NINTH CONTRIBUTION TO THE HERPETOLOGY OF TROPICAL AMERICA.

BY E. D. COPE.

THE materials examined, from which the present contribution is derived, are contained in six collections, viz: One made by the U. S. Expedition for the exploration and survey of a canal route across the Isthmus of Darien, under Commander Selfridge; a second by the U. S. Exploring Expedition to survey a canal route across the Isthmus of Tehuantepec, under Captain Shufeldt, made by Dr. T. Hale Streets, who accompanied it as naturalist—which collections were placed in my hands for determination by Prof. Henry, of the Smithsonian Institution; a third by John Hauxwell, our correspondent at Pebas, Eastern Equador; and a fourth made in the southeastern part of the Island of Hayti, in the republic of Santo Domingo, by our member, Wm. M. Gabb.

I. The first of these collections embraces the following species:—

LACERTILIA.

Goniodactylus, sp. aff., albigulari.

Corythophanes, sp.

Anolis squamulatus, Peters, Monatsb. Pr. Ac. 1863, 145.

Auricular opening nearly as large as eye-slit; scales smallest; seven rows between orbits, twelve at middle of muzzle, and eleven at middle of lores, the inferior not larger than the rest. No larger supra-orbital and infra-labial scales; scales of arm, back and tail, one-keeled.

Green, with seven crossbands, each of a double row of blackish spots from axilla to tail, the front very oblique. One anterior similar, extending from the ear to the shoulder.

This description is introduced for comparison with those of *Anolis microtus* and *A. insignis*, described a few pages later.

OPHIDIA, Kuhl.

Camilia Monotropis.

Ninia atrata, Hallow., var. with yellow inferior surfaces with median brown band.

Ophibolus micropholis, Cope.

Pliocercus euryzonus, Cope.

Dromicus ignitus, Cope, sp. nov.

Herpetodryas carinatus, L., var.

Thrasops occidentalis, Gthr.

Himantodes cenchoa, L.
Oxyrrhopus occipitoluteus, D. B.
Nothopsis rugosus, Cope, gen. et. sp. nov.

DROMICUS IGNITUS, Cope.

Posterior superior maxillary tooth scarcely longer than those preceding, but separated by a marked interspace. Scales in seventeen longitudinal series. Form slender, head little distinct. Rostral plate scarcely visible from above; common internasal suture considerably shorter than frontal shield, which is shorter than common suture of occipitals. Length of muzzle to orbit, equal width of frontal and one superciliary. Dorsal longer than high. Orbitals 2–2, in one case by median division, in another by inferior intercalated between labials. Temporals 1–1½, the first occupying the whole space between occipital and seventh labial. Eight superior labials, fourth and fifth in orbit; nine inferiors; geneial pairs subequal. Gastrosteges 128; urosteges, 62 + (the end lost, at least fifteen urosteges wanting).

Color brown above, blackish along the sides throughout, up to the middle of the fifth row of scales, then a very bright brown, commencing abruptly and shading to a deeper brown on the median region of the back. The light margin becomes a white line on the anterior fifth of the length, which extends to the orbit. Upper lip and throat light yellow, rest of inferior surfaces, dark crimson; a black dot on the end of each gastrostege. Scales dusted with black. Length restored? 15.5 inches; to vent, 10 inches.

This serpent is allied to the *D. tæniatus* of Peters (Monatsberichte, Berl. Ac. 1863, 275), from Mexico.

NOTHOPSIS RUGOSUS, Cope, gen. et sp. nov.

Teeth on all of the usual bones of the mouth, wanting on the premaxillary. Maxillary teeth of equal lengths, entire. Head flat, oval, moderately distinct; body and tail compressed. Urosteges in two rows, anal shield entire, gastrosteges narrow, angulate, the ends crossed by a longitudinal groove; pupil round. Head covered with small scales above, except a pair of internasals in contact with nasals and rostral; an isolated median frontal, and a pair of small oval occipitals, each also entirely surrounded by small scales. A single nasal pierced by the nostril; loreals

like other head scales, orbit surrounded by scales, labials not pitted. One pair of genеials. Scales of body subequal, keeled, without apical pores.

The above generic characters will indicate to the zoologist a type of whose affinities I have been quite uncertain. Its superficial characters remind one at once of the *Peropoda*, and the double urosteges suggest the *Pythons*. Examination shows that it does not possess the essential characters of the division, lacking all external trace of posterior extremities, and having the mandible constructed on the Colubrine type, thus lacking the coronoid bone. The form of the postfrontal bone is, however, significant; it is of considerable size, and sends forwards along the external margin of the frontal a process, as far as the prefrontal. This structure is characteristic of the family *Achrochordidæ*,[1] which embraces the genera *Chersydrus* and *Achrochordus*. The present genus differs in the possession of ventral shields, wherefore it may be referred to a new family under the name of the NOTHOPIDÆ. I should not be surprised to find that the genus *Xenodermus* of Reinhardt belongs to it.

The allies of this genus, then, are exclusively Old World, and confined to farther India and the Archipelago.

Char. Specif.—Head rather small; neck and tail rather slender. Scales of body in twenty-nine rows, all strongly keeled, those of the seven median rows a little broader than the lateral, and more strongly keeled. The scales of the inferior series are more acute than the superior. A broad shallow groove extends throughout the length, between the keel of the first row and the angle of the gastrosteges. The difference between the dorsal and lateral series of scales is more distinct posteriorly, which, with the angulation of the vertebral line, gives the animal a pentagonal section. The scales of the head are smaller than those of the body, not imbricate, and keeled; but one row separates the orbit from the labials. Muzzle rounded, a little projecting. Rostral plate not visible from above, subtriangular, broader than long. Nasal subparallelogrammic, the upper anterior angles nearly meeting above the rostral, the inferior approaching near to the labial margin. Superior labials small, twelve, seventh under orbit; inferiors fourteen or fifteen, the inferior four in contact with the genеials. First

[1] See Proc. Acad. Nat. Sci., 1864.

pair and genials separated by a median longitudinal groove; latter plates 2.5 times as long as wide; remainder of gular region covered with small scales. Internasals together crescentic, the points extending to behind the nostrils. Frontal broad cordate, the apex posterior; a half suture from the front divides it. Occipitals narrow, length equal from muzzle to frontal, greater than width of latter. They are separated by a single series of small scales, in contact at one point. Gastrosteges 158, anal 1; urosteges 1 entire, 55 divided, and probably 10 wanting from the loss of the extremity. The section of the tail is compressed, pentagonal. Length, .381 M.; to vent, .225; to rictus oris, .001.

