

Cope, (E. D.).

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**Catalogue of the Species of Batrachians
and Reptiles contained in a Collection
made at Pebas, Upper Amazon,
by John Hauxwell.**

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY, OCTOBER 2, 1885.

On the Species of Iguaninæ.

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY, OCTOBER 16, 1885.

**Thirteenth Contribution to the Herpe-
tology of Tropical America.**

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY, NOVEMBER 20, 1885.

BY PROFESSOR E. D. COPE.

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Catalogue of the Species of Batrachians and Reptiles contained in a collection made at Pebas, Upper Amazon, by John Hauxwell. By E. D. Cope.

(Read before the American Philosophical Society, October 2, 1885.)

The contents of a previous collection made at Pebas by Mr. Hauxwell are enumerated in the Proceedings of the American Philosophical Society for 1870, page 553. It included ten species of batrachians, four of lizards, and nine of snakes. The present collection embraces six species of batrachians, eleven of lizards, and fifteen species of snakes. The total number of species obtained is, fifteen batrachians, fourteen lizards, and twenty-three species of snakes. A considerable collection was made in the same region by the late Professor Orton, and the species are enumerated and described in the Journal of the Philadelphia Academy of 1875, p. 159. A previous collection, made by Professor Orton, is described in the Proceedings of the Philadelphia Academy for 1868, and one from Western and Central Peru is reported on in the Proceedings of the American Philosophical Society for 1877. These collections form the basis of a general review of the herpetology of Peru, which the writer hopes to publish with illustrations at no distant day.*

* Some species were obtained in the same region by Prof. Steere of Ann Arbor, Mich., and my thanks are due to this gentleman for the opportunity of examining them. From near Tarapota come the following species: *Dendrobates trivittatus* Spix; *Leptodactylus pacilochilus* Cope; *Neusticurus epleopus* Cope; *Polychrus marmoratus* L. From Toimbez: *Bufo hamatiticus* Cope; *Hyla phaxota* Cope.

From the Mamoré River in Eastern Bolivia, Dr. E. R. Heath presented to the museum of Ann Arbor the following species: 1. *Amphibana alba* L.; 2. *Pseudoeuryx mimeticus* sp. nov. The genus *Pseudoeuryx* Fitz., 1826, is the *Hydrops* Wagler, 1830, and *Dimades* Gray, 1843. It includes two banded species, the present

BATRACHIA.

HYLA FAYOSA, sp. nov.

The internal nares are about as large as the choanæ, and are a little longer than wide. The patches of vomerine teeth are between them, opposite a point anterior to their middle. The head is short and wide, and the canthus rostralis is rounded and concave. The muzzle is truncate viewed in profile, and the nostrils, though opening laterally, are terminal in position. The tympanum is small, being one-half the long diameter of the eye-slit, or a little less than half that of the eyeball. It is a little larger than the digital palettes of the anterior foot. On all the upper surfaces the skin is smooth. The usual areolation covers the abdomen and part of the femora. The three external fingers are about half webbed, the web not reaching the palettes of the third and fifth digits. The toes are more than half webbed, the membrane reaching the dilatations of all the toes except the fourth, where it reaches the base of the penultimate phalange. When the posterior limb is extended, the heel reaches the front border of the orbit. The upper arm is bound to the side for the greater part of its length by a strong extension of the skin. A trace only is seen at the anterior base of the femur.

one and the *P. plicatilis* Linn., and two ringed species, the *P. martii* Spix and *P. callostictus* Gthr. The *P. mimeticus* has a remarkable resemblance to the *Hydrocalamus quinquevittatus* (D. & B.) Cope, Proceeds. Amer. Philos. Soc., 1884, p. 176. The scuta of the head are as in the *P. plicatilis*. Dorsal region brown for a width of five and two half rows of scales. Sides, on the third and fourth and half of the second and fifth rows, marked with a black band, which extends from the orbit to end of the tail, and is yellow-bordered above. Below yellow with two small brown spots on each gastrostegæ and one on each urostegæ. Lips black, yellow spotted; a yellow band from eye to angle of mouth. A few small blackish spots on top of muzzle. Gastrosteges 163; anal 1-1; urosteges 35. Total length M. .490; of tail .056. 3. *Liophis almadensis* Wagl. 4. *Herpetodryas fuscus* Linn. 5. *Xenodon bipræoculis*, sp. nov. Body much compressed, and scales in nineteen longitudinal rows, and scarcely alternating. Anal plate entire. Eye large, profile convex. Superior labials eight, fourth and fifth entering orbit; seventh very wide above. Oculars 2-2, the anterior narrow, permitting the posterior angle of the large loreal to almost reach the orbit. Temporals 1-3; the anterior as deep as long. Both internasals and prefrontals a little wider than long. Frontal large, wide in front, longer than common suture of parietals. Parietals as wide as long. Ten inferior labials, the sixth much the largest. Genetals very short, the anterior a little the longer. Gastrosteges, 136; urosteges, 44. Color above olivaceous with three rows of equidistant spots. These are composed of coarse, black punctulations, and are without definite outline. Every third spot of the median line is in the centre of a pale ground, while the pairs between are connected by a dark shade. Inferior surfaces yellow; every other, or every second gastrostegæ, with a blackish edging at each end. Top of head olive, with black punctulations symmetrically arranged, so as to leave a curved unspotted space between the orbits and on the external border of the parietals. Labial plates unspotted. A very narrow black line from eye to superior border of last labial. Total length M. .590; of tail, .101. From its compressed form and natural coil, this species might be supposed to have arboreal habits. It agrees with three other species in its entire anal plate: viz., *X. suspectus* Cope; *X. colubrinus* Günth; and *X. angustirostris* Pet. In *X. rhabdocephalus* Boie, I find the anal plate entire or divided. 6. *Elaps surinamensis* Cuv.

The color of the upper surface is a brown, which is interrupted by a coarse honeycomb or net-like pattern of a bright yellow color. The inclosed spaces are as large or larger than the eye, excepting on the sides of the head and body and on the forelimbs, where they are smaller. They are distinct on the external two digits on both feet. The posterior faces of the femur, with all the inferior surfaces are uniform brown. The eyelids are of a paler brown, but whether this is due to the condition of the specimen or not, is uncertain.

Measurements.

	M.
Length of head and body .....	.635
Length to line connecting posterior borders of tympana. .	.010
Width of head at do.....	.012
Length of fore limb.....	.0233
“ “ “ foot .....	.010
“ “ hind limb.....	.056
“ “ tibia.....	.019
“ “ posterior foot.....	.026
“ “ astragalus.....	.011

This species belongs to the same type as the *Hyla leucophyllata*. Its coloration is unique in the genus. An allied species or subspecies has been brought from the Purus river, Brazil, by Prof. Steere, of Ann Arbor, Mich. It agrees in all respects with the *H. favosa*, but the heel reaches the end of the muzzle, and the color of the superior surfaces differs. The yellow covers the dorsal region, an imperfect reticulate pattern being only visible on the sides of the head and body.

HYLA MARMORATA Daud.

PITHECOPUS TOMOPTERNUS Cope.

CERATOPHRYS DORSATA Wied.

DENDROBATES TINCTORIUS Schn.

DENDROBATES TRIVITATUS Spix.

LACERTILIA.

MABUIA AGILIS Raddi.

MIONYX PARIETALIS Cope, gen. et sp. nov.

In his monograph of the Eclepoidine division of the Teidæ, Professor Peters referred the known species to five genera, three of which were divided into subgenera. The definitions of most of these groups were derived from the pholidosis, the exception being *Iphisa* (Gray), which was defined by the lack of claws on the pollices. I am of the opinion that Professor Peters was not fortunate in his selection of the pholidosis as the basis of generic and subgeneric divisions. Although such a system may associate species which agree in general appearance, and hence be thought by some to be "natural," it is certain that the various forms of scales pass into each other by such gradations, as to be unavail-able for the

characterization of tangible divisions. On the other hand, Professor Peters quite overlooked important characters of the squamation of the head, such as are usually found to distinguish natural genera in other families, including them only in his descriptions of the species. I propose to give a synopsis of the genera of this group as they appear to me. One result is a considerable reduction in the number of names. Agreeing with Dr. Boulenger that these species do not form a family distinct from the Teidæ, I define them as a group in that family with the nostril pierced in a single plate.

I. "Thumbs without claws."

A series of scuta on the nape; frontonasal and frontoparietal scuta present.

Iphisa Gray.

II. Claws all straight, conic.

No nucleal scuta; frontoparietals and frontonasals present.. *Mionyx* Cope.

III. Claws curved, present on all digits.

a. Dorsal series of large scuta.

Scuta in separate longitudinal series; forming keels on the tail.....

Neusticurus D. & B.

Scuta continuous, transverse; frontonasal and frontoparietal scuta.....

Placosoma Tsch.

aa. No larger series of dorsal scuta.

Frontonasals and frontoparietals present..... *Leposoma* Spix.

Frontoparietals, but no frontonasals..... *Proctoporus* Tsch.

No frontoparietals or frontonasals..... *Emphrassiotis* O'Sh.

In the above arrangement there is included, under *Iphisa*, *Perodactylus* R. & L. *Leposoma* includes nearly all the reputed genera of Peters and other authors, viz: *Loxopholis* Cope; *Cercosaura* Wagl.; *Pantodactylus* D. & B.; *Ecleopus* D. & B.; *Aspidolæmnus* Pet.; *Euspondylus* Tsch.; *Argalia* Gray (Peters); *Chalcidolepis* Cope; *Xestosaurus* Pet.; and *Pristidactylus* O'Sh. *Proctoporus* Tsch. includes *Pholidobolus* Pet., *Oreosaurus* Pet., and species referred to *Ecleopus* by O'Shaughnessy. Of the species referred to the group *Leposoma*, as originally restricted, but two have the abdominal scuta acute posteriorly, viz: the *L. scincoides* Spix, and the *L. carinicaudatum* Cope. The other species referred by O'Shaughnessy and Peters to that group have, according to them, the abdominal scuta truncate posteriorly, and must hence be referred to the group *Loxopholis* Cope, of which *L. rugiceps* Cope is type. These are the *L. dispar* Peters, and *L. buckleyi* O'Sh. The species thus arranged will be as follows:

Mionyx parietalis Cope.

Iphisa elegans Gray.

" *modesta* R. & L.

Neusticurus bicarinatus L.

" *eclipopus* Cope.

Placosoma cordylinum Tsch.

Leposoma scincoides Spix.

Leposoma carinicaudatum Cope.

" *rugiceps* Cope.

" *dispar* Pet.

" *buckleyi* O'Sh.

" *ocellatum* Wagl.

" *humile* Pet.

" *olivaceum* Gray.

Leposoma reticulatum O'Sh.

- " *picticeps* Cope.
 " *vertebrale* O'Sh.
 " *schreibersii* Wieg.
 " *bivittatum* Cope.
 " *concolor* Tsch.
 " *argulus* Pet.
 " *gaudichaudi* D. & B.
 " *affinis* Pet.
 " *maculatum* Tsch.
 " *rhomboferum* Gthr.
 " *acutirostre* Pet.
 " *ocellatum* Gray.
 " *strangulatum* Cope.

Leposoma guentheri O'Sh.

- " *olivaceum* Gray.
 " *marmoratum* Gray.
 " *pæcilochilus* L. & Von M.
 " *metallicum* Cope.
 " *bogotense* Pet.

Proctoporus pachyurus Tsch.

- " *unicolor* Gray.
 " *fraseri* O'Sh.
 " *oculatus* O'Sh.
 " *montium* Peters.
 " *striatus* Pet.
 " *luctuosus* Pet.

Emphrassiotis simoterus O'Sh.

