Third contribution to the HERPETOLOGY of Tropical America.

BY E. D. COPE.

Alligator h e l o i s.

Muzzle $6\frac{3}{4}$ inches from end to lines connecting orbits, $5\frac{3}{4}$ inches wide near the middle. Two keels behind and between the eyes, diverging posteriorly, a short and nearly transverse keel in front of the eyes. Upper eye-lid divided by grooves into three areas; an elevated keel above each ear opening. Two oblique rows of elevated horn-like shields on each side of the neck, of rather small size, four on the inner, three on the outer rows; the third of the inner and second of the outer form, with two large elevated median plates, a transverse row. Four very high, short, keel-like postcervicals. Eight rows of dorsal shields, excepting anteriorly where there are six in the first cross-row, and four in the two succeeding; all are like heads of spikes keeled. Four rows on the tail at its middle. Lateral caudal shields continuous, abruptly elevated, like the dorsals, subquadrate. Sides with small rounded scales; width between dorsals and ventrals equal to length of third dorsal cross series. A large row of plates on the inner side of the fore arm. Claws long; no palmar webs. Abdominal rows eleven, each plate with a thin ossification; two or three large plates in the thoracic cross-row. End of tail little serrate above, scarcely compressed. From end of muzzle to occipital 12 inches; to between femora 32 inches; from latter point to end of tail 50 inches; total 7 feet 10 inches.

Color dark brown with vertical yellow bars on the sides and tail, the former very irregular. Chin, throat, under and upper lips yellow, without spots.

This rugged looking species belongs to the genus Alligator, as restricted by Gray, in which the prolongation of the nasal bones separates the external nares, and there is no cross ridge between the orbits. It approaches Jacare in that an external portion of this cross-ridge exists on each side. The habitat is not known, as the single specimen I have seen is preserved without label in the Museum of the University of Munich. Through the courtesy of Prof. C. Von Siebold, I was enabled to make the above description.

I may mention here that the crocodile described by me (Proc. Acad. 1860, 550) as Mecistops b a t h y r h y n c h u s, is the species identified by Dr. Gray (Catal. Brit. Mus.) with the C. i n t e r m e d i u s Graves; with the limited published material as a basis, I have reached a different conclusion.

Chelopus p u n c t u l a r i u s, *Emys punctularia* Daud., *E. scabra* Bell, Gray, Linnæus (fide Agass.

At first sight, the female of this animal gives the impression of a Testudinid form, with separate caudal plates, but an examination of the phalanges shows their number to be that in the Emydidæ, two for the longest digits, (exclusive of ungueal,) instead of but one remaining upon the extinction of the proximal, as in the former. The proximal phalanx is articulated somewhat, as in Cistudo, but is shorter, and nearly excluded from a serial connection; its proximal glenoid cavity is superior, and near the distal condyle. The inferior projection of the proximal end gives the foot its angulated outline. The structure is not unlike that in Chelopus muhlenbergii, and there are really more phalanges than in Cistudo, where the foot is longer; the external digit behind having two internal phalanges instead of but one. In similar manner the reduction of the penultimate phalanx in the parallel Sternothaerus, prepares us for its absence in Pelomedusa*, the extreme of the Pleurodera in this direction, and representative of the Testudinidæ. Podocnemys and Peltocephalus imitate the Cheloniidæ in their overarched temporal fossæ, as observed by Wagler, while intermediate forms are more or less similar to some Emydidæ. After a consideration of various osteological peculiarities, I incline to differ

*Which has not, I believe, been previously noticed.

from Agassiz, who mingles these types with those of Amydæ, and to regard the Testudinata as primarily divisible into three orders or suborders, Chelonii, Amydæ and Pleurodira.*

The name Chelopus Rafinesque has been recalled by Leconte, as identical with *Calemys*, Ag., to which *Nanemys*, Ag., must probably be united, and which have been previously named *Geoclemmys*, by Gray. The present species is in any case congeneric with G. annulata, Gray, which is of terrestrial habit.

Pectoral plates normal, broad. sternum notched behind. Feet very short, clubbed, quite as in the Testudinidæ, digits flattened above, last phalanges only distinct, not webbed; claws short, obtuse. Head very small, covered with a smooth skin, without sub-divisions. Eyes lateral, with a transverse depression between them; muzzle short, nearly vertical, swollen above, nostrils anterior. Alveolar plate narrow, without median ridge, cutting edge smooth, neither notched, hooked nor toothed at the symphysis. Mandible broad. A strong zygomatic arch.

In a ♀ specimen the dorsal region is elevated with a trace of a broad keel, as in Cistudo, and the sides are steep. The outline is parallelogrammic, rounded at the extremities. Posterior slope regularly oblique. Margin nowhere reflexed, posteriorly weakly serrate. Twenty-five subquadrate marginals, the nuchal broad behind. Vertebrals, the four anterior of equal breadth, the anterior pentagonal, the remainder hexagonal. All the plates concentrically sulcate, with a slightly rugose areola. Inguinals very small; sterno-costal bridge very broad. Lobes of sternum short, free outlines, subquinquelateral. Large scales all round the forearm and foot, (seven rows anteriorly, two rows of three each behind,) on the sole and heel only of the hind foot. Above dark brown; sternum black, bordered with yellow; remaining under surfaces yellow; forelegs with a black stripe on outer edge. Top of head black; a narrow red band from behind and above the eye to the middle of the neck, above and below which are black lines on a yellowish ground; neck below immaculate.

This species is more elongate than C. annulatus; anal and gular plates larger; color of head and extremities different. It is nearer the C. areolatus,† A. Dum., but is even more testudiniform. The latter is less elevated, the hind feet a little webbed; the carapace more elongate and narrowed anteriorly; the artist has given six vertebral shields; the anterior lobe of the plastron is considerably shorter.

One ♀ specimen in the Smithsonian Museum, obtained in Yucatan by Arthur Schott, naturalist to the Scientific Exploration of that country.