The ground color is brown, which is yellowish on the sides, dark on the vertebral region, darker anteriorly, and almost black on the head. The sides are marked from the second to the tenth series of scales with dark brown yellow bordered triangles, apices upwards, three in an inch; the bases scooped out and with the legs sometimes cut off. A series of subquadrate blackish spots separates their apices along the median line; these sometimes divide, and the halves alternate. Head unspotted, upper and lower lips with lateral ventral groove ochre-yellow. Belly clearer yellow, with several series of small deep brown marking. Outer ends of urosteges blackish, anal shield black.

The above description indicates how closely this serpent resembles in coloration the young examples of *Trigonocephalus atrox* from the same country, and the *T. neovidii* of Brazil. This is so marked as to constitute a case of mimetic analogy. But few cases of mimicry of the Crotaline venomous snakes are to be observed in South America, the imitations being chiefly of the other venomous group *Proteroglypha*, as represented by *Elaps*. In this connection may be made a

Reclamation, of the discovery of this, perhaps the most extensive example of mimetic analogy known in zoology. Alfred R. Wallace, in his admirable work, "Contributions to the Theory of Natural Selection," London, 1870,[1] gives Dr. Günther as his authority for the facts of the case with regard to the genera *Pliocercus Oxyrrhopus*, *Erythrolamprus*, etc., and refers to his own previously published account of it in one of the British Reviews for 1869. The first published account of the case will be found

[1] Wallace is quoted by Darwin in "Descent of Man," to the same effect.

in the "Proceedings of the Academy of Natural Sciences, Philadelphia," 1865, 199, in a paper by the author; although attention had been called to it in the same publication for 1860, p. 262.

It was repeated and extended in "Origin of Genera," 1868, but had been already pointed out in conversation with Dr. Wallace, and probably Dr. Günther also, in London, in 1863, a fact which had probably escaped his memory.

II. Examination of a collection of reptiles and fishes brought from near San José, Costa Rica, by Dr. Van Patten. The collection embraced forty-one of reptiles, six of batrachia, and nine of fresh-water fishes from the Rio Grande. The facies of this part of the fauna may be seen in the following list:—

OPHIDIA.

Candisona durissa, L.

Bothrops atrox, L.

Bothriechis affinis, Bocourt.

Bothriechis nigroviridis, Peters.

Elaps nigrocinctus, Gird.

Elaps ornatissimus, Jan. var. with black annuli ten scales apart, nineteen on body, six on tail.

Elaps multifasciatus, Jan.

Pelamis bicolor, Daud.

Dryiophis brevirostris, Cope.

Dryiophis acuminatus, Wied.

Thrasops ? mexicanus, D. B.

Leptognathus nebulatus, L.

Dipsas gemmistratus, Cope.

Leptodira annulata, var.

" " var.

Masticophis margaritiferus, Schl.

Masticophis boddaertii, St.

Herpetodryas carinatus, L.

Spilotes melanurus, D. B.

Liophis epinephelus, Cope, Proc. A. N. S., 1862, 78.

Coniophanes fissidens, Günther. Scales in fifteen series; belly red behind.

Conophis lineatus, D. B.

Erythrolamprus venustissimus, L.

Rhadinæa serperaster, Cope, sp. nov.

Tantilla melanocephala, Linn. Abundant.

Tantilla melanocephala, Linn. Variety.

Stenorhina ventralis, D. B.

Stenorhina degenhardtii, Berth.

Ninia maculata, Peters. Abundant.

Ninia atrata, Hallow.

Colobognathus hoffmannii, Peters. Abundant.

Colobognathus brachycephalus, Cope, sp. nov.

Colobognathus dolichocephalus, Cope, sp. nov.

Epicrates cenchria, L.

LACERTILIA.

Anolis insignis, Cope, sp. nov.

Anolis microtus, Cope, sp. nov.

Anolis nannodes, Cope, P. A. N. S., 1864, p. 173, var. with only five scales between the canthal rows on muzzle, and six rows of large smooth geneials.

Anolis hoffmannii, Peters, Monatsber. Pr. Acad., 1863, 142.

Anolis trochilus, Cope, sp. nov.

Sceloporus malachiticus, Cope, Proc. Acad. Nat. Sci., Phila., 1864, 178.

Cyclura acanthura, Wiegmann.

Phyllodactylus.

BATRACHIA.

Trypheropsis chrysoprasinus, Cope, Proc. Acad. Nat. Sci., Phila., 1866, 130; 1868, 117.

Atelopus varius. Very abundant. The light spots on this species are crimson in life.

Bufo.

Smilisca daudinii, D. B.

Agalychnis moreletii, Dum. Very abundant. Golden and green in life.

Descriptions of new species are appended."

TELEURASPIDES.

This group of the rattlesnake family embraces those with undivided anal shields and no rattle. It stands immediately between the true *Trigonocephali* and the *Crotali*, as the former have divided caudal scutella and the rattle absent, the latter the rattle with simple scutella. One genus of this division was described long ago by Beauvois, and adopted by Gray and others, that is, the *Ancistrodon* of North America and Mexico, but most of the genera have only been recognized within a recent period. In March, 1859, Prof. Peters distinguished a second genus of the

group, and, towards the close of the same year, the writer named a third. Prof. Peters subsequently named another genus which may be retained, though in a sense quite different from that in which it was originally intended. I allude to *Bothriopsis*, first defined by the four small scuta on the top of the muzzle of one of the species, a character not worthy of such a valuation. The characters adopted will be seen below. All the known species are found between North Mexico and Peru.

I. Head scaled above.

a. Body compressed, tail prehensile (*arboreal*).

A series of horn-like scales above the eye, outside of the superciliary shield. TELEURASPIS.