The species number as follows :

Mionyx	1
Iphisa	2
Neusticurus	2
Placosoma	1
Leposoma	28
Proctoporus	7
Emphrassiotis	1
Total	42

The characters of the genus *Mionyx* are the following: First toe of both anterior and posterior extremities with rudimental straight claw; claws of other digits small, straight and conic. Prefrontal and frontoparietal plates present and distinct from each other. Ear-drum exposed. No distinct collar. Femoral pores present. Pholidosis squamous, nearly homogeneous.

Char. specif. These resemble those of the group *Leposoma* within that genus. The scales are imbricate and keeled, with acute posterior borders above and below. When the epidermis is lost the inferior scales are nearly truncate.* The dorsal and ventral scales are subequal and form twenty-one transverse series between the anterior and posterior limbs, across the back. Behind the auricular meatus, and in the axilla, they are coarsely granular. The upper and lower arms are covered with large keeled scales, although those of the posterior side of the former are smaller than those on the anterior side. The hind leg is similarly surrounded by large keeled scales, excepting on a band on the posterior side of the femur where they are granular.

There is a transparent disk of the lower eyelid, which is covered by two scales. The plates of the head are smooth. There is a loreal plate

* The truncation of the abdominal scales in the *L. rugiceps* is seen in the epidermis as well as the true skin.

which is higher than long, and projects at an angle between two preoculars. Of these the superior is large and extends partly over the eye, leaving only three narrow superciliaries. There are four well-developed supra-orbitals. The large internasal is about as wide as long. The frontonasals are well in contact by suture. The frontal is considerably longer than wide, as are also the frontoparietals. The interparietal is large, as wide as long, and would be a regular hexagon, but that the posterior border is rounded. The parietals are much smaller and trapezoidal, and longer than wide. No occipitals. Temporals small, squamous. Superior labials seven, separated from the orbit by a row of narrow suborbital scales. Inferior labials five. A symphyseal and an undivided postsymphyseal. Four infralabials, of which the first two are in contact, and the last two separated by flat scales, the fourth truncate posteriorly; no distinct pectoral scales.

The limbs are slender; when pressed to the side, the fingers reach to the middle of the tibia, and the toes to a little beyond the elbow. The toes themselves are weak and slender. The first digit is rudimental, and the second and fifth are very short, and of subequal length on the fore foot; and on the posterior foot, the second is a little the longer. The third digit is shorter than the fourth on both feet. They are all protected by a single row of flat scales below. The femoral pores extend entirely across in front of the anal scuta; there are ten on each side of the middle line. Of anal scuta there are six, arranged as follows: Two small ones on the middle line, one of which is marginal, and the other anterior to it; one large one on each side of these, also marginal; and a small one on the external side of these, also marginal.

Color, brown; dark above, pale below, darkest on the sides. The exact color is probably lost, as the specimen is not in the best condition. Side of head with some yellow spots. Lips and throat white, the former with a dark brown spot on some of the labial scuta.

	<i>Measurements.</i>	M.
Length from muzzle to vent . . . . .		.032
“ “ “ to axilla . . . . .		.015
“ “ “ to auricular meatus . . . . .		.0075
Width at auricular meatus . . . . .		.005
Length of fore limb . . . . .		.0105
“ “ hand . . . . .		.0035
Length of hind limb . . . . .		.0145
“ “ tibia . . . . .		.0048
“ “ foot . . . . .		.0056

LEPOSOMA PICTICEPS, sp. nov.

Dorsal scales very narrow, in regular cross-series, the acute extremities of those of one row alternating with those of the rows in front and posterior; each with a strong epidermal keel which is represented by a weak one of the true skin. These scales commence at the interparietal plate,

and present nine transverse series to the axilla, and twenty from the axilla to the groin. The scales of the tail are similar. The abdominal scales are smooth and parallelogrammic, being truncate behind, and are in sixteen transverse rows between the axilla and groin. A rather wide space posterior to the auricular meatus, and posterior to the axilla is covered with granular scales. The larger and square scales of the throat are in four transverse rows of two scales each. They are separated from the cross-row that marks the axilla by two cross-rows, and are bounded by some flat scales in front and at the sides.

The internasal plate is a little wider than long. The frontonasals are well in contact. The frontal is longer than wide. The frontoparietals are as wide as long, and are regularly five-sided, the supraorbital side a little longer than the others. The interparietal is nearly three times as long as wide. The parietals are larger and their posterior border forms, with that of the interparietal, a straight line. The posterior exterior border is excavated. The loreal is higher than long, and presents an obtuse angle posteriorly between the two preoculars. Of these the superior extends posteriorly over the eye, leaving three narrow superciliaries. Three supraoculars, the posterior with a small round plate posterior to it. Temporal scales rather large, smooth; no free marginal mental scales. Seven superior labials; six inferiors. A short symphyseal and a long postsymphyseal, both undivided. Posterior to the latter two pairs of large infralabials, touching on the middle line, followed by a large pair of infralabials which are separated on the middle line, each of which is followed by two large and some smaller scales.

Limbs rather short, posterior feet elongate. The fingers reach to the heel when both limbs are pressed to the side of the body, and the toes to the middle of the humerus. The limbs are covered by large, smooth scales, except on the posterior faces of the humerus and tibia, where they are smaller, and on the posterior face of the femur where they are granular. The claws are present on all the digits and are curved. Second and fifth fingers equal. Second toe longer than fifth, and fourth a good deal longer than third. Seven femoral pores and two preanals on each side. Preanal plates, seven. Of these six are marginal, a large one with a small one on each side of it, on each side of the middle line. The seventh is in front of the two median marginals, and is a large triangle.

Color, olive-brown or grayish, shaded with blackish on the head. The plates of the head have pale borders and centres, and the rostral and labial plates are yellow, the latter with a dark brown spot in the centre. A light (? yellow) band over the eye, and two rows of similar spots on the temporal region. Several rows of similar dark-edged spots on the nape. Granular region black, with yellow spots. The spots fade out on the dorsal region, each cross-row of scales has a blackish edge. On the tail two rows of such spots can be made out on each side. Inferior surfaces pale, probably yellow; lower labials, and the posterior infralabials with a dark brown spot in the centre.

	<i>Measurements.</i>	M.
Length from muzzle to vent.....		.057
“ “ “ “ axilla.....		.025
“ “ “ “ auricular meatus.....		.012
Width at auricular meatus.....		.0076
Length of fore limb.....		.015
“ “ hand.....		.0065
“ “ hind limb.....		.026
“ “ tibia.....		.007
“ “ foot.....		.0132

This species is evidently nearly related to the *Leposoma reticulatum* of O'Shaughnessy (*Cercosaura reticulata* O'Sh., Proceedings Zoöl. Society London, 1881, p. 230). It differs in not possessing the following characters of that species, as described and figured. In *L. reticulatum* there are two parietal plates on each side; abdominal scales are rounded in posterior outline, and in only eight rows, while they are in ten in *L. picticeps*; in having an azygous marginal anal instead of two, and in having a stripe on the body, and the tail differently colored from the back. The type of *L. picticeps* is a considerably larger animal than that of the *L. reticulatum*.

CENTROPYX DORSALIS Gthr. *Monoplocus dorsalis* Günth. *Centropyx pelviceps* Cope.

Mr. O'Shaughnessy finds these supposed species to be identical. Dr. Günther having established a new genus (*Monoplocus*) for the species on the supposed absence of femoral pores, I did not think it worth while to compare my specimens, in which they are numerous, with the one described by Dr. Günther. Mr. O'Shaughnessy has discovered that Günther's type possesses the pores.

AMIVA SURINAMENSIS Gray.

HYSIBATUS AGAMOIDES Spix.

HYPERANODON PELTIGERUS Cope.

ENYALIUS LATICEPS Guich.

ANOLIS BUCKLEYI O'Sh.

ANOLIS BOUVIERI Boc. O'Sh.

ANOLIS MACROPUS, sp. nov.

Tail subround, without crest. Ventral scales small, smooth; dorsal scales minute, rough. Occipital scale small, well separated from supra-orbitals; the latter separated from each other by three rows of scales, and not continued as a larger row anterior to orbit. Interorbital region concave: facial rugæ obtuse, separated by a concavity. Facial scales small, keeled, about twenty longitudinal rows at the middle of the muzzle, and ten in the facial concavity. No distinct canthus rostralis, and but two canthal scales distinguishable from those of the muzzle in size. Supraocular disk embracing a dozen scales of unequal sizes, and

surrounded by granules. Seven or eight loreal rows; labials, $\frac{9}{10}$; infra-labials all small. Auricular meatus small, but larger than occipital scale. The limbs are slender and long. The anterior appressed reaches the end of the muzzle by the end of the fifth digit; the posterior reaches the same by the end of the fourth digit. Digital dilatations narrow. Fan small.

The general color is blackish, below white, the line of junction of the colors on the sides of the belly, and ragged. A pale line across the chin.

	M.
Length of head and body .....	.045
" to posterior border of meatus auditorius.....	.061
Width at posterior border of meatus auditorius.....	.0065
Length of fore leg.....	.021
" " fore foot .....	.0072
" " hind leg .....	.041
" " tibia .....	.0125
" " hind foot .....	.017

This species approaches most closely the *A. limifrons* Cope from Veragua. In that species the facial rugæ have distinct large scales, which are wanting in the *A. macropus*, and the hinder legs are not so long. The facial scales are a good deal smaller, and the posterior legs shorter in *A. macropus* than in the *A. trachyderma*, which it otherwise resembles. The long hind legs distinguish it from other allied species.

OPHIDIA.

TYPHLOPS RETICULATUS L.

BOA CONSTRICTOR L.

RHABDOSOMA BREVIFRENUM Jan.

RHABDOSOMA MICRORHYNCHUM Cope.

CONTIA SERRATA, sp. nov.

RHADINÆA NICAGA Cope, *Lygophis nicagus* Cope, *Proceeds. Phila. Academy*, 1868, p. 132. *Proceeds. Amer. Philosop. Soc.*, 1870, p. 553.

Scales in seventeen rows, without fossæ, all of moderate width, the first not very wide. Eight superior labials, third, fourth and fifth entering orbit; fifth, sixth and seventh largest, subequal, their superior borders increasing in length in the order named. Rostral plate very small, barely visible from above. Nasal decurved forwards, deeper posteriorly; loreal deeper than long; ocular 1-2; the preocular narrow and widely separated from the frontal above. Temporals 1-2; the anterior in contact with the inferior postocular only. Internasals small, as wide as long; prefrontals much larger, wider than long. Frontal elongate, truncate in front, and with parallel sides; parietals long and large, extending on each side to the inferior postocular. Gastroteges 160; anal divided; urosteges 52. Total length, M. .245; to rectus oris, .0065; of tail, .070.

Color above dark brownish gray. A line of darker color extends along the third row of scales, and a similar one on the eighth row, which leaves

the ninth or median row of the ground color. These lines are quite indistinct. Ends of the gastrosteges of the ground color, shaded with bluish, so as to give the color border a serrate outline. Under surface of body and tail yellow, immaculate. Top of head paler. The frontal plate with dark edges and some dark specks on the prefrontals. A pair of light dark-edged small spots, close together, one on each side of the common parietal suture. Superior labial dark-edged. Lower labials and adjacent plates obscurely speckled.

Near the head the dorsal lines unite and form a serrate dorsal band, which is separated by a paler band from a darker lateral band with the superior edges serrate; but these markings are obscure. In another specimen which Prof. Steere, of Ann Arbor, brought from the Purus river,* the dorsal band is more distinct and extends to the end of the tail.

I originally referred this species to (*Lygophis*) *Aporophis*, but its equal teeth exclude it from that genus.

OPHEOMORPHUS MELEAGRIS Shaw.

HELICOPS ANGULATUS Linn.