In a female from Tabasco the frontal depression is less marked and the muzzle not quite so rounded. In a male from the same locality the muzzle is elongate and the vertex and front flat. This is evidently the *E. scabra* figured by Bell, agreeing with it in the superior position of the head bands, etc., thus differing from the allied dorsalis Gray, Spix. The carapace differs from that of the Yucatan female in sexual characters, as the revolution of the margins, but has a very small nuchal shield, and the first vertebral prolonged between the marginals, while the former exhibits a short broad shield. This is the only difference which cannot be regarded as sexual.

This, with the following seven species of Tortoises below enumerated, was presented to the Smithsonian Institution by Dr. Berendt, who, during a residence at Tabasco, Mexico, devoted much attention to the natural products and features of the country. He has furnished me with the following notes on the Testudinata. The specimens are complete and of adult age.

The Chelopus punctularius is the Mojina of the natives of Tabasco.

"*Mojina* is often found tame in the houses, and attaches itself very much to men. The very same specimen which I brought living with me, and left

* Vid. Proc. Acad. Phil., 1864, 181.

† Suspected by Agassiz to be the Malacoclemmys palustris of North America.

with Prof. Baird, I got from an Indian woman, living in a hut on the Tabasquillo River. I asked for turtles, when she said she had one, but it was in the woods behind the house. She went to the door and called, 'Mohina, Mohina!' and the turtle came out of the bushes to the house, and was sold to me. I could never induce her to eat any thing for more than three months, until I gave her, in Washington, some cherries, which she tried, and afterwards commenced to eat. It was told me that the *Mojina* eats animal food (?)"

Ptychemys ornata, Agass. et Bell.
"Hicotea" of the natives.

Dermatemys mavei, Gray. "*Emys berardi*, Dum."
Two specimens, eighteen inches long, of this remarkable species, agreeing with Gray's figure, except in the single gular plate, and presence of a minute gemmiform intergular plate, as in some Hydraspididæ. This is the first instance of the kind among the Emydidæ, of which family this species presents every character. Called Tortuga blanca.

"*Hicotea* and *Tortuga* live on vegetable food, leaves, grass, and, principally, the fruits of Tobillo (Spondias mombin) and Amate (a Ficus.) At the time the amate is ripe, the tortugas are caught easily, and in numbers, under these trees. They distinguish in Tabasco three kinds of Tortuga: T. blanca, or del rio, (white or river turtle;) T. negra, or de popal, (black or swamp turtle,) perhaps the same; and T. de Chilapa, (a village,) or de Chichicaste, (a very bitter Euphorbiaceæ,) which I have not seen. It is not eaten, as the former two are; the flesh is bitter and of a bug smell; their form is said to be not elliptic, but nearly round. It is believed that they feed on chichicaste. (Chichic is Mexican, and means *bitter*.)"

Prof. Poey has sent me from Cuba some living specimens of the Ptychemys decussata, (*Emys rugosa*, Sagra, and *Trachemys rugosa*, Agass. = ♀ fide Poey,) whose habits contrast with those of the P. ornata and Dermatemys. They devour flesh eagerly, but reject bread and vegetables, unless soaked with fresh gravy, and dislike apples, the only fruit offered them.

Chelydra sp. Called Chiquihuan.
This variety is well marked, but that it will eventually be found to be a different species seems very doubtful. In the single individual at my disposal, the only peculiarity observable in the shell is the broader and shorter posterior sternal lobe, which scarcely measures three-quarters the anterior, and has not the gradual acumination of the ordinary variety. The axillary plates are only distinguishable upon close examination, owing to the obsolescence of the sutures. The lateral processes of the pubis are more than double the length of the median; in a specimen of the northern variety, the former are only a little longer than the latter. The skin of the occiput and neck, instead of being tuberculate, is furnished with numerous flexible dermal appendages, and one side or angle of the warts on other regions of the skin is free. The large scales of the row on the outside of the antebrachium are larger and almost entirely free, forming a broad serrate dermal border. The caudal crest is not so elevated as in the common form, but one large process being higher than long. The color of all the under surfaces is very light.

Claudius angustatus, sp. nov.
Character genericus. A single row of marginal plates. Plastron small, cruciform, solid; hyo- and hyposternal bones connate, forming an exceedingly slender bridge, which connects the plastron with the carapace, and is not covered by a corneous axillary plate, but by thin epidermis. No inguinal or gular plates; anals united. Carapace completely ossified, extending much beyond plastron anteriorly and posteriorly, elevated and narrowed in front, neither dilated nor steeply descending behind; vertebral line nearly plane. Vertebral neural segments eight, the last pair of costals meeting on the median line, but separated from the small posterior marginal by a large penultimate

shield. Anterior in contact with a very large anterior marginal, making together eleven vertebrals in an interrupted series.

This interesting genus is nearest to Chelydra, though widely different; its general appearance and interrupted vertebral series approximate it to the Cinosternidæ, especially Aromochelys and Staurotypus s a l v i n i i,* Gray. Indeed it only differs from the latter species in the immobility of the anterior lobe of the sternum, and absence of inguinal and axillary plates, as well as the presence of the mesosternal bone, if the latter belong truly to the Cinosternidæ†. Claudius must be placed on the confines of the Emydidæ in this direction, as Chelopus marks the extreme in the other.

Character specificus.—Marginal scales all very narrow, especially anteriorly; four lateral grooved; nuchal very small, transverse. Anterior vertebral longest, broad as long, posteriorly rounded, acuminate, in contact with second marginal. Third and fourth vertebrals broader than long; last narrowed above. Anterior costal 1½ the length of the third. Epidermoid layer rather thin, concentrically ridged anteriorly and externally on the plates; a median and lateral keel on each side, all quite weak. Sternum rounded in front, acute behind, equal portions before and behind the abdomino preanal suture. Abdominal three-fifths of pectoro-gular plate. Above blackish brown, the plates paler medially, below yellow, unspotted.

