

The only other whale recorded as taken in the Chesapeake is mentioned in the above article as having been captured near New Point Comfort, Matthews County, north of Mobjack Bay, a few years previously.

On the REPTILIA and BATRACHIA of the Sonoran Province of the Nearctic Region.

BY EDW. D. COPE.

The material on which the present essay is based, is a collection made by Dr. Elliott Coues during a sojourn of sixteen months in and "travels over the Territory of Arizona from east to west, chiefly near the parallel of 35°, and along the valley of the Colorado from Fort Mojave to Fort Yuma." Notes of observations made by Dr. Coues on the different species materially add to their interest.

BATRACHIA.

URODELA.

Amblystoma ? nebulosum Hallowell, Journ. Acad. Nat. Sci. (2.) v. 252, iii.

In the *Siredon* stage differing from the *S. gracilis* Baird in its oblique branchial arches with finer pectinations, and in coloration. On the anterior side of the third arch, twenty pectinations or rakers may be counted; in the *S. pisciformis* (or *mexicanus*) there are but twelve. Color in life "shining green above, silvery greenish-white below, more yellowish about legs and gills; a few obsolete scattered black spots on head and back. Eyes and branchial fimbriæ black," (Coues' notes). 455—56 ♀ from Jacob's well; No. 491 ♂ from a deep water tank in the rocks of the San Francisco mountains.

Male about seven inches long; branchiæ well developed; gular derm free half-way to symphysis mandibuli. Twelve costal folds. Muzzle slightly narrowed, jaws equal. Lateral and dorsal peritonæum black. The lungs extend to opposite the inguinal region. Corpus adiposum extending on testes to their anterior extremity. Testes undivided, broad, length equal half that from axilla to anus; efferent vessels numerous, not entering directly the vas uro-spermatikus. The latter is very slender, lying along the outer margin, but not in contact with the narrow kidney; opposite the latter recurrently convolute, anterior to it straight, and extending to opposite axilla with decreasing diameter. It empties into the rectum near the cloaca. Cloaca protected on each side by a large vertical compressed gland, which is fringed on its inferior border, (which is received into the lip of the cloaca,) and also on its superior margin, which lies next the caudal vertebra. It is continuous in front of anus; behind the two edges are pressed together. Integument of cloaca thrown into numerous appressed vertical plicæ, as in other *Siredons*.

Stomach straight, extending to the left groin, filled with larvæ of Diptera Nematocera. Intestines long, rectum large.

Female smaller, many of the ova black. In these animals the tarsal and carpal bones are fully formed, but cartilaginous. The pterygoid and palatine teeth in continuous series, the latter slightly separated medially, and concentric with maxillary series. On this character, preserved in a stage of an allied species without branchiæ, I proposed the genus *Camarataxis*, the validity of which can only be established when the development of all our *Amblystomas* is known. It is a stage nearer the larval condition than the transverse series of *A. opacum*, while the \wedge -shaped series of *A. luridum* is intermediate.

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ANURA.

Spehammondii Baird, Pac. R. R. Rept. Williamson's Exped. 1857, 12.

Cope, Journ. Acad. Nat. Sci. 1866, 81.

Two specimens.

Hyla arenicolor Cope, Journ. Acad. Nat. Sci. Philada. 1866, p. 84.

H. affinis Baird, U. S. Mex. Bound. Surv. Tab., not of Spix.

Two specimens. 732, "sides of abdomen and inside of thighs bright yellow in life."—Coues.

Bufo frontosus sp. nov.

A species most allied to the *B. americanus*, but differing in the shorter and more elevated cranium, longer and larger hind limbs, and more acuminate parotoid glands.

The canthus rostrales not marked, the muzzle descending very steeply from the anterior angles of the orbits, shorter than the elevated perpendicular muzzle. Frontal ridges higher than eyelids, rising steeply behind, terminating in two short convergent tuberosities, divergent, with interior crenations behind; postocular ridge equally developed, sending a very small process to the anterior acuminate extremity of the parotoids. Elevation of cranium at parietal tubercle equal to length of same from the same point. Eye large; tympanum distinct, half eye; parotoid narrow, long, acuminate at both ends. Elbow to anterior margin of orbit; heel to end of muzzle. Skin everywhere with numerous small tubercles; soles rough; toes half webbed.

Brown above, with pale vertebral line, and three pairs of deep brown medium sized spots, with paler centres. Sides and lips with small brown spots. Femur and tibia with one indistinct brown cross-bar each. Below uniform yellow.

Total length four inches, of which the head is 9 lines to postocular ridges; breadth between orbits 2.5 lines; hind limb 5 inches; sacrum 1 inch across. One specimen.

Bufo microscaphus sp. nov.

Head broader than long, obtuse, muzzle descending in full arc to labial border from line of orbit; superciliary ridges well marked, but concealed by the thick skin, plane, parallel; postorbital not prominent; vertical gutter narrow. Eyes large, prominent, double tympanum. Parotoids broad, smooth. Skin little roughened. Toes two-thirds webbed; shovel very small, frequently not black-edged, outer tubercle small, heel to end muzzle.

Above blackish, a black spot on each parotoid, and dark light centred bar on femur and tibia; a yellowish bar across front and palpebræ, and spot on nape; muzzle dark.

Total length 1 in. 5.5 l.; to postorbital ridge 7.5 l.; fore limb 1 in. 9 l.; hind limb 3 in. 2 l.; femur $\frac{1}{2}$ included.

The oval, well separated parotoids and general appearance of this species ally it to the *B. speciosus* Girard, but in that animal the supraorbital ridges are obsolete, and the metatarsal shovel is very much stronger. The *B. dorsalis* Hallow. (*B. woodhousei* Gird.) is also allied, but is in all proportions and details more elongate, and has a stronger shovel and head ridges; it always has the dorsal band, which never exists in the *microscaphus*, and never the transverse face-band of the latter.