OXYRRHOPUS SCOLOPAX Klein.

DIPSAS CENCHOA L.

RHINOBOOTHYRUM LENTIGINOSUM Scop.

LEPTOGNATHUS CATESBYI Weigel.

LEPTOPHIS MARGINATUS Cope.

DRYIOPHIS ARGENTEUS Daud.

ELAPS LEMNISCATUS L.

BOTHROPS BRASILENSIS Latr.

* This collection was made at Canutama, a distance of six hundred miles, and at Marrahan, a distance of seven hundred miles above its mouth on the Purus river, and as the first indication of the reptile fauna of that region possesses considerable interest. It includes the following species: 1. *Liophis almadensis* Wagl.; 2. *Rhadinaea nicaga* Cope; 3. *Pseudocoryx callostictus* Günth (*Hydrops*); 4. *Tortrix scytale* Linn; 5. *Bufo aqua* L.; 6. *Hyla leucophyllata* var. Beir; and 7. *Lithodytes cinereus* sp. nov. This frog has a smooth belly and free toes with truncate pallettes on all the digits. There are no cranial crests, and but slight traces of dorsolateral dermal folds. The vomerine teeth are in J-shaped patches commencing opposite the posterior border of the choanæ, and curving inwards and backwards. Ostia pharyngea as large as choanæ. Nostril terminal. Tympanic drum round, two-thirds size of eye. Tongue oval, slightly notched behind. Head oval; muzzle truncate; lores straight, grooved; canthus rostralis distinct, straight. Heel of extended hind leg to end of muzzle. First finger longer than second. A prominent sharp metatarsal tubercle attached to base of first toe. No external tubercle. Color above gray, with pale brown markings. The most distinct of these is a cross-band between the orbits. Lower surfaces dirty-white; concealed surfaces brown. Upper lip with three yellowish spots extending from the orbit; to which two or three marks on the lower jaw correspond. Limbs faintly brown cross-banded. Length of head and body M. .653; width of head at tympana .018. Length of fore-leg .029; of hind leg .084; of hind foot .038.

On the Species of Iguaninæ. By E. D. Cope.

(Read before the American Philosophical Society, October 16th, 1885.)

By Iguaninæ I mean Iguanidæ* without abdominal ribs† or free dermal margins of the digits‡ which have the nostrils on the line of the canthus rostralis and not below it, and which possess the compressed form and other characteristics indicating an arboreal rather than a terrestrial habit of life. With one exception§ these animals are confined to the forest regions of Tropical America, the greater number of species being found in the West Indies and Mexico. A few species, as the *Conolophus subcri-*

* Exclusive of the Anolidæ, which I have shown to differ in the structure of the lower jaw. Proceedings Academy, Phila., 1864.

† Those with abdominal ribs are the Polychrinæ.

‡ The Basiliscinæ are characterized by the digital margins.

§ The *Brachylophus fasciatus* of the Feejee Islands.

tatus, are entirely terrestrial in their habits. The genera are distinguished as follows :

I. Premaxillary and symphyseal teeth conical.

a Posterior digits with separate combs.

Tail with much of its length free from spines ; a gular fold, *Cyclura* Harl.

aa No separate combs on posterior digits.

Tail with the basal half spinous ; a throat fold..... *Otenosaura* Wieg.

Tail short, spinous to the end ; a throat fold *Cachryx* Cope.

Tail not spinous ; a throat fold..... *Brachylophus* Cuv.

Tail not spinous ; a dewlap which has a crest of spines on its anterior edge. *Iguana* Laur.

II. Premaxillary and symphyseal teeth trilobate ; no combs on the posterior digits.

A throat fold ; tail not spinous *Conolophus* Fitz.

No throat fold ; tail not spinous..... *Amblyrhynchus* Bell.

CYCLURA Harlan.

Journal Academy Natl. Sciences, i, p. 242, 1825. Dum. Bibr., Erp. Gen., iv, 214, 1837. *Metopocerus* Wagl., Natürl. Syst. d. Amphibien, p. 147, 1830. Dum. Bibr., Erp. Gen., iv, p. 210, 1837. ? *Aloponotus* Dum. Bibr., Erpet. Générale, iv, p. 189, 1837.

The species of this genus known to me are the following :

I. Scales of muzzle all small ; combs on third toe only.

Several rows of infralabial scuta ; five scales on canthus rostralis ; crest interrupted at rump only..... *C. carinata* Harl.

II. Large scuta on muzzle ; combs on third toe only ; one row of large infralabials.

Infralabials and other scuta in contact with each other and with labials ; two scales on canthus rostralis ; crest low, much interrupted at nape and rump ; color uniform..... *C. boelophia* Cope.

Infralabial and other scuta separated from each other and from labials by small scales ; four scales on canthus rostralis ; green, with bands. . .

C. nubila Gray.

III. Large scuta on muzzle ; one on middle line protuberant ; combs on second and third toes ; several rows of large infralabials.

Scales very irregular, often minutely granular on scapular regions ; a trace of whorls on tail ; crest interrupted at nape and rump ; black. .

C. cornuta Daud.

The reputed species *Cyclura macleayi* Gray, from Cuba, and *C. lophoma* Gosse, from Jamaica, are unknown to me by autopsy.

CYCLURA CARINATA Harlan, Jour. Academy Philadelphia, iv, p. 250, 1825, pl. 15. Cope, Proceeds. American Philosoph. Society, 1870, 558 ; American Naturalist, 1885, 1006.

Turk's island, Bahamas ; Harlan, Ebell.

CYCLURA BÆOLOPHA Cope. Proceeds. Academy Philadelphia, 1861, p. 123; American Naturalist, 1885, 1006.

Andros island, Bahamas; Wood.

CYCLURA NUBILA "Shaw." Gray in Griffith's Animal Kingdom, ix, 39 fig. Cope, American Naturalist, 1885, p. 1006. *Lacerta nubila* Shaw (teste Gray) Zoology. *Iguana cyclura* Cuv. *Cyclura harlani* Cocteau Hist. S. l'Isle Cuba par de la Sagra Rep., p. 96. *C. carinata* Wiegman. Herpet. Mexicana, not of Harlan.

Cuba.

CYCLURA CORNUTA Dand. *Iguana cornuta* Daudin, Rept., p. 382. Latreille Hist. Nat. Rept., ii, 267, iv, 294. *Metopocerus cornutus* Wagler, Nat. Syst. d. Amphibien, 1830, p. 147. Wiegmann, Herp. Mex., 1834, i, p. 16. Dum. Bibl., Erp. Gen., iv, 211, 1837. Günther, Trans. Zool. Soc., London, 1882, p. 218, Pls. xliii, xlv. Boulenger Cat., Brit. Mus., ii, 1885, p. 188. *Cyclura nigerrima* Cope, American Naturalist, 1885, p. 1006. *C. onchiopsis* Cope, loc. cit.

This species has been until recently but little known, although its name frequently appears in literature. The characters ascribed to it by Duméril and Bibron do not agree with those of any individuals which have come under my notice. These authors distinguish the genus *Metopoceros* from *Cyclura* by the presence of two rows of femoral pores, a character which does not exist in either of the four specimens in the National Museum. The genus *Aloponotus* of the same authors possesses, according to them, the same peculiarity. M. Boulenger, in the last (1885) edition of the British Museum Catalogue, describes this character as though it only occurs "sometimes" in this species, evidently regarding it as inconstant. My confidence in its constancy leads me to describe as new, two forms which perhaps belong to the *C. cornuta*, under the names *C. nigerrima* and *C. onchiopsis*. These differ from each other very much as the genera *Metopocerus* and *Aloponotus* are said by Duméril and Bibron to differ from each other, *i. e.*, in the character of the scutellation. In the *C. nigerrima* the scales are distinct everywhere; in the *C. onchiopsis* they are minutely granular on the sides of the back and on the nape and withers. In a third specimen (in alcohol, No. 9977), the characters are intermediate. Thus, in the type of *C. onchiopsis*, the masseteric protuberances have larger scales set in a general surface of granulations; in the third specimen, the same surface is nowhere granular, but is scutellate. The anterior dorsal region is less granular in this specimen. I therefore think it necessary to unite my supposed species, as has been done by M. Boulenger.

If the presence of the second row of femoral pores is not constant in the *C. cornuta*, then the genus *Metopocerus* cannot be distinguished from *Cyclura*. M. Boulenger relies on the rather greater number of denticles in the lateral teeth in the *C. cornuta*, but my specimens show a tendency

to the tridentate form of the *C. nubilata*. The character is, I think, even if constant, insufficient for generic distinction.

I describe the two specimens which represent the extreme of variation of this species, commencing with the type of *C. nigerrima*.

In this specimen the scales of the superior regions are smaller than those of the inferior regions, and are in regular transverse rows, each scale surrounded with granules. There are three rows in two millimeters. The scales of the inferior surfaces are about a millimeter in diameter; like those of the back they have faint traces of keels. The scales of the limbs and tail are keeled. At intervals of about six scales, there are, on the median portions of the sides of the tail, two rows of scales a little larger than the others, which are homologous with those which form the spiny whorls in other species. The crest is rather low on the nape, and is well developed on the dorsal region and anterior part of the tail. On the latter it becomes lower, forming serrate teeth, which are distinguishable to the end of that organ. The crest is interrupted at both withers and rump. Besides the combs on the second and third digits, there is a rudiment of a comb at the base of the first digit. Femoral pores 14-16.

The type specimen of this species was partially skeletonized before it was suspected to be other than a *Metopocerus cornutus*. The plates and scales of the head cannot therefore be described excepting so far as to state that there is a median large scale at the middle of the base of the snout, on an elevation of the nasal bones just behind the transverse line connecting the posterior borders of the bony nares. Between this plate and the canthus rostralis the horizontal surface of the muzzle is covered with rather large antero-posteriorly oval scales, which have a median keel. In the center of these is a larger plate, several times as large as any of them. The scales on the post-frontal region are similar and those of the zygomatic arch posteriorly are larger.

<i>Measurements.</i>	M.
Length of skull to end of quadrate bone .....	.108
Width of skull at front of tympanum.....	.070
Least interorbital width of skull.....	.018
Length of alveolar edge of maxillary bone.....	.050
“ “ body to vent.....	.340
“ “ tail.....	.500
“ “ humerus.....	.060
“ “ fore arm.....	.057
“ “ femur.....	.075
“ “ tibia.....	.063
“ “ foot.....	.110

The color is everywhere uniform black.

From Navassa island. National Museum, No. 9974.

In a second specimen, the type of *Cyclura onchiopsis*, the scales of the

inferior surfaces are similar in every respect to those of the one described above, while those of the sides, tail, and superior surfaces are quite different. Those of the tail are flat and keeled, and smaller than those of that species, and of equal size. In the scutellation of the back the granular scales are far more numerous, covering almost the whole of the scapular regions and sides of the neck and body. Where the larger scales appear they are round and not arranged in rows, and are separated by granular interspaces as wide as or wider than themselves. On the temporal and lateral gular regions the larger scales are scattered at wide intervals in the granular surface. On the muzzle there are two pairs of scuta behind the nasal plates, which are separated by a granular interval. Behind these, and separated by another interval, is a knob-like median scutum. Between this and the canthus rostralis, but separated from it by a wide granular space, are several scales like the smaller ones in the same position in the *C. nigerrima*. There are three rows of small prominent scales over the eye, forming a rough surface. A series of larger scuta on the zygomatic arch, as far as below the front of the orbit. Two prominent scuta not in contact on the anterior border of the tympanum. Two large and two small rows of infralabial plates. Labials $\frac{5}{8}$. Symphyseal plate large, angulate behind. A longitudinal median gular fold, which terminates in a pendulous transverse gular fold. The scales on these folds are like those of the belly, and not granular like those of the lateral gular region. Femoral pores 18. Tail compressed. Dorsal crest low, interrupted at the withers and groin.

