays which bifurcate only twice.

Br: V—VI; D IX. 11; A III. 8; C 4. I. 8. 7. I. 3; V I. 5; P 14.

The scales are large, provided posteriorly with slender and filiform serratures. They are higher than long, anteriorly subtruncated, and rounded upon the other sides of their outline. Four longitudinal rows are observed between the anterior dorsal and the lateral line, and about twelve rows beneath, between the latter and the middle line of the belly. They diminish in size towards the occiput and nape, as well as towards the inferior surface of the body. The largest may be seen upon the middle of the flanks. The upper surface of the head is naked and perfectly smooth. Small scales exist on the cheeks, and somewhat larger ones on the opercular apparatus. The suborbitals and the maxillary are scaleless. The lateral line, in which there are about thirty-five scales, from the upper part of the opercle to opposite the middle region of the second dorsal fin, constitutes a depressed and occasionally somewhat undulating arch; then runs nearly straight towards the base of the caudal fin.

The ground-color assumes either a light reddish or reddish brown hue. The head, dorsal region, and sides of body and tail, are irregularly blotched with blackish or deep brown—the blotches being the result of an accumulation of minute dots. The lower surface of the head and throat are sown over with similar dots sometimes disposed in irregular streaks. The ground-color of the fins is light yellowish, the rays made blackish by crowded dots; the pectorals and ventrals less so than the dorsals, caudal, and anal.

Inhabits the Rio de Maypu; specimens were obtained from an affluent of that river, in the vicinity of Santiago.

Plate XXIX, fig. 5, represents the profile of *Percilia gillissii*, size of life.

fig. 6 is an outline, viewed from above.

fig. 7, a scale of the dorsal region.

fig. 8, a scale of the lateral line.

fig. 9, a scale of the abdominal region.

Figs. 7, 8, and 9 are magnified.

FAMILY OF ATHERINIDÆ.

The study of this family, heretofore composed of the single genus *Atherina*, has led us to establish several new genera in which the rather numerous species are grouped according to several structural peculiarities which, though apparently inappreciable on account of their moderate development, are not to be altogether overlooked.

The genus ATHERINOPSIS is to receive such species in which there are no palatine teeth, with both jaws equal, and the snout more or less rounded.

Atherina menidia, LINN., and *Atherina notata*, MITCH., will find a place in this genus alongside with *Atherinopsis californiensis*, GRD.

The genus BASILICHTHYS will be characterized by the protrusion of the upper jaw beyond the lower one. There are no teeth on the palate.

To this must be referred:

1°. *Atherina microlepidota*, JEN., from the fresh waters of Chile, described further on.

2°. *Atherina laticlavia*, CUV. and VAL.,* from the coast of Chile, and easily distinguished by its large scales and its broad silvery lateral band.

3°. *Atherina argentinensis*, CUV. and VAL., observed at the mouth of the Rio La Plata and Bay of Maldonado, and commonly known as *Pescadilla del rey*.

4°. *Atherina macrophthalma* AGASS.,* *A. brasiliensis*, CUV. and VAL.; from the bay of Rio de Janeiro.

5°. *Atherina bonariensis*, CUV. and VAL., from Buenos Ayres.

6°. *Atherina lichtensteinii*, CUV. and VAL., from Montevideo.

And, in all probability: *Atherina regia*, HUMB.,† from Peru, and *Atherina lessonii*, CUV. and VAL., from Brazil.

The genus HETEROGNATHUS is based upon the elongation of the lower jaw, which projects considerably beyond the upper one. No teeth on the palate, or else in a rudimentary state only.

Atherina humboldtiana and *A. vomeriana*, CUV. and VAL., both from Mexico: whether from the fresh or salt waters, it is not stated.

In all *Atherinopsis*, *Basilichthys*, and *Heterognathus*, the intermaxillaries constitute the upper arcade of the mouth at the exclusion of the maxillaries, which are situated behind the latter. This character will distinguish them at once from *Atherina* proper.

Genus BASILICHTHYS, Girard.

GEN. CHAR. Intermaxillaries constituting the upper part of the month, the maxillaries being placed behind. Head and snout subconical; upper jaw protruding beyond the lower. Small teeth on both jaws; none on either the vomer or palatines. Upper surface of the head scaly.

SYN. *Basilichthys*, GRD., Pro. Acad. Nat. Sc. Philad. VII, 1854, 198.

OBS. Like *Atherinopsis*, the present genus includes species of its family which are unprovided with teeth of any kind on the upper roof of the mouth. The mouth itself has the same general structure as regards the disposition of the intermaxillaries and maxillaries, but the conical shape of the head, and the protrusion of the upper jaw beyond the lower, will constitute the generic feature of *Basilichthys*.

BASILICHTHYS MICROLEPIDOTUS, Girard.

PLATE XXX, Figs. 6—9.

SPEC. CHAR. Upper surface of head depressed and subconvex. Cheeks and upper portion of opercle covered with conspicuous scales. Origin of anal considerably in advance of anterior margin of second dorsal. First dorsal opposite the middle of space between anals and ventrals. Caudal forked. Ground-color yellowish brown, dotted with blackish; a silvery grey band along the middle of the flanks.

SYN. *Atherina microlepidota*, JEN. Zool. of Beagle, IV, Fish. 1842, 78, Pl. xvi, fig. 1, 1a, 1b.

GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 253.

Basilichthys microlepidotus, GRD. Acad. Nat. Sc. Philad. VII, 1854, 198.

Peje rcy, vernacular.

DESCR. The general form is elongated, subfusiform, and slender; the back being rounded, whilst the flanks diminish considerably in thickness from the silvery band towards the medial line of the belly. The greatest depth of the body, measured above the insertion of the ventral

* Pisc. Brazil, 1827, Pl. xlvii, Fig. 1.

† Rec. d'Obs. de Zool. et d'Anat. Comp. I, 1833.

fins, is contained between five and six times in the total length; and the least depth, taken on the peduncle of the tail, near the base of the caudal fin, is about the third of the greatest depth. The greatest thickness is considerably more than half the greatest depth. From the origin of the ventral the body tapers slightly anteriorly, and quite rapidly posteriorly from the anterior margin of both the anal and second dorsal fins.

The head above is depressed, subconvex, and rather small. In length it constitutes about the two-elevenths of the whole. It is a little deeper than broad at its base. The mouth is well developed, the lower jaw being a little shorter than the upper, which is protractile. Several rows of very small and subconical teeth may be observed on the maxillaries and on the dentaries. The palate is perfectly smooth, or without teeth. The pharyngobranchials, upper and lower, are densely covered with card-like teeth. The tongue is smooth and narrow, and of but medium development. The posterior extremity of the upper maxillary does not quite extend to a vertical line which would pass through the anterior rim of the orbit. The nostrils are very small, the anterior one being the smallest, and both of them are nearer to the anterior rim of the orbit than to the lip of the upper jaw when the latter is in its retracted position. The eye, though well developed, is small when compared to other species, circular in shape, and its diameter contained nearly five times in the length of the side of the head. Its upper margin approximates the line of the profile. The opercular apparatus is rounded, and convex upon its margin. Conspicuous scales cover its upper margin as well as the cheeks. On the remaining portion of the opercle, and the sub and interopercles, scales are apparently wanting, owing to the transparency of the argentine membrane which passes over them. The branchial apertures are broadly open and continuous under the hyoid apparatus. The branchiostegals, six in number, are mostly concealed under the subopercle; the innermost are flattened; the two outermost, small and filiform.

The first dorsal is quite small, and composed of slender rays. The posterior margin of that fin is nearly equidistant between the upper lobe of caudal fin and the extremity of the snout. The second dorsal is of moderate development, with one anterior rudimentary ray, undivided, like the second. The central rays bifurcate twice, with a slight indication of a subdivision of the third degree upon the fourth, fifth, and sixth rays. That fin is a little higher anteriorly than long, with its upper edge concave, and its posterior margin about half the height of the anterior. It is situated immediately opposite the posterior portion of the anal. The base of the anal is much longer than that of the second dorsal, and longer also than the depth of its anterior margin. Its external edge is likewise concave, and its posterior margin about two-fifths the height of the anterior. The first ray is rudimentary; the second is simple; the central ones bifurcate only twice. The caudal is deeply forked with sub-acute lobes. It constitutes the sixth of the entire length. Its central rays bifurcate three times, with partial indications of a subdivision of the fourth degree. The ventrals are altogether situated in advance of the first dorsal; these fins are short and broad exteriorly, when expanded. The anterior ray is the smallest, and remains undivided; the others subdivide three times. The pectorals are of moderate development and acute posteriorly; their ray subdividing but twice, the uppermost remaining simple. They are obliquely inserted below the middle line of the body.

Br. VI; D VI. 11; A 16 + 1; C 3. I. 8. 7. I. 2; V 6; P 15.

The scales are rather small, and subquadrangular in general form; sometimes a little longer than high, at others a little higher than long. They are posteriorly rounded, and subtruncated anteriorly. They constitute more than twenty longitudinal rows upon the line of the greatest depth of the body, and about fifteen rows on the peduncle of the tail. Small and irregular scales may be observed upon the base of the caudal fin. The scales on the cheeks are equal in development to those on the nape. On the opercular pieces they are little larger than on the cheeks. The ground-color is yellowish brown, minutely dotted with blackish. The dorsal region between the silvery bands has a darker hue than the inferior part of the flank, owing to

a great accumulation of dots over the whole surface of the scales, whilst beneath it there is but one series of these dots along the very margin of the scales. The caudal, dorsal, and pectoral fins are greyish yellow; the ventrals and anal are yellowish. The upper surface of head and snout being dark brown.

This species, which is said to inhabit the fresh waters of Chile, was caught by Mr. Darwin in the vicinity of Valparaiso. The specimens before us were collected by Lieut. Gilliss in the Mapocho, an affluent of the Rio de Maypu.

Plate XXX, fig. 6, represents *Basilichthys microlepidotus* in a profile view, and of the size of life.

fig. 7 is an outline, viewed from above.

fig. 8, a scale of the dorsal region.

fig. 9, a scale of the abdominal region.

Figs. 8 and 9 are magnified.

FAMILY OF SILURIDÆ.

Genus NEMATOGENYS, Girard.

GEN. CHAR. Head very much depressed and large. Body posteriorly compressed; posterior margin of caudal fin rounded. Anal opposite space between the dorsal and caudal. Ventrals under the dorsal. Mouth broad, but not deeply cleft; its angle provided with a long barbel. A second pair of subhyoidal barbels shorter than the buccal ones. A still shorter and prenasal barbels constitute a third pair of these appendages. Intermaxillaries and dentaries provided with a patch of card-like teeth. Pharyngobranchials covered with similar asperities. Eyes rather small, situated on the upper surface of head. Opercular apparatus without any spines. Branchial openings continuous under the throat. A spine at the anterior margin of the pectoral fins. Skin scaleless.

SYN. *Nematogenys*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 198.

OBS. The most prominent characters by which this genus may be distinguished from *Trichomyxeterus*, consist in the presence of one pair of barbels only at the angle of the mouth, another pair under the head, which is wanting in the latter, and by the absence of prickly or small spines on the opercular apparatus. The absence of an isthmus under the throat may become another not less important point of discrimination between the two genera.

NEMATOGENYS INERMIS, Girard.

PLATE XXXII, Figs. 1-3.

SPEC. CHAR. Head large and wedge-shaped: snout anteriorly broad and rounded. Origin of ventrals opposite the anterior margin of dorsal. Spiny ray of pectorals prickly beneath. Tip of buccal barbel extending beyond the base of pectorals. Skin beset with minute pustules. Ground-color yellowish brown maculated with white.

SYN. *Trichomyxeterus inermis*, GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 312. Ictiol. Lam. ix, fig. 2.

Nematogenys inermis, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 198.

Bagre or *Vagre*. Vernacular.

DESC. The body is elongated, subquadrangular or subrounded upon its anterior half, very much compressed posteriorly, and thinning off towards the base of the caudal fin. The greatest depth, measured in advance of the dorsal fin, is about the eighth of the entire length, whilst the least depth, immediately behind the anal, enters nine times and a half in the same dimension. The greatest thickness, at the origin of the trunk, is equal to the least depth, and the thickness above the anal fin is contained nearly three times and a half in the depth upon that same region. The head constitutes about the fifth of the total length. It is very much depressed, and broader than the body anteriorly. Its depth upon the occipital region is a little less than the half of its length, hence tapering off to the extremity of the snout, being also declive towards the sides. The mouth is broad, though not deeply cleft; the posterior extremity of the upper maxillary reaching a vertical line which would pass a little nearer to the anterior rim of the eye than to the posterior nostril. The jaws are nearly equal, and surrounded with well developed membranous lips, expanding considerably towards the angle of the mouth, where a subcylindrical barbel is observed, which extends posteriorly beyond the base of the pectoral fins. A pair of flattened barbels may be observed under the head, attached to the anterior part of the hyoidal apparatus, each widely separated from one another. When stretched backwards in a straight line from their insertion, their tip reaches the edge of the branchiostegal membrane. The nostrils, right and left, are wide apart; the anterior is much the largest, situated close to the jaw, and provided at its upper and posterior rim with a flattened and tapering barbel about seven twentieths of an inch long, immediately behind which may be seen the posterior opening, subcircular in shape, and provided upon its upper and posterior rim with a membranous expansion sufficiently large to cover that aperture when let down upon it. The eyes, situated towards the upper surface of the head, are small, inconspicuous, and elongated; their longitudinal diameter measuring but a quarter of an inch; their posterior rim being nearly equidistant between the margin of the upper jaw and the posterior edge of the opercular apparatus. An oblong and rather large patch of card-like teeth exists upon the intermaxillaries; the upper maxillaries being toothless. A broad band, posteriorly tapering, of similar but smaller teeth, may likewise be seen upon the dentary or lower jaw. The roof of the mouth is smooth; but at the entrance of the esophagus the pharyngobranchials, upper and lower, are possessed with teeth of the same description, but smaller still than those of the dentaries, becoming almost velvet-like. The upper pharyngobranchials are subelliptical in shape and convex, whilst the inferior pair of these bones are subtriangularly elongated and subconcave. A double row of conical processi are observed, one upon each side of the branchial arches; the anterior row more developed than the posterior one. The tongue is short, and provided on each side with a fleshy expansion. The opercular apparatus is concealed under the skin, without either spines or serratures of any kind. The branchial apertures are broadly open, and split to the hyoidal apparatus, without any intermediate membrane connecting the right and left flaps. The branchiostegals are numerous and slender; those next to the opercular apparatus are flattened, the others circular—all more or less curved. The membrane which unites them extends beyond their tips.