Numerous specimens in Dr. Coues' collection, also two previously in Mus. Smithsonian (4106, 4184), from the upper Colorado region, procured by H. B. Möllhausen.

Rana halecina Bosc.

Near Fort Wingate; Zuni City.

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REPTILIA.

SAURIA.

Iguania.

Phrynosoma douglassii Bell. *Tupaya ornatissima* Girard, Herp. U. S. Expl. Ex. 1858, 396.

Abundant, and exhibiting much variety of coloration, some being uniform brown above, some with dark cross-bars, light edged behind, some with dark oval spots, and some with dark yellow-edged spots; others have the temporal spines and sides of the head bright red. The length of the tail varies from one and three-fourths to two and three-fifths times in the total. From Fort Whipple, San Francisco Mountains, and the Colorado Chiquito River. The two from the last locality are the only ones with oval brown yellow-edged spots. Dr. Coues says of this species: "Very abundant at all points from Santa Fe to Fort Whipple, chiefly in dry and sandy or rocky situations. The males are usually smaller and more delicate in form than the females. Those of the latter sex taken after the middle of July were almost invariably pregnant, and the young appeared in great numbers after the first of August. When on sand or soft soil, the horned frogs watch their chance, and when they think nobody is looking, they quickly and quietly bury themselves quite out of sight. This is accomplished by a gradual, insinuating, lateral and forward wriggling of their bodies: nose down, and paws drawn to their sides. When newly caught, some of the larger specimens are a little inclined to be irascible and pugnacious; and they bite, but rather weakly. If a dog approaches, they stretch up on their legs, swell out their bodies, open their mouths, and make a low hissing noise. This is about all they do, however. They always become tame and quiet after a few minutes' handling. They eat readily, snapping at passing flies, and catching them by protruding their viscid, fleshy tongues. When tickled with a straw they lean the whole body towards the side touched, humping up their backs, and setting their horns; but this is the utmost they do on the defensive, torment them as you may."

Phrynosoma brevirostre Girard, Herp. U. S. Expl. Exped. 1858, 377.

One specimen from Bero Springs (No. 407). This species is very near the *P. douglassii*, but has the muzzle and nostrils of the *P. cornutum* type, that is, the latter on the front of the muzzle; the tail is also very short, being a little over one-third length of head and body; above with a few pairs of pale-edged brown spots. I am not prepared to depend on its permanent distinction from the *P. douglassii*.

Phrynosoma platyrhinus Girard, Stansbury's Report, Utah, Reptiles, 263.

Phrynosoma modestum Girard, 1852, Herp. U. S. Expl. Exped. 1858, 365, Tab. vi. Bero Spring.

As a synonym of *Ph. regale* Girard, is to be placed *Ph. solaris* Gray, Catal. Sauria Brit. Mus., 229. *Ph. blainvillei* Gray, l. c. 228, is the common species of California which has been called *Ph. coronatum* by Girard. The latter species, of Blainville, has been sent by John Xantus to the Smithsonian Institution from Lower California, where alone it has been found.

Crotaphytus collaris Say, Holbrook, N. Amer. Herp. ii. 1842, 72, tab.

From Bero Springs and along the Colorado Chiquito River, where they are abundant. Dr. Coues says of its habits: "Occurring on sand, logs, among brush, etc. Throat very dilatable, os hyoides large and strong. Length 11—12 inches. Bites fiercely, and a little powerfully when caught. Common all along the Colorado Chiquito River.

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"In confinement, this species is just the opposite of the smaller lizards and of the horned frogs. They retain to the last their fierceness and irascibility, and their biting inclinations. My specimens were all perfectly untameable, though petted for several days; they all ultimately died, apparently of pure rage and chagrin at being trapped. They bit fiercely at the finger, and whipped good-sized dogs. They also bite indiscriminately a stick or anything else presented to them; and hold on so tenaciously that I have hung them up for half an hour by their hold on a stick or string. They were ever on the alert, watching every motion with cunning and wrathful eyes. Every now and then they would seem to lose their tempers completely, and tug frantically at their 'lariettos,' leaping fiercely about in all directions. They refused all food, and their lovely colors faded very perceptibly some time before death."

Crotophytus wislizenii Baird, Girard, Proc. Acad. Nat. Sci. 1852, 69. *C. fasciatus* Hallow., *C. gambelii* B. G.
Colorado Chiquito River.

Holbrookia propinqua Bd., Gird., Proc. Acad. Nat. Sci. 1852, 126.
Navajo Springs; Fort Wingate; San Francisco Mountains; Colorado Chiquito River; Zuni City. "Very abundant; not very agile."

Holbrookia maculata Girard, Proc. Amer. Assoc. 1850, 201.
Fort Whipple.

Holbrookia texana Troschel, Wieg. Archiv. 1850, Tab. Bd., Gird., Proc. Acad. Nat. Sci. Philada. 1852.

Uta symmetrica Baird, Proc. Acad. 1858.
Bero Springs, near Fort Wingate. "On rocks in a cañon. Very agile, and difficult to secure. Tails very fragile.

"All have lemon or orange-yellow throats. Of some the bellies are plain silvery white; of others bright greenish olive. Some are deep greyish-black above, others much lighter, with a dark lateral streak. The former I procured on light yellowish sandstone; the latter on dark blackish lava rocks. Saw none except on rocks." (Coe's notes.)

Sceloporus consobrinus B. & G., Marcys' Report, 1853, 237.
San Francisco Mountains; Colorado Chiquito River; Zuñi Mountains. In dry pine woods.

Sceloporus graciosus B. & G., Proc. A. N. S. Phil., 1852, 69. *Sc. gracilis* B. & G., l. c.
Colorado Chiquito River, in sandy situations; Navajo Springs.

Diploglossa.

Heloderma horridum Wiegmann, Herpet. Mexicana Tab. Baird U. S. Mex. Bound. Surv. Tab.
Fort Whipple. Yellow orange, the black cross bars parallel and connected margins of orange spots.