Color, dark brown; belly, breast, fore limbs and sides of head black.

<i>Measurements.</i>	M.
Length of head to end of os quadratum . . . . .	.102
Width of head at front of tympanum . . . . .	.055
Length of body to vent . . . . .	.290
“ “ tail (tip wanting) . . . . .	.370
“ “ fore leg. . . . .	.140
“ “ humerus (measured behind) . . . . .	.050
“ “ forearm. . . . .	.057
“ “ hind leg. . . . .	.200
“ “ femur (measured above) . . . . .	.058
“ “ tibia . . . . .	.065
“ “ hind foot. . . . .	.095

There are three specimens of this species in the National Museum which agree in all essential respects. They are from the Island of Navassa. In all of them the temporal and pterygoid muscles are enormously developed, forming swollen enlargements unlike anything seen in any other Iguanid.

According to Duméril and Bibron there are in the *Metopocerus cornutus* three pairs of scuta on the muzzle. According to the description of these authors this animal also differs from the *M. cornutus* in having eight supe-

rior labials; in the nasals being subround instead of triangular; in having a large instead a small symphyseal plate. The specimen typical of *C. orchropsis* has a very low and even imperfect dorsal crest, with a wide interruption between the shoulders, while in the other two it is better developed, and in the type of *C. nigerrima* best of all.

CTENOSAURA Wiegmann.

Isis von Oken, 1828, p. 371. *Enyaliosaurus* Gray. Catal. Lizards, Brit. Mus., 1845, p. 192.

The species of this genus are restricted to the Mexican and Central American regions as *Cyclura* is to the West Indian. The species known to me are six in number, as follows:

I. Caudal whorls complete; dorsal crest extending only on the anterior dorsal region.

Tail round, whorls separated by one row of scales; brown with a few black cross-bands on anterior dorsal region..... *C. hemilopha*.

II. Caudal whorls complete; dorsal crest extending to rump.

a Caudal whorls separated by one row of scales.

Three scales on canthus rostralis; dorsal crest interrupted at rump; black or dark brown..... *C. multispinis*.

aa Caudal whorls separated by two or three rows of scales.

Head short, obtuse; three scales on canthus rostralis; dorsal crest interrupted at rump; black with yellow cross-bands; sides of neck yellow..... *C. brevirostris*.

Head wedge shaped; three or four scales on canthus rostralis; all, except the posterior one, deeper than long; dorsal crest interrupted at rump; black, with yellow and green cross-bands and speckles..... *C. teres*.

Four canthal scales, the posterior longer than deep; head elongate, wedge-shaped; dorsal and caudal crests continuous at rump; tail compressed; green with narrow black cross-bands to belly.. *C. completa*.

III. Caudal whorls interrupted; each represented by a median dorsal spine and two on each side at the base.

Tail depressed, shorter; dorsal crest widely interrupted at rump; pale brown with black cross-bands on anterior dorsal region. *C. quinquecarinata*.

CTENOSAURA HEMILOPHA Cope, Proceedings Philadelphia Academy, 1863, p. 105. *Ctenosaura acanthura* Bocourt, Miss. Scient. Mexique Rept. p. 138. *Cyclura acanthura* pars, Dum. Bibr., Erp. Gen. iv., p. 224.

This species is regarded by DeBlainville and Bocourt as the *Lacerta acanthura* of Shaw.* This cannot be correct, as Shaw distinctly states that the dorsal crest of his species extends to the rump. It is probably one of the species of the next section of the genus (II), but which one I am unable to ascertain.

Lower California only; *Botta*; *Xantus*.

* Zoology III.

CTENOSAURA MULTISPINIS sp. nov.

Head elongate, flat above, muzzle narrowed; nostril in the second third of the length to the orbit. Three scales on canthus rostralis, each deeper than long. Seven flat scales across muzzle between anterior angles of orbits. Two rows between supraorbital series. Scales above temporal muscles rather large, weakly keeled. Five series of infralabial plates, not separated by smaller ones. Dorsal crest rather elevated in adult, terminating at the rump. Median caudal crest composed of conical scales, commencing above the posterior margin of the femora. Tail cylindrical at base, covered by whorls of prominent scales with conical points which project strongly, and which are separated by one row of smaller flat scales on the upper half of the tail. On the inferior side of the tail the whorl rows are separated by two intervening rows, which are just like them, having a keel and a mucronate apex. Beyond the middle of the length (end lost) the tail is strongly compressed, but whether this is due to shriveling on drying, I am not sure. Median series of spinous scales uninterrupted. The abdominal scales are larger than the dorsal, which are longer than the lateral scales; all are subquadrate, and none are keeled.

Seven femoral pores.

Color above and below, black.

<i>Measurements.</i>	M.
Length from end of muzzle to vent. ....	.255
" to line of axilla .....	.125
" " line of auricular meatus .....	.062
Width of head at auricular meatus .....	.042
" " " above " " .....	.035
Length of anterior limb .....	.093
" " " foot .....	.037
" " posterior limb .....	.150
" " " foot .....	.076

I have before me two stuffed specimens of this species, a large one and probably adult, and a smaller and younger one. The former, which I described above, is No. 201 of Sumichrast's collection, and was procured by him at Dondomingvillo, in the State of Oaxaca, and sent to the Smithsonian Institution. The other specimen was obtained near Batopilas, Chihuahua, by Mr. Edward Wilkinson, and was recorded by me as *Cyclura acanthura* in the catalogue of his collection, Proceedings American Philosophical Society, 1879, p. 261. It agrees with the type specimen in having the distal two-thirds of the tail strongly compressed. The dorsal crest is much less elevated, probably owing to its younger age. The colors are paler, the prevailing tint being light brown with indistinct darker brown cross-bands.

I find a specimen of this species enumerated as var. B. of *Ctenosaura acanthura* by Boulenger in the vol. ii of the Catalogue of the Lizards in the British Museum, p. 197, which has just reached me.

CTENOSAURA BREVIROSTRIS, sp. nov.

Head short, with obtuse muzzle with decurved profile. Eyes large; nostril near end of muzzle, in the anterior third of distance between end of muzzle and orbit. The scales of the top of the muzzle and of the frontal region, are subquadrate or subhexagonal, and those of the temporal regions are but little longer than wide. All are more or less convex, the temporals most so. There are six rows of scales between the nasal plates, some of which are wider than long. Three canthal scales, of which the anterior is horizontally divided in one specimen. Four rows of wide loreal scales above four rows of narrow scales above the supralabials. Labials 13. Infralabials graduating in size to gulars, but there are five rows of subcarinate scales distinctly larger. Two rows between the subquadrate supraorbitals. Scales of lateral temporal region convex. Scales of belly larger than those of back and sides, which are equal, except those of the axillar, scapular and lateral cervical regions which are nearly granular. Dorsal crest very low, contiguous, excepting for a short distance at the base of the tail. Tail nearly cylindric. The scales of the median superior crest are not more prominent than those of the sides of the tail, but they are not interrupted as are the latter. For the terminal three-fifths of the length, the scales of the tail (except below) are equally spinous. For the basal third they are separated above by two rows of non-spinous scales, and on the lower parts of the sides by three rows.

In both the specimens the femoral pores are exceedingly small and indistinct and are five in number on each thigh. The throat is distinctly cross-folded, but very indistinctly longitudinally folded on the middle line. The sides of the neck have two longitudinal folds.

The general color of the head and body is a blackish-brown, paler below. This is crossed on the back between the sacral and postscapular regions by five yellow marks, which are bands posteriorly, but become spots anteriorly. The sides of the neck are of the same color, contrasting strongly with the black of the throat and nape. This yellow space is partially divided by a black line, which extends posteriorly from the angle of the lower jaw. The limbs are blackish, and on the fore arm are numerous yellow scales, and the tibia is faintly cross-banded. The digits and the tail are annulated with blackish brown and yellow rings of about equal width.

Measurements.

	M.
Total length to end of tail (end of latter imperfect)....	.645
Length from muzzle to vent.....	.242
“ “ “ “ line of axilla.....	.097
“ “ “ “ “ meatus of ear.....	.045
Width at front of auditory meatus.....	.040
Length (axial) from orbit to end of muzzle.....	.022
“ of fore leg.....	.096
“ “ fore foot.....	.047

<i>Measurements.</i>	M.
Length of posterior leg.....	.162
“ “ posterior foot.....	.085
“ “ tibia.....	.045

Two specimens of this species are in the National Museum, which were sent from Colima, in Western Mexico, by John Xantus.

CTENOSAURA TERES Harlan, Bocourt, Miss. Sci. Mexique, Reptiles, p. 142
Cyclura teres Harlan, Journ. Acad. Philada., iv, 1825, p. 246, tab. 16
 Wiegmann, Herpert. Mex., 1834, p. 42. “*Ctenosaura armata* Gray
 Synopsis Griff. Anim. Kingdom, ix, 1831,” Bocourt. *Cyclura pectinata*
 Weigmann, Herpetol. Mexicana, 1834, p. 42, tab. 2. Dum. Bibron,
 Erp. Gen., iv, 1837, p. 221. *Cyclura acanthura* Sumichrast, Univ. et
 Revue Suisse; Archiv. des Sciences Phys. et Nat., 1864, p. 49. *Cteno-*
saura pectinata Wiegman., Gray Catal. Lizards, Brit. Mus., 1845, p. 49.
 Bocourt, Miss. Scientifique Mexique, Reptiles, p. 140.

Tehuantepec, *Sumichrast*; Colima, *Xantus*; Tampico, *Dallas*; Vega
 de Alatorre, Vera Cruz, *Comision Geografica*.

Subspecies BRACHYLOPHA Cope.

Four stuffed specimens from Mazatlan differ from others of equal size and age from other localities in the extreme shortness of the processes which compose the dorsal crest. They are in fact merely elongated compressed scales, longer than high, except on the interscapular region, where they are as high as long. The same character is seen in young specimens of the ordinary variety. There are three scales on the canthus rostralis, of which the posterior is longer than deep, the second deeper than long, and the third, adjacent to the nares, is deeper than long, and divided into a superior and an inferior plate. The color is apparently green in life, punctulated with blackish brown. The punctulations arrange themselves into a row of median dorsal spots, and in three of the specimens into two transverse bands near the middle of the sides of the abdomen. Tail with broad blackish rings. The measurements of the largest specimen are: Total length, 630 mm; to vent, 263 mm; to posterior border of membranum tympani, 59 mm; width of head at front of mem. tympani 40 mm; length of posterior leg and foot, 124 mm; of posterior foot 52 mm.

Mazatlan *Bischoff*; Nos. Natl. Museum, 7180-81-82-83.

CTENOSAURA COMPLETA Bocourt, Miss. Scientif. Mexique, Reptiles, p. 145. *Ctenosaura pectinata* Cope, Proceedings Academy Philada., 1866, p. 124; Proceedings Amer. Philos. Soc., 1855, p. 388.

Aspinwall, Panama, *Gill*; Guatemala, San Salvador, *Miss. Scientif.*;
 Yucatan, *Schott*; Cozumel Id., *Ridgway*.

CTENOSAURA QUINQUECARINATA Gray. Cope, Proceedings Amer. Philosophical Society, 1869, 161. *Cyclura quinquecarinata* Gray, Zoological Miscellany, p. 59. *Enyaliosaurus quinquecarinatus* Gray, Catal. Lizards, Brit. Mus., 1845, p. 192.

Tehuantepec, *Sumichrast*.

CACHRYX Cope.

Proceedings Academy Philada., 1866, p. 124.