The head is disproportionately large, and of an elongate form, with narrow postorbital arches; baove plane, covered with a soft skin, except an oval plate of horn on the top of the nose. Maxillary sheath hooked in front, and with a sharp tooth below the anterior margin of each orbit; edges sharp. Mandible with a remarkably long symphyseal hook, which is received into a correspondingly deep premaxillary pit. A pair of barbels; skin of neck without warts or appendages. Toes and claws rather slender, very fully webbed; the forearm with three anterior curved corneous ridges, and the heel with four series. Tail (of ♀) very short, without terminal claw, and with a double dorsal row of skin warts.

Color blackish plumbeous, the inferior surfaces paler.

Called Talmame by the natives. Museum Smithsonian, 6518.

"*Talmame* lives in swamps, and digs itself in to a depth of two and three feet; eats small fish, crustaceans, snails, etc. Animal food I have found also in the stomach of Chiquihuau, (entire ampullarias,) Huau and Pochitoque."

Staurotypus t r i p o r c a t u s, Wagl.

Called by the natives Huau.

Travellers relate that the alligator is often killed by a turtle, which he swallows alive, and which devours the intestines to get out. Heller (Reisen in Mexico, p. 313) says that he has seen a living turtle "of the genus Cynixis" within a fresh-killed alligator. Waldeck, whose imaginatory power exceeds far his observatory, says (in Voyage pittoresque) that he has found in every killed alligator's stomach a living "Ticotea or potchitoqué, which is the same known in Egypt, (thirsé,) and also the Testudo triunguis of Torskäl." (!)

I have it from a number of different and reliable persons that they have witnessed the fact; either found a living Huau in the body of a dead alligator, who was supposed to have run on shore and died, or even seen the Huau just breaking out of the dead body of the alligator; but never any other kind of turtles; only the Huau.

Huau has two very distinct voices; one imitated in the name, a strong expiration in the given vowels, not intoned with the larynx, but only with the fauces and mouth,—and a squeak, like that of dry carriage wheels or of a large door. The first seems an expression of anger, when teased; the second perhaps a call, as I heard them often when at night; once alone in a corner of my house; never when male and female were near each other.

* Proc. Zool. Soc., Lond., 1854, 127.
† Vid. Le Conte's system, Pr. A. N. S., 1854, 182.

Mohina has a soft, melancholy piping, which is rather touching when they are killed."

Cinosternum leucostomum, Duméril. Arch. du Mus. 18, p. .

The number of specimens of this species would indicate it to be the most abundant. Called Pochitoque camatotl. The Mus. Smithsonian possesses also a specimen from Turbo, in New Grenada, from the Michler Surveying Expedition.

Cinosternum berendtianum, sp. nov.

Most nearly allied to the preceding, agreeing with it in the contracted rounded outline of the posterior lobe of the sternum, which fits the carapace accurately, and is without emargination, in the large size of the caudal marginals, and the absence of lateral dorsal keels. The carapace, though more or less keeled, is more depressed than in leucostomum, the outline rising behind, and the fixed plastron has greater longitudinal breadth.

leucostomum.		berendtianum.
Shorter than front, three-fifths of hind lobe.	*Middle plastron;*	Longer than front, four-fifths of hind lobe.
Rounded, without external angle; a groove near upper margin.	*Marginal bones;*	Strongly angulated.
Equilateral, bordering second marginal.	*First vertebral plate;*	Lanceolate rarely touching second marginal.
Long as remaining median suture.	*Gular plate;*	Two-fifths longer than remaining median suture.
Broader.	*Last vertebral;*	Narrower.

The shell is a very dark brown above; below, a dark brownish yellow, with reddish stains on the sutures, or over portions not touching the ground. Length of carapace, 3 in. 9 l.; of plastron, 3 in. 6 l.; breadth of carapace, 2 in. 6 l. Mus. Smithsonian, No. 6,517.

Called in Tabasco, Pochitoque jaquactero and negro.

"I have heard of a third Cinosternum in Tabasco called Pochitoque huaugito, (the little huau,) which is said to be smaller than the leucosternum, and has the same three longitudinal keels as the Huau on the upper shell." *Berendt.* Probably the C. shavianum (*mexicanum*, Lec., fide Agass.)

"Tortugas, Hicoteas, Mohinas and Pochitoques are generally eaten in Tabasco. The Staurotypus is considered good enough for the Indians, who like it much, but it is despised by the whites. I had it cooked, and found it better than the Dermatemys. The flesh is reddish when boiled.

"I was told that, in Tabasco, Staurotypus and Dermatemys lay their eggs in November and December; Hicotea in February; Pochitoque in March and April.

"Staurotypus lays 10 to 30 eggs; Dermatemys, 20 eggs; Hicotea, 12 to 15 eggs; the Mojina, Pochitoque and Talmame, only a few."

On the etymological character of the native names, Dr. Berendt states as follows:—

"In Tabasco come together three languages of entirely different families; the principal language is the Chontal, closely related to the Tzendal (Chiapas) and belonging to the *Maya family*,—the Zoque to the South, and the Mexican to the West. We find, consequently, a great mixture of languages in names of natural objects; besides those names introduced by the Spaniards, either from the Spanish or from the West Indian language, (Haiti, Cuba,) and applied to the same or similar things found on the continent.

"*Huau* is Maya. ('Uauu—*unos ya ápagos ó tortugas de agua dulce*'—fresh-water turtles.)

"*Chiquihuau*. Chic is maya,—means flea, (jumping Huau.)

"*Hicotea* or *Scotea* is 'turtle' in the Haitian language.

"*Tortuga blanca*, white turtle, (is Spanish.)

"*Pochitoque* or Puchitoque seems Maya. *Puch* is bark, and *tok* flint.

"*P. Jaguactero*. Jaguacte is a palm tree, (a Bactris,) standing in thick groups in low swamps, which are called jaguacteros.