The anterior margin of the dorsal fin is nearly equidistant between the extremity of the snout and the base of caudal. That fin is higher than long, superiorly convex; its central rays are subdivided three times. The anal resembles the dorsal in general appearance, being deeper than long, but more acuminate posteriorly. Its central rays bifurcate, likewise, thrice, and their tips reach the rudimentary rays of the caudal, between the base of which and the origin of ventral its anterior margin corresponds. The caudal, which constitutes a little less than the sixth of the entire length, is broad and rounded posteriorly; its central rays bifurcate three times upon their length; there are numerous rudimentary rays above and below. The insertion of the ventrals is nearly opposite to the anterior margin of the dorsal. These fins are of medium size, exteriorly rounded when expanded, and their rays three times bifurcated. The pectorals are longer and narrower than the ventrals, and inserted near the inferior surface of the body;

their anterior edge being placed a little in advance of the posterior expansion of the opercle. The spine which occupies this region is well developed, provided with minute prickles beneath, and with a series of small, subtriangular serratures posteriorly. Its tip is continued to the margin of the fin under the form of a membranous ray. The soft and articulated rays are bifurcated three times. The external margin of these fins is rounded when expanded.

Br. XII; D 10; A 11; C 16. I. 7. 7. I. 12; V 6; P I. 7.

The anterior ray of both the dorsal and anal fins is small and slender, and the second shorter than the third, which is a little longer than the last of all.

The skin is densely studded with minute pustules, smooth to the touch, and extending to all the regions, except the lower surface of the head, throat, and belly. The lateral line, from the opercular apparatus, runs almost straight along the middle of the flanks to the base of caudal fin, undergoing but a very slight inflexion downwards upon the thoracic region. It is much more conspicuous anterior to the dorsal fin than farther back, where it exists under the shape of small pores.

The ground-color is reddish, or yellowish brown. The upper surface of head is nearly black; numerous blackish and rounded spots or blotches are spread all over the body and sides of the head, with a tendency towards longitudinal series along the flanks and tail; the blotches often being confluent, and inconspicuously defined. On the fins, these spots assume a transverse arrangement, and give to the latter an irregularly banded or barred appearance. The inferior surface of the head and belly are whitish, the former regions sometimes maculated. The buccal and prenasal barbels are black; the subhyoidal ones whitish, or semi-blackish. The ventrals and pectorals are lighter beneath than above.

Specimens of this species were collected in an affluent of the Rio de Maypu, in the vicinity of Santiago. According to Mr. Gay, it is to be found in the fresh waters throughout the republic of Chile.

Plate XXXII, fig. 1, represents *Nematogenys inermis* in a profile view, and nearly the size of life. fig. 2, is an outline of the fish seen from above, to show the disposition of the eyes, nostrils, and prenasal barbels. fig. 3, is a view of the inferior surface of the head, exhibiting the insertion of the subhyoidal barbels, the continuity of the branchial aperture with the hyoidal apparatus, and the branchiostegal rays.

Genus THRICHOMYCTERUS, (Humb.) Valenc.

GEN. CHAR. Head depressed and rather small. Body anteriorly rounded; posteriorly compressed. Caudal fin emarginated or subemarginated. Anal under the posterior part of dorsal, and ventrals in advance of the latter. Mouth small, or of medium size, inferior, and provided with a double pair of barbels at its angle. No barbels under the head. One pair of prenasal barbels. Velvet-like teeth upon the intermaxillaries and lower jaw. Palate smooth. Eyes very small, situated on the upper surface of the head. Opercular apparatus prickly. Branchial openings not continuous under the throat. Fins without any spiny rays. Skin scaleless and smooth.

SYN. *Thrichomycterus* (Humb.), VALENC. in *Humb. Rec. d'Obs. de Zool. et d'Anat. comp.* II, 1833, 347.

CUV. et VAL. *Hist. Nat. Poiss.* XVIII, 1846, 485.

GÜICH. in *Gay, Hist. de Chile, Zool.* II, 1848, 309.

GIRARD, in *Proc. Acad. Nat. Sc. Philad.* VI, 1854, 198.

Obs. The name of *Thrichomycterus* was first framed by Humboldt,* under the following circumstances: Having obtained a fish from the Rio Bogota, in New Grenada, he published a memoir thereon, in which he says: "Je l'ai nommé *éremophile*, à cause de la solitude dans laquelle il vit à de si grandes hauteurs, et dans des eaux qui ne sont presque habitées par aucun être vivant. Les naturalistes qui craignent que de nouvelles espèces de ce même genre ne viennent à être découvertes dans des situations très-différentes, pourraient changer le nom d'*éremophile* en celui de *thrichomycterus*, tiré des barbillons attachés au nez de ce poisson."

Thrichomycterus, therefore, in the estimation of Humboldt, was exactly the synonym of *Eremophilus*.

Now, in the second volume of the same work, Valenciennes, after giving us a more complete description of *Eremophilus mutisii*, mentions that another fish, generically distinct from the above, had been obtained from Brazil, and for which he would propose the name of *Thrichomycterus*, imagined by Humboldt.

No reference to the history of this generic name being made in the *Histoire Naturelle des Poissons*, we have considered ourselves fully justified in relating it here. The transfer of a name to a thing for which it was not originally intended, if not explained, is liable to throw a great deal of confusion upon the subject it refers to, and is likewise an infraction to sound rules of nomenclature.

Many species having been described under the name of *Thrichomycterus*, we would advise that it should be retained, rather than to frame another one. The species of *Thrichomycterus* are closely allied to *Eremophilus*, from which they chiefly differ by the presence of ventral fins.

THRICHOMYCTERUS MACULATUS, Cuv. et Val.

PLATE XXXIV, Figs. 1—3.

SPEC. CHAR. Head small and very depressed, declive towards the snout, which is anteriorly rounded. Mouth small. Maxillary teeth inconspicuous. Upper buccal barbel longer than the lower, neither of which reaching the base of pectorals. Prenasal barbel as long as the upper buccal. Opercle and subopercle prickly. Isthmus quite small. Branchiostegals, six. Caudal subemarginated posteriorly. Skin perfectly smooth. Ground-color yellowish or brownish, maculated with black. Fins greyish yellow.

SYN. *Thrichomycterus maculatus*, CUV. et VAL. Hist. Nat. Poiss. XVIII, 1846, 493.

GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 311.

GIRARD, in Proc. Acad. Nat. Sc. Philad. VI, 1854, 199.

Bagre, or *Vagre*. Vernacular.

DESC. The species is one of small size. The body is slender and elongated, anteriorly rounded, and slightly compressed; posteriorly more so. The greatest depth, measured immediately behind the tip of pectoral fins, is contained nearly nine times in the total length, and the least depth, taken on the peduncle of the tail, enters in that same length thirteen times. The greatest thickness, at the anterior portion of the body, is about equal to the depth. The head is contained six times and a half in the total length. It is much depressed, wedge-shaped, and equally declive towards the sides. The snout is anteriorly rounded. The upper jaw overlaps the lower, thus giving the mouth an inferior situation. The latter is small, and surrounded with thick and fleshy lips, but little extensible upon the upper jaw. A membranous expansion is to be observed at the angle of the mouth, immediately below the barbels. The latter are

* Recueil d'Observations de Zoologie et d'Anatomie Comparée, &c., Vol. I, 1811, 18.

flattened, thick at their base, and filiform towards their extremity. The upper one is a little longer than the lower, its tip extending to the posterior edge of the opercular apparatus, when stretched straightway backwards. The velvet-like teeth constitute an elongated and transverse patch upon the intermaxillaries. A similar area of similar teeth exists upon the symphysis of the dentaries, or lower jaw. The palate is perfectly smooth. The pharyngobranchials, upper and lower, are either smooth or provided with very inconspicuous prickles: as far as we could ascertain, they appeared to be smooth. The anterior nostril approximates the upper jaw, and is provided at its external edge with a flattened (at base) and filiform (at tip) barbel, and about as long as the upper buccal. The posterior nostril, situated a little behind the anterior, is a little larger than the latter, and provided anteriorly with a very low and thin membrane. The eyes, which are situated towards the upper surface of the head, and far apart, are very small and somewhat elongated, nearly equidistant between the margin of the upper jaw and the posterior edge of the opercular apparatus. The cheeks are smooth, like the upper surface of the head, and the opercular apparatus concealed under the skin exhibits only a small group of prickles, situated at the upper angle of the opercle. The subopercle is largely developed, and its surface is covered with very conspicuous club-shaped prickles. The branchiostegal rays are entirely concealed under the subopercle. They are six in number; the four innermost flattened—all being enclosed in a tough membrane which projects beyond their tips. The branchial apertures are continuous, but not split under the hyoidal apparatus. The dorsal fin is situated far back; its anterior margin being much nearer to the posterior extremity of the caudal than to the tip of the snout. It is nearly as high anteriorly as its base is long; the height of its posterior margin is less than the half of the anterior margin. Its upper margin is subconvex. The origin of the anal is situated opposite the posterior third of dorsal. It is nearly twice as deep as the extend of its base, and exteriorly convex. The tips of its central rays consequently extend farther backwards than those of the dorsal, without, however, reaching the base of the caudal. The latter constitutes about the eighth of the entire length. It is posteriorly subemarginated, with its lobes rounded. There are numerous rudimentary rays which contribute to give to the extremity of the peduncle of the tail a dilated appearance. The ventrals are situated in advance of the dorsal; their posterior extremity reaching a vertical line which would pass immediately in advance of the anterior margin of the last mentioned fin. The ventrals themselves are small and convex exteriorly, their tips not reaching the vent, which is situated somewhat in advance of the anterior margin of the anal fin. The pectorals are likewise short, broad, and rounded exteriorly, their insertion being almost horizontal, and below the middle line of the body.

Br. VI; D 13; A 8; C 10. I. 6. 5. I. 9; V 5; P 9.

The anterior three rays of both the dorsal and anal fins are simple and shorter than the fourth, the first being quite rudimentary. The anterior ray of the ventrals and pectorals is simple also, and enclosed in a thick membrane. The central rays of all the fins are bifurcated three times upon their length. The lateral line is very inconspicuous, and visible only upon the anterior third of the body, where distant pores may be followed from the upper part of the opercle towards the middle of the flanks, after a slight convexity upwards at its origin. The skin is otherwise perfectly smooth. It is needless to add that a thick layer of mucosity covers the whole body, the head, and the fins.

The ground-color is either yellowish or brownish, with small purplish maculae spread all over the head, where they assume a cloudy aspect; also over the body, along the sides of which obsolete longitudinal stripes are to be seen. Two other stripes, more indistinct still, along the dorsal line, from nape to origin of dorsal; and three along the sides, the middle one of which running along the middle region of the body and tail. The inferior surface of the head and the belly are of a soiled yellow hue. The barbels and the fins are greyish yellow.

Specimens were caught in the Rio Mapocho, near Santiago.

Plate XXXIV, fig. 1, represents *Thrichomycterus maculatus*, size of life, and in profile.
 fig. 2 is an outline of the same, seen from above.
 fig. 3, the head, seen from below.

THRICHOMYCTERUS MACRÆI, Girard.

SPEC. CHAR. General aspect elongated, subfusiform; peduncle of tail long and slender. Dorsal fin elongated, and quite low posteriorly. Anal fin narrow. Ventrals and pectorals rather small. Caudal posteriorly emarginated. Ground-color greenish brown, with small, pavement-like blackish spots extending all over the body.

DESCR. The general form resembles that of *T. maculatus*; the peduncle of the tail is still more slender, and the posterior edge of the caudal subrescenscentic, with the inferior lobe larger than the upper lobe. The head is contained nearly six times and a half in the total length, which measures four inches and a half. The base of the dorsal fin is contained three times in the distance between its anterior margin and the extremity of the snout, and once between its posterior margin and the base of the caudal; the latter fin being one fourth shorter. The anterior third of said dorsal fin is higher than the remaining portion, which is comparatively very low. The origin of the anal takes place opposite the middle of the length of the dorsal; it is deeper than long, and rounded upon its external margin, which extends backwards almost evenly with the posterior margin of the dorsal. The ventrals and pectorals are short and rounded exteriorly. The buccal and nasal tentacles are shorter than in *T. maculatus*. The prickles about the opercular apparatus are but little conspicuous. The head is broad and depressed; the mouth is moderately developed.

The ground-color is greenish or yellowish brown; the upper regions are covered with numerous small blackish spots, assuming a tessellated or else a pavement-like aspect. Beneath, the color is uniform yellowish or greyish. The fins present the same tint, with a blackish hue towards their margin.

Three specimens of this species were collected by Lieutenant MacRae near Uspullata, east side of the cordilleras, at an elevation of about 7,000 feet.

FAMILY OF CLUPEIDÆ.

Genus ALOSA, Cuv.

GEN. CHAR. No teeth upon any of the bones constituting the apparatus of the mouth.

SYN. *Alosa*, CUV. Règn. Anim. (2d ed.) II, 1829.

CUV. et VAL. Hist. Nat. des Poiss. XX, 1847, 389.

OBS. The total absence of teeth in this genus will readily distinguish it from any other of the same family. It is here admitted as characterized in the "Histoire Naturelle des Poissons." The species resemble the herrings in their general appearance; the stomach being rather large and acute, and the pylorus provided with numerous cœca. The intestine likewise folds twice upon itself. The air-bladder is large, attenuated at both extremities, swollen upon its middle region, and communicating with the stomach; its anterior extremity not extending beyond the third vertebra.