This genus is of the type of *Ctenosaura*, differing only in the characters of its tail. It lacks the terminal portion which is in that and other genera free from spinous scales. It is not in my opinion allied to *Urocentrum* or *Hoplocercus* as suggested by Bocourt, genera which belong to the terrestrial division of the family, or *Humivagæ*.

CACHRYX DEFENSOR Cope. Proceeds. Acad. Phila., 1866, p. 124. Proceeds. Amer. Philos. Soc., 1869, p. 169, pl. 10. Bocourt, Miss. Sci. Mexique, Reptiles, p. 148, pl. xvii. bis. figs. 12, 12a.

Yucatan, *Schott*.

BRACHYLOPHUS Cuvier.

Regne Animal, edit. ii, p. 41. Duméril Bibron, Erp. Gen., iv, p. 225. Gray, Catal. Brit. Mus., 1845, 187. Fitzinger Systema Reptilium, 1843, p. 55. *Chloroscartes* Günther, Proc. Zool. Soc. London, 1862.

BRACHYLOPHUS FASCIATUS Brong. Cuv. Regne Animal, ii edit., p. 41. Dum. Bibron, Erp. Gen., iv, 1837, p. 226. Gray, Catal. Liz. B. M., 187. *Chloroscartes fasciatus* Günther, Proceeds. Zool. Soc. London, 1862, pl. xxv.

Feejee Is.

IGUANA Laurenti.

Specimen Synopsis Reptilium, 1768, p. 47. Duméril Bibron., Erp. Gen., iv, 1837, p. 199. Gray, Catal. Brit. Mus., 1845, p. 186. *Hypsilophus* Wagler, Nat. Syst. Amphib., 1830, p. 147. *Amblyrhynchus* "Bell" Wagl., l. c., p. 148 (nec Bellii.).

IGUANA TUBERCULATA Laurenti.

Subspecies TUBERCULATA Laurenti, l. c., p. 49. Dum. Bibr., Erp. Gen., iv, p. 203; Gray, Catal. Liz. Brit. Mus., 1845, p. 186.

South America, east of the Andes; Lesser Antilles.

Subspecies RHINOLOPHEA Wiegman. *Iguana rhinolopha* Wiegmann, Herpetol. Mexicana, 1834, i, p. 44. Dum. Bibr., Erpet. Gen., iv, p. 207. *Iguana tuberculata* var. Wiegmann, Isis, 1828, p. 364; Cope, Proceeds. Amer. Philosoph. Society, 1869, p. 161.

Costa Rica, *Gabb*; Tehuantepec, *Sumichrast*; Colima, *Xantus*; Cozumel, Yucatan, *Ridgway*.

Tierra Caliente of Mexico.

IGUANA DELICATISSIMA Laurenti. Specimen Syn. Reptilium, p. 48, 1768. Gray, Catal. Brit. Mus., 1845, p. 187. *I. nudicollis* Cuv., Regne Animal, ii, p. 40. Dum. Bibr., Erp. Gen., 1837, iv, p. 208.

Guadalupe, Nevis, *Ober*.

CONOLOPHUS Fitzinger.

Systema Reptilium, 1843, p. 55. Boulenger, Catal. Lizards, Brit. Mus., 1885, ii, p. 186. *Amblyrhynchus* pars Dum. Bibr., iv, p. 197. *Trachycephalus* Gray, Catal. Liz. Brit. Mus., 1845, p. 188.

M. Boulenger (Catalogue Lizards Brit. Museum, 1885) first pointed out the characters which distinguish this genus from *Brachylophus*.

CONOLOPHUS SUBCRISTATUS Gray. *Amblyrhynchus subcristatus* Gray, Zool. Misc., p. 6, 1831. Zoology Beechy's Voyage Rept., p. 93, 1839. *Amblyrhynchus demarlii* Dum. Bibr., Erp. Gen., iv, p. 197, 1837; Bell Zool. Beagle, iii, p. 22, 1843, pl. ii. *Conolophus demarlii* Fitz., Syst. Rept. *Conolophus subcristatus* Steindachner, Festschr. K. K. Zool. Bot. Gess. Wien; Die Schl. u. Eid. d. Galapagos Ins. 22, 1876, tab. iv, v, figs. 6-9; vi, figs. 4-6; vii, 5-8. *Trachyphalus subcristatus* Gray, Cat. Liz. Brit. Mus., 1845, p. 188.

Galapagos Ids.

AMBLYRHYNCHUS Bell.

Zoological Journal, London, 1825, p. 195. Dum. Bibr., Erp. Gen., iv, 204 pars. *Oreocephalus* Gray, Catal. Liz., Brit. Mus., 1845, p. 189.

Steindachner states that the *Amblyrhynchus cristatus* possesses no gular cross-fold. I know of no other ground for separating it generically from the *Conolophus subcristatus*.

AMBLYRHYNCHUS CRISTATUS Bell, loc cit. Tab. xii. Do. Voyage of the Beagle, iii, p. 23. Steindachner Festschrift der K. K. Zool. Bot. Gess., Wien, 1876; Die Schlangen u. Eidechsen der Galapagos Ins., p. 16, tab. iii, v, vi, figs. 1-4. *Hypsilophus cristatus* Fitzinger. *Amblyrhynchus ater* Gray. Synops. Rept. Griff. Anim. Kingdom, ix, p. 37. Dum. Bibr., Erp. Gen., iv, p. 196. *Oreocephalus cristatus* Gray. Catal. Brit. Mus., 189.

Galapagos Ids.

Thirteenth Contribution to the Herpetology of Tropical America. By E. D. Cope.

(Read before the American Philosophical Society, Nov. 20, 1885.)

I. NICARAGUA, Bransford.

Dr. J. F. Bransford, U. S. N., has sent from time to time collections from Central America to our scientific institutions, which have thrown much light on the zoölogy of the regions he has visited. In 1874, I had the privilege of publishing a report on a collection obtained by him in Nicaragua* ; and later (1875) I published an account† of a collection sent

* Proceedings Academy Philada., 1874, p. 64.

† Journal Academy Philada., 1875, p. 155.

by him from Panama. On these occasions I defined six species not previously known to science. On the present occasion I am able to determine the contents of a new collection obtained by Dr. Bransford in Nicaragua. This embraces thirty species, of which ten are new to science. The collection adds very much to our knowledge of the range of various species, both as to their southward and northward extension. The specimens are the property of the National Museum at Washington, which institution placed them in my hands for identification and description.

BATRACHIA.

ANURA.

1. BUFO HAEMATITICUS Cope, Nos. 14178, 14181. Abundant.
2. BUFO MARINUS L., Nos. 14198, 14213. One specimen.
3. BUFO VALLICEPS Wieg., Nos. 14194-5-88. Three specimens.
4. DENDROBATES TINCTORIUS Ichn., No. 14183. Abundant.
5. DENDROBATES TYPOGRAPHUS Keferst. No. 14189. Abundant.
6. ENGYSTOMA PICTIVENTRE, sp. nov.

One small metatarsal tubercle. Muzzle anterior to eye equal to twice long diameter of latter, and projecting well beyond the mouth. Nostrils lateral-terminal. No fold across occiput. Skin everywhere smooth. First finger shorter than second, which reaches end of muzzle when the limb is extended. When the hind limb is extended forwards, the distal end of the astragalus reaches the extremity of the muzzle. First toe very short; second a good deal longer than fifth; fourth elongate.

Color above olivaceous brown. A black band with a very narrow pale superior border extends from the end of the muzzle to the lower part of the groin, the superior border descending posteriorly. No inguinal spot. Below black, with white spots. Those on the abdomen are very large; those on the femora and tibia are smaller, and those on the thorax and gular region are still smaller.

Total length of head and body, 22.5 mm.; of posterior leg, commencing at groin, 29 mm.; length of posterior foot, 14 mm., of which the astragalus portion measures 4.5 mm.

No. 14196; National Museum.

7. HYSIBOAS MILIARIUS, sp. nov.

A species above medium size, in which the pollex is free from the index for most of its length, and terminates in a flattened cone, instead of a curved, acute spine.

Vomerine teeth in two transverse series behind the posterior borders of the choanae, and within the lines of their internal borders. Ostea pharyngea half the size of the choanae. Tongue subround, feebly emarginate posteriorly. Eyes large and prominent. Head flat and depressed, wider than long, muzzle broadly rounded and with perpendicular profile; and as long as the orbit's diameter. Canthus rostralis almost wanting, very

concave. Nostrils terminal and lateral. Tympanum three-fifths diameter of orbit, larger than digital discs. Both anterior and posterior feet palmate to the bases of the last phalanges of the longest digits, except between the second and third anterior digits, which is only palmate to the bases of the penultimate digits. When the hind leg is extended the heel reaches the end of the muzzle. The posterior digits are short, but two phalanges projecting beyond the knee when the leg is closed. The palmation is wide, and extends a short distance between the external metatarsals. A well-marked coniform tubercle, with slightly free apex.

The under surfaces have the usual areolation. The superior surfaces are thickly covered with small tubercles, which are largest and most prominent on the top of the head, where some of them are subspinous. There is a serrate narrow free dermal margin on the external edge of the fore leg, from the elbow to the end of the fifth digit, and a similar one on the external edge of the posterior foot. There is none on the side of the body.

Length of head and body M. .062; length of head on middle line to line connecting posterior extremities of maxillary bones, .017; width of head at same point, .025; length of anterior limb from axilla, .035; do. of fore arm, .011; length of carpus and digit, .019. Length of thigh from groin, .025; of tibia, .032; of tarsus, .019; of foot to end of fourth digit, .025.

The color of all the upper surfaces is a dark plum or mulberry, with an obscure coarse reticulation of a darker shade. The color of the inferior surfaces everywhere is yellowish, spotted with the color of the dorsal region. At each heel, and just below the vent, there is a yellow spot. The webs of both fore and hinder feet are plum-color, except the borders, which are yellowish. The digits are yellowish on the under sides. There is a spot of pale color on the upper lip below the space between the orbit and the tympanum, and some less distinct spots on the lip anterior to it. The dermal processes of the fore-arm and tarsus are light yellowish.

Collection No. 14193.

This fine species approaches nearer in coloration, dermal character, and form of palmation to the *Hyla marmorata* than to any other species of that genus. The remarkable development of the pollex, however, places it in the genus *Hypsiboas*, although it differs materially in the details of this part from the known species of the genus.

8. *HYPYSIBOAS ALBOMARGINATUS* Spix. Nos. 14190-91-92. One of the three specimens has a yellow dorsolateral band on each side.

9. *HYLA QUINQUEVITTATA*, sp. nov.

Rather small. External fingers with a slight rudiment of a web at their bases. Toes with web only reaching the middle of the penultimate phalanges of the third and fifth digits. Vomerine teeth in two rather large rounded fasciculi close together on the anterior half of the space between the choanæ. Tongue a little longer than wide, feebly notched. Tympanic membrane round, two-fifths the long diameter of the eye-fissure. The

muzzle is rather acuminate and projects beyond the mouth. The canthus rostralis is distinct and concave. The skin is perfectly smooth on all the superior surfaces. The wrist of the extended fore limb extends to the end of the muzzle; while the heel extends a little beyond the same point.

Length of head and body M. .029; of fore leg, .017; of hind leg, .043; of hind foot, .019; of tarsus, .009; of tibia, .015.

Color above light gray, with five parallel dark gray longitudinal bands. The median band is somewhat indistinct posterior to the interscapular region and in front of the sacrum. Anteriorly it expands so as to form a large subtriangular spot between the eyes, the apex being posterior. The femur has one cross-band; the cubitus two, and the tibia three. Inferior and concealed surfaces unspotted.

Coll. No. 14187.

This species is, in many technical respects, similar to the *Hyla eximia* Baird. The hinder legs are much longer; the muzzle is more acuminate, and the color bands are much wider. The frog is probably of a different color in life.