"*P. chato*. Chato is Spanish; means short or upturned nose.

"*Talmame*, perhaps Talmeme, (a corruption of Tlameme, a Mexican word,) means 'carriers.'

"*Mohina* is Spanish, (anger, sadness,) though I do not see why applied to this turtle."

Pliocercus dimidiatus.

Tail two-fifths the total length, urosteges 120, nearly equal in number to the gastrosteges—127. Scales in seventeen rows, the median scarcely narrowed. Head very distinct, flat, muzzle truncate. Top of rostral shield round, curved back on the upper plane. Internasals very small; lateral borders of frontal (vertical) nearly parallel, a little shorter than anterior. Occipitals large. Temporals, 1 very narrow, 1 pentagonal, 2. Loreal nearly a rhomb lower than postnasal; preoculars three, upper not reaching frontal, lower cut from labial. Superior labials nine, fifth and sixth entering orbit: postoculars two, superior in contact with occipital only. Nine inferior labials, sixth largest; genials equal. Teeth equal.

Red, crossed by fourteen black rings on the body, and eight and a part on the tail. These are separated by nearly equal spaces below, and rather narrower (3½ scales) above. A black space involves the nape to the tips of the occipital and last upper labial plates and all the last lower, and does not cross the jugulum. The remainder of the head above black, except the anterior part of the frontal and the first second and third superior labial shields. Lower labials bordering anterior genials, with mental, black.

From Arriba, Costa Rica. Sent by Chas. N. Riotte, correspondent of the Smithsonian Institute: Mus. No. 6363.

The species of this genus now known are four,—viz.:

Two præoculars; dentition isodont; scutella near 143+85. Color of Elaps lemniscatus type, red with black wings in threes separated by yellow.

P. elapoides m. *Elapochrus deppei* Pet. *Liophis* (*Cosmiosophis*) *tricinctus* Jan.

One preocular; dentition diacranterian; scutella near 130+97. Color of the E. corallinus type, red with simple numerous black rings.

P aequalis Salvin. P. Z. S., 1863.

Three præoculars; dentition isodont; scutella 129+120; color of the E. type, few approximated black rings on red ground.

P. dimidiatus m.

Two præoculars; dentition isodont; scutella near 138+46. Color of the E. langsdorffii type; broad contiguous equal black rings, leaving but lines of the red ground.

P. euryzonus m. *Liophis* (*Cosmiosophis*) *splendens* Jan. Coronellidæ Arch. p. l. Zoologia Modena, 1863.

Tropidoclonium storerioides.

Size small, form not slender, muzzle obtuse; in general similar to Storeria dekayi. Scales fifteen rows; the inferior row only smooth, much broader than the others, which are narrowest medially. Scales of tail strongly keeled, in six rows. Nasals not elongate, usually entirely, sometimes half separated. Loreal trapezoidal touching the decurved postfrontals by the superior angle only, its hinder suture shortest, sometimes entering the orbit posteriorly between the two preoculars; of the latter, the inferior is the smaller. Postoculars three; in contact with one broad temporal, which separates two

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labials from the occipital. Superior labials seven, or six from confluence of two, sometimes of the third and fourth which bound the orbit. Inferior labials seven, fourth largest; postgeneial equal pregeneial, separated by scales. Vertical shield longer than broad, outlines straight, posterior angle less than right; occipitals nearly as long as from their border to rostrals, emarginate behind. Gastrosteges 126, 1—1 urosteges forty pair. Color olive brown (one specimen light brown), with dense, minute punctulations above and below, and about fifty-four light-edged black cross-bars extending over six rows of scales, alternating with shorter ones on the sides: both are broken into spots on the neck, where there is a large postoccipital blotch on each side.

Length of rictus of mouth, 4 lines; of head and body, 10 inches, 9 lines; of tail, 2 inches, 8 lines.

Habitat.—Mexican plateau between the eastern range and the valley of Mexico. Sent by our correspondent, Dr. Ch. Sartorius.

Ancistrodon bilineatus, Gthr. Ann. Mag. N. H. 1863, 364.

Fine specimens in Mus. Smithsonian from Western Mexico, from Guadalaxara and Colima, from our correspondents, I. I. Major and Jno. Xantus. The species nearest our A. contortrix.

Crotalus ravus.

Twenty-three rows of scales, all keeled, except the exterior; keels of the median thick. Head broad in front, canthus rostralis and muzzle rounded, the latter elevated. Rostral abruptly acuminate; both pairs of frontals broader than long; occipitals well developed, their outer portion cut off wholly or in part by a suture. Temporal scales all smooth. Pit separated from labials by a series of small scales; one row between the former and orbit. Superior labials eleven and twelve, last eight nearly equal; inferiors, twelve and thirteen; gastrosteges, 147, urosteges, 26. Color yellowish brown, with from twenty-six to thirty-one elongate deep brown narrow parallelogramic spots, four scales long to five wide, and a series of as many short transverse bars on the sides *opposite* them: a series of thrice the number of small spots on the inferior rows of scales. Belly yellowish, thickly varied with blackish brown. Tail yellow brown, with but two proximal cross-bars. Head pale, similar, without spots or marks, except a minute punctulation. A brown anteriorly furcate nuchal spot.

Length of rictus, 5.7 lines; of head and body, 7 inches, 6 lines; of tail, 10.2 lines.

Hab.—Table land of Mexico.

The specimens in the Mus. Smithsonian are young: the species is, no doubt, small, and nearer C. miliarius than any other.

Caudisona polysticta.

The species which I call by this name reminds, at first sight, of the Bothriechis mexicanus, and the head markings resemble those of the South American Trigonocephalus alternatus. The pattern of color is, however, more broken than in either, and represents a new type in the genus.