Superciliary reaching to the edge of the eye opening, no horns. BOTHRIECHIS.

aa. Body cylindric, tail straight (*terrestrial*).

Nasal plate one. PORTHIDIUM.

Nasal plates two. BOTHRIOPSIS.

II. Head with nine plates above.

Body cylindric; two nasals. ANCISTRODON.

TELEURASPIS, Cope.

Proceed. Acad. Nat. Sci., Phila., 1859, 338; 1860, 345.

The species of this genus are few, and are so far only known from the Isthmus of Darien and west of the Andes to Peru.

Teleuraspis schlegelii, Berthold, Abh. wiss., Göttingen, 1847, iii. 13 (*Trigonocephalus*). Cope, Pr. A. N. Sci., 1859, 338; 1860, 345.

From Veragua and Darien.

Teleuraspis nitida, Günther, Proc. Zool. Soc., London, 1859, Nov. Tab. (*Lachesis*). Cope, l. c. 345, et 1868, 110.

Equador.

Teleuraspis nigroadspersus, Steindachner Sitzungsber. Wien. Academie, 1870, May, pl. viii.

This species is near the last, especially to a bright yellow variety of it. It differs, according to its describer, in the two nasal shields, and the fewer superciliary horns.

Central America.

BOTHRIECHIS, Peters.

Monatsber. K. Preuss. Academie, 1859, 278. Cope, Pr. A. N. Sci., Phil., 1859, 345. *Thamnocenchris*, Salvin.

This genus is, like the last, confined to the great forests of Central America and the northwest of South America. Species have been found further north than those of *Teleuraspis*. Like the latter, they inhabit trees, filling the place in America of the species of the East Indies which belong to the *Trigonocephali*, and of the tree-vipers of West Africa, *Atheris*, Cope. All the species of these different groups are of green colors, in contradistinction to those of terrestrial habits, which are of various shades of brown. This is evidently related to their convenience in the struggle for existence in the localities in question.

Bothriechis nigroviridis, Peters, l. c. Cope, l. c.

Costa Rica. A specimen from Dr. Van Patten's collection is peculiar in having the nasal shield to reach the labial border in front of the labials, and the superciliary shield transversely divided. In all other respects it agrees with Peters' description and figures.

Bothriechis lateralis, Peters. Monatsb. Preuss. Acad., 1862, 674. *Bothrops bilineatus*, Pet. l. c., 1859, 278.? *Bothrops bicolor*, Bocourt, Ann. des Sci. Nat., 1868, p. 201.

Costa Rica.

Bothriechis aurifer, Salvin (*Thamnocenchris*). Proc. Zool. Soc., 1860, 459. Tab. pulcherrima!

Coban, Vera Paz.

PORTHIDIUM, Cope.

This genus is proposed to accommodate the *Bothrops lansbergii* and related species, which display characters intermediate in some respects between the last genus and *Bothriopsis*.

Scales in 23 rows. Rostral plate narrow, high; two or three scuta above canthus rostralis; superciliary wide. Body compressed. Dark brown crossbars alternating on sides. P. LANSBERGII.

Rostral higher; scales of vertex more elongate in front. P. NASUTUS.

Porthidium lansbergii, Schlegel, Magazine de Zoologie, 1841. Tab.

Tropical America.

Porthidium nasutum, Bocourt, Ann. Sci. Nat., 1868, p. 202 (*Bothrops*).

Guatemala.

BOTHRIOPSIS, Peters.

Monatsber. Preuss. Acad., 1861, 359, emendatus.

The species of this genus are all of terrestrial habits, and approach, in this respect, the *Ancistrodontes*. They have a more extended range than any of the preceding, occurring from the upper or Peruvian Amazon to northern Mexico. They are very venomous, but not so much dreaded as the true *Trigonocephali* of the same regions, which attain a larger size.

a. Superciliary shield wide.

Scales in 21 rows, two inferior smooth; canthus rostralis with two scales only; two rows below eye; a series of brown dorsal rhombs. B. GODMANII.

Scales in 23 rows; rostral a narrow vertical parallelogram; three scales on canthus; 2–3 rows below orbit. Light, with twenty-one or fewer broad brown crossbars, alternating on each side; mouth black. B. BRACHYSTOMA.

Similar, but with forty quadrate spots on each side the middle line, with two rows of spots below them on each side. B. OPHRYOMEGAS.

B. CASTELNAVI.

aa. Superciliary shields very narrow.

β. No small scales surrounding rostral.

Scales in 23 ("25") rows, three inferior smooth; small scales on canthus, four rows below eye; rostral broad as high; nine superior labials, fourth largest. Twenty-two dorsal rhombs. B. AFFINIS.

ββ. Rostral separated from nasals by small scales.

Scales in 25 rows; rostral triangular, broader than high; small scales on canthus, five rows below eye; 10–11 superior labials. A series of large dark brown dorsal rhombs. B. MEXICANUS.

Bothriopsis godmannii, Günther (*Bothechis*). Am. Mag. N. H., 1863, nov. pl. vi., f. G. *Bothrops brammianus*, Bocourt, Ann. Sci. Nat., 1868, p. 201.

Vera Paz and Guatemala.

Bothriopsis brachystoma, Cope, Proc. Acad. Nat. Sci., Phila., 1861, 295 (*Bothiechis*). *B. castelnavi*, var. *brachystoma*, l. c. 1859, 339.

Guatemala.

Bothropsis ophryomegas, Bocourt (*Bothrops*, Bac.). Ann. Sci. Nat., 1868, 201.

Central America.

Bothriopsis castelnavii, Dum. Bibr. Erp. Gen. vii. (*Bothrops*). Castelnau, Anim. Nouv. ou rares Am. Sud. Rept. Tab. Steindachner, Sitzungsb. Wien. Acad., 1870, May. *Bothriopsis quadriscutatus,* Peters, Monatsb. 1851, 359.

Equador; Peru.

Bothriopsis affinis, Bocourt. Ann. Sci. Nat., 1860, 201. *Teleuraspis mexicanus,* Cope, Proc. A. N. S., 1859, 339. *Bothriechis, do.,* Cope, l. c. 1860, 345, nec *Atropus mexicanus,* D. B.