10. AGALYCHNIS HELENÆ Cope. Proceeds. Amer. Philosoph. Society, 1884, p. 182.

A larger specimen than the type, in which yellow border of the lateral purple stripe, and the bars which cross it, are wider. There are also traces of pale cross-bands on the back. No. 14186.

11. LITHODYTES DIASTEMA Cope. One specimen; No. 14209.

12. LITHODYTES BRANSFORDII, sp. nov.

Represented by a number of individuals of small size, but which are adult. The characters are well marked. The legs are short, the posterior when extended only bringing the heel to the orbit. The vomerine teeth are in two transverse or slightly arched series, near together well behind the line of the posterior nares, and not extending exterior to the middle of the latter. The tympanic disc is large, in four of the specimens equaling the diameter of the eye-fissure, in three others not exceeding two-thirds of that size. The muzzle does not project, and is slightly truncate, and is about equal in length to the diameter of the orbit. The nostril is nearly terminal-lateral. Canthus rostralis distinct, obtuse, nearly straight. The toes are entirely free, and the dilatations are moderate. Two metatarsal tubercles, the inner larger. The skin of the back is thrown into delicate longitudinal parallel folds, which are easily lost.

Length of head and body, M. .0255; length of anterior limb, .013; of posterior limb from groin, .036; of foot, .017; of tarsus, .0075; of tibia, .012.

In the color there is much pink on the upper and concealed surfaces. There are two dark spots on the lip, one below each canthus of the eye. There is a large more or less obsolete spot behind and above the axilla, with an oblique posterior border. There is a dark spot on the parietal region and generally one between the anterior parts of the orbits. There

is generally a light open chevron pointing forwards across the middle of the back, with a dark one in front of it. In the largest specimen a pink band extends from the orbit posteriorly to the ilium. Posterior face of femur brown with light specks or finely brown mottled. Other lower surfaces whitish, except that in a few specimens the gular region is obscurely brown mottled.

This species belongs to the short legged group represented by the *L. diastema*, and need not therefore be compared with the *L. podiciferus*, *muricinus* and *rhodopis*, where the heel reaches much beyond the muzzle. From *L. diastema* it differs in the much longer posterior foot, and in the close approximation of its teeth, which form a row and not a fascicle. The tympanum is at all times much larger and more distinct, although it is variable in diameter.

This species is dedicated to Doctor John F. Bransford, U. S. N., whose researches have thrown much light on the fauna of Nicaragua.

Museum; No. 14200.

13. LITHODYTES RANOIDES, sp. nov.

This form is a little nearer to some already known than the last described. The heel of the extended hind leg reaches exactly the end of the muzzle, being thus still shorter than in the group above mentioned, which is represented by the *L. rhodopis* and its allies. The vomerine teeth, unlike any of the forms mentioned, are in small fasciculi, which are not widely separated, and which are entirely behind the line of the posterior border of the nares, and within that of the internal border. A distinctive character is the presence of a small web between the toes, which is nearly as well developed as in the *Hylodes (Lihyla) guentherii* Keferst. The diameter of the tympanic disc is about half that of the ball of the eye. The tongue is a parallelogrammic oval, and is entire posteriorly. The head is relatively rather long, and the muzzle is acuminate. The muzzle projects somewhat beyond the mouth, and beyond the nares, which are above the edge of the symphysis mandibuli. Its length a little exceeds that of the eyeball, which itself is more than half larger than the interorbital width. The canthus rostralis is distinct and nearly straight. The digital dilatations are truncate. The external metatarsal tubercle is obsolete, and the internal one is small. The skin is nearly smooth, but a pair of feeble folds form an obscure pattern on the scapular regions.

Length of head and body, M. .0265; do. to line connecting posterior borders of tympana, .10; width at anterior borders of do., .0105; length of fore limb from axilla, .0155; of hind limb from groin, .041; of hind foot, .019; of tarsus, .0075; of tibia, .014.

Color dark ashen above, darker on the head. A pale cross-band across frontoparietal region. Four large dark spots on upper lip, commencing at end of muzzle. Limbs dark cross-banded; three on tibia and two on femur. Sides and lower surfaces white, the former and the gular and

pectoral regions thickly speckled with dark ash; a few larger splotches of the same in front of and at the groin. The cross-bands of the tibia extend on the skin that covers the flexors of the foot so as to be seen from below.

Four specimens; No. 14179.

14. *HYLODES POLYPTYCHUS*, sp. nov.

Vomerine teeth in two transverse series behind the posterior borders and within the lines of the internal borders of the choanæ. Tympanic disc a vertical oval, the long diameter two-thirds that of the orbit. Limbs short, the heel only reaching the muzzle. The toes are rather long, have rather small oval dilatations and are perfectly free at the base. The head is short, and the muzzle has an oval outline, and projects a little beyond the mouth. Its length anterior to the orbit equals the diameter of the same, and the nostril is nearly terminal. Two distinct metatarsal tubercles, the internal with a rather prominent apex. The tubercles below the bases of the phalanges are rather prominent. The skin of the abdomen is areolate. That of the upper surfaces is plicate and tuberculate. The plicæ are interrupted, and may be regarded as forming eight longitudinal series, the external of which are dorso-lateral. Below these the sides are tubercular; as are also the spaces between the dorsal plicæ, the superior surfaces of the limbs, and the top of the head, especially the superior face of the eyelids. An external fold on the distal half of the tarsus.

Length of head and body, .027; of head to posterior line of tympanum, .009; width at anterior line of do., .011. Length of fore limb, .015; of hind limb, .037; of hind foot, .018; of tarsus, .0073; of tibia, .012.

Color above dark ashen, with indistinct shades. Four dark spots on upper lip; a dark shade above and posterior to axilla; four narrow black cross-bands on thigh, two across tibia and four across external side of foot. Inferior surfaces dirty white. Posterior face of thigh and gular region thickly clouded with brown.

Two specimens; No. 14199.

15. *RANULA CHRYSOPRASINA* Cope. Several specimens; No. 14180.

REPTILIA.

LACERTILIA.

16. *AMIVA FESTIVA* Licht. et Von M. All of the specimens (four) have but three supraocular scuta. Nos. 14204-5.
17. *CORYTHOPHANES CRISTATUS*. No. 14202. One specimen.
18. *ANOLIS COPEI* Boc. No. 14210. One specimen.
19. *ANOLIS RODERIGUEZII* Boc. Cope, Proceedings Amer. Philos. Soc., 1885, p. 391. Three specimens; No. 13721.
20. *ANOLIS CRASSULUS* Cope. One specimen; No. 14208.
21. *ANOLIS CAPITO* Peters. Three specimens; No. 14203-12.
22. *ANOLIS OXYLOPHUS* Cope. Four specimens; No. 14211.
23. *ANOLIS QUAGGULUS* Cope. Numerous specimens; No. 14208. The

coloration of none of these individuals agrees with the type in having the vertical black lines, on the sides which I have described. The dorsal chevrons are frequently present, but they are sometimes replaced by large pale brown rhombs or a uniform metallic pale brown. The keels of the ventral scales are sometimes obsolete. The scales round the occipital are generally keeled, as well as those of the rest of the head.

24. *SPHÆRODACTYLUS HOMOLEPIS*, sp. nov.

Scales of upper surfaces small, flat, not granular nor keeled, a little smaller than those of the abdomen. Rostral plate large. Labials $\frac{3}{4}$, first inferior labial corresponding to three superior labials. Muzzle a little longer than distance from eye to auricular meatus, and one and two-thirds times the length of the eye's diameter. Scales of lower surface of normal tail similar to those of upper surface.

Brownish cream color with dark brown bands, longitudinal on the head, and transverse on neck, body and tail. There are seven lines on the head, one median, and three on each side. The inferior is short and is anterior to the auricular meatus; the second extends from the end of the muzzle through the eye to the neck, and the third runs backwards from the superciliary region to an equal length. The cross-bands are not so wide as the spaces between them. One is at the nape, one crosses the shoulders, one the middle of the body and one the groin. There are four complete annuli on the tail.

This species is of very small size. Total length M. .024; of head and body, .016; of head to auricular meatus, .004. No. 14207.

This *Sphærodactylus* is nearest the *S. sputator* of Cuba. In that species the scales are smaller, there are subcaudal scutella, and the head-bands are less numerous and distinct.

25. *RHADINÆA DECORATA** Günther. No. 14217.

* A species of this genus in my collection from the State of Hidalgo, Mexico, is apparently undescribed. I call it *Rhadinæa quinquelineata*. It is nearest the *R. taeniata* Peters, but has a much shorter tail, and differs in coloration. The scales are in seventeen longitudinal rows, and as in other species of *Rhadinæa*, are poreless. There is but one preocular plate, which does not approach the frontal. The loreal is longer than high; postoculars 2; temporals 1-2. Superior labials, eight, all higher than long, excepting the last, which is as high as long; the third, fourth and fifth entering the orbit. Parietal plates elongate, exceeding the frontal. Anterior border of frontal angulate, its length about equal to the lateral border. Inferior labials ten, the pregenaeals considerably shorter than the postgenaeals. Gastroteges 179; anal 1-1; urosteges 77. Total length M. .435; of tail, .115; to canthus oris .011.

Color light brown above; below to ends of gastroteges, and upper lip, yellow. A black band runs along the middle of the fourth row of scales, and a dusky one on the adjacent halves of the seventh and eighth rows. A narrow black line along the median row. The lateral band extends through the eye to the end of the muzzle, crossing the tops of the 8th, 7th, 6th and 5th labials, becoming darker anteriorly. The band of ground-color above it extends to the eye, narrowing in front. The three dorsal bands unite into a wide brown one on the nape, which spreads out and covers the top of the head. The last two maxillary teeth are much stronger than the others.

Discovered by my friend Dr. Santiago Bernad; two specimens; a third from the State of Pueblo.

26. OPHIBOLUS POLYZONUS MICROPHOLIS COPE. No. 14214.

27. HERPETODRYAS MELAS, sp. nov.

Scales in ten longitudinal series, all smooth, those of the median rows larger than those of the lateral, and rather smaller than the parietal scuta. Parietals rather short and wide, openly emarginate behind. Nine superior labials, all longer than high, the fourth, fifth and sixth entering the orbit. Nasals well developed; loreal square; oculars 1-2; temporals 1-1-1. Muzzle rather short, and eye large; diameter of the latter equal length from orbit to nostril. Frontal not much concave at sides. Inferior labials ten, fifth longest, narrow, and the last one in contact with the genials. Postgenials longer than pregenials. Gastrosteges 158; anal 1-1; urosteges 139. Total length M. 1.210; length of tail, .470; length to rictus oris, .029.

Shining black, except on the superior labial scuta and anterior half of body, which are cream-colored. The ends of the light gastrosteges remain black. Here and there a black scale has a white edge, and several present this character distinctly just posterior to the angle of the mandible on the neck. No. 14219.

This interesting species is nearest to the *Herpetodryas grandisquamis* Peters (Cope, Journal Academy Philada., 1875, p. 135), but differs in having the scales smaller, without keels, and in ten longitudinal rows. Peters placed the latter in *Spilotes*, but I have not adopted this arrangement, since like the *H. melas*, it has a divided anal plate, and scales without fosse in an even instead of an odd number. These characters indicate clearly that its place is in *Herpetodryas*.