Leptoglossa.

Cnemidophorus sexlineatus Linn. var. *gularis* Bd. Grd. *Cnem. gularis* B. G., l. c. 1852, 128. *Cn. guttatus* Hallow., l. c. 1854, 192.
Fort Wingate; Colorado Chiquito River; Lithodendron Creek.

"This is the lizard, *par excellence*, of Fort Whipple and vicinity. All summer it has been very numerous in and about the Fort—coming into our tents at all times, silently and furtively hunting for flies. Although so familiar, it is exceeding timorous and darts out of sight at the least movement or noise. It is, I think, by far the most agile of all its tribe. When running on level ground the eye can hardly follow it; but receives merely a dim impression of 1866.]

a lengthy streak of black and yellow. I found it impossible to secure specimens till I hit upon the expedient of shooting them with a small charge of mustard seed shot out of an old fashioned pistol; with which I could procure any quantity of them. They live chiefly in high dry open woods, among dry leaves, at the feet of bushes, etc. They are emphatically ground lizards, not tree or rock species."

Plistodon obsoletus Bd. Gird., l. c. 1852, 129.

Plistodon guttulatus Hallowell, Proc. Acad. Phila., 1852, 206.
Fort Whipple.

OPHIDIA.

Asinea.

Contia isozona n. sp. nov.

Char. Two postoculars; six rows of gular scales. Rostral rounded, slightly produced backwards. Scuta $158 \frac{1}{4}$, 52. Twenty black half rings, separated by equal spaces of pinkish ground color.

Descr. Eye small, diameter twice in length of muzzle. Preorbital narrower above, not extending above lower margin of superciliary; loreal twice as long as high. Prefrontals and internasals much broader than long; frontal slightly angulate in front, longer than broad; parietals rather elongate, subtruncate behind. Postorbitals subquadrate, temporals 1—2. Postgenials minute. Superior labials seven, all higher than long, eye over third and fourth. Scales in fifteen rows, all broader than long. Tail four and two-fifths times in total length, which is 10.25 inches. Below immaculate; tail completely six-annulate.

Another specimen from the Museum Smithsonian, from Rockville, Kane Co., Utah, from A. L. Siler, indicates a variety. The body is longer than in the type, and is crossed by twenty-five black bars, between these and on top of muzzle vermilion, below yellow. Scuta $167 \frac{1}{4}$, 52. Both specimens resemble the *Sonora semiannulata* B. & G., but that species has two nasals, three postoculars, the superior reaching the frontal; frontal wider behind than before, and only 149 gastrosteges.

Rhinochilus lecontei Bd. Gird., Catalogue 120.

A well marked variety, having fewer (twenty) black half rings on the body extending to the gastrosteges and separated by a narrow interval. Abdomen with subquadrate black spots opposite the former and their intervals. Otherwise as types.

Phimothyra hexalepis n. sp. nov.

Resembles the *P. grahamiae* (*Salvadora* B. G.) but differs in having a shorter tail, five and one-third times in length, instead of four times; eye resting on sixth supralabial on account of the presence of three narrow preoculars; two or three loreals—largest higher than long; nostril on suture between nasals and internasals; dorsal stripe narrow—one and two half scales and lateral brown band wide, four and a half to five scales, whose superior margins are ochraceous at base. Rostral plate well developed, higher than broad. Nasals elongate, much depressed, anterior extending behind first labial; postoculars two; two long narrow temporals. Width of occipitals nearly equal common suture. Nine superior labials; first pair inferior labials much dilated medially, their common suture nearly equal that of pregenials. Scales seventeen rows. Gastrosteges 176, urosteges 75. Tail and below uniform yellowish.

Fort Whipple. The stomach contained a *Cnemidophorus sexlineatus*.

Hypsiglena ochrorhynchus Cope, Proc. Academy 1860, 246. Var. *chlorophaea*, l. c. 247.

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Specimen with the small spots (sixty-six dorsal usually divided) of the variety described as above as a species.

Ophibolus boylii Baird and Girard, Serpents 82.

Specimen with loreal minute on one side, wanting on the other. As the practice of employing generic names which have not been explained by a diagnosis is a very questionable one, and only to be allowed in case of necessity, I employ in this and other cases Baird and Girard's names in preference to the prior ones of Fitzinger; e. g. the above, in place of *Lampropeltis*.

Ophibolus pyromelanus m. sp. nov.

Char. Scales in 23 longitudinal rows; tail five and one-half times in total length. Scuta 224, 1, 66. Fifty to fifty-eight black annuli on an ochraceous white ground, on the body; each anteriorly completely, posteriorly more or less incompletely split by a vermillion annulus; all extending with irregularities on the belly.

Descr. Head quite distinct from body, muzzle contracted. Frontal plate broad, with prolonged apex; parietals elongate, emarginate behind; cephalic shields otherwise as in *polyzonus*, *splendidus*, etc. Postgenaeals half the length of the pregenaeals. Dorsal scales rather broad, outer series not abruptly enlarged. In one specimen all the black annuli to the middle of the tail are divided by the red, thus leaving the black as a margin to it; hence the number of these annuli is fewer; they are four scales wide behind the middle of the body; in another specimen only four anterior rings are completely divided, those on the following third of the length being divided by red on the sides; the remaining annuli black, three scales wide; white annuli one and one-half scales; anterior or nuchal red; annulus widest, its anterior black margin attaining parietals; an ochraceous band from gular region, not quite completed across parietals. Muzzle, prefrontal plates and labial margin ochraceous, remainder of top and sides of head black. Total length 30.5 inches. Nos. 731—760.

This species has a longer body than the known red-ringed species, and is indeed most closely related to the *O. boylii*; it will always be distinguished from the latter by the much more numerous annuli (twenty-eight in *boylii*.)