ALOSA MUSICA, Girard.

PLATE XXXI, Figs. 1—4.

SPEC. CHAR. Body subfusiform, elongated, compressed, and tapering posteriorly. Origin of ventrals opposite the middle region of dorsal. Posterior extremity of upper maxillary reaching the vertical of anterior rim of pupil. Lower jaw longest. Back bluish; sides silvery. A series from nine to eleven roundish spots along the sides.

SYN. *Alosa musica*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 199.

DESCR. The body is elongated, subfusiform in its profile, tapering considerably on the peduncle of the tail. The greatest depth, measured immediately in advance of the anterior margin of the dorsal fin, is a little less than the fifth of the entire length, whilst the least depth, near the base of the caudal, is about the third of the former. The greatest thickness, on the thoracic region, is equal to half the greatest depth. The dorsal and abdominal outlines are very regular and but moderately convex. The head, which forms about the fourth of the total length, continues uniformly towards the outlines just mentioned, in the shape of an acute triangle, rounded upon its summit, where the mouth opens, with a lower jaw somewhat longer than the upper; the latter is but slightly notched. Its upper surface is flattened. The upper maxillary is broadly dilated, and rounded posteriorly, where it reaches a vertical line which would intersect the anterior rim of the pupil. The nostrils are small, and nearer to the tip of upper jaw than to the anterior rim of the eye. The anterior one is rounded, whilst the posterior one is subrescendent and convex posteriorly. The eye is large and circular, and approximates the upper profile of the head; its diameter being contained about four times and a half in the length of the side of the head. The opercular apparatus is posteriorly subtruncated and undulated; the upper part of the opercle exhibits small, radiating grooves, whilst oblique and rectilinear striæ are observed along the anterior half of its lower part. The other opercular pieces are smooth. The branchiostegals, six in number, are very thin and flattened; the innermost is particularly expanded and notched upon its posterior and external margin, corresponding to a similar emargination of the inferior edge of the opercular apparatus at the junction of the sub and interopercles.

The anterior margin of the dorsal fin is nearer to the tip of snout than to the base of caudal fin. It is higher anteriorly than long, with its first three rays rudimentary and simple, like the fourth, which is the highest; the posterior margin of that fin is comparatively low, having but the third of the height of the anterior margin. Its upper margin is concave. The central rays are bifurcated twice, the first subdivision taking place upon the posterior third of their length. The anal is situated far back, is very low, and subconcave exteriorly; its base is a little longer than that of the dorsal, and its anterior margin less deep than half the height of the anterior margin of the dorsal. The second, third, and fourth rays are the longest, and remain simple, as well as the first. The central rays subdivide but once. The caudal fin is deeply forked, and its lobes are acute, constituting about the sixth of the total length, its central rays bifurcating three times upon their length. The origin of the ventrals is situated opposite the middle of length of dorsal. These fins are of moderate development, and posteriorly subtruncated, their tips projecting slightly beyond the longest rays of the dorsal. The pectorals are well developed, of a rather slender appearance when contracted, and very broad exteriorly when expanded. They are inserted immediately beneath the subopercle; their external margin is twice and a half as long as the internal, their posterior edge being rounded and subconcave. The central rays bifurcate three times, as do also those of the ventral fins.

Br. VI: D 19 + 1; A 16 + 1; C 5. I. 9. S. I. 4; V 8; P 17.

The anterior ray of both ventral and pectoral fins is simple, but articulated.

The scales are large, and nearly as long as deep, irregularly subtruncated anteriorly, rounded and convex upon their anterior margin, which is minutely serrated. They are nowhere sufficiently preserved upon the specimens before us to allow an enumeration of the longitudinal rows.

The upper part of the head and dorsal region are of a uniform bluish slate hue. The sides of the head and body are silvery, with a bluish reflexion. Nine to eleven bluish black and subcircular or subelliptical spots are observed, forming a series from the upper part of the thoracic belt to half-way between the posterior extremity of the caudal and the origin of the anal. These spots are mostly situated upon the upper margin of the silvery portion of the sides of the body, a circumstance which gives to them a very conspicuous appearance. The fins are yellowish; the dorsal and caudal, mayhap also the anal, being transversally strigated with greyish.

From Caldera bay; caught in the winter months. This is the fish, referred to in the narrative, (page 270-271,) which, in the opinion of the inhabitants of that locality, emits melodious sounds as they enter the harbor. Without giving any more credit to that popular belief than it really deserves, we have designated this species under the above appellation.

Plate XXXI, fig. 1, represents *Alosa musica* in a profile view, size of life.

fig. 2, is an outline, viewed from above.

fig. 3, a scale from the dorsal region.

fig. 4, a scale from the abdominal region.

Figs. 3 and 4 are magnified.

Genus ENGRAULIS, Cuv.

GEN. CHAR. Body rounded or compressed. Mouth large; snout protruded beyond the lower jaw. Intermaxillaries very small, and hidden under the snout. Maxillaries slender, stretching over the cheeks. A few teeth on front of vomer. Palatine and pterygoidian teeth sometimes reduced to mere asperities. Gill openings very large and continuous under the throat. Branchiostegal membrane narrow and hidden under the jaw; its rays being short and variable in number. Caudal fin forked. Dorsal fin rather small. Insertion of pectorals near the gill openings. Ventrals very small.

SYN. *Engraulis*, CUV. Règn. Anim. II, 1817.

CUV. and VAL. Hist. Nat. Poiss. XXI, 1848, 2.

OBS. The peculiar structure of the snout, as well as the shape of the mouth, will strike every one as the most characteristic feature of the small Clupeoid which constitutes this genus. The head, which is very elongated in some species, is short in others.

ENGRAULIS PULCHELLUS, Girard.

PLATE XXXI, Figs. 5-9.

SPEC. CHAR. Body subfusiform, slender, and compressed. Origin of ventrals situated in advance of anterior margin of dorsal. Vent immediately opposite the hind margin of same fin. Scales higher than long. Dorsal region purplish. Sides of head and body silvery.

SYN. *Engraulis pulchellus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 199.

DESCR. The head constitutes about one fourth of the entire length, and is in direct continuity with the trunk, being slightly declive from the occipital region towards the tip of the snout, which has the shape of a flattened cone. The anterior margin of the anterior nostril opening is nearly equidistant between the tip of snout and the anterior rim of the orbit; the posterior nostril opening is situated immediately behind the former; both being rather small and of the same development. The eye is large and subcircular, its upper rim approximating the line of the profile of the head. Its horizontal diameter is contained a little over four times in the length of the side of the head, and once between the tip of the snout and the anterior rim of the pupil. The extremity of the lower jaw does not extend beyond a vertical line, which would pass immediately in advance of the anterior nostril. The posterior extremity of the upper maxillary reaches the extremity of the preopercular carina: not the posterior limb of that bone. The intermaxillaries, the maxillaries upon the whole extent of their margin, and the dentaries, are minutely crenated, not to say serrated, or toothed. The middle lingual earina is quite conspicuous, and obsoletely crenated also. The posterior edge of the opercular apparatus is convex, and subelliptically rounded. Its component pieces are smooth, except the upper portion of the opercle, which exhibits a few minute carinae. The preopercle sends off a thin expansion of its limb over the junction of the opercle, subopercle, and interopercle. The gill openings are broadly open under the head, extending forwards almost opposite to the anterior rim of the pupil.

The body is slender, subfusiform, and compressed; deepest anteriorly, and gradually tapering posteriorly in depth and width. The greatest depth, taken across the base of the pectoral fins, is contained over six times and a half in the total length; whilst the least depth, near the base of the caudal fin, is scarcely half the latter. The greatest thickness, upon the thoracic region, is a little more considerable than the least depth. The peduncle of the tail is flattened, and wedge-shaped towards the base of the caudal fin. The back is uniformly rounded or convex, and the ventral region narrow. The anterior margin of the dorsal fin is equi-distant between the tip of the snout and the base of the caudal; its anterior margin is equal in height to its base, and its posterior margin is about one fourth of the anterior margin. Its upper margin is slightly subconcave. The origin of the anal is opposite the tips of the posterior rays of the dorsal. Its base is one fourth longer than that of the dorsal, and its anterior margin about the three fourths of its base. It is concave upon its external margin, and rapidly decreasing in depth beyond the anterior third of its length. The rays of the dorsal and anal subdivide but once upon the posterior third of their length. The caudal is slender and deeply forked, constituting a little less than one seventh of the total length; its central rays are subdivided three times with obsolete indications upon their tip of a subdivision of the fourth degree. The ventrals are rather short, broad exteriorly when expanded, and rounded or convex upon their margin; their central rays subdividing twice. Their origin is situated in advance of the anterior margin of dorsal, and their tips extend slightly beyond the middle of the base of the same fin. The pectorals are rather slender, and attached to the inferior part of the thoracic region; their external margin is much longer than the internal, and moderately broad when expanded. Their central rays bifurcate twice upon their length; the anterior one being simple, as well as that of the ventrals.

Br. IX; D 16; A 17; C 3. I. 9. S. I. 3; V 7; P 16.

The anterior two rays of the dorsal and anal fins are simple, the first being but little developed.

The scales are very large, much deeper than long, irregularly rounded, convex posteriorly, and undulated anteriorly. Five longitudinal rows may be counted immediately above the posterior extremity of the anal fin, and perhaps six or seven rows upon the line of greatest depth of the body.

The lateral line is not discernible.

The dorsal region is yellowish, covered with numerous purplish dots, so crowded on the middle line of the back, and along the argentine surface of the flanks, as to appear upon these regions like purplish vittæ. The flanks are uniformly silvery; the upper limits of the argentine surface running straight from the upper part of opercle to near the origin of the upper part of the base of the caudal fin. The opercular apparatus and sides of head are silvery like the flanks. The fins are yellowish, the rays of the dorsal and caudal fins alternately spotted greyish or blackish.

Specimens of this species were caught in Caldera bay, in the month of July.

Plate XXXI, fig. 5, represents *Engraulis pulchellus* in profile, and size of life.

fig. 6, is an outline, viewed from above.

fig. 7, the head enlarged.

fig. 8, a scale from the dorsal region.

fig. 9, a scale from the abdominal region.

Figs. 8 and 9 are magnified.

FAMILY OF CHARACINI.

Genus CHEIRODON, Girard.

GEN. CHAR. Body compressed; abdomen not serrated. Adipose fin present. Teeth upon the maxillary, the intermaxillary, and the dentary disposed upon a single series along both jaws, and dilated towards their edge, which exhibits generally five acute points. No canine. Palate without teeth. Scales large. Gill openings large. Branchiostegal rays, three in number. Pharyngeal teeth velvet-like, very minute. Dorsal fin situated between the ventrals and the anal.

SYN. *Cheirodon*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 199.

OBS. The form of the teeth bears a general resemblance to those of *Astyanax*, but it will be remembered that in the last genus they are disposed in a double row on both the upper and lower jaws. The dorsal fin in *Cheirodon* is placed opposite the space between the ventrals and anal, whilst in *Astyanax* it is situated above the ventrals.

CHEIRODON PISCICULUS, Girard.

PLATE XXXIV, Figs. 4—7.

SPEC. CHAR. Snout short and rounded; eye rather large. Maxillary teeth very small and few. Dorsal fin higher than long. Caudal forked. Anal nearly as deep as long. Ventrals and pectorals slender. Scales proportionally very large, higher than long. A silvery band along the middle of the flanks, margined above with black. Fins unicolor, olivaceous.

SYN. *Cheirodon pisciculus*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 199.

DESCR. A small fish of a rather short appearance, in spite of the slenderness of the peduncle of the tail. The dorsal and ventral lines are equally arched, forming two opposite curves, embracing the head in a uniform outline. Thus the general profile has more of a subelliptical than subfusiform aspect. The body is very much compressed. The greatest depth, measured just above the insertion of the ventrals, is contained from three to four times in the total length;

whilst the least depth, on the peduncle of the tail, is but two-fifths of the greatest. The greatest thickness is about one half of the greatest depth. The head is short, compressed like the body, and rounded upon its anterior outline. It constitutes about one fifth of the entire length. The nostrils are very much developed, placed towards the upper surface of the head, and nearer to the anterior rim of the eye than to the extremity of the upper jaw. The anterior opening is subcircular; the posterior one, subrescentic. The eye is large and circular; its diameter is contained about three times in the length of the side of the head, and less than once in advance of its anterior rim. The mouth is small and slightly oblique; the posterior extremity of the upper maxillary extending to a vertical line which would pass immediately in advance of the anterior rim of the eye when the mouth is closed. There is one row of teeth upon each jaw; on the dentary the teeth are much larger than on the intermaxillaries. Their form is flattened, dilated towards their upper edges, which are provided generally with five subconical points, the middle one being the longest, giving them the appearance of a digit. The palate is perfectly smooth, and unprovided with teeth. The opercular apparatus is very much developed, and subconvex upon its outer edge. The sub and interopercles are quite large, and occupy a prominent place. The opercle is narrow above, expanded below, and slightly convex posteriorly. The subopercle is curved, and in an oblique situation, with reference to the orientation of the head. The gill openings are continuous under the hyoidal apparatus; the branchiostegals, three in number, are well developed, curved and flattened, the outermost being but a little smaller and more slender than the innermost, or next to the opercular apparatus.