Mexico, as far north as Tuxpan, and Central America to Costa Rica.

Bothriopsis mexicanus, Dum. Bibr. (*Atropus*). Erp. Gen. viii., p. 1521, Tab. 83 bis.? *Atropus nummifer,* Rüppel, Verzeichn. Senck. Mus. Frankr. p. 21. *Teleuraspis,* do., Günther. Am. Magaz. Nat. Hist., 1867, March, Tab. iii., fig. C, nec Copei, Pr. A. N. S. Phila., 1859, 339, et 1860, 345 = *B. affinis,* Boc.

Rüppel's description is so brief and worthless as to be unfit for application to any species. I used it for what turns out to be the *B. affinis of Bocourt,* but Dr. Günther retains it for this one, believing it to be identical with the former. Bocourt first distinguished them, but they may prove to be the same; they are at least very closely allied.

Common in Mexico.

Numerous specimens of these species are in the collections of the Smithsonian Institution, chiefly obtained by Henry Hague, of Coban.

ANCISTRODON, Beauvais.

Trans. Amer. Philos. Soc. *Agkistrodon* and *Toxicophis* (Troost). Baird and Girard.

Ancistrodon bilineatus, Günther. Am. Magaz. Nat. Hist., Nov. 1863.

Guatemala; Tehuantepec. Coll. Smithsonian.

Ancistrodon pugnax, Bd. Girard. Catal. Serpents N. Amer., 18.

Texas.

Ancistrodon piscivorus, Catesb.

United States, from Texas to Virginia; the Mississippi Valley to south Illinois (Kennicott).

Ancistrodon contortrix, Linn.

North America. East of Rocky Mountains, from Texas inclusive of Massachusetts.

Elaps multifasciatus, Jan. Mag. Zool. 1859, pl. A.

An elongate species, with extremely short tail, and head rather

1871.]

suddenly wider than the body, and with closely approximated broad black rings.

Tail one 22d or 3d of the total length, obtusely conic at the apex. Scales rather broad, in fifteen longitudinal rows. Head broad and short, the muzzle broadly rounded. Eye very small, not exceeding the external nostril. Rostril plate broad, low; internasals a little longer than wide. Frontal elongate, exceeding superciliaries by .33; occipitals large. Preocular large, triangular, the apex just touching the postnasal. Postoculars small, the upper larger, and in contact with occipital. Labials high and narrow, seven on the upper lip. Of these, the third is as wide as the base of the preocular, while the fourth and fifth, which support the orbit, are very narrow. The sixth is very large, and reaches the occipital on one side, but is separated on the other by a narrow temporal cut from its upper margin. Counting this one, the temporals are 1–1–1; the last two being large. Seventh labial but little longer than deep. The venom gland of this species must be large, as the head is much swollen laterally, and the labials exhibit a broad infolded margin at the borders of the lips which are in contact. The fangs are short. Inferior labials seven, all wide; genials large, the pairs equal, separated by three scales from the first gastrostege. Fourth labial in contact with genial in part, the other part with the fifth and sixth, bordered posteriorly by a plate which diverges from the genials. Gastrosteges 268; anal divided; urosteges 23.

Ground color crimson, crossed by numerous closely placed black annuli, which are closer together above than on the abdomen. They cover four series of scales above, and two gastrosteges. There are fifty-five on the body in the specimen, and two and a tip on the tail. The scales of the red annuli on the sides are dotted with black. The first ring forms a collar, in front of which the head is yellow as far as the postoculars and middle of fifth labials. In front of this point it is unspotted black. Chin little or not dark-spotted. Total length, M. 9.35; of tail, 0.47; width of head, 0.19.

The very *small* eyes and broad head give this serpent a vicious expression, and it is probably one of the most venomous of the genus. Its characters are intermediate between those of the *E. corallinus* and *E. mipartitus*, and the large extent of the sixth upper labial, if normal, will ally it to the *E. riisei*. It is as large

as the *E. lemniscatus*. It is evident from the above description that it is distinct from the *E. mipartitus*, D. and B., with which Günther is disposed to unite it. See Am. Magaz. Nat. Hist., Sept. 1859. Prof. Jan's figure does not represent the species well, having the black rings too wide; it must have been taken from a young animal.

COLOBOGNATHUS DOLICHOCEPHALUS, Cope, sp. nov.

Scales in thirteen longitudinal series carinate to the urosteges on the tail, to the first row of scales on the posterior, and to the second row on the anterior part of the body. Head elongate, conic, scarcely distinct from the neck. Internasals very small, prefrontals very long. Frontal wide, openly angulate in front, with superciliary margins distinct from the parietal; latter plates well developed. Superior labials six, second bounding nasal and loreal; third a little, fourth largely in eye, fifth longer than high, in contact with parietal. One temporal above sixth labial, which is higher than long. Inferior labials six, second and third minute, fourth long and narrow. Postgenеials small, separated by a scutum. Oculars 0-1. Rostral elevated, not separating internasals. Tail slender, 5.75 times in the total length. Gastrosteges 131, anal 1, urosteges 39. Color of body above, and entire tail, black; a series of large distant red spots on each side, which often meet above, forming half-rings. These disappear on tail and neck. Below red, lower lip and chin black. Length, 12–14 inches.

San José, Costa Rica. Dr. Van Patten.

This species differs from the *C. hoffmannii*, Pet., in its more numerous labial shields, keeled scales, coloration, etc. From the *C. nasalis*, Cope (*Catostoma*, olim), in the fewer scale-rows (the latter has seventeen), the coloration, etc.

COLOBOGNATHUS BRACHYCEPHALUS, Cope.

Scales in fifteen longitudinal rows, smooth, except a faint trace of carination near the posterior part of the body. Head flat; rather wide behind, and distinct from neck. Postgenеials small, separated by a scale. Rostral moderate, internasals not minute, prefrontals nearly broad as long. Frontal broad convex in front, superciliary and parietal sutures nearly continuous. Oculars 0–1. Superior labials six, two behind orbit, sixth longer than high, surmounted by one temporal; fifth longer than high, bounding

parietal; third and chiefly fourth in eye. Lower labials seven; geneials short, wide. Gastrosteges 124, anal 1, urosteges 38.