The superciliary plates are normal; the rostral higher than broad, acuminate; two marginals between them, the anterior pair linear, separated by a small plate, the posterior broad oval, separated by two rather narrow plates. Three between the superciliaries, the outer large. Two nasals, two loreals, one above the other. Superior labials fourteen, separated from the orbit by two rows of smooth scales; inferior labials thirteen; temporals smooth. Rows of scales twenty-seven, all keeled, except the outer two. Gastrostega 123, urostega 19, the first only divided. Crepitaculum slender, acuminate, delicate for the size of the animal; joints eleven. The color above is laterally gray brown, medially yellowish brown, marked by seven longitudinal

series of brownish black spots. These alternate; the inferior involves the tips of the gastrosteges; the median embraces the largest spots, eight and nine scales wide, which are occasionally subdivided, the halves alternating. The tail is brown, crossed by three pairs of dark brown bars. Lips pale, with a spot below the pit, and one from behind the eye to near the canthus of the mouth. A dark band convex forwards extends between the eyes, and is continued below the eye nearly to the labial border. A pair of blackish bands form a V-shaped figure, the limbs diverging over the temples, each followed by a spot: two small round spots in the angle of the V, and a broad divergent band from the occiput on each side of the nape. Below pale, each scute with a broad basal border of blackish spots and punctulations.

Length of rictus of mouth, 11 lines; breadth between eyes 5 lines; length of tail, 15½ lines; of rattle, 13 lines; total, 23 inches, 9 lines.

Habitat.—Table Land, Mexico.

In the related C. triseriata, there are twenty-three rows of scales, a broader front, and different coloration.

Laemanctus alticoronatus.

Posterior outline of cephalic casque nearly vertical; its lateral borders ascending from the parietal plane, and furnished with six corneous processes or horn-like scales on each side (each once or twice constricted). Two scales on canthus rostralis; two between them and labials, and two between nasal and orbit. Nine upper labials, ten lower, infralabials broad as long, nearly smooth. Four between second labials. Scales all keeled, fifty-one in a ring round the body, dorsals a little larger than laterals, scarcely smaller than ventrals. A few elevated vertebral scales on nape and interscapular region, the latter equal dorsal scales; no further crest. Four pairs of supranasal plates, posterior largest, lateral parietal much larger than median. Forelimb extends from wrist to nostril; posterior limb heel to neck fold. General color chestnut, with five deep brown dorsal cross-bars (last sacral) and a narrow yellow band from loreal region to groin, bounded above, from orbit to tympanum, by black and chestnut. Muzzle and front above, with lower surfaces "emerald to pale malachite" (Schott), limbs scarcely banded, darker; lumbar and inguinal regions yellow.

End of muzzle to end of casque, 14.2 lines; anterior limb, 22.8 lines; axilla, 18.8 lines; throat to top of casque. 9.2 lines; vent, 3 inches, 4.5 lines; vent to end of tail, 11 inches, 8 lines; vent to end of hind limb, 3 inches, 4.5 lines.

Habitat.—Yucatan, near Merida. Collected by Arthur Schott, naturalist of the Comision Cientifica de Yucatan, under authority of D. Jose Salazar Starregui, Governor of that country.

Called Yaxtoloc Maya, Coll. No. 308. Nearly allied to L. serratus. Cope, Pr. A. N. S., 1864, p. 176.

Sphaerodactylus glaucus.

Dorsal scales very small, but flat, rounded, smooth; about ninety series round the body; abdominals larger, rounded, about forty-four rows from vent to axilla, continued larger on under side of tail (not reproduced in this specimen). Labials $\frac{4}{4}$, three scales bordering mental. Supraorbital mucro present, orbit equal from its border to, or little beyond, nostril; muzzle and front gradually acuminate. Auricular meatus smaller than digital pallette. Above light brown, "greenish stone color or glaucus" in life, with minute paler spots and dark vermiculations; below whitish. Tail in life orange, more intense toward tip; in spirits with two yellow black-edged spots near tip, and one on each side the origin. Limbs and digits annulated with yellow, black bordered.

Muzzle to axilla, 5.5 lines; Muzzle to vent, 11.6 lines; vent to end of tail, 10.4 lines.

Habitat.—Near Merida, Yucatan. Coll. Comision Cientifica under Arthur Schott.

Allied to the cinereus and sputator, and somewhat intermediate between them. The second from Mexico.

Pharyngodon petasatus.

Char. Gen.—Fam. Hylidæ. No fronto-parietal fontanelle; prefontals extensively in contact anteriorly, developed into an angulated preorbital crest. Corium entirely involved in the ossification of the cranial bones, to which the epidermis is closely adherent. Tympanum distinct; vomerine teeth present, *a longitudinal series on the parasphenoid bone*, tongue round, but little free. Digits normal, the posterior webbed.

This genus is strictly a member of the Hylidæ, as lately defined,* and allied to Trachycephalus; the character in which it differs from that genus, and which is unique in the whole order of Salientia, is the presence of a longitudinal series of teeth on the parasphenoid bone. If this point is unique, the physiognomy of the animal is equally so, its profile resembling that of Aëtobatis, or some allied genus, more than anything else in the animal kingdom. This results from the extraordinary development of the canthus rostralis, which forms a transverse wing entirely across the muzzle, and prominent angular process in front of and continuous with the superciliary border; and the more excessive prolongation of the angular outline of the maxillary and premaxillary bones. The latter projects in a more convex arc than the outline of the former, and as far beyond the mouth as the external nostrils are in advance of a line connecting the orbits. The mouth is, therefore, very inferior, its margin being a little behind the opening of the aforesaid nares. The outlines of the muzzle are recurved and serrate, leaving the loreal region as a gutter, overhung by the canthus rostralis. Straight sutural grooves outline all the bones of the cranium, as in Trachycephalus scutigerus, leaving the ethmoid plate nearly an obliquely placed square. The border of the cranial casque is a straight line just behind the tympanum, elevated, continuous, and serrulate. A strong ridge passes over the tympanum and joins on bordering the orbit. Supercilia much elevated, eyes large, directed nearly forward, protected behind by a large development of the united palpebræ, the opening about three times the size of the tympanum. Between supercilia proper equal from occipital crest to union of canthus rostralis; from latter to premaxillary border, one half the same. Breadth between maxillary ridges at canthus oris less than length of casque, and three and a half times into total length. Vomerine teeth in two rounded ridges nearer each other than to the nares, and behind posterior border of latter. Parasphenoid series simple, as long as from nostrils to premaxillary border.