The anterior margin of the dorsal fin is nearer to the extremity of the snout than to the tip of the caudal fin; it is much higher than long; its upper edge is rounded or subconvex. The rays bifurcate but once, and this for more than the half of their length. The anterior ray is rudimentary, the second undivided. The adipose is slender, nearer to the base of the caudal than to the posterior edge of the dorsal, and consequently situated behind the anal. The anal is longer than the dorsal, and nearly as long as it is deep; its exterior edge, convex anteriorly, is subconvex posteriorly. Its anterior margin is situated backwards of the posterior edge of the dorsal. There are very slight indications of a bifurcation of the second degree upon the tip of its central rays; the first being rudimentary, and the second simple or undivided, as is the case in the dorsal. The caudal fin, which constitutes about one fifth of the total length, is deeply forked posteriorly; its lobes are rather rounded, and acute only upon their extremity. The central rays, towards their extremity, exhibit a subdivision of the third degree. The insertion of the ventrals takes place upon the middle of the abdomen, somewhat in advance of the anterior margin of the dorsal. These fins are rather slender, with their tips acute, and reaching the vent. Their central rays bifurcate twice. The origin of the pectorals is situated near the inferior region of the thoracic belt. These fins are longer and more slender than the ventrals; their tip almost reaching the origin of the latter fins. Their anterior ray is simple; the central ones are but once bifurcated, and only towards the last third of their length.

Br. III; D 10. O; A 14; C 3. I. 9. S. I. 2; V 7; P 11.

The scales are of moderate development, higher than long, subelliptical in shape, sometimes very irregularly so. Ten or eleven longitudinal rows may be counted upon the line of the greatest depth, and six or seven rows upon the peduncle of the tail. The lateral line is not to be seen.

The ground-color is olivaceous brown, with a silver band along the middle of the flanks, extending from the upper angle of the opercular apparatus to the base of the caudal fin. The cheeks, the opercles, and branchiostegal apparatus are silvery. A blackish stripe may be traced all along the upper edge of the silvery band of the sides. The dorsal region is minutely dotted with blackish, the dots being more particularly crowded upon the outline of the scales. These dots extend to the upper surface of the head, and sparingly to the upper region of the thoracic and abdominal regions; also to the inferior half of the peduncle of the tail. The dorsal, cau-

dal, and anal fins are almost greyish, through the accumulation of the above mentioned dots. The ventrals are unicolor; the pectorals greyish upon their external margin. The abdominal region sometimes exhibits an argentine reflection.

Inhabits the lagoons in the vicinity of Santiago, Chile.

Plate XXXIV, fig. 4, represents the profile of *Cheirodon pisciculus*, size of life.

fig. 5, is a scale from the dorsal region.

fig. 6, a scale from the lateral line.

fig. 7, a scale from the abdominal region.

Figs. 5, 6, and 7 are magnified.

FAMILY OF MYXINOIDEA.

Genus BDELLOSTOMA, Müll.

GEN. CHAR. Body eel-shaped. Anterior portion of head provided with four pairs of tentacles. Eyes small. One hook-like tooth on the middle of the palate; a double and arched series of teeth upon the tongue. External branchial apertures from six to fourteen, corresponding to as many gills, which are situated far behind the head.

SYN. *Bdellostoma*, MÜLL. Abhand. Akad. Wis. Berl. (1834) 1836, 79, and (1838) 1839, 173.
Heptatrema, DUM. Zool. Anal. 1806.

OBS. We refer naturalists to the memoir on the "Comparative Anatomy of the Myxinoids," published in the Transactions of the Academy of Berlin for the years 1834 and 1838, for information upon the internal structure of the fishes constituting the present genus. The species which is described below might have furnished some interesting anatomical facts had the specimen been in a better state of keeping. There are fourteen pairs of gills, seven more than in either of the species previously known.

The description of a Chilean species under a new specific name may well raise the question as to whether we had not before us the *Gastrobranchius dombeyi* of Lacépède (*Bdellostoma dombeyi*, Müll.), of which very little is known up to the present time. Lacépède's description was drawn from a dried specimen, no mention being made as to the number of respiratory apertures. The anterior row of hyoidian teeth is composed of eleven teeth on each side, and the posterior row of seven only, whilst in the one here described there are twelve teeth, on either side, in both rows. Moreover, as the eyes are said to be wanting in the species referred to by the French ichthyologist, we did not feel justified in attempting, for the present, its identification, since the absence of the organs of vision would even remove it from the genus *Bdellostoma*.

It is to be regretted that Duméril's appellation of *Heptatrema*, by referring to a point of organic structure subjected to variations, could not be retained to designate these fishes generically. If that name be restricted to the species provided with seven respiratory apertures, then each species would constitute a genus by itself; that with six of these apertures ought accordingly be called *Hexatrema*; then *Heterotrema* when six are observed on one side and seven on the other; *Heptatrema* when seven; and finally *Polytrema* for the species described farther on.

Considering, however, the structure of the mouth, both internally and externally, we would not hesitate in uniting them all under the well appropriated name of *Bdellostoma*, suggested by Prof. Müller.

BDELLOSTOMA POLYTREMA, Girard.

PLATE XXXIII, Figs. 1—5.

SPEC. CHAR. Fourteen respiratory apertures and gills on either side. Twelve teeth on either side in the posterior as well as in the anterior row. Eyes present. Color not preserved in the specimen described.

SYN. *Bdellostoma polytrema*, GRD. Proc. Acad. Nat. Sc. Philad. VII, 1854, 199.

OBS. In the second part of his memoir on the "Comparative Anatomy of the Myxinoids," Prof. Müller is inclined to believe that all the species enumerated in the first part, and which came to his knowledge, are but simple varieties of *Bdellostoma forsteri* (*Petromyzon cirrhatus* of Forster), an inhabitant of Queen Charlotte's bay, New-Zealand. This would give a remarkable geographic range to that species, as it is well known that *Bd. hexatrema* and *Bd. heterotrema*, both, inhabit the Cape of Good Hope; *Bd. dombeyi* the coast of Chile, and *Bd. heptatrema* the southern seas. The latter is more closely allied to *Bd. forsteri* than any other, and its locality in the southern seas may after all prove not to be far from New-Zealand.

Since *Bd. polytrema* has come to light, bearing in itself the remarkable fact of having fourteen pairs of gills, instead of six and seven, which are the usual number in the species previously known, we deem it advisable to retain them all as provisionally distinct. Moreover, the genus would not be limited to the austral hemisphere, for we find mentioned, in the "Fauna Japonica," p. 310, a species under the name of *Heptatrema cirrhatum*, which is another *Bdellostoma* (*Bd. burgeri*), judging of it by the figure given on Plate CXLIII, which exhibits a similar aspect of the head, the same shape of the mouth and cephalic tentacles. The eyes appear to be very small. A singular circumstance is mentioned by Mr. Bürger, by whom it was collected, and who states that during the summer months these fishes, generally a foot and some inches long, are caught in great numbers on muddy bottoms in the Bay of Simabara, at some distance from Nagasaki, and that the Japanese usually eat them raw. This latter species is more slender than the one of which we give a figure and a description.

DESCR. *Bdellostoma polytrema* is about fifteen and a half inches long. The body is subcylindrical anteriorly and compressed posteriorly, particularly upon the tail, which constitutes a little less than one sixth of the entire length. The head is slightly tapering towards the snout. The nasal opening (*a*) which terminates its anterior extremity, is transversally elliptical and very large, provided on each side with two tentacles; the uppermost (*b*) is the smallest and directed upwards; the other, (*c*), a little longer, stretches laterally outwards. Underneath the head we find the mouth (*d*), longitudinally subovoid, beset with minute cirrhi around its external margin. A broad and flattened tentacle (*f*), directed inwardly, may be seen extending over the buccal aperture across the middle of its longitudinal diameter. Another slender and second pair of buccal tentacles (*e*) is inserted near the base and external margin of the latter flattened pair, stretching outwardly backwards.

The tongue (fig. 5) is subcordiform, bearing two arched series of subconical teeth obliquely directed backwards. The posterior series is composed of considerably smaller teeth than the anterior one. In both there are twelve teeth on either side. A tooth from each series is represented isolated (*a*) on the right side of figure 5. To the left (*b*) may be seen the hook-like palatine tooth, subconical in shape, and likewise directed backwards.

The eyes are not very conspicuous, and are situated at about eight tenths of an inch from the extremity of the snout. A series of mucous pores may be seen extending below the middle of the sides, from near the anterior part of the body to near the extremity of the tail. The six or seven anterior holes are much larger than the remaining ones, which diminish backwards, becoming almost minute along the caudal region. The respiratory apertures are situated immediately above the series just alluded to, and may easily be distinguished by their larger size.

There is no dorsal fin. The caudal fin surrounds the extremity of the tail, extending a little farther forwards above than below, and tapering gradually towards, or else rising gradually from, the outlines of the caudal region. The anal fin is long, but very low. The vent is situated about six tenths of an inch from the posterior margin of the latter fin.

The precarious state of keeping the unique specimen which was obtained at Valparaiso, leaves us in doubt as to whether the bluish slate color of its epidermis was a true approximation towards its natural hue.

Plate XXXIII, fig. 1, represents *Bdellostoma polytrema*, size of life.

fig. 2, is an outline of the head, seen from above, exhibiting the cephalic distance between the eyes, the position and direction of three pairs of tentacles.

fig. 3, being a front view of the head, exhibits the nasal opening (*a*), and the same tentacles as in fig. 2.

fig. 4, which is the head, seen from below, shows the four pairs of tentacles, (*b, c, e, f,*) as well as the mouth (*d*), and nasal aperture (*a*).

fig. 5, is the tongue, with its double and arched series of conical teeth—*a* being two detached teeth, and *b* the palatine tooth.

DESCRIPTION OF CERTAIN CRUSTACEA, BROUGHT HOME BY THE U. S. N. ASTRONOMICAL EXPEDITION.

BY CHARLES GIRARD.

The Crustacea collected are but few, and of the Decapod division: some Brachyura, an Anomoura, and a Macroura, constitute the entire list.

The latter two, *Æglea* and *Rhynchocinetes*, constitute, each in itself, a natural group; both their structural peculiarities, and the deep interest which their history consequently involves, have suggested the following detailed descriptions of these two types.

DECAPODA ANOMOURA.

CENOBITIDÆ ÆGLEIDÆ.

Genus ÆGLEA, Leach.

GEN. CHAR. Carapax depressed, longer than broad, anteriorly tapering, dilated upon the branchial region, diminishing in width posteriorly, and biarticulated. Frontal region armed with an acute rostrum. External antennæ about the length of the carapax. External maxillaries pediform. Posterior segment of the thorax movable. Legs of moderate size. Abdominal region shorter than the thoracic; broad, reflexed inferiorly and anteriorly, composed of six or seven segments, five of them bearing oviferic legs.

SYN. *Æglea*, LEACH. Dict. Sc. Nat. XVIII, 1850, 29.

OBS. At the time this genus was instituted, there was but one species known, *A. levis*, an inhabitant of the coast of Chile. Recent investigations have brought to light a second, from the same litoral, and to-day we add a third to the list, inhabiting the fresh waters of the mountainous regions of the Chilean republic, not knowing, however, whether it is altogether peculiar to that geographic range.

A great deal remains to be done in order to ascertain whether these species are really distinct from one another. In the want of authentic specimens of both *A. levis* and *A. denticulata*, I was not prepared to remove all the doubts I had entertained in regard to their zoölogical similarities and dissemblances. With upwards of twenty-five specimens, including both sexes, of *A. intermedia*, before me, I have been compelled to avail myself, for their determination, of the writings of my predecessors in the field; and this has been done with the most earnest desire to arrive at the truth on this subject. I candidly confess that had I had but one specimen and but one sex, I would have hesitated describing it as a new species. But since my materials were ample, and the specific characters hence drawn were found not to vary throughout the whole range of the specimens examined, I felt much less justified in calling them either *A. levis* or *A. denticulata*, than ascribing to them a new name.

The description given below, it may be trusted, will enable my followers in the field, with the assistance of similar materials from the coast of Chile, to determine the true zoölogical

relations which may exist between the marine and fresh water representatives of this interesting genus.

To facilitate their researches, I subjoin the references I have gathered touching the history of the two species described by different authors.

ÆGLEA LÆVIS, Leach.

SYN. *Galathea lævis*, LATR. Encycl. Méth. Crust. Pl. cccviii, fig. 2.

Æglea lævis, LEACH, Dict. Sc. Nat. XVIII, 1820, 49.

DESM. Consid. Gén. Crust. 1825, 186, Pl. xxxiii, fig. 2.

LATR. in *Cuv. Règn. Anim.* IV, (2d edit.) 1829, 84.

GRIFF. *Cuv. Anim. Kingd.* XIII, 1833, 184, Pl. vii, fig. 2.

MILN. EDW. Hist. Nat. Cr. II, 1837, 258; Atlas du Règn. Anim. de Cuvier, Pl. xlvii, fig. 3.

EDW. et LUC. in *D'Orb. Voy. Amér. Mérid.* VI, I. Crust. 1843, 34.

NIC. in *Gay, Hist. de Chile, Zool.* III, 1849, 199.

DANA, U. S. Expl. Exped. Crust. XIII, I, 1852, 476, Pl. xxx, fig. 6.

ÆGLEA DENTICULATA, Nic.

SYN. *Æglea denticulata*, NIC. in *Gay, Hist. de Chile, Zool.* III, 1849, 200, Lam. ii, fig 1.

ÆGLEA INTERMEDIA, Girard.

SPEC. CHAR. Carapax finely punctate; rostrum moderate, acute, depressed (incurved) upon its middle, with its point slightly turned upwards. Edges of carapax subdenticulated; denticulations more conspicuous on the stomacal region than on the branchial region. Anterior legs larger in the male than in the female; in both sexes the arm has a prismatic shape, and is denticulated upon its upper and its lower and inner edges; the external lower edge being nearly smooth. Carpus provided with two rows of subconical tubercles (teeth) upon its upper and inner portion. Hand exhibiting internally a flattened processus, often denticulated. Inner edge of claws tuberculous or subtuberculous. Abdominal segments divided into three lobes, by an undulating line forming a subaneate triangle upon each segment.

DESC. The body is very much depressed, longer than broad; anteriorly about half the width of the posterior margin. The depth upon the middle region is about equal to the width of the anterior region immediately behind the orbits. The margin of the carapax is sharp and slightly indentated; the outline is slightly incurvated upon the suture which separates the thoracic from the cephalic region. The latter, convex upon its middle, is terminated anteriorly by a subtriangular, acerated, and carinated *rostrum*, slightly raised upwards upon its tip. On each side of the rostrum a semi-elliptical notch, at the external angle of which a small spine exists, constitutes the orbit. The suture, between the cephalic and thoracic regions, is very convex posteriorly upon the middle region, then slightly concave laterally and anteriorly, then again oblique towards the edge of the carapax.