28. DENDROPHIDIUM DENDROPHIS* Schl. *Herpetodryas poitei* D. & B.

Two specimens (Nos. 14215-20) adult and half-grown. The latter has the coloration ascribed to this species, while the cross lines and lateral spots are obsolete in the former. There are no markings on the head and neck of the adult. The top of the head is red in the adult. Oculars

* A species allied to the *D. dendrophis* was sent to the Smithsonian Institution from Guatemala by H. Hague, which has not yet, so far as I am aware, received a place in the system. It may be called *Dendrophidium chloroticum*. The scales are in seventeen rows, of which four rows on each side are smooth on the anterior part of the body, and only two smooth on the posterior. The parietal plates are a little longer than the frontal, which has straight sides. The eye is large, its anteroposterior diameter equaling the width of the superciliary and frontal scuta combined, and equaling the length of the muzzle to the middle of the prenasal plate. Oculars 1-2. Temporals 2-2, all narrow. Superior labials nine, the last three longer than high. Loreal large, higher than long; nasals rather small. Gastrosteges 169; anal 1-1; urosteges, 117. Color above, including ends of gastrosteges, green; below yellow. On stretching the skin it is seen to be black between the scales of the sides of every second or third row, in oblique lines running upwards and forwards. Total length M. 1.048; of tail, .341; to rictus oris .027.

This species is abundantly different from the *D. melanotropis* Cope, but is near to the *D. dendrophis* Schl. The muzzle is shorter than in our specimens of the latter, and in those figured by Jan, and the number of keeled rows of scales is less, nine to fifteen. The color is entirely different.

1-2. Three temporals border the labials above, except on one side of the younger specimen where there are but two, as in the individuals figured by Jan in *Iconographic Generale des Ophidiens* Livr. 31, Pl. iii. The specimens of the species hitherto described are from Cayenne.

29. *HAPSIDOPHRYS SATURATUS* Cope. *Leptophis saturatus* Cope, *Journal Academy Philada.*, 1875, p. 133; Pl. 28, fig. 10.

The frontal plate, in the single specimen sent, has its lateral borders straight and not contracted as in the type specimen figured. No. 14216. *Hapsidophrys* Fisch. differs from *Leptophis* in having a loreal plate, and from *Philothamnus* Smith, in having keeled scales. Its American species are *H. mexicanus* D. & B.; *H. diplotropis* Gthr. and *H. saturatus* Cope. To *Leptophis* belong *L. bilineatus* (*Diploptropis* Gthr.), *L. occidentalis* Gthr., *L. sargii* Fisch., and *L. prastans* Cope. To *Philothamnus* must be referred *P. aruginosus* Cope; *P. modestus* Gthr. and *P. depressirostris* Cope.

30. *ELAPS NIGROCINCTUS* Gird. No. 14214; one specimen.

31. *ELAPS MULTIFASCIATUS* Jan. No. 14218; one specimen.

GENERAL REMARKS.

A general analysis of the Herpetological fauna of Nicaragua cannot yet be given, especially as the distribution of species within the State has not been furnished by explorers. It will however be of interest to note the following points:

Of the thirty-one species enumerated in the preceding catalogue four are widely distributed South American forms, viz: *Bufo marinus*; *Hypsiboas albomarginatus*; *Dendrobates tinctorius* and *Dendrophidium dendrophis*. Three are especially Mexican forms, although they extend as far south as Costa Rica, viz: *Bufo valliceps*; *Rhadinæa decoratu* and *Ophibolus polyzonus*. The remainder are especially Central American forms, which have been found either in Guatemala, Costa Rica or Panama, or are new to science. Of these the number having a southern range is considerably in excess of those ranging to the north of Nicaragua.

II. PANAMA Nelson.

The following species were obtained at Panama by Dr. George W. Nelson, and sent to the National Museum at Washington. Two of the species are new to science.

BATRACHIA.

1. *HERPELE OCHROCEPHALA* Cope. *Proceedings American Philosoph. Society*, 1885, p. 171. *Cacilia ochrocephala* Cope, *Proceedings Academy Philadelphia*, 1866, p. 132; Brocchi *Mission Scientif. Mexique*. One specimen; No. 14116.

OPHIDIA.

2. *RHADINÆA FULVICEPS*, sp. nov.

Scales in seventeen longitudinal rows. Two preoculars, the inferior

small and occupying a notch between the third and fourth superior labials. Preorbital part of head short. Internasals and prefrontals broader than long. Frontals, supraorbitals and occipitals rather large. Rostral plate wider than high, rather prominent. Postnasal higher than prenasal, its posterior border an arc of a circle. Loreal higher than long. Postoculars two, the inferior the smaller. Temporals 1-2-3. Superior labials eight, all longer than high, excepting the sixth, which is as high as long; the fourth and fifth bounding the orbit. Inferior labials nine, fifth largest, and the last one in contact with the genials. Postgenials longer than pregenials. Gastrosteges 144; anal 1-1; urosteges 109.

Color above dark brown, with three darker brown longitudinal bands. The lateral one is on the second and third rows of scales, and the median stripe occupies four rows. Below yellow, with a serrate blackish border on each side, due to the presence of an angular spot at the extremity of each two gastrosteges, which covers the suture between them. Top of head yellowish-brown, quite distinct from the body, and without markings. Sides of head darker; lips yellow, each plate with a black border, and more or less numerous black spots. One of these, larger than the rest, extends upwards towards the line of the posterior extremities of the parietal scuta. Another extends a short distance posterior to the angle of the mouth.

Total length, M. .341; of tail, .148; to rictus oris, .007. Collection, No. 14118.

This small species is nearest to the *R. ignita* (Cope, Journal Academy Phila., 1875, p. 140), in technical characters, but the interior preocular has a different position, and the coloration is entirely distinct. No. 14118.

3. LEPTOGNATHUS STRATISSIMA, sp. nov.

This species belongs to the section of the genus with elongate colubri-form geniale scuta, smooth scales, and a larger vertebral series. The scales of the vertebral series are longer than wide, and are truncate at the apex, and do not exceed the other scales so much as is seen in some species. This species differs from most of those of the same section, in having the loreal entirely separated from the orbit by the well-developed preocular.

Scales in seventeen series. Internasal and prefrontal scuta broader than long. Frontal large, wide. Parietals large, loreal as high as long at base. Oculars 1-2, the inferior postocular much smaller than the superior. Superior labials eight, the third, fourth and fifth entering orbit. Temporals 2-3. Inferior labials six, in contact with genials, the sixth separated by a scale from the postgeniale for most of its length. Gastrosteges, 232; anal, 1-1; urosteges, 130.

Total length, M. .381; of tail, .100; to rictus oris, .008. Coll., No. 14121.

Ground color light gray, which is covered by the following markings: There are sixty-nine cross-bands of a deep brown, which narrow a little on the sides, and have broadly rounded extremities at the second row of

scales. The centres of the spaces between them on the sides are occupied by a light brown spot. Each gastrostegite has a dark brown spot on its extremity,* and the rest of the scutum is thickly dusted with brown. Thirty-nine cross-bands on upper surface of tail. Three brown chevrons on the parietal region, directed backwards, the anterior commencing with the superciliary. Muzzle and sides of head brown speckled; throat and chin immaculate.

4. *DIPSAS CENCHOA* L. Nos. 14119-20.

5. *DRYMOBIUS BODDAERTII* Seetzen. No. 14117.

6. *ELAPS NIGROCINCTUS* * Girard. No. 14115.

7. *BOTHRUPS ATROX* L. No. 14114.

III. CHIRIQUI.

HYLA MICROCEPHALA, sp. nov.

Fingers free; toes webbed nearly to the palettes of the third and fifth digits. Vomerine teeth in two fascicles between the nares, with their anterior edge in line with the anterior edge of the latter. *Membranium tympani* round, its diameter one-third that of the eye. The latter equals the length of the muzzle, which is short and rather deep, and not prominent. The external nostril is at one-fourth the length posterior to the apex. The head is small in its dimensions, its length to the line of the posterior border of the tympana entering the length of the head and body, three and a half times. The eyes are little prominent. The general form is slender, and the hinder legs are long, the heel reaching to beyond the end of the muzzle. The metatarsal tubercles are not distinguishable as dermal differentiations. Digital dilatations not so large as the tympanic membrane. Skin everywhere smooth on superior surfaces. Length of head and body, .0275; do. of anterior limb from axilla, .014; of posterior

*A species of this genus has been obtained by Francis Sumichrast, on the Pacific side of the Isthmus of Tehuantepec, which I believe to be undescribed. It is referred to in the Proceedings of the American Philosophical Society, 1869, p. 162, as *Elaps aglaope*; but it is distinct from this species. I propose that it be called *Elaps ephippifer*. It has the seven superior labials and fifteen rows of scales of the most of the American Elaps, and the labials are separated from parietals by one row of temporals. The rostral plate is transverse and not particularly prominent, and its posterior border is very openly angulate. The frontal plate has long parallel lateral borders, and much shorter posterior ones. Gastrosteges, 218; anal divided; urosteges, 43. There are seventeen black rings on the body, which encircle the abdomen, covering a length of four and a half scales and five or six gastrosteges. They are separated by nine or ten scales, and have a wide yellow border of one and a half or two scales in width. The entire space between these yellow borders is occupied by a large black spot, which descends on each side to the second row of scales. The remaining space between the yellow borders is red. There is a wide black entire collar, which cuts off the apex of the parietal shields. The muzzle and front are black as far as the anterior part of the parietals.

The wide yellow borders in this species are like those of the *E. eurzyanthus*, while the black saddles represent the black spots of the *E. aglaope*.

limb from groin, .0415; do. of posterior foot, .019; of tarsus, .0095; of tibia, .0145. Width of head at anterior border of tympana, .008.

Rich cream-color on all the upper surfaces, on one specimen tinged with brown. Below lighter cream-color. A pale brown band with a narrow yellow superior margin from the end of the muzzle to the groin. The brown tint fades out rapidly below, and on the posterior half of the side is reduced to a narrow line. A narrow brown band on each side of the back, which extend as far forward as the orbit.

This species is well characterized, having little resemblance to any other member of the genus. It was taken along a mountain stream in the department of Chiriqui. Two specimens; No. 13473.

IV. CITY OF CHIHUAHUA, Wilkinson.

Information as to the character of the reptilian fauna of the central part of the State of Chihuahua, has been a desideratum. A few specimens from the region were sent many years ago to the Museum of the Smithsonian Institution by Mr. John Potts, and are recorded in the report of the Mexican Boundary Survey by Professor Baird. A collection from the southern part of the Sierra Madre in this State, from the mining district of Batopilas, was sent me for study by Mr. Wilkinson, and was reported on in the Proceedings of this Society for 1879, p. 261. That region is however much to the south of the one represented by the present collection, and is much more elevated.

The great plain in which the city of Chihuahua stands is arid, and the vegetation is generally sparse. Low mountains bound it on the east and west. The formation of the surface of the plain is a coarse drift composed principally of little or much rounded fragments of basalt, more or less cemented together by a calcareous mud. The same formation composes the plains of Southern New Mexico. The vegetation of this plain consists of mesquit, Fouquieria, Yuccas and Opuntias. South of the city is a considerable tract of grassy country. The city stands on a creek, whose waters are used by the inhabitants for supporting a cultivation which produces a most agreeable contrast to the general aspect of the country.

Mr. Wilkinson's collection indicates that reptiles are numerous, since he obtained, in a short time, 471 individuals. These only represent twenty-six species and subspecies. They are as follows.

LACERTILIA.

1. PHRYNOSOMA CORNUTUM Harl. Abundant; Nos. 14228-52-90, 14300.
2. PHRYNOSOMA MODESTUM Gird. Abundant; Nos. 14229-51-91; 14301.
3. HOLBROOKIA TEXANA Trosch. Abundant. Nos. 14234-38-43-47, 14309.
4. HOLBROOKIA MACULATA B. & G. Abundant. Nos. 14239-40-45, 14310.
5. CROTAPHYTUS COLLARIS Say. Moderately abundant. Nos. 14306-7.