Pityophis bellona Bd. Girard Serpents. Stansbury's Exploration, 1852, 350.

Numerous specimens illustrate well the great variability of the shields of this species. About half do not possess the anterior frontal (vertical,) several have two loreals on one side, some have one preocular on one side, some on both, (typically two;) four postoculars occur on one side only in two specimens, and one has the eye on one side resting on the fifth superior labial, the others on the fourth. Apparently the most abundant snake in the region explored by Dr. Coues.

Masticophis testaceus Say, Long's Expedition, 1823. *Herpetodryas flavigularis* Hallowell, Pr. A. N. S., 1852.

Masticophis taeniatus Hallowell, (*Leptophis*) Proc. Acad. 1852. *M. schottii* B. G., Catalogue Serpents. *Leptophis lateralis* Hallow., Proc. Acad. 1853.

The young, of the form *lateralis*, the adult, the *taeniatus*.

Eutaenia vagnans B. & G., Catalogue.

Var. with top of the head black. From Zuñi City, in water. Var. with head brown; like back from San Francisco Mountains.

Eutaenia ornata B. & G., U. S. Mexic. Bound. Surv. Tab. *E. parietalis* B. & G., Catalogue Serpents.

A very distinct species from the last. Superior labials seven; postgenaeals considerably longer than pregenaeals. Tail three and three-fifths in total
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length. Scuta 167, 1, 85. Lateral stripe on second and third rows of scales; vertebral band not visibly black margined. Color above apparently uniform olivaceous until the skin is stretched.

Eutaenia cyrtopsis Kennicott, Proc. Academy, 1860, 333.

Four specimens, Fort Whipple.

Eutaenia macrostemma Kennicott, l. c. 1860, 231.

Two specimens, Fort Whipple.

The following comparative table will assist in the recognition of these and some other scarcely known species of the genus.

Scales in nineteen rows; lateral stripe on the second and third rows:

Form stout. Temporal small, not attaining the reduced last upper labial; superior labials seven; nuchal blotches same color as head: one series of numerous brown bars connecting the light stripes, none of which are black edged..... *scalaris**

Form slender. Temporal large, margining the last three upper labials, none of which are reduced; superior labials eight (seven); general color brown, large nuchal blotches and a double series of very small lateral spots black; latter forming continuous zigzag on stretched skin; no black margins. *cyrtopsis.*

Form slender, tail three and two-fifths in total; head narrow, elongate, loreal longer than high; seven superior labials, temporal not extending beyond penultimate; above uniform, except on stretched skin, where there is a broad border to dorsal vitta and one lateral row of black spots separated by rufous..... *ornata.*

Scales in nineteen rows; lateral stripe on third and fourth.

Form stout, head short, rounded, occipital regions convex; labials 7—8, temporal plate small; gastrostega 138—148; tail one-fifth total length. Olive brown, unspotted, dorsal and lateral stripes yellow, black bordered; lips, chin and a postoral crescent to near occipitals, with occipital spots, golden yellow; two small black nuchal spots ... (sp. nov.) *flavilabris.†*

Scales in nineteen rows; no longitudinal bands.

Olive brown, with four series of small black spots, and a trace of two exterior anteriorly; eight superior labials, last very small, no black margin on the sixth or posterior margin of eighth, but a strong black band from eye across posterior margin of seventh to mouth. Sides of head white, extending upwards as two areas, margining each occipital; behind each a black nuchal spot separated by a narrow white line from its fellow, and extending over occipital plates and half of frontal; prefrontals transverse..... *sumichrasti.‡*

Scales in twenty-one rows, lateral stripe on the third and fourth.

Frontal plate longer than occipital suture; temporal small, margining only anterior part of penultimate labial; post-

* *Thamnophis scalaris* Cope, Pr. A. N. Sci., 1860, 369, from Jalapa, DeOca. Also Orizava, Prof. Sumichrast. Nos. 36, 37.

† Two specimens Museum Smithsonian, from the Table Land or Southern Mountains of Mexico, sent by Dr. Chas. Sartorius—vide Proc. Academy, 1865, 197. One specimen exhibits eight upper labials, the other seven; in the latter, one preocular is divided, and four posterior superior labials united.

‡ The markings of this species are entirely peculiar; it is also distinguished by the transverse or narrow prefrontals and internasals. Orizava, Mexico, Prof. F. Sumichrast; No. 45.

genials longer than pregenials; superior labials eight; loreal higher than long, olivaceous, with one row of small black spots below, and two rows above the lateral stripe. Two small black nuchal spots and a short postoral pale crescent..... macrostemma.*

Scales in twenty-one rows, lateral stripe on the second and third.

Frontal plate shorter than common occipital suture; temporal small, superior labials eight, postgenials equal or shorter than pregenials. Ashy, sometimes brown, with narrow, unmarginated stripes and very small lateral spots in two rows..... vagrans.

Heterodon nasicus B. & G. Stansbury's Explorations, 1852, 352.

Proteroglypha.

Elaps euryxanthus Kennicott, Proc. Acad., Philada., 1860, 337.
Two specimens. Fort Whipple.

Solenoglypha.

Caudisona molossus Bd., Gird., Catalogue. Baird, U. S. Mex. Bound. Surv., Tab.

Two specimens; dry rocky ground, San Francisco Mountains.

Caudisona scutulata Kennicott, Proc. Acad. 1861.

One specimen, twenty inches long; San Francisco Mountains.

Caudisona confluenta Say, Long's Exped. Rocky Mts., ii. 1823, 48. Baird and Girard, Catalogue, 8.