The *thoracic region* is divided by two longitudinally shallow and smooth furrows into three regions—a medial or cardial, and two lateral or branchial regions. Again, it divides transversally into three regions also—an anterior, a medial, and a posterior; the last embracing a very narrow space upon the posterior extremity of the carapax, and extending but very slightly upon the branchial regions. The central portion of the cardial region is slightly convex, and limited by a sinuating depression or groove. The last segment of the thoracic region is move-

able, very small, posteriorly rounded and convex, laterally acute, giving points of attachment to two inferior, transverse, and very slender pieces, situated close to the posterior margin of the sternal shield, to which system the anterior piece undoubtedly belongs. The fifth pair of legs is likewise articulated upon that segment. Upon the extremity of the posterior transverse piece just alluded to, is articulated a rudimentary caudal appendage, or so called oviferic leg.

The *sternal shield* is subtriangular; its summit, which is directed forwards, being truncated. It is composed of four transverse pieces, soldered together, and corresponding to the anterior four pairs of legs. It is a little longer than the cardinal region above.

The *eyes*, semiglobular in shape, are inserted upon a very short peduncle immediately beneath the base of the rostrum, and directed forwards.

The *inner antennæ* have a peduncle composed of three articles. The basal is globular, inserted immediately beneath the peduncle of the eye. The second article is the longest, very slender, subcompressed, slightly curved, implanted upon the inner edge of the first or basal, and provided upon its inner margin with a row of setæ. The third article is shaped like the second, more slender, and one third shorter: the antenna proper is about the length of the second article of the peduncle, compressed, tapering, consisting of eleven narrow articles, the inferior edge being provided with a double series of very short setæ. A filiform, eight-jointed appendage, may be observed inserted at the upper and anterior margin of the third article of the peduncle, and shorter than the anterior proper.

The *external antennæ*, inserted upon the same transverse line as the inner, are slender, elongated, cylindrical, and tapering to a point, composed of narrow and somewhat irregular articles, upon a length of nearly one inch and a quarter. Their peduncle, about a quarter of an inch long, is composed of four articles, two of which might almost be considered as forming but an irregular odd basal, at the upper and anterior margin of which a rudimentary processus may be observed. The two remaining articles are subcylindrical: the fourth is the longest.

The *inferior labia*, or else anterior abdominal segment, on the sides of which the external jaw-legs articulate, is very small and bidentate.

The *external jaw-legs* are pediform, provided internally with setæ, and composed of six articles besides the basal. Upon this, and exteriorly, is inserted the *palpa*, the first article of which is exceedingly small; the second slender, subcompressed, and elongated; the third, small and cylindrical, is followed by a lanceolated, thin blade surrounded with setæ. When stretched out, the tip of the palpa extends to the base of the terminal article of the jaw-leg properly so called. The first article of the jaw-leg proper is the smallest of the six composing it; the second and third, subprismatic in shape, are the largest; the fourth, fifth, and sixth, are subdepressed, the latter conical, and the three together equal in length to the second and third combined.

The *second pair of jaw-legs* consists of the same number of parts as the first or external pair, viz: of a palpa and a mandible; both being composed of the same number of articles; its differences consisting in a smaller and more slender form, and in the palpa being more elongated than the mandible, with its first article almost as long as the second. Setæ occupy the same edges and surfaces.

The *first mandible*, or *third pair of jaws*, is composed of a triple foliaceous cochloid piece, subrenated upon its margin, each expansion being provided upon its base with a rudimentary palpa, and the external having in addition an elongated membranous expansion which extends towards the gills.

Finally, the *second or inner mandible* (*fourth pair of jaws*) is an elongated and rigid piece, composed of three articles intimately soldered together; the third article being the most developed of the three, and terminated by a subcircular and interiorly concave head, giving to the whole the form of a small dipper, at the upper and anterior part of which a small rudimentary palpa may be seen, inclined inwardly.

The *anterior* or *upper labia* is small and tuberculiform, situated in a concavity of the epistoma concealed by a slight ridge.

The anterior—pincers or claws-bearing—pair of legs is the stoutest and longest of the ambulatory appendages. The second, third, and fourth pairs are flattened; the second a little longer than the third, and the third a little longer than the fourth. The fifth pair is very exiguous, folded inwardly, and not used at all as an ambulatory organ.

The first (basal) article in the anterior four pairs of legs is similar in shape and structure in all; preserving, however, their due proportions.

In the first pair of legs the second article is subprismatic, short and stout, larger than the first article, angular anteriorly and inwardly, provided with a few rudimentary spines along its inner edge. The third article (arm) is prismatic, tapering, posteriorly provided with a row of small spines upon its edges, and subtubercular upon its anterior margin. The fourth article (carpus) is short, subtriangular and stout, provided upon its inner edge with a double series of tubercular spines. The fifth article (hand) is subelliptically rounded exteriorly, flattened inwardly, and provided upon its inner margin with a flattened processus, subrenated upon its edge. The inferior claw, slightly curved inwardly, is concave upon its middle, and margined with a series of transversally elongated and depressed tubercles disposed upon a double row towards its base. The upper claw is elongated, subcylindrical, tapering, curved downwards, thus forming an arch above the inferior one; being similarly provided upon its margin with a series of flattened, transversally-elongated tubercles, largest posteriorly.

The second, third, and fourth pairs of legs are composed of six articles, including the basal, already alluded to. The second article is the second also in size; then the fourth (carpal), which is slightly bent downwards; then the fifth; the third is the longest of all; the sixth (tarsal), about equal to the fifth in length, is very slender, cylindrical, tapering, and terminated by a minute spine.

The fifth and exiguous pair of legs, inserted, as stated above, upon the post-thoracic and moveable segment, is composed first of a very small subglobose article, followed by four others more elongated and slender, subequal, slightly diminishing in length from the base towards the tip, which consists in a rudimentary claw concealed under a tuft of setæ and moveable upon the fifth article.

The caudal region is shorter than the carapax; bent upon its middle, and brought forward beneath in close contact with the inferior surface of the body, the extreme margins of the caudal paddle covering the posterior half of the sternal shield. It is composed of five segments, divided into three lobes by a lateral undulating groove. The posterior four segments are angular, and acute externally, while the anterior one is rounded; all being margined with a series of setæ. Inwardly and laterally they are provided in the female with rudimentary three-jointed, egg-bearing legs. A subpentagonal thin piece, as sixth segment, terminates that region, having on either side caudal paddles composed of a basal subtriangular piece inserted partly upon the fifth segment, and directed forwards; whilst on the latter are inserted, towards its external extremity, two subelliptical plates, margined with setæ as well as the central piece, and directed backwards and inwards.

The main surface is minutely punctured; the second, third, and fourth pairs of legs are provided with short and scattered setæ, more thickly set, and more developed upon the tarsal article.

The body and tail are bluish yellow above, yellowish beneath. The legs are reddish and bluish, and the antennæ reddish.

Specimens were collected in the upper affluents of the Rio de Maypu, 2,000 feet above the level of the sea, near Santiago.

DECAPODA MACROURA.

PALÆMONIDÆ ALPHEINÆ.

Genus RHYNCHOCINETES, Edw.

GEN. CHAR. Body moderately compressed; carapax exhibiting a spinous process towards the middle of the region of the stomach. Fronto-interocular margin provided with three spines; two more spines may be observed laterally upon the same anterior margin. Rostrum very large, sword-shaped (ensiform) attached to the front by a gynglymic articulation in a vertical plane, allowing a free motion downwards between the antennæ, and upwards to a vertical position of its axis. Its length equals, or exceeds a little, that of the carapax. It is toothed, or else denticulated upon its edges. Eyes conspicuous, and, when brought forward, find a resting place in an excavation of the peduncle of the superior antennæ, the basal article of which is large, and armed exteriorly with a spiniform blade. The terminal threads of these appendages are two in number, and constructed as in *Hippolytus*. External jaw-legs pediform and elongated; their terminal article is slender, cylindrical, and spiny upon its apex. A rudimentary palpiform appendage may be seen exteriorly at the base of each leg. Tarsus of second pair of legs not multiarticulated. First pair of legs larger than the others, and stretching beyond the peduncle of external antennæ; pincers short and spoon-shaped; finger moveable and toothed. Second pair of legs very slender, terminated by a small chela, and shorter than the third; the tarsus of the latter and the following pairs being short and toothed as in *Hippolytus*. Abdomen not different from the latter-mentioned genus. Several pairs of small spines upon the median blade between the caudal paddles. Gills, nine on either side of the thorax, disposed upon a double row.

SYN. *Rhynchochinetes*, Edw. Ann. Sc. Nat. Deux Sér. Zool. VII, 1837, 165.—Hist. Nat. Crust. II, 1837, 383.

Edw. et Luc. in *D'Orb. Voy. Amér. Mérid.* VI, 1, Crust. 1843, 35.

Nic. in *Gay, Hist. de Chile, Zool.* III, 1849, 215.

OBS. There is one point in the history of this genus which cannot be looked upon with indifference by naturalists—the fact that the only species on record, when first described, was given for fatherland the Indian ocean. Specimens thus labelled had been deposited in the museum of the Garden of Plants in Paris, and these became the originals from which Milne Edwards's first description was drawn. As such it was produced in the *Histoire naturelle des Crustacés*.

Subsequently, Alcide d'Orbigny brought to the same establishment specimens collected at Valparaiso, which, on being submitted to Milne Edwards, were pronounced identical with those previously described, and Valparaiso given as locality for the species, without any further remark upon the subject. Nicolet, in Claude Gay's *Historia de Chile*, follows Milne Edwards's determination; adding, however, that the sole species hitherto known of this genus was indigenous both to the Indian ocean and to Chile. Dana, in his *Report on the Crustacea of the United States Exploring Expedition*, adopts the views of his predecessors in regard to the identity of the species, ascribing to it, in his tables of geographic distribution, a still wider range, since it is stated to occur in the northern zone of the western coast of the Pacific ocean.

The question now occurs as to whether the specimens labelled "Indian ocean," in the Paris Museum, do really belong to that district, or else got a wrong label; no mention being made by any one as to the channel through which they have been obtained. The figure published

at the time in the *Annales des Sciences naturelles* is a female, answering altogether to the specific features in the specimens of the same sex now before us.

There can be also no doubt as to the specific identity of both d'Orbigny's and Gay's figures, the originals of which were procured at Valparaiso. They both represent the female.

Specimens of both sexes were brought home by Lieutenant Gilliss. In the female the external maxillipes are equal in length to the distance between the apex of the rostrum and the articulation of the caudal region upon the thorax. The first pair of legs extends to nearly the serrated portion of the rostrum; the apex of their chela, therefore, does not reach as far as the extremity of the latter organ. The tip of the second pair of legs is even with that of the first pair, though inserted behind it. The third pair of legs is the longest, projecting beyond the second and first pairs, and extending to nearly the apex of the rostrum. The tip of the fourth pair is nearly even with the second and the first. Finally, the extremity of the fifth pair reaches the base of the last article of the third pair; its tip, therefore, remaining behind that of all the others. The rostrum is equal in length to the middle line of the cephalo-thoracic region. Now there can be no doubt as to the identity of these specimens with those figured by d'Orbigny and Gay.

In the male the external maxillipes are nearly as long as the absolute length of the animal, since they equal the distance between the apex of the rostrum and the middle of the length of the caudal paddles. The first pair of legs is stouter, the hand more elongated, and extending beyond the apex of the rostrum for the whole length of the finger. The second pair is very slender, hardly reaching with its extremity the middle of the hand, and not quite as far as the denticulated portion of the upper edge of the rostrum. The third pair extends to the base of the moveable finger or upper portion of the big claw, and consequently a little beyond the apex of the rostrum. The tip of the fourth pair is nearly even with, mayhap slightly longer than the second. Finally, the fifth pair slightly projects beyond the base of the last article of the third pair. The rostrum is somewhat longer than the middle line of the cephalo-thoracic region. The antennæ are longer than in the preceding instance. In every other particular both sets of specimens appear to agree perfectly. Those from which our description is drawn belong to the latter group.

RHYNCHOCINETES TYPUS, Edw.

SPEC. CHAR. Dull greenish, variegated with yellowish red. Locomotory appendages and jaws transversally barred or annulated with pinkish. Patches of the latter hue are also observed upon the convexity of the caudal region.

SYN. *Rhynchocinetes typus*, EDW. Ann. Sc. Nat. 2de Série VII, Zool. 1837, 165, Pl. iv, C.—
Hist. Nat. Crust. II, 1837, 383.

EDW. et LUCAS, in *D'Orb. Voy. Amér. Mérid.* VI, 1; Crust. 1843, 36, Pl. xvii,
fig. 1.

NIC. in *Gay, Hist. de Chile, Zool.* III, 1849, 216; Crust. Lam. I, fig. 7.

Rhynchocinetes typicus, DANA, U. S. Expl. Exped. Crust. XIII, I, 1852, 568, Pl. xxxvi,
fig. 7.

DESCR. The following description is based upon the male: The entire length, from the tip of the rostrum to the extremity of the caudal paddles, is four inches and a quarter; the rostrum measures one inch and an eighth; the middle line of the cephalothorax one inch and a sixteenth.

The cephalothoracic region is rounded above, compressed, deeper than broad, smooth, with the exception of the anterior extremity, which is provided with eight acerated points; two of which being situated upon the middle line, and one immediately above the base of the rostrum:

the other is behind it, at a distance of about an eighth of an inch. One pair of spines may be seen—one on each side of the postrostral—immediately above the orbit. Another pair occupies the externo-inferior angle of the orbit. Finally, a third and very small pair may be observed at the inferior and anterior angle of the carapax.