Abdominal areolæ wanting on breast and gula, but extending on prebrachial and lateral regions, otherwise nearly smooth. Tibia half the length to orbit; foot rather short, digits stout, web measuring three-fifths of the longest. Fingers free, stout; dilations not broad.

Above ashen olive, with many irregular brown spots; external surfaces of limbs barred with the same. Head blackish, with white punctulations. Below uniform ashy white.

Length of cranium, 12.1 lines; of body from casque, 24.2 lines; from axilla to wrist, 10.1 lines; of hand, 8 lines; femur, 12 lines; tibia, 14 lines; foot, 19.3 lines.

Habitat.—The vicinity of Mérida, Yucatan. A ♀ specimen, No. 363 of the collection made by authority of José Salazar Starregui, Governor of Yucatan, by Arthur Schott, Naturalist of the Comision Cientifica de Yucatan.

According to the notes of Arthur Schott, this animal was taken from a hole in the rocky wall of the Cenote Pamanche, on the new road to Progreso.

* Nat. Hist. Review, London, 1865, p. 108.

It is interesting that an animal living in rocky situations should present such a singular cranial bony development: this, in connection with its colors, no doubt, aids especially in concealment, and is another instance of the Creator's bountiful care for his humblest creatures.

It will be useful here to present a synopsis of the genera of Hylidæ.

I. No Frontoparietal fontanelle.

α. Cranium above connate with a dermoössification; prefrontals in contact.

A series of parasphenoid teeth; no dorsal pouch..... Pharyngodon.
No parasphenoid teeth; no dorsal pouch..... Trachycephalus.
No parasphenoids, a dorsal dermal pouch..... Opisthodelphys.

αα. No cranial dermoössification.

β. A dorsal dermal pouch.

Toes slightly webbed..... Nototrema.

ββ. No dorsal pouch.

γ. Prefrontals united by suture.

Two longitudinal cranial carinæ; no gland..... Osteocephalus.
No carinæ; a parotoid covering head and back..... Scytopis.
No carinæ or parotoid; prefontals large..... Acrodytes.

γγ. Prefrontals small, separated by ethmoid.

No keels or glands; ?a coccygeal diapophysis ..... Dryomelictes, *g.n.**

II. A frontoparietal fontanelle.

α. Posterior digits free, opposable, two and three.

Parotoid glands present; tongue elongate free..... Phyllomedusa.

αα. Posterior digits on same plane not opposable.

β. Posterior digits webbed, prefrontals separated by the large ethmoid plate.

γ. Brain case and fontanelle broad; superior ethmoid plate broad; inner finger not opposite to the others.

δ. An elongate acuminate flat postorbital process of the frontoparietal bone.

Form stout..... Smilisca,† *g. n.*

δδ. No postorbital process.

Tongue elongate, extensively free; inferior palpebra reticulate with white fibres: vomerine teeth..... Agalychnis.
Tongue short, attached or little free; palpebra usually transparent; vomerine teeth..... Hyla.
Tongue short; palpebra transparent; no vomerine teeth..... Hylella.
Tongue extensively free; dilatations minute, palmation extensive behind; vomerine teeth..... Acris.

γγ. Brain case and ethmoid elongate, fontanelle narrow; inner finger opposed to the others.

Tongue slightly free..... Litoria.

ββ. Posterior digits free.

Superior ethmoid plate osseous; prefrontal bones separated ..... Chorophilus.
Superior ethmoid plate cartilaginous, the prefrontals developed, in contact medially..... Thoropa.

Hyla gracilipes.

Tongue elongate, free one-third its length. Inferior palpebra not veined.

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*Type Hyla aurantiaca auctorum.

† S. daulinia, sp. nov. This species I only know from a skeleton in the private anatomical museum of Hyrtl, Professor of Anatomy in the University of Vienna. The head is a little broader than long; the interorbital width greater than from external nares to orbit; vomerine teeth in short transverse series; general form similar to the Acrodytes venulosus.

Fingers elongate, free; toes webbed at base only, remarkably elongate, the foot from tarsus a little longer than the tibia, and equal from axilla to middle of origin of femur, the width of head. Head flat, longer than broad, eyes little prominent, one-half tympanic disc; canthus rostralis little concave. Body elongate, skin entirely smooth above: vomerine teeth in two almost connate fasciculi which present a convexity to each narial opening and posteriorly where they are opposite the hind outline of the latter. Sacral diapophyses much dilated, presenting a prolongation posteriorly.

Length of fore limb, 9 lines; posterior limb, 24.4 lines; from end of muzzle to behind tympanum, 4.4 lines; muzzle to vent, 15 lines.

Color above, bright leek green, with a brown band from the nostril through the tympanum to the middle of the side, white-bordered above; and a short band on each side the ilium, white-bordered. Femora not spotted behind; limbs not cross-banded. Upper lip with a brown border; its green becoming yellow under the tympanum. Below whitish.

Habitat.—Mexican table land, north-east of city of Mexico.

A species near in technical characters to the e w i n g i i, r e g i l l a, and s q u i r e l l a, but abundantly distinct from all, in its sacrum, feet, head, etc.

Hyla s t a u f f e r i.

Tongue rounded, a border only free; a large gular vocal vesicle; vomerine teeth in fasciculi between nares, which are a little larger than the choanæ. Digits all short, with pallettes large; the anterior free, the posterior short, the palmation measuring half the length of the longest digit. The heel extends to in front of orbit. Head plane, depressed, muzzle very prominent, rounded. Outline from above elongate oval, canthus rostralis weak, straight, lores flat, oblique.

