

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 demarllii* Dum. Bibr., Erp. Gen., iv, p. 197, 1837; Bell Zool. Beagle, iii, p. 22, 1843, pl. ii. *Conolophus demarllii* 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. Zoolog. Botan. 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* Wiegman, 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 astragalar portion measures 4.5 mm.

No. 14196; National Museum.

7. *HYPHIBOAS 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 choanæ, and within the lines of their internal borders. Ostea pharyngea half the size of the choanæ. 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 cuneiform 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. *HYPSIBOAS 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* Kester. 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 $\frac{5}{4}$, 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, Meixco, is apparently undescribed. I call it *Rhadinæa quinquelineata*. It is nearest the *R. teniata* 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. Gastrosteges 179; anal 1-1; urosteges 77. Total length M. .438; of tail, .115; to canthus oris .011.

Color light brown above; below to ends of gastrosteges, 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. Pariëtals 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 geneials. Postgeneials longer than pregeneials. 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 fossæ 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* (*Diplotropis* Gthr.), *L. occidentalis* Gthr., *L. sargii* Fisch., and *L. præstans* Cope. To *Philothamnus* must be referred *P. æruginosus* 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 decorata* and *Ophiobolus 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. *Cæcilia 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 geneials. Postgeneials longer than pregeneials. 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 inferior 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 geneial 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. Pariëtals 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 geneials, the sixth separated by a scale from the postgeneial 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. *BOTHROPS 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 aglæope*; 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. euryxanthus*, while the black saddles represent the black spots of the *E. aglæope*.

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* Wiegman. 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. scalaris*. 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. *BASCANIUM TÆNIATUM* Hallow. One specimen; No. 14272.

17. *BASCANIUM 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 *Eutania*, as *Regina* does to *Tropidonotus*.

19. *EUTANIA 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. *EUTANIA 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 OCHRO RHYNCHUS* 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 pregeneials, and none in contact with postgeneials. Postgeneials much shorter than pregeneials. 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 gastrostegite 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. wilkinsonii 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 *wilkinsonii*. 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. Pregeneals longer than postgeneals. 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 gastrostege 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.

An Obituary Notice of James Macfarlane. By J. P. Lesley.

(Read before the American Philosophical Society, December 4, 1885.)

The Society has suffered, by the recent death of its member, Mr. James Macfarlane, of Towanda, in Bradford county, Pa., the loss of a man of distinguished abilities and sterling virtue, universally loved, respected and confided in, a practical business man of the first rank, a lawyer of great reputation, especially for his conduct of railway litigation, a judicious geologist especially devoted to the subject of coal, the author of valuable books in extensive circulation, and a citizen of the Commonwealth entrusted at various times with the conduct of public affairs.

He was elected to membership in this Society, Jan. 19th, 1883, and regarded it with genuine pleasure and pride, as the best recognition of his standing among men of science and literature, not only in his native State, but in this and foreign lands. But his busy life and literary works prevented him from making communications to the Society, at its stated meetings, which he could not attend on account of the distance from his home, the multiplicity of his engagements, and his failing health.

He became a member of the American Association for the Advancement



Cope, E. D. 1886. "Thirteenth contribution to the herpetology of tropical America." *Proceedings of the American Philosophical Society held at Philadelphia for promoting useful knowledge* 23, 271–287.

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