There are nine gills on each side, disposed in a double series, in the following manner: The external series, composed of five of these appendages, are much the smallest; the anterior one rests upon the base of the external jaw-leg; the four remaining ones are situated immediately above the insertion of the anterior four pairs of ambulatory legs. The gills of the inner series, four in number, are disposed obliquely opposite the insertion of the ambulatory legs; they increase gradually in size from forwards backwards.

The *jaw-leg* (external or sixth pair of mandibles) is three inches and a quarter long, stretching beyond the apex of the rostrum for about the half of their length, and composed of five articles. The basal is a circular ring, bearing a very small palpiform appendage, placed transversally, and directed backwards. The second article is subtriangular, very small, developed only upon the outer or inferior aspect of that organ, and upon its inner edge is a slender, palpiform, subarticulated appendage, nearly two thirds the length of the third article, tapering, flattened, and provided upon its inferior edge with a series of closely-set hairs or setæ. The third article itself is three quarters of an inch long, anteriorly subcylindrical, posteriorly concave immediately beneath the mandibles, for whose benefit this concavity exists; its antero-superior edge is provided with two small spines. The fourth article is small, about a quarter of an inch long, subcylindrical, and spineless. The fifth article measures two inches and three sixteenths; it is slender, cylindrical, and tapering towards its extremity, which is provided with five or six minute spines.

The *mandibles of the fifth pair* (proceeding from the innermost or first) are composed of five articles, the fifth and largest of which is flattened and bent downwards upon the fourth, which is the smallest. Exteriorly to the first or basal article arises a processus, bearing a membranous palpa and a subcircular flap, above which, and from the external edge of the second article, may be seen, stretching forwards, a palpiform appendage about half an inch long, and exhibiting distinct traces of transverse articulations, most numerous towards its extremity. The third article is of moderate development.

The *fourth pair of mandibles* consist of but one article each, thin, foliaceous, subtriangular, cochloid, provided upon the posterior portion of its base with a double, subelliptical, membranous expansion, and directed forwards; a crustaceous expansion, terminating in two small, filiform pseudopalpæ, one larger than the other.

The *third mandible* is composed of a few very thin, foliaceous, and rounded pieces, broadest towards the mouth, and provided upon their external margins with a crustaceous expansion, directed forwards, besides a tapering and hairy one extending backwards across the gills.

The *second mandible* consists of three small plates, two inferior, subcrustaceous, and flexible, whilst the third is rigid, cochloid, and provided upon its margin with a double and close series of very small, conical, and slender black spines. At the base and upper portion of this pair of mandibles may be observed a rudimentary palpa.

The *first or innermost mandible* consists of one piece only, subcylindrical upon its base, terminating anteriorly in processi, the inner of which is stout and blunt upon its apex, whilst the other is cochloid, and margined with a series of small, conical, black spines.

The *upper labia* is short and stoutish, flattened and rounded upon its margin.

The *external antennæ* are more than five inches in total length. The first article is short and stout; provided upon its anterior margin with a small spine, and upon its inner edge is inserted an elongated, sword-shaped, subtriangular appendage, anteriorly tapering to a point, and apparently composed of two elongated pieces soldered together, judging of this by the presence of a groove upon its external or upper surface. It is provided upon its inferior and crenated edge with a series of closely-set hairs or bristles. Beneath, and towards the inferior surface of the

first article, arise the antennæ proper: three articles (second, third, and fourth of the series) follow one another within a distance of about half an inch, the first two being small and irregular, the next is subtriangular or rather compressed; to the latter is appended the remaining portion of these organs, composed of narrow and circular articles, increasing in length up to the middle of their extent, hence diminishing again gradually towards their filiform apex.

The *superior antennæ*, two inches and three quarters in total length, are composed of a basal, rather large and subtriangular piece, anteriorly tapering into several points, followed by two small articles, upon the latter of which, the smallest of the series, are inserted: first, a filiform, transversally and minutely articulated antenna; and, second, a flattened, much shorter antenna (about half an inch long), provided inferiorly or interiorly with a series of closely-set hairs or setæ.

The eyes, inserted upon a short peduncle immediately above the superior antennæ, are large and conspicuous, and when inflexed they are lodged in a concavity of the basal article or segment of the organs just alluded to.

The *rostrum*, one inch and an eighth in total length, is very much compressed, and thin, tapering off towards its extremity, which is slightly curved downwards, and provided upon said curvature with ten acerated spines, directed forwards, the anterior one being the largest, and constituting the very extremity of that piece. Two more spines, similarly directed forwards, exist upon the upper margin, one near the base, the other a quarter of an inch anteriorly. The inferior edge is provided upon its whole extent with eighteen spines, similar to the anterior upper ones, but much larger and broader posteriorly. On the posterior edge of each of the latter spines exists a series of minute and closely-set hairs.

The anterior—pincers-bearing leg—is the stoutest and longest of the five pairs; the second pair is the most slender and the shortest; the third, fourth, and fifth pairs are equal as far as stoutness is concerned, but the third pair is a little longer than the fourth, and the fourth a little longer than the fifth pair, which is somewhat longer than the second.

The first (basal) and second articles in the five pairs of legs are similar and proportional in their development; the first is an annular ring, bearing a rudimentary palpiform appendage, similar to that observed upon the basal article of the jaw-leg; the second is subtriangular and acute exteriorly.

In the first pair of legs the third article is a little larger and more acute exteriorly than the second. The fourth article is long, compressed towards its base, and subcylindrical anteriorly, where it is provided with a small spine. The fifth article is short, subprismatic, bearing a large spine upon its anterior margin, and several small ones beneath and exteriorly. The sixth, which forms the claw, is the stoutest and longest, bearing upon its extremity three small, black spines; the upper piece of the claw is slightly arched, bearing upon its convexity a well-developed tuft of hairs; its anterior extremity is provided with a series of about a dozen small, black spines, largest near the apex.

In the second pair of legs the third article is nearly as long as the fourth, and similar to the latter in shape, in a reverse position. The fifth article is the longest, and subcylindrical. The sixth article, which bears a small claw, is likewise subcylindrical, or slightly compressed and elongated. The moveable upper piece is provided anteriorly with four small, black spines, whilst there are but two below.

In the third, fourth, and fifth pairs of legs the third article is a little larger than the second, and also more acute. The fourth article, the longest of all, is compressed, and provided along its external edge with three or four small spines. The fifth article, one-third shorter than the sixth, is likewise compressed, and provided externally with a few minute spines. The sixth is slender, a little shorter than the fourth, provided with exceedingly minute spines beneath, and terminated by a subconical and slightly-curved spine, moveable upon the latter, representing a seventh article.

The caudal region, composed of six segments, is rather stout, compressed, higher than broad

upon the extend of the first segment, the third being considerably developed upon its upper region, which is prominently convex. The remaining portion of the tail is very much reduced, tapering posteriorly, bent downwards and forwards under the body. The lateral and free expansions of the anterior three caudal segments are rounded off; that of the second segment is the largest, subcircular in shape, external, and covering partly the expansions of the first and the third segments. In the fourth and fifth segments that expansion is subtriangular, posteriorly acute. The sixth ring has no such lamellar expansions, but is provided upon its posterior and inferior angle with a slight ridge, at the inner margin of which a row of setæ is observed similar to that which exists upon the external margin of the lamellæ of the other segments. The central caudal appendage, subconical in shape, elongated and tapering, is convex above, concave beneath, and terminated by three pairs of spines; a very minute external pair, and two median, the upper one very slender, and two thirds the length of the lower pair, which is the most conspicuous. Along the upper and convex surface there are three pairs of rather short, stoutish, though small spines. On each side of this central appendage, and inserted in a concavity of the lateral and posterior edge of the sixth segment, with one spiny process above and below, is another appendage composed of a short basal piece, upon which are inserted two moveable very thin lanceolated lamellæ, provided upon their edges with well developed setæ disposed upon one close series. The inner lamella is made of a solitary piece; the external one is composed of two pieces, the undulated and transversal articulation of which may be seen across the posterior third of said lamella, exteriorly marked by two small spines belonging to the largest piece.

The *caudal* or *oviferic legs*, five in number (one pair for each anterior five caudal segments), are of moderate development, the second and third pair being the largest. The posterior four pairs are similarly constructed. They consist of a flattened article, terminated by two narrow, elongated, thin blades, margined with setæ. The anterior pair is distinguished from the others in the structure of the terminal pieces, the inner of which is short and rather broad, and deprived of setæ upon its edge, whilst the outer one is similar to those of the other legs, being, however, considerably smaller.

The surface of the carapax is almost entirely smooth; a minute, prickly granulation becomes visible under a magnifying glass and to the touch also. This granulation is more apparent upon the locomotory and other appendages than elsewhere. The upper margin of the large claw is provided with an elongated tuft of setæ extending from the anterior portion of the hand (so called) along the convexity of the finger to near its apex. An elongated cushion of short setæ may also be observed along the convexity of the finger to near its apex. An elongated cushion of short setæ may also be observed along the inner surface of the third, fourth, and the base of the fifth article of the jaw-legs. Scattered bristles or setæ exist along the inner surface of most of the articles constituting the legs, and principally upon the mandibles.

The ground-color is yellowish; the sides of the cephalothorax and tail are variegated with irregularly meandric, fuliginous red maculæ. The appendages are annulated with purplish red. The third caudal ring is purplish upon its convexity, exhibiting two parallel light vittæ along the upper surface of the anterior three rings, uniting at an acute angle upon the posterior portion of the third ring. The caudal legs are spotted with fuliginous red.

The specimens were caught in Caldera bay.

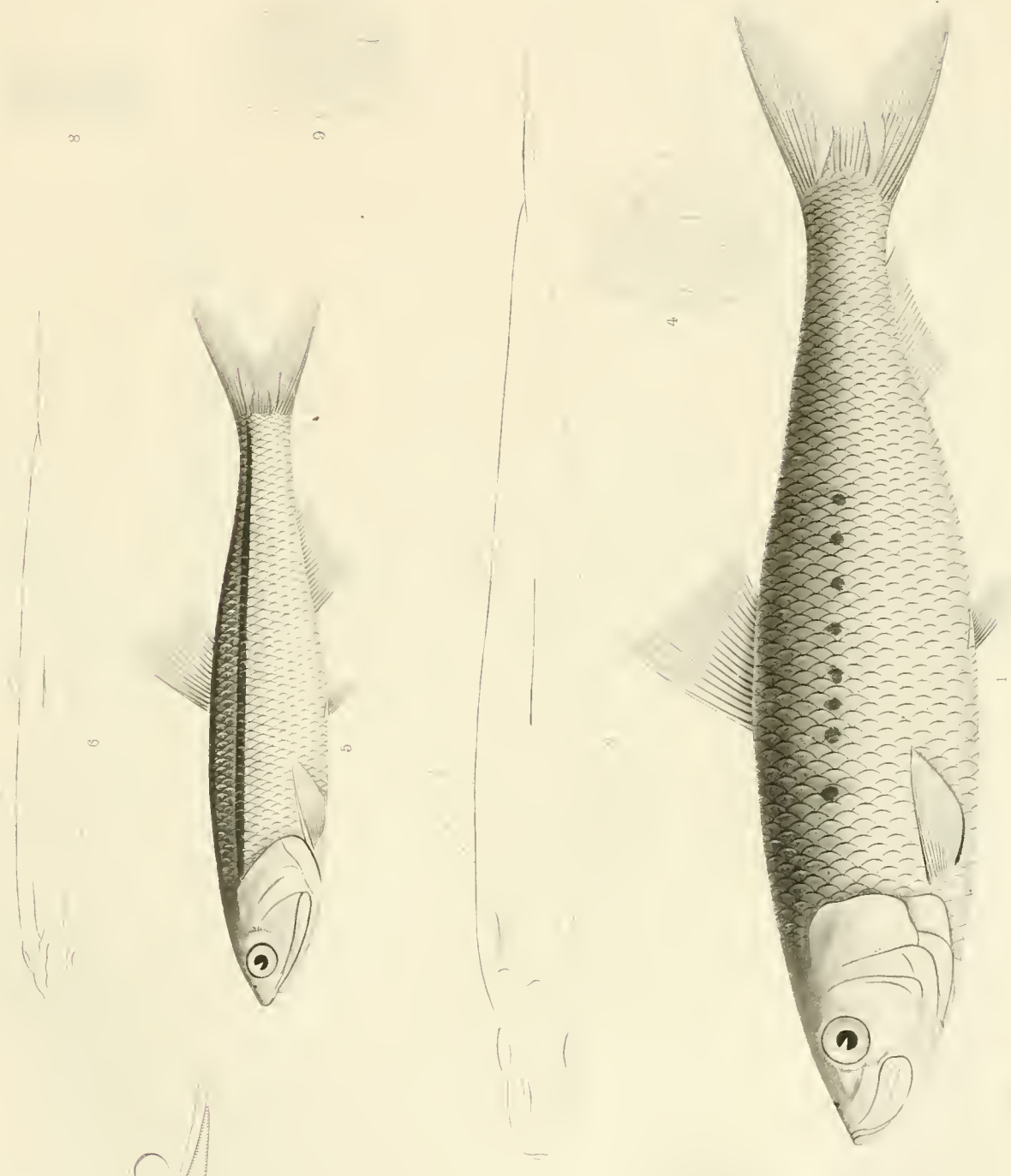




Fig. 1-4 PERCIGITHYS CHILENSIS, Girard. FIGS. 5-9. PERCILIA GILLISSI, Girard.

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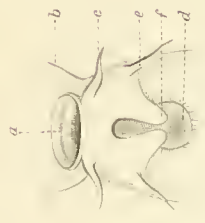
FIGS. 1-4 ALOSA MUSCICOLA, GORD. FIGS. 5-9 ALOSA MUSCICOLA, GORD.