Color of body and entire tail black; gastrosteges reddish, brown margined. A yellowish or orange collar crosses behind the parietal plates, and a band of the same color extends from the side of the neck to the tail on the second and third rows in front, and third to fifth behind. This band is composed of two rows of alternating narrow spots, which are not always perfectly united.

Total length eight inches, the tail one-sixth of the total.

The species just described agree with the *C. nasalis*, the *C. hoffmannii*, and the *Catostoma semidoliatum*, in having the first labial behind the eye in contact with the parietal shield. They are intermediate, in the structure of the jaws, between the type of the genus and the last-named *Catostoma*. In the *C. semidoliatum* the maxillary bone is developed, and bears teeth opposite the first labial plate. In the *Colobognathus hoffmannii*, it, with the palatine, is cartilaginous in front, and bears no teeth anterior to the fourth labial shield. In the *C. brachycephalus* and *C. dolichocephalus*, the maxillary and palatine are a little better developed, the teeth extending to the posterior margin of the second superior labial. In the serpent described by me (Proc. Acad. Nat. Sci., 1868, p. 131) as *Catostoma nasale*, the dentition is precisely as in the two species here described, and I accordingly refer it to *Colobognathus*. This genus will then embrace four species. In the genus *Colophrys*, Cope (l. c., 1868, 130), the maxillary is still better developed, the teeth commencing at the anterior part of the second upper labial.

RHADINÆA SERPERASTER, Cope, sp. nov.

This species agrees with those regarded as typical when the genus was first defined (see Proc. Acad. Nat. Sci., 1868, 132). That is, the teeth are equal, the scales smooth and poreless, the anal plate divided, the nasals two, loreal one, and oculars 1–2.

In this serpent the scales are in nineteen series. Superior labials eight, not elevated, fourth and fifth bounding eye. Temporals 1–2–3. Internasals transverse, narrow; postnasal larger than prenasal. Frontal wide, superciliary suture shorter than anterior, total length exceeding that of common parietal suture. Loreal square; geneials subequal. Gastrosteges 164, anal 2, urosteges 78.

Dark brown, with six longitudinal yellow or white lines, of

which the first and second are brightest. The second dark band is wider than the first and vertebral; it and the third are partly divided by a faint white line. Another white line on each side is produced by a series of dark spots on the ends of the gastrosteges. Labial plates black, yellow spotted. Head dark brown above, with a pale shade across frontal, and two just behind parietals. Chin and belly yellowish.

ANOLIS INSIGNIS, Cope, sp. nov.

Auricular opening half as large as eye. Scales intermediate; seven rows between orbits; one or two superorbital rows but little larger than the others; eight rows across middle of muzzle, and six across loreal region at middle. Three large and two small keeled infralabial rows. Scales of arm smooth, of tail striate.

Fawn-brown, with four double bands of greenish-blue between axilla and tail. Divided between the brown band by a yellow band, which widens below and breaks into spots above. A large round greenish-blue spot with brown centre in front of axilla.

Interorbital and occipital regions deeply concave, the latter bounded posteriorly by two elevated osseous ridges which meet behind at an acute angle. No facial rugæ, front flat except a slight median elevation. Muzzle with broad median ridge. Scales of front equal, those of canthus osseous. Postfrontal and zygomatic arches prominent, rugose. Inferior loreal rows of scales larger than others, nares surrounded by small scales. Fan very largely developed. An elevated crest or dermal fold on the nape. Scales of the sides and back (except some median rows) flat, pavement-like, equal, smooth, one-third the size of the smooth ventrals. Four median dorsal rows subconic, smaller than the ventrals. Tail proximally compressed, covered with equal scales. Limbs stout, the anterior extending four-fifths way to groin; the hinder reaching nearly to the ear. Scales of the limbs small; dilatations distinct.

The colors of this *Anolis* are very elegant. Besides the large spot behind the angle of the mandible, there is a blue one on the angle surrounded by fawn color, and this by yellow. Sides of the temporal region and neck with yellow spots. Bluish of first cross-band in a coarse netted figure. Top of head fawn color; fan entirely vermilion; belly bright yellow. Tail with broad blackish annuli; limbs with dark crossbars, three on tibia, femur, and forearm; two on humerus.

Total length, 0 M. 44. Length to orbit, .0183; to ear, .037; to axilla, .062; to groin, .135; to angle of parietal crests, .035. Width at anterior angle orbits, .014; zygomatic arches, .019; length fore foot, .023; of tibia, .029; of hind foot, .04.

From San José. Dr. Van Patten.

This is a large species, being about equal to the *A. edwardsii* of Jamaica. It is one of the most elegantly colored among the species of a beautiful genus.

Its affinities, as already pointed out, are to the *A. squamulatus*, Peters, which is very near the *A. laticeps* of Berthold.

ANOLIS MICROTUS, Cope, sp. nov.

Auricular opening not larger than nares. Scales generally larger; four rows between orbits; two rows of large ones above orbits; seven rows between rows of canthus rostralis at middle of muzzle; three loreal rows at middle; three large smooth infralabial rows. Scales of tail and foreleg three or four keeled.

Brown, with cross-bands of large paler ocelli crossing the sides behind the axilla, at middle, and at crura. Eye and a broad band to shoulder, dark brown.

Description.—Scales of back, sides, and belly equal and smooth. Tail compressed at base, distally cylindric, covered with equal scales. Front without ridges, but with well-marked concavity; all the scales covering it equal and smooth. Occipital or parietal region concave, with high latero-posterior bounding ridges, which do not unite, but leave a notch between them (in one specimen). Occipital region covered with small scales. Zygomatic arch prominent, canthus rostralis not tubercular. Fan well developed. First two infralabial scales longer than the others. Limbs short, stout, anterior not reaching groin, posterior extending to angle of lower jaw. Dilatations well developed.