Length of orbit equals frontal width. Skin of sides rugulose, otherwise smooth above; no appendages. Muzzle to rictus oris, 4 lines; anterior limb, 6.4 lines; muzzle to vent, 11.7 lines; posterior limb, 17.1 lines.

Color above dark olive, with a short longitudinal black bar over each scapula, and one from eye to eye, with a trace along the coccyx. Below yellowish, deeper to brown on the extremities. Upper lip olive, sending a pale line to near axilla, sides minutely varied with dorsal and ventral tints.

Habitat.—Orizava, Mexico. Obtained by Prof. T. Sumichrast.

The species sent from Orizava by Prof. Sumichrast to the Smithsonian Institution are:—

Spelerpes chiropterus.
Geotriton carbonarius.
Hyla baudinii.
Hyla staufferi.
Hyla miotympanum.
Hylodes conspicillatus.
Bufo valliceps (*nebulifer*, Gird.)
Rana sp.
Sceloporus.
Sceloporus.
Sceloporus.
Anolis nannoles.
Corythaeolus cristatus (*Thysanodactylus*, Gray, *Dracontura*, Hallow.)
Gerrhonotus gramineus.
Diploglossus steindachneri.
Oligosoma gemmingeri.
Catostoma semidoliatum.
Ninia collaris.
Ninia diademata.
Coniophanes fissidens (*Glaphyrophis la eralis*, Jan Elenco.)
Spilotes poecilonotus.
Atropus undulatus.

Hemidactylium p a c i f i c u m.

This species is of some interest, inasmuch as our native species of this genus has hitherto been the only representative of its form. It differs from this in its uniform brown color above and below, and in some more important points. Vertebræ and costal folds between axilla and groin, seventeen, the latter not prolonged dorsally, as in the s c u t a t u m. Head oval, elongate, lip rounded, eyes large, prominent, longitudinal diameter longer than length of muzzle. Muzzle to humerus, half length from latter to groin. Tongue elongate oval;

sphenoid teeth approaching near to the short oblique series of vomerines. Fore limb to orbit, hind limb scarcely longer, reaching the eight fold from behind. The inner digit on both extremities is so short, as to render the numbers almost 3–3. Tail elongate, slender subcylindrical. Gular fold represented by a line.

Length of head to angle of mouth 2·5 lines. Breadth of head behind eyes 2 lines. From muzzle to humerus 5 lines. From muzzle to groin 16·5 lines. Length of tail 17 lines. Length of posterior limb 3·5.

Hab.—Santa Barbara, on the coast of Southern California. Sent to the Smithsonian Institution by Dr. Hays.

Spelerpes cephalicus.

With the present addition to the Batrachian fauna of tropical America, it is appropriate to enumerate the salamanders so far known from this region. They are mostly natives of the mountainous sections, or of that elevated plateau which presents us with most of the northern forms found in Mexico.

Geotriton* carbonarius, Cope, Pr. Ac. Nat. Sci., Phil., 1860, 373. North Eastern Mexico.

Geotriton adspersus, Peters, Monatsber. Acad. Berlin, 1863, 468. Bogota, New Grenada.

Spelerpes cephalicus, sp. nov. Table Land, Mexico.

Spelerpes orculus, sp. nov. Table Land, Mexico.

Spelerpes chiropterus, Cope, Pr. Ac. Nat. Sci., 1863, p. 54. North Eastern Mexico.

Spelerpes bellii, Gray, Cat. Brit. Mus., 46, 1850. Cope, l. c., 1860, 372. North Eastern Mexico.

Spelerpes lineolus, sp. nov. Table Land, Mexico.

The form of the present species is more that of Amblystoma opacum, and is the shortest and stoutest seen in the genus. Muzzle rounded, truncate, with obtuse angles at the nares, its length from line connecting anterior canthus oculorum equal length of eye. Distance between these canthus equal from hinder canthus to nares. Breadth behind orbits equal length of tibia and foot. Muzzle to axilla equal $\frac{2}{3}$ distance from axilla to groin. Costal folds (i. e., dorsal and lumbar vertebræ) eleven. Tail swollen, little compressed, constricted at base. Posterior limb stout, extending to sixth fold from behind; toes flat, depressed, margined, inner very rudimental. Inner and outer digit of anterior limb similar; the longest extend to the middle of the orbit. Series of vomerine teeth nearly straight, not in contact. A post gular fold. Skin everywhere finely wrinkled. Color dull black, paler on the sides: lips and gular region minutely marbled with ashen.

Length of rictus oris 2·75 lines. Length to axilla 6·8 lines. Length to groin 16 lines. Length of tail 15 lines. Length of hind limb 5·2 lines.

Habitat.—Mexican Table Lands, Dr. C. Sartorius.

Spelerpes orculus.

Form like that of S. chiropterus, (the inner digits being similarly rudimental) but stouter, a body of equal length being thicker, and the head and neck longer and larger; the lip is not angularly truncate, and the color is uniform black. Costal folds eleven. Head elongate, broader behind; muzzle rounded, truncate, lip rounded; eyes little prominent; length of orbit equal from orbit to nostril, and greater than between their anterior canthi. Anterior digits to middle of orbit; posterior extends to the sixth from the groin. Tail compressed, flat above. The digits are all short and flattened, not palmate. Series of vomerine teeth very oblique, in contact medially. Postgular fold distinct.

From end of muzzle to postgular fold 3·8 lines. From end of muzzle to ax-

* The genus recently named, by Du Bocage, Chioglossa, P. Z. S., 1864, p. 264, appears to be not different from Neurergus, Cope, Pr. A. N. S., 1862, 343.

illa 5·4 lines. From end of muzzle to groin 13·9 lines. From groin to end of tail 21·1 lines. Length of hind limb 4·4 lines.

Habitat.—Mexican Table Land, Dr. C. Sartorius.

Spelerpes lineolus.