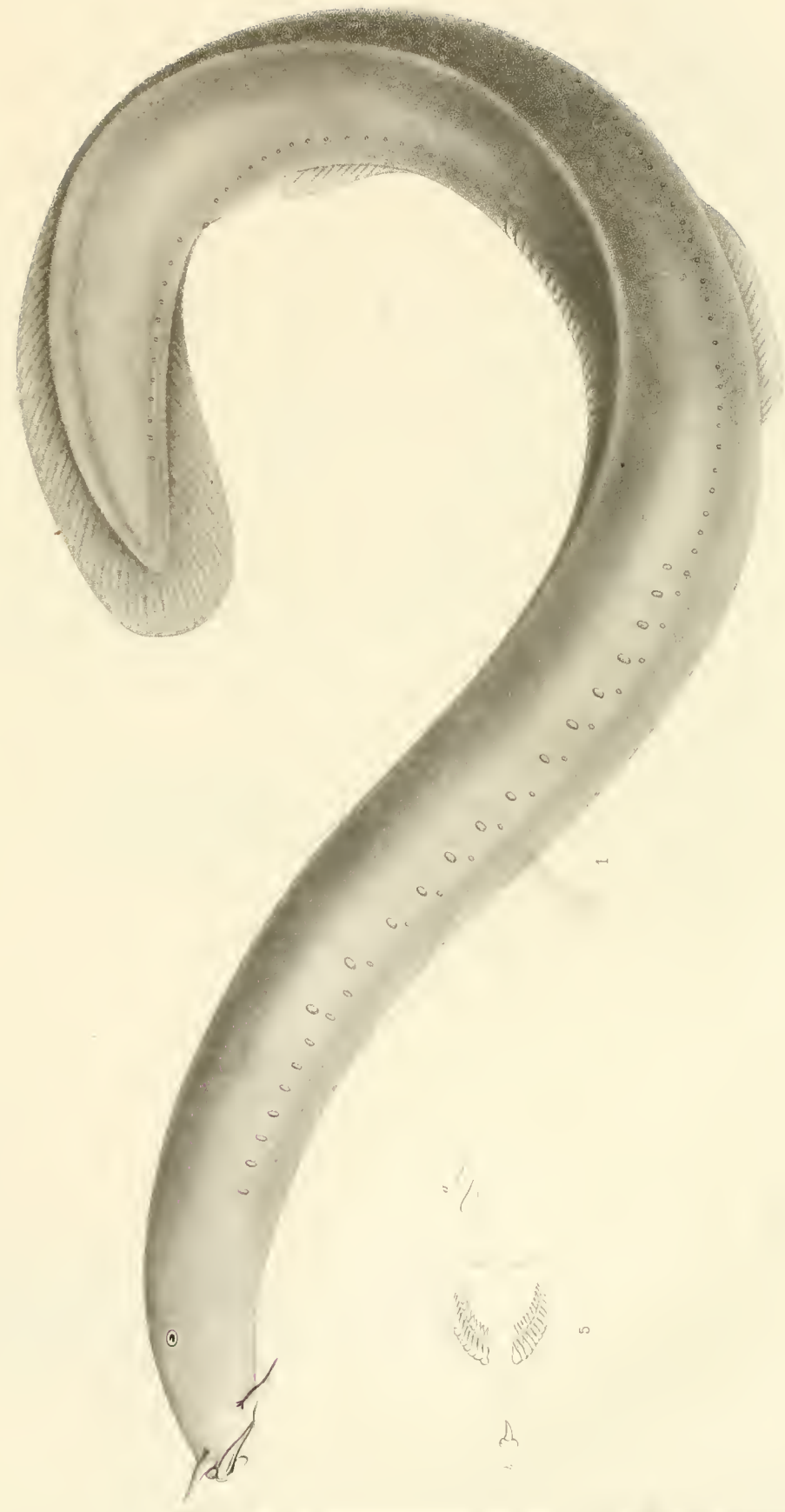
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NEMATOGENYS INERMIS, Grd

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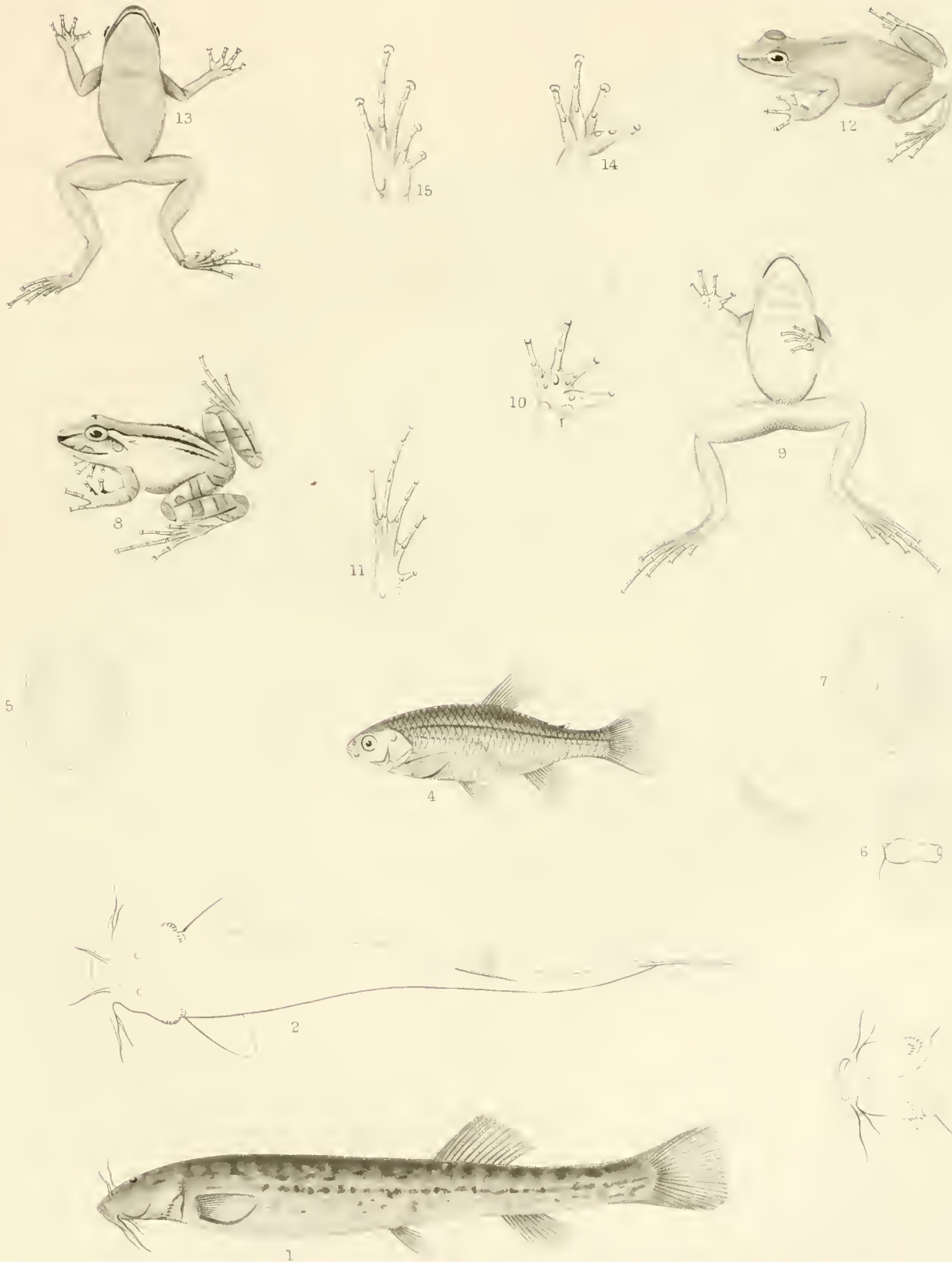
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Figs. 1-3 TRICHOMYCTERUS MACULATUS, Cuv & Val. Figs. 4-7. CHEIRODON BISCUTELLUS, Gio.
 Figs. 8-11. CYSTIGNATHUS TAENIATUS, Grd. Figs. 12-15. PHYLLOBATES AJFAI, Grd.



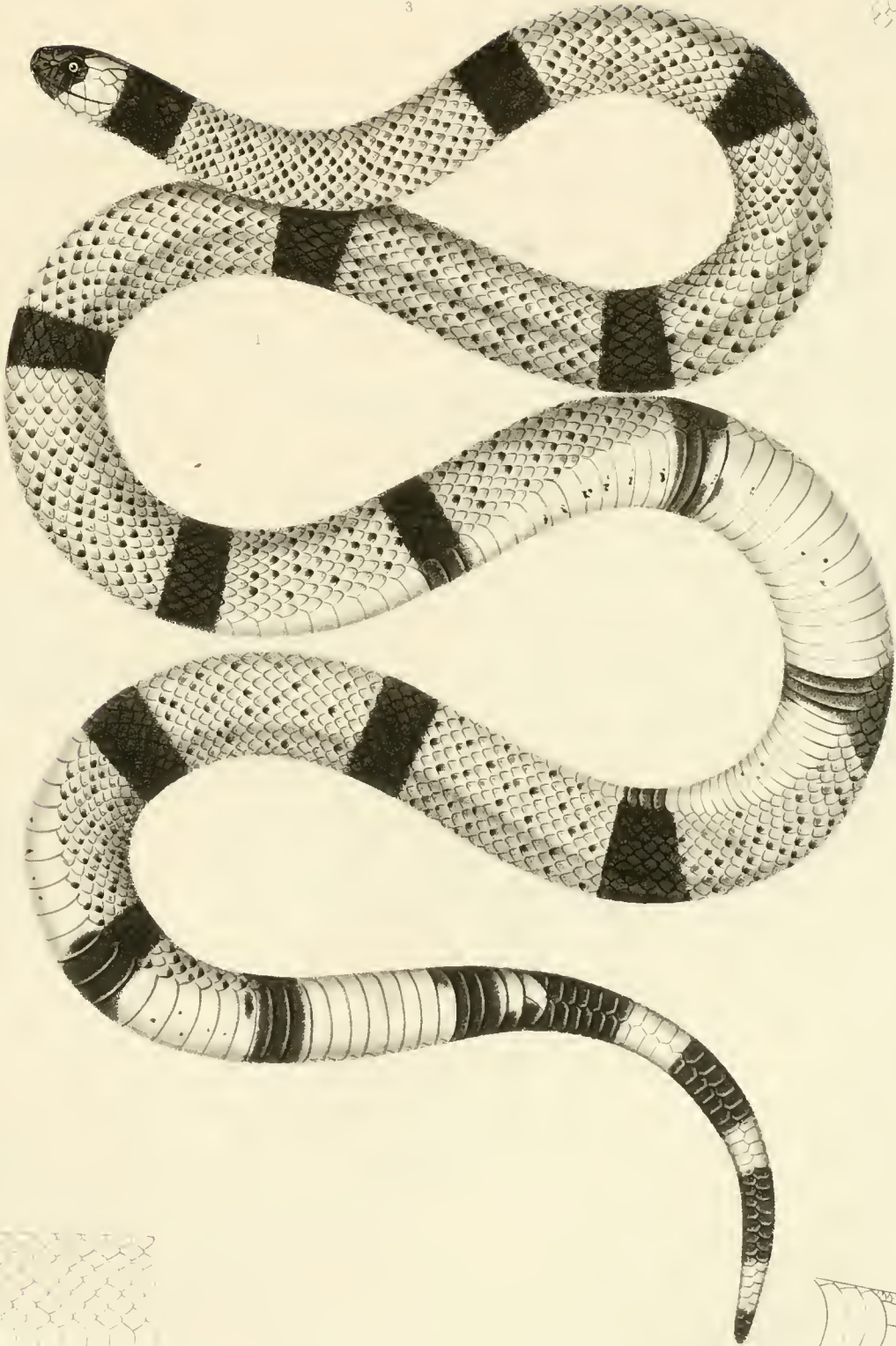
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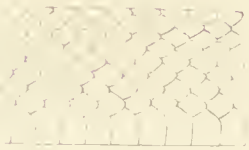
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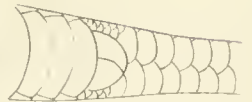
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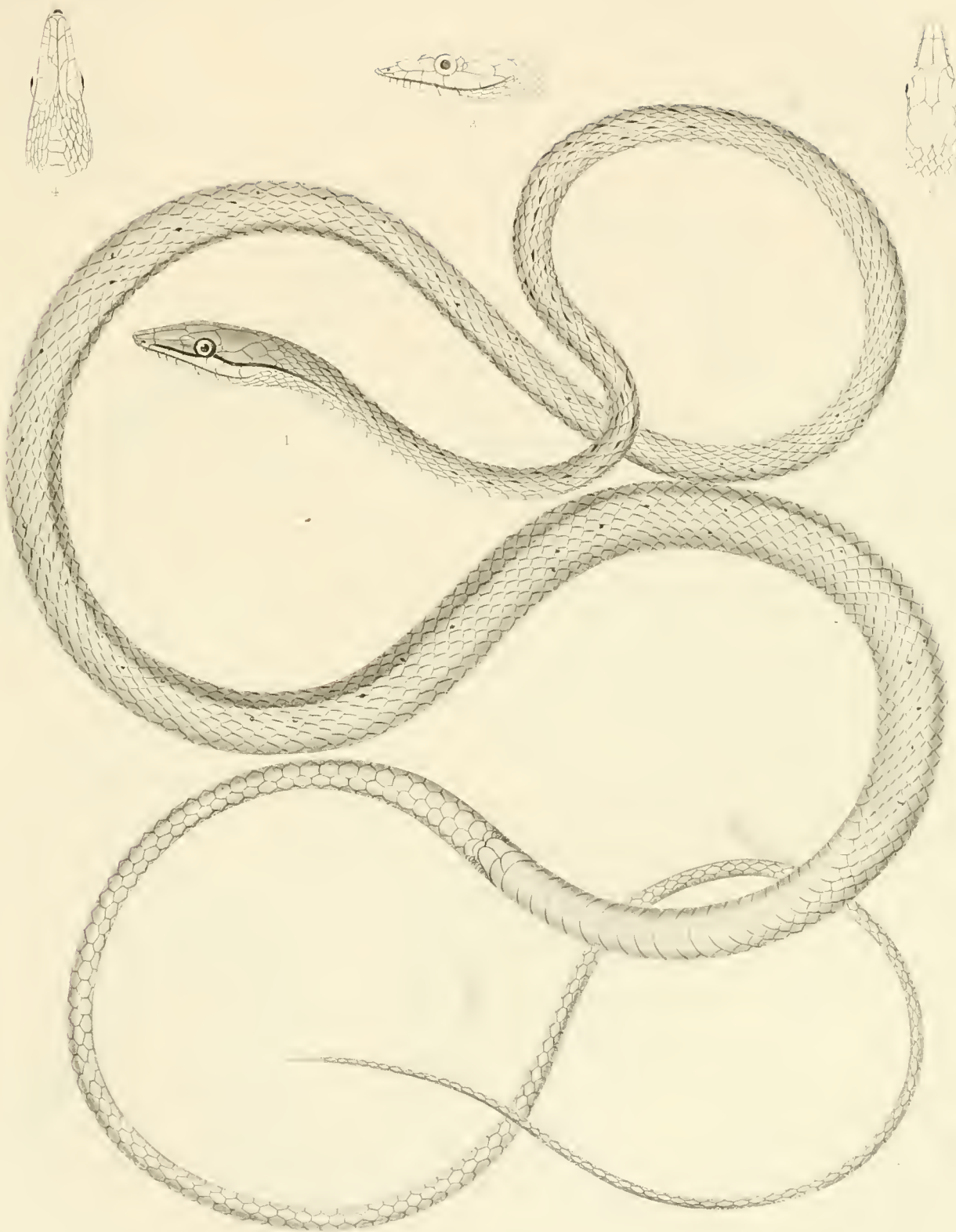
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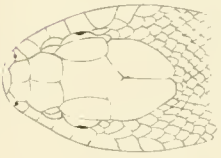