	M.
Total length	0.31
Length to orbit	.015
" " ear	.03
" " axilla	.05
" " groin	.0955
" " convergence of parietal crests	.029
" of fore foot	.017
" " tibia	.0183
" " hind foot	.029
Width at anterior angle orbits	.0125
" " zygomatic arch	.017

This species is darker than the last, and is much less ornamented. The color is a rich yellowish-brown; where the epidermis is lost on the head, a strong yellow pigment appears, so that it is probable that it could in life change to that color at will. A deep brown band commences by covering the whole eye and extends to the shoulder, where it is marked by pale centred ocelli. It is separated above by a narrow paler band from a large dark brown patch that covers the nape and scapular regions. Limbs and tail broadly and indistinctly brown cross-banded. Belly and throat immaculate.

San José, Costa Rica. Dr. Van Patten.

This large species is allied to the last, but perhaps resembles more the *Anolis biporcatus*, Wiegm., the largest *Anolis* of Mexico. The latter has, among other points of difference, keeled abdominal scales and a shorter muzzle, with very different coloration. The uniform size of all the scales is a noteworthy character of the *A. microtus*.

ANOLIS TROCHILUS, Cope, sp. nov.

Abdominal scales small, flat, smooth; tail cylindric, with similar scales. Dorsal scales smaller than ventral, pavement-like, very weakly keeled, graduating into those of the lower part of the side, which are smaller. Head moderately elongate; width between anterior margins of orbit, equal length of muzzle from same point, measured on the side. Interrugal concavity of the front well marked, occupied by very small scales, much less than those of the rugæ, in nine rows. Scales between rugæ and canthus, large. Two rows separate the superciliaries, which are separated by three or four rows from the occipital. Five rows of loreal scales. Six smooth scales in the supraorbital disc, those inner larger, transverse, the three outer longitudinal. Four rows of infralabials medially; nostril surrounded by small scales. Auricular meatus one-half eye-slit.

Limbs long, toes slender, the dilatations well marked. The fore limb oppressed, reaches the groin; the hind limb extended, attains the end of the muzzle. Fan little developed.

Above and below, brilliant metallic green with a few black dots along the vertebral line. Head and anterior part of sides, brown; a black V extending from the auricular openings, which are connected by a broad black band with the orbits. Another V ex-

tends towards the occiput from the limbs of the nuchal V, inclosing a narrow brown area with it. Top of muzzle and limbs, blackish.

	M.
Total length	0.108
Length to orbit	.005
" " ear	.011
" " axilla	.018
" " groin	.0378
Width head behind	.006
Length hind foot	.014

San José. Dr. Van Patten.

A small species of metallic colors, allied to the *A. viridiaeneus*, Peters. It is the eighty-fifth of the genus known to the writer.

III. The third collection was made by the U. S. Expedition to survey the Isthmus of Tehuantepec for a ship canal, under Capt. Shufeldt, by T. Hale Streets, M.D. It included a few species of fishes whose names are appended.

OPHIDIA.

Elaps ornatissimus, Jan. (with distant annuli).

Masticophis margaritiferus, Schl.

Oxybelis acuminatus, Wied.

Coniophanes fissidens, Gthr.

Oxyrrhopus plumbeus.

Hydrops lubricus, Cope, sp. nov.

LACERTILIA.

Sphaerodactylus glaucus, Cope. Adult of two inches: labials $\frac{5}{4}$ $\frac{6}{4}$; tail orange-red. Scales smooth, flat. See Proc. Acad. Nat. Sci., 1865, 192.

Cyclura acanthura, Wiegm.

Cyclura pectinata, Wiegm.

Sceloporus.

Amiva.

Cnemidophorus.

Plistodon.

BATRACHIA.

Systoma ustum, Cope (*Engystoma mexicanum*, Peters).

Bufo agua, Dand.

Bufo sternosignatus, Gthr.

Lithodytes rhodopis, Cope (*Hylodes sallaei*, Gthr.).

FISHES.

Philypnus dormitator, C. V.
Tetragonopterus streetsii, Cope, sp. nov.
Xiphophorus hellerii, Heck.
Fundulus, sp. 1.
Fundulus, sp. 2.

HYDROPS LUBRICUS, Cope, sp. nov.

Head short, broad, little distinct from neck. Scales entirely smooth, poreless. Posterior grooved tooth not much larger than those in front of it. Head-shields normal, labials not divided; loreal distinct, not reaching orbit; oculars 1–2.

Internasals contracted in front. Frontal wide, with parallel sides longer than muzzle in front of it. Parietals still longer, somewhat contracted behind. Rostral broad, low; loreal small, higher than long. Temporals 1–2, first in contact with two labials. Superior labials eight, fourth and fifth bounding rather small orbit; seventh wider above than below. Inferior labials 10 or 11, 4.5 in contact with anterior, 1.5 with posterior or longer genials. Scales in 21 rows. Anal divided. Tail $4\frac{1}{6}$ times in total length.

Ground color above, a stone brown. A blackish lateral band extends from the end of the muzzle to the end of the tail, including all between the approximated edges of the second and sixth rows of scales. A dark brown shade extends throughout the length on the vertebral, and two series of scales on each side of it. Below the second row of scales white (? in life yellow), a large black spot marking the third from each end of each gastrostege and urostege, thus forming two series. Labial plates above and below, pale with a black spot; gulars and geneials similar. Total length two feet. Gastrosteges 162. Urosteges 71.

This species was found by Dr. T. H. Streets on the bank of the Coatzacoalcos River, in the department of Vera Cruz, Mexico. It is excessively smooth, so much so as to produce the sensation of an oiled surface when the finger is passed over the scales.

TETRAGONOPTERUS STREETSII, Cope, sp. nov.

Radii D. 11, A. 25; scales 7–41–5. Maxillary bone elongated, the extremity extending to below the anterior part of the pupil, its margin toothless. Profile nearly plane, rising into the convex dorsum at the supra-occipital crest; muzzle obtuse, jaws nearly

equal. Interorbital region transversely convex, as wide as the diameter of the orbit. Dorsal fin originating a little behind that of the ventral.

General form elongate rhombic. Depth 2.5 times in length less caudal fin; length of head 4 times in same. Eye 3.2 times in head. Total length five inches. Color of superior half of head and body blackish; a vertical clavicular dark band, a leaden band from its upper margin to basis of caudal fin terminating in a pyriform black blotch of considerable size, which is prolonged on the caudal radii. Below, yellowish-white. Fins unicolor.