Four specimens of this species, which correspond more or less closely with Say's diagnosis, one of them especially, in having the cervical macule confluent into a band. The animal called by this name by Baird and Girard, and named *C. lecontei* by Dr. Hallowell, which is found on the eastern slopes of the Rocky Mountains and the central plains of Kansas, Missouri, etc., differs from the Arizona form, as I pointed out in Synopsis of Crotali in Mitchell's Researches, not having then seen specimens of the latter; yet the two are probably varieties of but one species. They differ as follows:

Var. *confluenta*: sixteen superior labials, (eight to) ten rows of scales between superciliaries; ground color above bluish slate, no yellow band between eyebrows, on rostral, or margining labials in front. Spaces between dorsal spots orange

"San Francisco Mountains (510). No. 801 under a log on a mountain, altitude 12,000 feet. 572. No. 678, thirty-one inches long, had an adult *Sialia mexicana* in its stomach."

Var. *lecontei*: fourteen superior labials, six between superciliaries. Ground color, and space between spots brown; a yellow margin to mouth and rostral plate, and band between supercilia.

No specimens from Arizona.

Caudisona lucifer Baird and Girard, Catalogue, p.

The numerous specimens of this species brought from Arizona by Drs. Coues and Irwin are nearly black, especially the head.

509—511, etc., San Francisco Mountains.

* In Mus. Smithsonian there are two varieties, neither of which agree strictly with Kennicott's type. First, the two from Dr. Coues, in which the lateral spots are minute, not in contact, and the dorsal vitta more or less black margined; and second, three specimens from Mirador, Vera Cruz, Dr. Sartorius. In these the spots are quadrate, large, including the inferior row; those of the two superior in contact at their angles. *Gastrostega* of the first 163, of the latter 160.

Caudisona pyrrha sp. nov.

Scales in twenty-five series, broad and rounded, the two inferior rows smooth. Head short and very obtuse, the nostrils opening subvertically. Superior labials higher than long, three rows of temporals smooth; scales of vertex small, keeled; those more anterior, striate. Superciliaries broad oval, striate. Canthus rostralis none. Inferior labials fifteen, the first and second margining a plate which meets its fellow in front of the genicals, and is in other species a continuation of the first. Gastrosteges 178, urosteges 24; joints of rattle 9. The general tint of this species is a bright salmon red, the scales of the inferior rows punctulate with brown. Other details of structure and coloration are given in the description below.

The species is one of the most handsomely colored of the genus. Its affinities are with the *C. mitchellii* m., but it exhibits an even higher degree of subdivision of the head shields. Mus. Smithsonian, No. 6606.

I am now acquainted with eighteen well defined species of this genus, while one or two named remain to be further investigated. They are distributed as follows:

Regio Neotropica.....	5	
S. R. Brasiliiana.....		2
S. R. Mexicana.....		4
Regio Nearctica.....	13	
S. R. Sonoriana.....		10
S. R. Californiana.....		1
S. R. Media.....		3
S. R. Orientalis.....		2

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The intensity of distribution is then the Region of Lower California, Upper Sonora and Arizona, which has seven peculiar species, and three which enter from the neighboring districts.*

The scattered nature of the literature of this subject renders a synopsis of the species of this important genus desirable. The genus divides itself into two natural sections:

I. Top of muzzle covered by three pairs of symmetrical shields in contact; nasals distinct.

a. Rattle acuminate.

C. DURISSA Linn. Scales in twenty-nine rows, four rows scales below orbit. Yellow, with two brown longitudinal bands on anterior part of body, remainder with black rhombs embracing yellow centres. Surinam and Mexico, to Vera Cruz.

C. TERRIFICA Laurenti. Four rows scales below orbit; brown, with two darker bands above anteriorly, and a series of large darker dorsal rhombs with yellow outlines. Brazil, Mexico.

C. BASILISCA Cope. Two and three rows scales below eye; rows on body 29; labials 14. Yellow-brown, with large adjacent chestnut-red, yellow-bordered dorsal rhombs, alternating with chestnut spots; no longitudinal bands anteriorly. Western Mexico.

aa. Rattle parallelogrammic.

C. MOLOSSUS Bd. & Gird. Twenty-nine rows of scales, eighteen labials, separated by five rows from orbit. Brownish-sulphur above, with small transverse reddish dorsal rhombs, the angles produced as lateral bands; no longitudinal bands on neck; tail black. Arizona, New Mexico.

* These facts have been pointed out, Proc. Acad. 1861, 294.

II. Nasal plates distinct; muzzle with small plates or numerous scales above.

a. Muzzle with two marginal shields above each canthus rostralis.

β. An elevated narrow cuneiform rostral.

γ. The rattle acuminate.

C. POLYSTICTA Cope. Scales 27 rows; sup. labials 14; separated from orbit by two rows. Gray-brown, with seven longitudinal rows of brown spots; top of head variegated. Mexico.

C. TRISERIATA Wagler. Scales twenty-three rows; two pairs of large scales on top of muzzle; six rows between orbits. Yellowish, with a dorsal series of sub-round brown spots. Mexico.

C. CONFLUENTA Say. Scales 25-7 ? (-9) rows; labials 15 to 18, separated from orbit by four rows; six to ten rows between superciliaries. Yellow line from supercilium above angle of mouth; a medial dorsal row of brown spots emarginate before and behind, with two alternating lateral series. Central and south-west North America.

γγ. The rattle parallelogrammic.

C. LUCIFER Bd. Gird. Scales 25-7, labials 15-16, with four rows above them. Numerous sub-round blackish dorsal spots, separated by narrow yellow lines; a light band from supercilia above angle of mouth. Pacific region North America and Arizona.

C. SCUTULATA Kennicott. Scales 25 rows, superior labials 16; three or four rows interorbital scales, bounded in front by two shields. Yellow stripe from eyebrow above rictus oris; yellowish-brown, with a dorsal series of truncate brown yellow-edged rhombs; tail black-ringed. Arizona.

C. ATROX Bd., Gird. Scales 25-7 rows, labials 15; muzzle with small scales above; yellowish, with a dorsal series of complete yellow-edged brown rhombs; yellow band from supercilium above angle of mouth. Texas and Sonora. Tail black-ringed.