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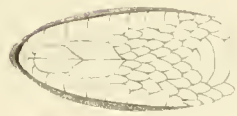
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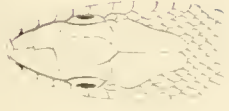
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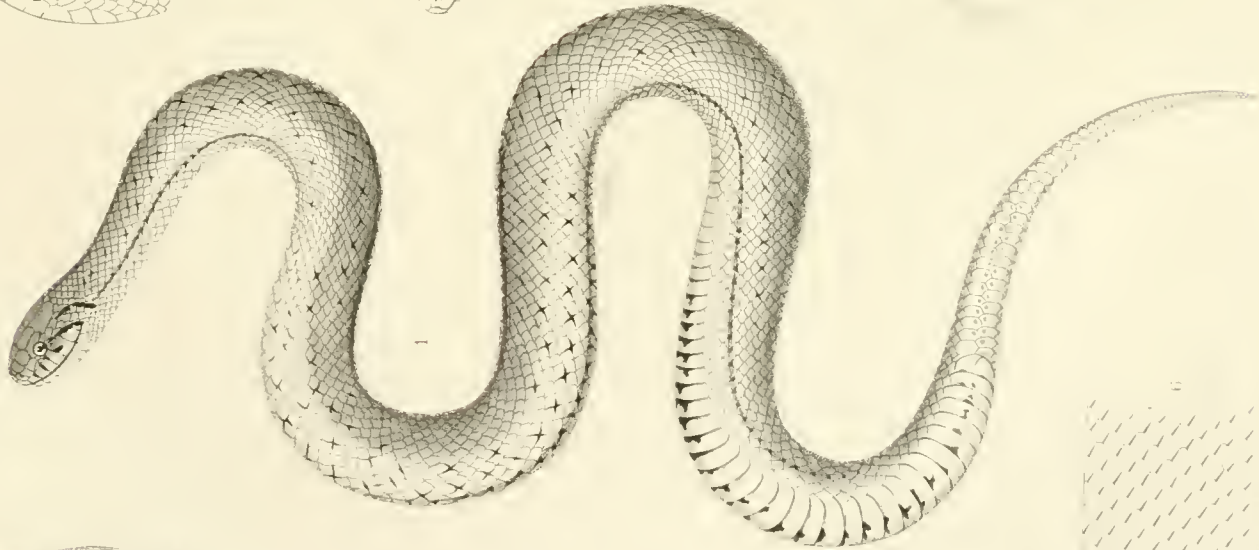
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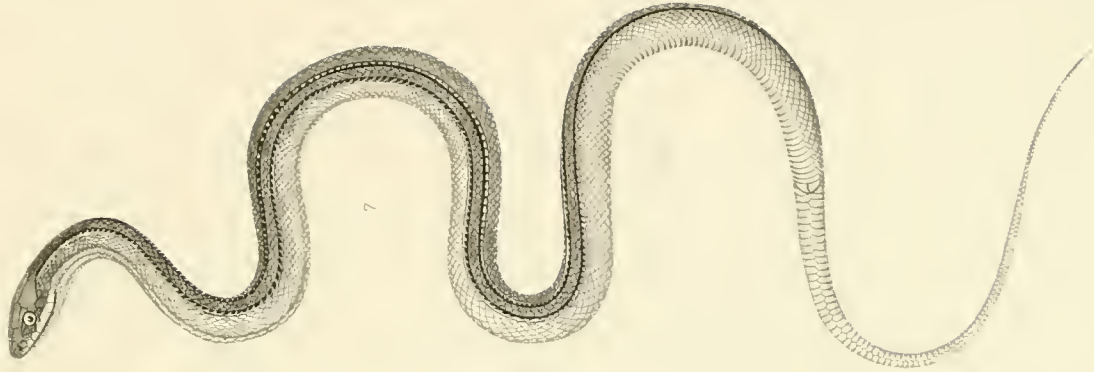
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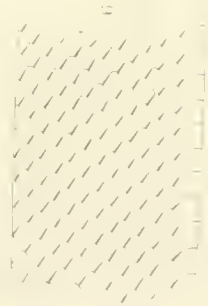
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12



6

Woodward

De Mead. Sc.

TACHYMENES CHILENSIS, Gir.

TAENIOPHIS TANTILLUS, Gir.





J. H. Richard

APOROMERA ORNATA, Duméril & Bur

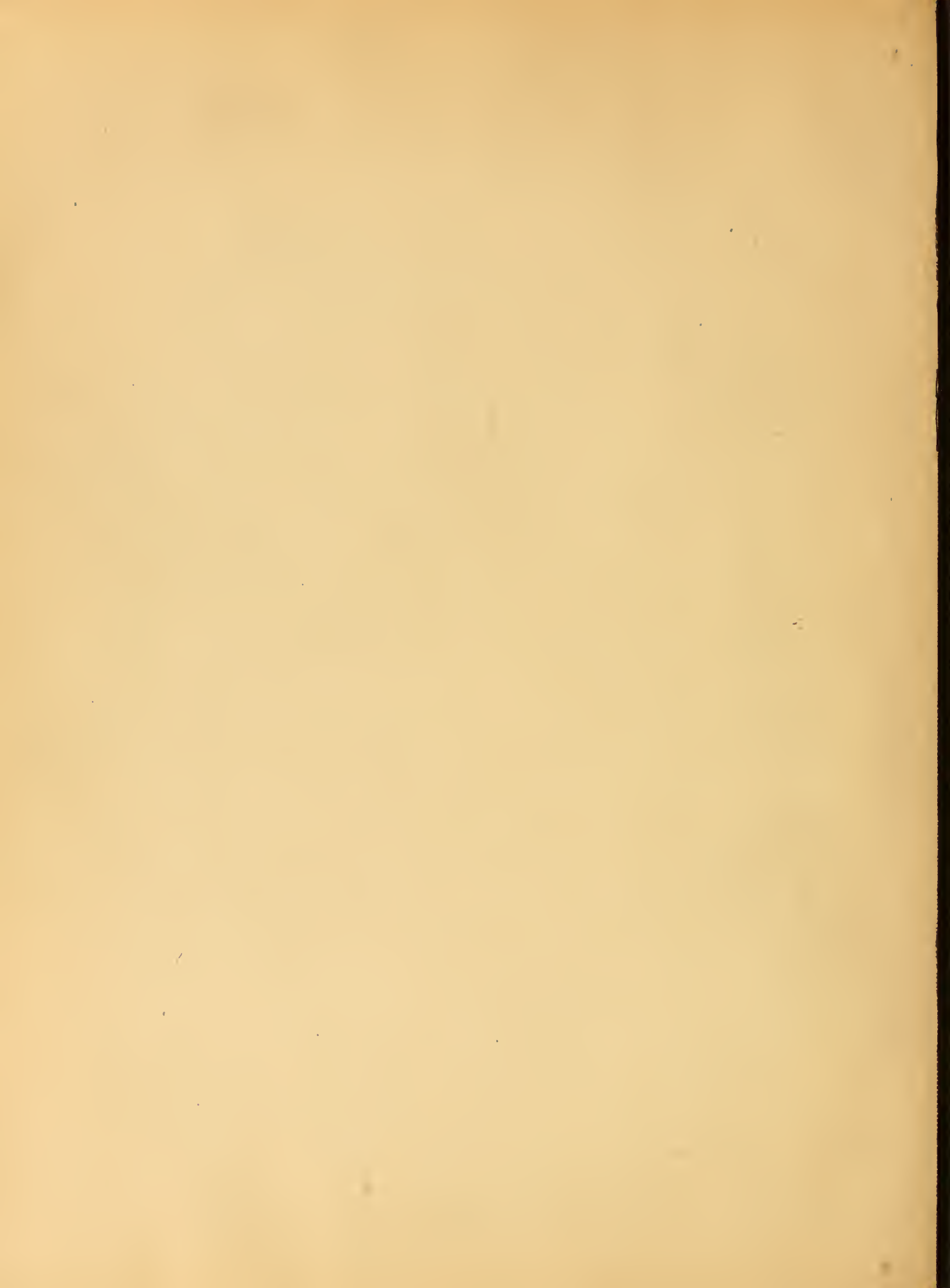
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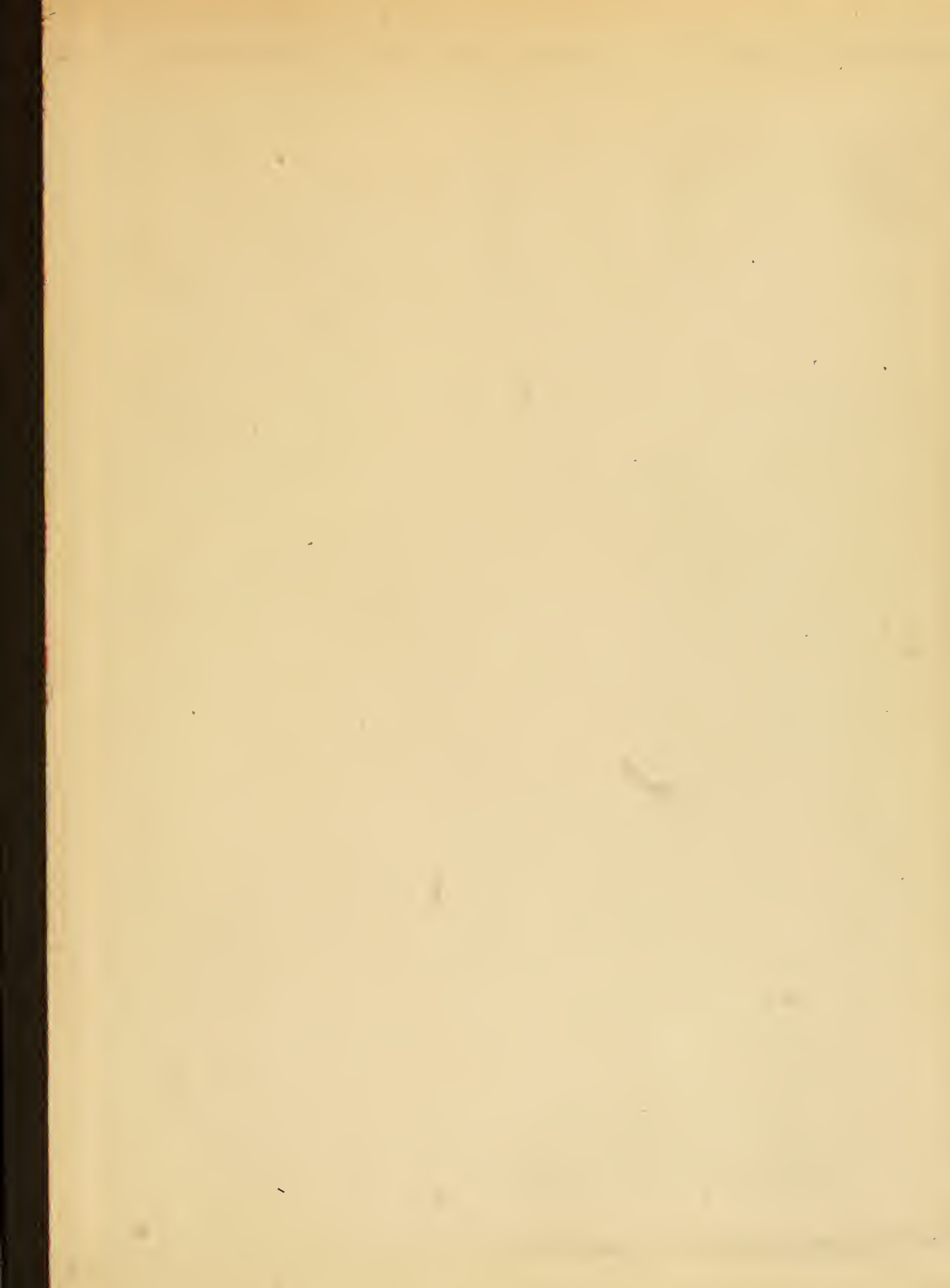


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Figs 1-4 PROCTOTRETUS TENUIS, Dum & Bibr. Figs 5-12. PROCTOTRETUS FEMORATUS, Grd.
 Figs 13-20 PROCTOTRETUS STANTONI, Grd.





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