The species has the general form of Batrachoseps attenuatus, but, as the number of digits is as in Spelerpes, I retain it for the present in that genus. Form very slender; fourteen costal folds from femur to axilla, the first at the femur. Muzzle short, rather thick, regularly rounded; eye large, diameter equals frontal width between middle supercilia, longer than length of muzzle. A delicate linear supraoccipital crest on the cranium. Limbs very small, each extending backwards or forwards over but two costal folds. Digits obtuse, rudimental; no web. Tail compressed, slightly flattened above and below, two and a half times length of body. Head to axilla a little less than half from axilla to groin. A delicate postgular fold. Color, above and below, uniform glossy black.

Length from end of muzzle to rictus oris 1·4 lines. Length from end of muzzle to axilla 3·8 lines. Length from axilla to groin 8·2 lines. Length from groin to end of tail 20·4 lines. Length of anterior limb 1·2 lines. Length of posterior limb 1·5 lines.

Habitat.—Table Land of Mexico. Dr. Chas. Sartorius.

The species sent by Dr. Sartorius to the Smithsonian Institute, are as follows:

From near Vera Cruz.	*From Table Land and Southern Mountains.*
Spelerpes chiropterus, s. n.	Siredon, sp.
Spelerpes bellii	Spelerpes cephalicus, s. n.
Geotriton carbonarius.	Spelerpes orculus, s. n.
Hyla miotympanum, s. n.	Spelerpes lineolus, s. n.
Hyla baudinii.	Hyla gracilipes, s. n.
Rana, sp.	Hyla miotympanum, var.
Sceloporus.	Rana montezumæ*(*mexicana*, Rüppel.)
Sceloporus.	Sceloporus.
Læmanctus longipes,	Sceloporus.
Corythæolus vittatus.	Sceloporus.
Anolis biporcatus.	Anolis biporcatus.
Gerrhonotus tessellatus.	Gerrhonotus.
Ameiva undulata.	Ameiva.
Boa eques.	Ameiva.
Catostoma semidoliatum.	Plistodon lynxe.
Tantilla miniata, s. n.	Catostoma semidoliatum.
Stenorhina ventralis.	Catostoma chalybaeum.
Ophibolus polyzonus, (*Coronella formosa*, Schleg.,) s. n.	Tantilla.
	Ophibolus micropholis.
Diadophis ?stictogenys, (*D. texensis*, Kenn.)	Rhadinæa decorata.
	Pliocercus elapoides.
Ninia collaris.	Thamnophis.
Ninia diademata.	Thamnophis.
Chersodromus liebmanni.	Tropidoclonium storerioides, s. n.
Thamnophis, sp.	Arizona deppei, (*lineaticollis*, Cope.)
Spilotes auribundus,† s. n.	Drymobius margaritiferus.

* The species from Natal, supposed by me to be R. mascariensis, from Natal, Pr. Acad. Phil., 1862, 340 is very different, and may be called R spinidactyla.

† The so-called diacranterian and allied genus Stegonotus, D. B., has but a slight development of the posterior tooth, and might be as well considered coryphodont. Günther's *Lielaphis* is identical.

Tropidodipsas sartorii, (*Leptognathus dumerili*, Jan Elenco,) s. n.
Sibon septentrionale et var.
Himantodes leucomelas, s. n.
Elaps elegans.
Trigonocephalus atrox.
Bothriechis mexicanus.
Himantodes cenchoa.
Elaps, sp.
Trigonocephalus atrox.
Crotalus ravus, s. n.
Caudisona polysticta, s. n.

A Contribution to a Knowledge of the DELPHINIDÆ.

BY E. D. COPE.

Thirty specimens of species of this family at my disposal indicate twenty-two species, of which ten are in the Museum of the Academy. They are:

Monodon monocerus. Specimens from Drs. Hayes and Kane; the latter complete.

Beluga catodon. Three complete skeletons, from Drs. Kane and Hayes.

Phocaena, undetermined.

Globicephalus intermedius Gray, Harlan. Jour. Acad. Nat. Sci., 1829, 51; Gray, Catalogue B. Mus.

One specimen from Cape Cod, Mass, kindly lent me from the Mus. Salem, Mass., (No. 223,) through my friend F. W. Putnam, indicates a form differing little from the European G. melas, or Pilot Whale.

The muzzle from the maxillary notch is longer, and the premaxillaries a little narrower on its terminal two-thirds than represented by Cuvier's plate (Ossemens Fossiles 222), or Gray's measurements of the melas. Like the melas, it is characterized by the straightness of the plane between the foramen magnum and the supraoccipital crest, by the large exposure of the vomer to beyond the maxillary notch, and of the inner portion of the maxillaries from the nasal meatus to opposite the notch. The concavity of the cranium at this point is 1 in. 4 l. below the plane connecting maxillary alæ at the notch, and the intermaxillaries fall very much out of view, except on the terminal half of the muzzle.

In this specimen the supraoccipital crest and spine and the protuberance of the nasal bones are remarkably developed; and the palatines and pterygoids regularly rounded and without angle in section.

	In.	Lines.
Length from end of muzzle to occipital condyle	24	6
" " " to maxillary notch	13	6
" " " to occipital crest	22	4
" from occipital crest to foramen magnum	6	2
Breadth of muzzle at middle	7	2
" " at notch	9	3
" of premaxillaries at front of blow hole	6	4
" between orbits	15	4
" " temporal crests	11	
Elevation of nasals above maxillary plate	2	6
Teeth	9 or 10	
	?	

Orca meridionalis Flower, Proc. Zool. Soc. London, 1864, 420.

A muzzle and jaws of this formidable tyrant of the Australian seas are in the Mus. Salem, Mass., unfortunately without locality. The specimens in its museum are derived from the merchant vessels which trade between that port and various parts of the world.

The form is massive, and agrees closely with the description and figure above cited; the end of the muzzle is perhaps a little more arched. The outline is more acuminate and the intermaxillaries broader, the mandibular rami