C. ADAMANTEA Beauvois. Scales 27 rows; labials 15-16; muzzle above with small scales, acuminate. Brown, with three series of brown yellow-edged complete rhombs, the median larger, only separated by their yellow margins; a yellow line from supercilium to angle mouth. Florida and Georgia.

C. HORRIDA Linnæus. Scales 23-5 rows, all carinate; labials 12-14; two rows between them and orbit. Light line from superciliary plate to angle of mouth; two series of dorsal rhombs, confluent except on the anterior part of the body, forming transverse zigzag blotches; tail black. Eastern district of North America.

ββ. An equilateral broad or depressed rostral. Rattle acuminate.

C. ENYO Cope. Scales 23 rows, sup. labials 13; superciliaries separated by six rows; scales on muzzle small. Above yellow, with a median series of small transverse rhombs, which are prolonged into vertical lateral black bars; former median and longitudinal on neck; light line to above canthus oris. Lower California.

C. TIGRIS Kennicott. Scales 21-3 rows, numerous smooth plates on top of muzzle; labials 14, separated by two rows from orbit, superciliary space wide. Yellowish ash, with small dorsal blotches on anterior one, and cross-bands on posterior two-thirds of body. Deserts of Gila and Colorado.

αα. Upper margin of canthus rostralis with small scales like the others.

a. Prenasal in contact with rostral; superciliary prolonged into a horn.

C. CERASTES Hallowell. Two elongate preorbitals; rostral broad as high; rattle parallelogrammic. Scales 21-3; labials 11-13. Light yellowish, 1866.]

with several series small brown spots, median largest. Deserts of Gila and Colorado.

“ Prenasal separated from rostral by scales; superciliary not prolonged.

C. MITCHELLI Cope. Rostral broad as long; scales 25 rows; labials 16, separated from orbits by three rows; two elongate preorbitals, one loreal; yellowish-gray, with indistinct quadrate dorsal spots separated by yellow, and becoming cross-bands on posterior fourth. Rattle parallelogrammic. Lower California.

C. PYRRA Cope. Rostral broad as long; head very obtuse rounded. Scales 25 rows, seven between superciliaries, three below orbit; labials 14; two very small preorbitals and four loreals. Pale vermilion varied with yellow on the sides of the belly, with numerous large reddish-bay transverse hexagons, which become transverse bands on posterior two-thirds of length; yellow below. Rattle subacuminate. Arizona.

The *C. lepida* of Kennicott remains, which is the type of a genus now first defined under the name of

APLOASPIS n., and characterized by the presence of a single large nasal shield, which is pierced by a small central nostril.

I. Muzzle with numerous smooth plates above.

A. LEPIDA Kennicott. Rostral broad, low; scales of top of muzzle and vertex large, smooth; upper preorbital very small, loreals three; labials twelve, separated by one row from orbit; no postocular band. Rio Grande, Texas.

TESTUDINATA.

Aromochelys carinatus Gray, Catal. Shield Rep. Brit. Mus. *Ozotheca tristycha* Agassiz, Contrib. N. Hist. U. S., vol. i.

To the forty-four species procured by Dr. Coues may be added the following, procured by Dr. Irwin from the neighborhood of Fort Buchanan (near Tucson), in the southern part of the territory:

*Uma notata** *Bd.* *Trimorphodon lyrophanes* Cope.
Gyalopium canum Cope.

Added chiefly by Maj. Emory, on the United States and Mexican Boundary Survey, mainly according to the Report by Prof. Baird.

Cnemidophorus melanostethus Cope.

“ <i>gracilis</i> <i>Bd.</i>	<i>Caudisona atrox</i> <i>Bd.</i> , <i>Gird.</i>
<i>Euphyryne obesa</i> <i>Bd.</i>	“ <i>tigris</i> <i>Kenn.</i>
<i>Uta graciosa</i> <i>Hallow.</i>	“ <i>cerastes</i> <i>Hallow.</i>
<i>Sceloporus clarkii</i> <i>Bd.</i> , <i>Gird.</i>	<i>Tropidonotus validus</i> <i>Kenn.</i>
<i>Dipsosaurus dorsalis</i> <i>Hallow.</i>	<i>Ophibolus splendidus</i> <i>Bd.</i> , <i>Gird.</i>
<i>Callisaurus ventralis</i> <i>Hallow.</i>	<i>Phimothyra grahamiæ</i> <i>Bd.</i> , <i>Gird.</i>
<i>Phrynosoma regale</i> <i>Gird.</i>	<i>Sonora semiannulata</i> <i>Bd.</i> , <i>Gird.</i>
“ <i>maccallii</i> <i>Hallow.</i>	<i>Chionactis occipitale</i> <i>Hallow.</i>
<i>Coleonyx variegatus</i> <i>Baird.</i>	<i>Diadophis regalis</i> <i>Bd.</i> <i>Gird.</i>
“ <i>alvarius</i> <i>Gird.</i>	
“ <i>debilis</i> <i>G.</i> (<i>insidiator</i> <i>Gird.</i>)	
<i>Hyla cadaverina</i> Cope.	

In all, sixty-eight species, referable to twenty-seven genera. Of the latter there are:

* This is the only adult in the Smithsonian Museum, a young specimen having previously served as the type. The genus is distinguished from *Callisaurus* by the presence of a series of spines moveable on their bases, on the outer margin of the foot.

The coloration is peculiar; ground color black, covered everywhere by large yellow (red?) disciform spots, whose margins are everywhere nearly in contact, leaving a pattern like the refuse of a button-maker's plates; each spot has a black centre. Length eight inches, tail short.