6. *UTA BICARINATA* Duméril. One specimen; No. 14248. The most northern locality for this lizard.
7. *SCELOPORUS TORQUATUS* Green & Peale; subspecies *POINSETTII* Bd. & Gird. Two specimens; Nos. 14233-43.
8. *SCELOPORUS UNDULATUS* Latr. Abundant; many of the males are without the undulating cross-lines. The most southern locality in Mexico.
9. *SCELOPORUS GRAMMICUS* Wieg. One specimen; No. 14246. I mention here that the range of the *S. variabilis* has been recently extended a considerable distance to the northward of the limit, Monterey, which I gave in my synopsis of the species of *Sceloporus* in the Proceedings of this Society, 1885, p. 397. Mr. Wm. Taylor has found it near San Diego in S. W. Texas, and Mr. Eugene Aaron has procured it from near Corpus Christi. For specimens from the latter place I am indebted to my friend Mr. J. L. Wortman.
10. *CNEMIDOPHORUS SEXLINEATUS* Linn. Very abundant in three principal subspecific forms, which received names from Messrs. Baird and Girard. The characters displayed by these forms are instructive as showing how a longitudinally striped coloration may pass by insensible gradations into a cross-banded one. The subspecies and their forms are distinguished as follows:
- Six longitudinal narrow stripes with unspotted interspaces.....
subsp. *sexlineatus*.
- Six stripes as above, the dark interspaces with small white spots.....
subsp. *guttatus*.
- Six stripes as above, wider, and very obscure; small obscure spots.....
subsp. *No. 3*.
- Six stripes as above, but wider, and the spots enlarged so as to be confluent occasionally with the light stripes.....subsp. *No. 4*.
- The stripes wider, and the spots confluent with them, so as to reduce the dark ground color to a series of rows of short transverse cross-lines..
subsp. *No. 5*.
- The short black cross-bars more or less confluent across the positions of the light stripes, forming transverse cross-bands, which are generally best developed on the sides.....subsp. *tigris*.

Of the above forms all are numerously represented in the collection. The modification of the color pattern described, is not entirely due to age, as some of the largest specimens belong to subspecies *guttatus*, and No. 3. Nevertheless small specimens predominate in the subspecies *sexlineatus*, and large ones in the subspecies *tigris*. Subspecies No. 4 presents a good many small specimens. The form I described as *C. communis* (Proceedings Am. Phil. Soc., 1877, p. 95), from Southern Mexico, has the coloration of the subspecies *guttatus* and No. 4, but differs from them in possessing a frenoöcular plate. In a few cases, however, this plate is wanting in

specimens from the same locality, so that the form *communis* had best be regarded as another subspecies of the *C. sexlineatus*. The latter is the only one which is found in the Eastern and Austroriparian districts of North America.

Subspecies *SEXLINEATUS*; Nos. 14236-41-49-69; 14305.

Subspecies *GUTTATUS* B. & G. 14231-41-305-308.

Subspecies No. 3; 14231-50-308.

Subspecies No. 4; 14241-50-302-5.

Subspecies No. 5; 14237-50-302.

Subspecies *TIGRIS* B. & G. 14237-50-302.

11. *EUMECES OBSOLETUS* B. & G. Two specimens; No. 14244.

OPHIDIA.

12. *SALVADORÆ GRAHAMIÆ* Bd. Gird. Two specimens; Nos. 14255-95.

13. *RHINECHIS ELEGANS* Kenn. *Arizona elegans* Kennicott, U. S. Mex. Boundary Survey, Reptiles, page 18, Plate . *Pityophis elegans* Cope, Check List Reptiles N. Amer., p. 39.

This species exhibits all the characteristics of the genus *Rhinechis*, which is represented by a single species of Southeastern Europe, the *R. sealaris*. The genus agrees with *Pityophis* and *Spilotes* in its entire anal scutum; but differs from the former in having but two postfrontal scuta, and from the latter in its prominent rostral plate.

The Chihuahua specimen of this rare species differs somewhat from the type. It possesses twenty-seven rows of scales. The sides are of the darker tint of the dorsal spots, from which it results that the light interspaces of the dorsal region are entirely enclosed. There is no distinct row of lateral spots. No. 14298.

14. *PITYOPHIS SAYI* Schl., subsp. *MEXICANUS* D. & B. Several specimens; Nos. 14222-66-93-94.
15. *COLUBER EMORYI* B. & G. Five specimens, two with twenty-nine, and three with twenty-seven rows of scales. Most of them have the normal number of labial plates, eight; but one has nine on one side, and one has abnormally, ten on both sides. Nos. 14223-53-62-84-99.
16. *BASCIANUM TENIATUM* Hallow. One specimen; No. 14272.
17. *BASCIANUM FLAGELLIFORME* Catesby, subsp. *TESTACEUM* Say. Three specimens; Nos. 14224-79-83.
18. *EUTÆNIA MULTIMACULATA* Cope. *Atomarchus multimaculatus* Cope, American Naturalist, 1883, p. 1300.

The large numbers of this species taken by Mr. Wilkinson shows that Central Chihuahua is its headquarters. The specimens display a remarkable variability in coloration, and also prove that the azygos plate which exists between the prenasal plates of the typical specimen, is an abnormality. In one of the Chihuahua specimens there is an azygos plate between the internasals, which is of shorter form than in the type; while

in another there is an azygos plate between the prefrontals. In all of the others azygos plates are wanting. The ocular plates are normally 3-3, but the following variations occur. 2-3-2-3, one; 2-3-3-3, one; 2-2-3-3, one. The loreal is normally quite elongate; in one specimen it is shortened. The color varies from uniform brown above, to spotted in two styles. In one of these there are seven rows of brown spots with paler or rufous centres; in the other the brown borders of the spots have disappeared, and the rusty centres are represented by small rusty orange spots. The under surfaces are yellow, the gastrosteges with dark shading at the ends. In young specimens the head is more or less marked with obscure blackish marks. This species is distinguished by its long compressed muzzle.

The teeth in this species are equal, so that the genus *Atomarchus* to which I referred it stands related to *Eutænia*, as *Regina* does to *Tropidonotus*.

19. *EUTÆNIA MEGALOPS* Kenn. Cope, *Proceeds. Amer. Philosoph. Society*, 1884, p. 173.

Evidently the most abundant snake of Chihuahua. The large number of specimens sent display very little variation, and agree with one from New Mexico, described by me as above. The lateral band generally occupies only the third row of scales, but sometimes borders the fourth. The dorsal band very frequently occupies but one row of scales, but occasionally covers the halves of the adjacent rows. Nos. 14226-27-58-59-60-67-77-85-89-92.

20. *EUTÆNIA CYRTOPSIS* Kennicott. Cope, l. c., 1884, p. 174.

Only one specimen; No. 14256. The number of urosteges is exactly intermediate between the figures representing the supposed species *cyrtopsis* and *collaris* Jan. As there is no other difference it is probable that the latter name must become a synonym of the former.

21. *HYP SIGLENA OCHRORHYNCHUS* Cope. One specimen; No. 14287.

22. *TRIMORPHODON VILKINSONII*, sp. nov.

Scales in twenty-three rows. Superior labials nine, of which the fourth and fifth enter the orbit, and of which all are higher than long excepting the fifth and the eighth. Loreals two; oculars 3-3; temporals 3-3-3. Rostral not prominent, but the apex is recurved on the summit of the snout. Frontal plate rectangular, the lateral and anterior sides equal. Pariëtals narrowed posteriorly. Inferior labials eleven, the fifth in contact with pregenials, and none in contact with postgenials. Postgenials much shorter than pregenials. Gastrosteges 231; anal 1-1; urosteges 77. The body is compressed, and the head is very distinct. Total length, M. .272; of tail, .045; of head to rictus oris, .0092.

General color gray; the back is crossed by narrow black cross-bands, at rather remote intervals. These bands are pale bordered, and narrow to an apex below, which is above the gastrosteges. They become narrower

posteriorly, and on the tail form half-rings. On the extremity of every third or fourth gastrostege there is a small black spot, throughout the length to the tail. There is a larger black spot on the sides between the extremities of a few of the cross-bands. The superior border of the sixth, and the adjacent part of the fifth superior labial, is black. On the top of the head are three large round black spots; one is on the centre of the frontal and one is on the anterior part of each parietal. No cross-bands on the muzzle. The dark cross-bands are only two scales wide on the posterior part of the body; on the anterior part they are three or four scales wide. The interspaces vary from twelve anteriorly to seven posteriorly.

One specimen; No. 14268. This species is nearest the *T. biscutatus* D. & B. in squamation, but differs greatly in coloration from this or any other species of the genus.

I have given a brief synopsis of the species of this genus in the Proceedings of the American Philosophical Society for 1869, pp. 151-2. In introducing two new species I give another synopsis, the more, as I have received a considerable addition to my material since that date.

I. Scales in 21 rows; superior labials nine.

Head with brown chevrons above; back with diamond-shaped spots.

T. lambda Cope.

Head with a lyre-shaped pattern above; dorsal spots in pairs.

T. lyrophanes Cope.

II. Scales in 23 rows; superior labials seven.

Top of head black with a white T shaped spot; dorsal spots entire transverse diamonds. *T. tau* Cope.

III. Scales in 23 (4) rows; superior labials eight.

Top of head brown, with a small brown Y-shaped mark; dorsal spots transverse diamonds, more or less transversely divided by paler.

T. upsilon Cope.

IV. Scales in 23 (4) rows; superior labials nine.

Top of head brown; dorsal spots numerous transverse more or less divided diamonds. *T. collaris* Cope.

Top of head white, with three round black spots; dorsal spot, few transverse undivided black rhombs, with pale edges. . . . *T. vilkinsonii* Cope.

V. Scales in 25 (7) rows; superior labials nine. Top of head with chevron bands; dorsal spots formed of four confluent spots and enclosing a pale centre. *T. biscutatus* Cope.

Of the preceding species I have before me one each of the *T. lambda*; *tau*; *collaris* and *vilkinsonii*. Of the *T. lyrophanes* there are six specimens; of the *T. upsilon* six, and of the *T. biscutatus* four.

I append a description of the new species *T. lambda*. The muzzle is rather elongate, as in the *T. biscutatus*. There are three loreals, and the oculars are 3-3; the temporals are 3-4-3-4. The fourth and fifth labials enter the orbit, and the sixth, seventh and eight are higher than long. Pregenials longer than postgenials. Internasals small, wider than long;

pariëtals rather short. Gastrosteges 234, anal 1-1 ; urosteges 83. Color above light gray crossed by brown transverse diamond-shaped spots, each with a pale transverse centre. Three or four of the most anterior spots are subhexagonal, being truncate at each side. All are surrounded by a pale shade. Each end of every second or third gastrostegite is marked with a small dark brown spot, which extends upwards on the first row of scales, and sometimes is confluent with the lateral apex of the dorsal spot. Total length, .304; of tail, .054. From Guaymas, Sonora, presented to the National Museum by Mr. H. F. Emerich. No. 13487.

23. *CROTALUS ADAMANTEUS ATROX* B. & G.

One specimen ; No. 14280.

24. *CROTALUS ADAMANTEUS SCUTULATUS* Kenn.

Five specimens ; Nos. 14225-73-78. The tendency to the development of scuta on the head, especially on the pariëtal region, is greater than in any specimens I have seen from other localities.

GENERAL REMARKS.

The preceding investigation shows that the reptile fauna of the plain of Chihuahua is that of the adjacent regions of Arizona, New Mexico and Texas, with the accession of a very few forms which are more distinctively Mexican. Only two species come under this designation, viz: *Uta bicarinata* and *Sceloporus grammicus*. The *Eutania cyrtopsis* has also an extensive Mexican distribution.