From the head-waters of the Coatzacoalcos River among the Cordilleras.

This species may be allied to those mentioned by Bocourt from the rivers of Belize and Peten (Ann. Sci. Nat., XI.); but it will be impossible ever to recognize them from the notes attached to the names.

IV. The collection made by Dr. Gabb was chiefly obtained near the city of San Domingo, in the southeastern part of the island. It embraces twenty species, as follows:—

OPHIDIA.

Dromicus parvifrons, Cope.

Hypsirhynchus ferox, Gthr. (*H. scalaris*, Cope).

This is no doubt the true habitat of this snake.

Thrasops catesbeyi, D. B.

" **oxyrhynchus**, D. B.

Ungualia maculata.

Homalochilus striatus, Fisch.

LACERTILIA.

Amiva vittipunctata, Cope.

Liocephalus raviceps, Cope.

Anolis cœlestinus, Cope.

" **semilineatus**, Cope

" **cybotes**, Cope

" **distichus**, Cope.

Hemidactylus.

Sphærodactylus notatus, Baird. Abundant.

BATRACHIA.

Bufo gutturosus, Latr. (Günther Cat. Anura B. M. Pl. V. fig. B.)

Hyla vasta, Cope, sp. nov.

Trachycephalus marmoratus, D. B.

Lithodytes lineatus, Grav.

HYLA VASTA, Cope, sp. nov.

The largest species of the genus, equalling in size the *Hypsiboas maximus*, *Cincloscopus granulatus*, etc.

Form stout and rather clumsy. Head broad; muzzle short, rounded; canthus rostralis well marked, concave; vertex strongly concave. Width of head at tympana .33 greater than length to line of the same. Eye not very large, tympanic disc one-fourth its area. Teeth in two rather long transverse arches opposite the posterior margin of the inner nares. Tongue broader than long; choanæ smaller than inner nares. Parietal fontanelle not large.

The limbs are stout, the forearm and tarsus bordered by a dermal fold behind, which has a scalloped thickened margin. No fringes on the body, but the skin is covered everywhere with small warts, which are indistinct or obsolete on the median upper surfaces of body and limbs. The under surfaces, except the tibia, are areolate-warty, nearly smooth on the pectoral region. The fingers and toes are webbed to the base of the last phalange of all but the longest or median toes. The dilations are immensely large, the largest being twice the size of the tympanum. The fore limb extended reaches a little beyond the groin; the hind limb measures the end of the muzzle with the heel. Some small dermal flaps on the ischia.

	M.
Length of head and body (5 inches)	0.126
" to line of tympana	.032
" of fore limb	.076
" of hind limb	.187
" of hind foot	.081

Color above smoky gray, blackish on the head, with a brown band between the eyes. Inner surfaces dirty flesh-color, femur with three or four dusky cross-bands, unspotted behind. Throat black-spotted.

Near the city of Santo Domingo, W. I.

This tree-frog is probably not abundant, as it occurs now for

the first time in our collections, though I have examined four made in the island. From its size, its voice must be sufficient to betray its whereabouts to the naturalist. Its structural characters are apparently somewhat like those of *Hyla lichenosa*, Gthr., from Mexico. It differs in the larger palmation of the hand, concave front, minuteness of warts, size, coloration, etc.

AMIVA VITTIPUNCTATA, Cope, sp. nov.

Twelve series of abdominal plates; no heel spurs; one frontal plate. Seven plates in the infralabial series separated by granules and scales from the labials throughout; no plates inside the infralabials behind. A few gulars a little enlarged in the middle of the area. Edge of gular fold widely granular. Three supraorbitals, seven superciliaries. Teeth, 18 on maxillary bone, the anterior 14 with anterior denticle, the last 4 with both anterior and posterior. Brachial scales rather small, one row larger; postbrachials similar, two rows enlarged; antebrachials two narrow, one transverse row, well separated from brachials. Preanals, a marginal series with small central, with large ones bounding it, and three short rows of diamond-shaped scuta in front of them.

	M.
Length (tail perfect)	0.273
" to vent	.088
" to auricular meatus	.021
" of fore limb	.03

Longest toe of extended hind limb reaches to orbit. Femoral pores 18.

Color above, olive, with three pale lines on each side of the median line; a light lateral band from above axilla to groin, separated from outer dorsal line by a broad black band, which is marked by a median series of light dots. Sides and limbs white-spotted, tail brown-spotted, black below. Belly and throat uniform light olive; head above, uniform brown.

V. A small collection from the Island of Saint Eustatia, made by Dr. R. E. Van Rijgersma, contained the following species:—

Hemidactylus mabia, Cuv.

Anolis sagræ, D. & B. var.

Anolis gingivinus, Cope.

This species was described by me from specimens in the British

Museum said to be from "Anguilla Rock, near Trinidad." It appears, from Dr. Van Rijgersma's investigations, that the Island of Anguilla, far north of Trinidad, was meant.

Anolis leachii, Gray.

This species is near the last, but has coarser lateral scales and more slender mandible; it is also larger, and the color is quite different. It is bright green with a pale band over the shoulder, with a black spot above it, opposite the axilla. The fan is small.

AMIVA ERYTHROPS, Rijgersma, MS., sp. nov.

Abdominal plates in 12–14 series; no spurs on the heel. One frontal, four supraorbital, nine superciliary plates. Five infralabials separated by a few intermedials from posterior labials, first not separated from third labial. Seven rows of larger gular scales extending entirely across the throat. Three larger series on gular fold, which has several rows of granules near margin. Brachials small, in four rows; postbrachials small. Antebrachials large, two rows hexagonal, one transverse. Femoral pores small, 36 in a series. Preanal scales two large median with a single row of one or two in front; small scales occur in some specimens behind the posterior two. Outer hind toe a little longer than inner.

Teeth in adults compressed, one or two only with denticulations. The end of the longest toe of the extended hind foot reaches the anterior margin of the ear.

Color brownish-olive, with a broad greenish band on each side the back from the nape above the ear. In young specimens these bands are bright. Another less distinct band extends along the side from above axilla to groin. Between these and the dorsals, and across the back, are transverse black reticulations. Belly greenish, the color appearing as spots on the outer scales. Thorax and edge of sides of fold black; throat bright yellow; sides of head red; upper surface brown; limbs olive, with black reticulation.