I.	II.	III.
Entirely or nearly entirely Nearctic.	Nearctic: extensively distributed in Mexi- can district of Neo- tropical R.	Nearctic: extending into Continental district of Neotropical.
Phrynosoma, Crotaphytus, Holbrookia, Plistodon, Contia, Diadophis, Pityophis, Aromochelys, Amblystoma.	Sceloporus, Ophibolus, Eutænia, Tropidonotus, Rana, Spea,	Cnemidophorus, Heterodon, Masticophis, Elaps, Caudisona, Bufo, Hyla.
Sonoran Species 19.	Species 13.	Species 22.
IV. Genera confined to the Sonoran district, which extend into the Mexican:		
Uta,	Heloderma, Sonoran species 5.	Euphyryne, Pimothyra.
V. Genera confined to the Sonoran district which do not extend into Mexico:		
Callisaurus, Gyalopium, Species 6.	Dipsosaurus, Chionactis.	Uma, Sonora,
VI. Genera chiefly Mexican, which extend into the Sonoran district, (the first two to the Rio Grande):		
Coleonyx, Species 3.	Hypsiglena,	Trimorphodon.
Of the nineteen species embraced in the first table, there are—		
Found in Pacific district, Phrynosoma douglassii.	Middle district, Phrynosoma douglassii, Crotaphytus collaris, Holbrookia maculata, " texana, Plistodon guttulatus, " obsoletus, Pityophis bellona, Aromochelys carinatus.	Peculiar, Phrynosoma, 5 sp., Crotaph. wislizenii, Holbr. propinqua. Contia isozona. Diadophis regalis, Amblystoma nebulosum.
1 sp.	8 sp.	10 sp.
Of the thirteen species of the second table there are of the same character—		
Sceloporus graciosus, Ophibolus boylii, Spea hammondii.	Sceloporus consobrinus, " clarkii, Eutænia vagrans, Rana halecina.	Ophibolus pyromelanus, " splendidus, Eutænia cyrtopsis, " macrostemma, " ornata, Tropidonotus validus.
3 sp.	4 sp.	6 sp.
Of the twenty-two species of the third table of genera, the distribution in the same respects is as follows:		
Masticophis tæniatus, Caudisona lucifer.	Cnemidophorus 6-lineatus, Heterodon nasicus, Masticophis testaceus, Caudisona confluenta, " atrox, Bufo dorsalis.	Cnemid. gracilis, " melanostethus, Elaps enryxanthus, Caudisona scutulata, " pyrrha, " molossus, " tigris, " cerastes, Bufo microscaphus, Hyla arenicolor, " cadaverina,
2 sp.	6 sp.	11 species.

It then appears, from the preceding tables, that the species of this district are of the following distribution :

Occurring in the Pacific district.....	6	
“ “ middle “	18	
Confined to the Sonoran dist.	Tab. I	10
	II.....	6
	III.....	11
	IV.....	5
	V.....	6
	VI.....	6

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We may now institute some comparisons with the Reptile fauna of Cape St. Lucas, based on the material obtained by Consul Jno. Xantus; and give first a

Tab. VII. Genera common to Cape St. Lucas and Arizona :

Caudisona,	Uta,
<i>Trimorphodon</i> ,	<i>Callisaurus</i> ,
<i>Hypsiglena</i> ,	Sceloporus,
Pityophis,	Phrynosoma,
Tropidonotus,	<i>Dipsosaurus</i> ,
Eutænia,	Cnemidophorus,
<i>Phimothyra</i> ,	Bufo,
Masticophis,	Hyla.
Ophibolus,	

Seventeen, of which five are peculiarly characteristic of the Sonoran district among those of the Nearctic Region, as per tables iv. v. vi.

I have already pointed out (Proc. Acad. 1861, 305*) that of the sixteen species of Ophidians of Cape St. Lucas eight are peculiar to it; as the *Hypsiglena* of Arizona is probably not different, the number should be reduced to seven. Of the remaining nine there are—

Of the Pacific district,	Sonoran,	S. Central,
Ophibolus boylii.	Caudisona atrox,	Caudisona atrox,
	<i>Trimorphodon lyrophanes</i> ,	
	<i>Hypsiglena ochrorhynchus</i>	
	<i>Tropidonotus validus</i> ,	
	<i>Eutænia cyrtopsis</i>	
	<i>Phimothyra grahamiæ</i> ,	
	<i>Masticophis testaceus</i> ,	Mastic. testaceus.
	<i>Stenostoma humile</i> .	
1 species.	8 sp.	2 sp.

Of the Lacertilians, of which no synopsis has hitherto appeared, there were fourteen in the Xantusian collections. Of these there were—

Confined to the Cape,	Also Sonoran,	Represented in Sonoran
<i>Diplodactylus unctus Cope</i> ,	<i>Uta stansburiana</i> ,	by—
<i>Phyllodactylus xanti C.</i> ,	<i>Dipsosaurus dorsalis</i> .	
<i>Uta nigricauda C.</i> ,		
“ <i>thalassina C.</i> ,		
<i>Callisaurus draconoides Blv.</i>		<i>C. ventralis Hall.</i> ,
<i>Sceloporus zosteromus C.</i> ,		<i>S. clarkii B., G.</i>
<i>Phrynosoma coronatum, Blv.</i>		
<i>Ctenosaura hemilopha, C.</i> ,		
<i>Cnemidophorus maximus, C.</i> ,		
“ <i>hyperythrus C.</i> ,		
<i>Xantusia vigilis Bd.</i>		
11 sp.	2 sp.	2 sp.

Gerrhonotus multicarinatus Blv., one sp., belonging entirely to the Pacific district.

* In enumerating the Ophidian genera of Central America in the same connection, by a lapsus calami *Hydrodipsas* was written instead of *Hydromorphus* Peters, and not properly corrected. The former is really East Indian (Malaccan), and is the same as that previously named *Cantoria* by Girard,—a fact apparently not before noticed.

There were four species of Batrachia of the following range :

Peculiar to the Peninsula,	<i>Hyla curta</i> Cope, s. n.
Extending to Pacific district,	“ <i>regilla</i> B., G.
Extending to South Central,	<i>Scaphiopus couchii</i> , (var. <i>varius</i> C.)
“ “ “	<i>Bufo punctatus</i> B., G.

The relations of the Sonoran district fauna, then, to that of Cape St. Lucas, are as follows :

Total number Sonoran.....	68
Confined to it.....	45
Total number Cape St. Lucas.....	34
Confined to it.....	19
Common to the two.....	10
Cape St. Lucas sp. in South Central district.....	4
“ “ Pacific district.....	3

The only genus occurring at Cape St. Lucas which does not exist elsewhere in the Regio Nearctica, is *Ctenosaura*, which is Mexican.

Prof. Baird has regarded (Proc. Acad. 1859, 300) the Sonoran and Lower Californian provinces as identical, and has pointed out the slight affinity of the latter to the Pacific district. It appears from the preceding that, in respect to the reptiles, they constitute provinces nearly as distinct from each other as the Sonoran is from the Central, a conclusion agreeing with that attained by Dr. John L. LeConte from a study of the Coleoptera, (vid. Proc. Acad. 1861, 335). That these, and the Pacific province, are more nearly related to each other than to the Eastern province, is sufficiently apparent on general Herpetological and other grounds, as set forth in Prof. Baird's masterly review of the distribution of North American Birds, Silliman's Journ. Sci. and Arts, 1866.

Dr. Günther has indicated the Tropic of Cancer as the approximate division line between the Nearctic and Neotropical Regions; the writer (l. c. 1861, 306) has regarded this as the parallel of its eastern extremity, and placed the western several degrees further north. More recently Prof. Baird (l. c.) has indicated a less oblique division, raising the eastern extremity to the mouth of the Rio Grande, and terminating it on the west at Guaymas. While he characterizes the line as “arbitrary” for the birds, it is much less so for terrestrial vertebrates; in these the transition of faunæ is striking and quite abrupt.

Description of Hyla curta Cope, *supra*.

Form stout, size small, breadth of jaws entering total length two and two-thirds times. Males without gular vocal vesicle. Tongue nearly one-third free. Femur posteriorly unicolor; basal fold weak. A dark labial border and band from nostril to axilla, above ashy brown, with a dark interocular triangle and a broad dorso-lateral band on each side, often broken into elongate spots. Limbs punctulate and cross-barred.

Muzzle projecting beyond nares not very prominent; canthus rostralis well defined, straight, loreal region not concave. Eyes little prominent, diameter less than distance between origins of canthus rostralis, three times that of tympanum. Vomerine fascicles entirely between nares, choanæ small. Skin smooth to sparsely and finely tuberculate above. Digits stout, dilatations well defined except on the inner anterior; all the latter free, the posterior not elongate, webbed to base of second phalanx. Hind foot measures one and two-thirds width of head; the heel extended reaches anterior margin of orbit. The sacral diapophyses are slender, like those of *H. pickeringii*. Tarsal fold distinct, cuneiform process small; heel extended reaches anterior orbit.

The groin is sometimes mottled with black, and the sides often with brown, 1866.]

or marbled, which may extend over the iliac region. Sometimes all the dark markings are marbled with paler. There is a band on the front of the humerus, and the hind limbs are frequently double-banded.

	Lines.
From end of muzzle to canthus oris.....	3.9
“ “ to vent	12
Length of fore limb.....	7.4
“ hind “	18.4
“ “ foot.....	8.6
Interorbital breadth.....	1.8

Like *capistrata*, *palliat*a, and the Eastern *pickeringii*, this is one of the smallest species of the genus; in form it is the most distantly removed from the typical forms, approaching distantly *Chorophilus*, which it resembles in color. The lack of a vocal vesicle, not rarely occurring in the genus *Rana*, I have not observed in any other species of this genus.

No. 5293, 19 specimens half ♂), Cape St. Lucas. Jno. Xantus.

November 6th.

MR. VAUX, Vice-President, in the Chair.

Thirty-three members present.

The following were offered for publication:

“Fifth contribution to the Herpetology of Tropical America.” By Ed. D. Cope. “On the Habits of the Agricultural Ant of Texas.” By Gideon C. Lincecum.

Dr. Hayden made some remarks in regard to an extensive chalk deposit on the Missouri river. He also exhibited to the Academy some fossils, fishes and shells, which had been taken from these chalk deposits by Mr. Geo. A. Propper, a resident of Yankton, the capital of Dakota Territory. This formation has been known for many years, and represents No. 3, or Niobrara group of the Cretaceous series of this region. It commences at a point on the Missouri river not far from Blackbird hill, overlapping, on the high hills, Nos. 1 and 2 of the Cretaceous series. Near the mouth of the Vermilion River it begins to occupy the country, to the exclusion of any other rocks, and passes beneath the bed of the Missouri near the Great Bend. It is thus visible for nearly 400 miles along the river. The fossils which have thus far been taken from this bed are not numerous in species. The *Ostrea congesta*, Conrad, is perhaps the most abundant shell. It is found in many localities aggregated in vast masses, reminding one much of the little raccoon oyster that is left by the receding of the tide along the shores of the sea islands of South Carolina.

Inoceramus problematicus is abundant between Blackbird hill and mouth of Big Sioux river. It is found in a grey, rather hard, chalk limestone, which forms the base of the formation No. 3, and the rock is used much by the settlers for building purposes and for burning into lime. *I. pseudomytiloides* and *I. aviculoides* are found at different localities. This rock varies greatly in color as well as texture, from a lead grey to milk white. It is oftener a deep rust color, owing to the presence of the peroxide of iron. It resembles very much our common chalk of commerce, and might be used for similar economical purposes. Although the organic remains thus far found in this formation do not positively affirm it, yet there can be hardly a doubt that it is the American representative of the white chalk beds of Europe. The fish remains are many of them quite well preserved, and as they belong apparently to undescribed species, they are placed in the collections of the Academy for future study.

[Nov.