	M.
Length of (tail reproduced)	0.32
" to vent	.126
" to auricular meatus	.029
" of fore limb	.05

VI. The collection from Ambyiacu R., from John Hauxwell, included the following:—

Helicops carinicauda, Wied.
Liophis pygmaeus, Cope.
Amiva surinamensis, Gray.
Mabuia? cepedii, Gray, with only 28 series of scales on the body.
Goniodactylus humeralis, Guich.
Goniodactylus varius, Dum.
Hyperanodon ochrocollaris, Spix.
Podocnemis sp. pullus.
Ranula palmipes, Spix.
Atelopus spumarius, Cope, sp. nov.
Scytopis allenii, Cope.
Scytopis aurantiacus, David.
Hyla marmorata, Daud.
Hyla leucophyllata, Beireis.

ATELOPUS SPUMARIUS, Cope, sp. nov.

Muzzle projecting, forming a narrow rim which is concave below, and overhangs the upper lip. Nostril lateral, above the symphysis of the mandible, when the mouth is closed. Loreal region plane, canthus rostralis straight, angular. Head, viewed from above, a section of a cone which is rounded truncate at the apex. Diameter of orbit equal from its front border to the nostril. Width of head behind equal length of humerus. Fingers nearly free, toes webbed at base. Tongue narrow, subcylindric. Muzzle marking basal third of forearm, and near middle of tarsus of hind limb.

Above, dark brown, with a broad band from orbit to groin, composed of numerous aggregated annuli of greenish-yellow, which has the appearance of dried foam. The band sends branches inwards on the back. Bands of the same character cross the fore and hind limbs in various places. Soles, palms, under surfaces of the limbs except tibia, and tarsus, yellow. Throat and belly yellow, dark brown spotted. Length M. .0275; width of sacral diapophyses .007.

In a second specimen the gular region is very sparsely spotted.

VII. Two new serpents from the Atlantic Southern States have been recently received by the Academy, as follows:—

DROMICUS FLAVILATUS, Cope, sp. nov.

This species is of especial interest, as the first representative of a West Indian and Mexican genus, found in the Nearctic Re-

gion. No species of *Dromicus* has been known in North America, and the occurrence of this one on the extreme eastern coast, and its very close affinity to a species (*D. callilæmus*, Gosse) common in Jamaica, are circumstances suggestive of origin by carriage in floating driftwood on the current of the Gulf Stream.

Habit moderately slender; tail 3.2 times in total length; head distinct, elongate, oval. Scales very thin, without scale-pores, in seventeen longitudinal series. Superior labials seven, third and fourth in orbit; fifth higher than long, with sixth separated by a narrow temporal from occipital; seventh longer than high. Inferior labials nine, four bounding geneials. Postgeneials longer than pregeneials. Internasals nearly quadrate; prefrontals longer than wide. Frontal, anterior width .75 length; parietals rather elongate. Nostril in prenasal, which is lower than postnasal; loreal very small, high as long; sculars 1–2. Gastrosteges 126; urosteges 77.

In *D. callilæmus* the frontal plate is very nearly as wide as long, and the gastrosteges number 140; the coloration is also different.

Color above, a rich golden brown, the scales of the two inferior rows on each side broadly gold-edged, the color of the back commencing on the third row. The ends of the scales of the vertebral row are sometimes darker-tipped. Head dark brown, darkest behind, with numerous but obscure paler vermiculations. Sides of head paler, with a reddish-brown band from the rostral plate through the eye to the middle of the last labial. Labials whitish, with black dots on the posterior, in oblique rows. Below white, lower labials sparsely black-dotted A pair of pale dots on the common occipital suture.

This, the first addition to the Ophidia of our Eastern States made for some years, was discovered by Dr. Henry C. Yarrow, near Fort Macon, on the coast of North Carolina. Near the same time another new Ophidian came to hand, as follows:—

CONTIA PYGÆA, Cope, sp. nov.

In its generic features, this species may be thus described. The dentition is complete, and the teeth of the maxillary bone are of equal length. The scales are smooth and without pores, and the anal plate is divided. The head-shields are normal; the nasal, usually entire in the genus, is in this species half divided by a

suture from the nostril to the labial border. Two pairs of genei-als; a loreal; rostral obtuse. The head is little distinct from the body, and the pupil is round.

The form of this species is stout and subcylindric, the tail entering the total length 4.33 times. The head is stout, oval, the profile a little arched. The centre of the orbit, anterior to the middle of the lip margin. The rostral is visible from above; the nasals approach so as to reduce the internasals to a subtriangular form each, of which the middle and posterior suture are equal. The frontal is long, and with parallel sides, its length exceeding that of the head in front of it. The parietals are still longer, and wide, with subtruncate outline behind. Loreal plate higher than long, half the height of the single preocular, which does not reach the frontal. Postoculars 2; temporals 1–2, the first in contact with three labials. Superior labials eight, their height subequal, the fourth and fifth bounding the orbit. Inferior labials nine, six in contact with geneials, five with the first, two with the second geneial. Latter subequal. Scales in seventeen series, those of first deeper than long. Those of sides at vent and of basal two-thirds of the tail roof-shaped or obtusely keeled. About one-sixth of the length in front of and behind the vent compressed, the dorsal outline keel-formed. Gastrosteges 120; urosteges 54.

Coloration above, black, with a very faint pale line along the centre of each scale of several lateral series. The lines are more distinct near the vent and on the tail, and heighten the effect of carinæ produced by the angulation of the scales. Beneath, pale in the alcoholic specimen; the posterior half of the body, with the tail, red; each scutum with a short black crossbar at its ends on the anterior margin. These cease a short distance anterior to the vent.

Length nine inches. Discovered at Volusia, Florida, by Edward Tatnall, of Wilmington, Delaware.

This interesting addition to our reptile fauna is quite unlike any species heretofore found in our territory. Its nearest affinity is apparently with the *C. mitis* of Baird and Girard, common in California. The only other American species, *C. episcopa* of Kennicott, has been found in Texas.