



SYNOPSIS OF THE SPECIES OF THE CHELYDRINÆ.

BY E. D. COPE, A.M.

THIS group of tortoises, so far as their structure is exactly known, is confined to North and Tropical America. The number of species is small, though the present list adds several to those previously known. Their structure is highly interesting, as expressing relationship to groups which existed during mesozoic time. I allude to the family of *Propleuridæ*, found in the cretaceous greensand of New Jersey, which possessed features of the sea-turtles, combined with those of the present group, or the snappers. The latter possess the imperfect and small plastron of the *Propleuridæ*, conjoined with the ambulatory limbs of the *Emydidæ*. In other respects they resemble the *Emydidæ*, and I am inclined, until further discoveries of structural peculiarities shall have been made, to allow them to remain in that family, although both Dr. Gray and Prof. Agassiz have referred them to a distinct one, under the name of *Chelydidæ*. Certain it is, that they are also related to the *Cinosternidæ*, which is peculiar in the absence of the mesosternal bone. *Claudius* approaches the latter family in its short tail and lack of posterior vertebral bones.

The only possible exception to the rule of distribution above laid down, is the genus *Platysternum*, Gray, from eastern Asia. This form has been placed here, but appears to associate them with more typical *Emydidæ*; until its structure be better known, its position will remain doubtful.

The vertebræ of *Chelydra serpentina* present some peculiarities as compared with *Trionyx Testudo* and *Emys*, as follows:—

Testudo polyphemus. Cervical vertebræ 2-3 and 4 opisthocælian, 4th bi-convex, remainder procelian. Caudal vertebræ all procelian.

Trionyx ferox. Cervical vertebræ all opisthocælian, caudals all procelian.

Chelopus guttatus. Cervical vertebræ as in *Testudo*, the balls of the posterior transverse bilobed; caudals all procelian.

Chelydra serpentina. Cervicals as in *Testudo*; the caudals all opisthocælian.

There are only three well-ascertained genera of this family, to which a fourth may perhaps be added. They are distinguished as follows:—

I. Tail elongate, five pairs of scuta of the plastron.

Two rows of marginal scuta ; inguinals separated from ventrals by a long scute. MACROCHELYS.

One row of marginals ; inguinals as last. CHELYDRA.

II. Tail short, four pairs or fewer scuta of the plastron.

Anterior lobe of plastron fixed. CLAUDIUS.

Anterior lobe of plastron movable on the remainder ? STAUREMYS.

MACROCHELYS, Gray.

Gypochelys, Agassiz.

MACROCHELYS LACERTINA, Schweigger.

Chelydra, Schw., *Chelydra temminckii*, Troost., *Chelonura*, do., Holbrook, *Emysaurus*, do., Dum. Bibr.

Mississippi River and rivers of Texas.

CHELYDRA, Schw.

Chelonura, Flem. *Emysaurus*, Dum. Bibr.

CHELYDRA SERPENTINA, L.

From Canada to Equador.

This species presents an extraordinary range, enduring both arctic cold and tropical heat. I can find no specific difference between shells from Pennsylvania, Mexico, and Equador. Prof. Peters has reached the same conclusion respecting Equadorian specimens.

CHELYDRA ROSSIGNONII, Bocourt.

Miss. Scientif. Mexique Reptiles et Batrach, 1870, p. 18, Tab. V., fig. 2.

This species differs from the last in having four barbels instead of two, a larger plastron with a stouter bridge, and in the stronger and longer dentations of the posterior margin of the carapace.

Mexico and Guatemala (Bocourt).

Some extinct species of this genus have been discovered in the miocenes of Europe.

CLAUDIUS, Cope.

Proced. Ac. Nat. Sci. Phila., 1865, 1867. Bocourt, Miss. Sci. Mex. Rept., p. 19.

This genus has received several accessions through the efforts of those excellent naturalists, MM. Sumichrast and Bocourt. The latter has described two species as previously named, but I 1872.]

think the identifications must be reconsidered, and one of the names originally proposed by himself (*C. megalocephalus*), be retained. The species are thus distinguished:—

I. Inguinal scuta two.

Shell depressed, broad, carinæ very weak; one long anal plate; inguinals transverse; tail smooth; head brown, shielded above to behind the eyes.

C. SEVERUS.

Shell with three elevated keels, the carapace emarginate between the anal scuta; one short anal plate; inguinals longitudinal; tail with four rows of tubercles; head white spotted above, brown spotted below.

C. PICTUS.

II. Inguinal scuta one or wanting.

Head very wide, smooth above; two anal scuta; lobes of plastron sub-similar; dorsal keel grooved.

C. MEGALOCEPHALUS.

Head narrower, with a horny shield on the top of the nose; posterior lobe of plastron narrower and more acute than anterior; dorsal keel simple.

C. ANGUSTATUS.

CLAUDIUS SEVERUS, Cope, sp. nov.

Carapace an elongate oval, with convex sides; the upper surface nearly plane in profile, rising anteriorly, sloping to the anterior margin, and descending rather abruptly to the posterior. General form rather depressed, the middle line including the entire width of the vertebral scuta below the level of the proximal part of the costals. The latter present an obtuse longitudinal carina on the two median. The two central vertebral scuta also possess a weak keel, of which a trace appears anteriorly on the fifth or last; first and second flat. The scutal sutures bounding the vertebrals, costals, and marginals (except those between the last) are bounded by flat but marked grooves of the shell. Thus a continuous band-like groove extends round the carapace above the marginal bones, and is continuous with a similar one passing along the anterior margin of each costal, and undulate grooves along the margins of the vertebrals. The first costal is one-fourth longer than the second. The vertebrals are hexagonal, longer than broad, with a rounded notch behind and projection in front. The first is narrowed urceolate, deeply notched behind, and margining nearly half the first marginal in front. The nuchal is broad transversely, and very narrow; the anterior one narrower than the posterior. The last and penultimate are a little wider,

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the last joining the last costal by a very short suture. The margin of the carapace is regular without notch behind or elsewhere. The plastron is small, rather broad, and rounded in front, and much contracted and acute behind. The bridge is rather wider than in *C. angustatus*, and more as in *Chelydra*. The anterior lobe is immovable in the dried specimen. Pectoro-abdominal suture transverse, length of pectoral on median suture equal abdominal and two-thirds femoral length, and equal to that of the anal. Latter much longer than wide. The abdominal plate is the only one which covers the bridge from within, but does not extend quite half-way across. Each is met by two large inguinals, which are broadly in contact with each other, and are broader than long.

The color of the carapace is brown, but wherever rubbed of a wax-yellow. The marginals at the bridge are principally a strong yellow, which color covers the whole of the plastron.

The soft parts are preserved in alcohol. The head is large for the size of the carapace, and is remarkably broad, and with rather short muzzle. This projects, however, much beyond the mouth, the end of the under jaw visible when closed, being scarcely beyond the margin of the orbit. Beak short, obtuse, not dentate; an obtuse festoon of the tomia below the orbit. Two beards. Head covered with skin above, except from the line of the posterior margin of the orbits to the end of the muzzle, which is protected by an undivided horny plate.

The skin is but slightly granular. There are five curved scuta on the inner side of each fore foot, and a single row of scuta above on each digit. The fore feet are webbed to the bases of the ungues. The hind feet are well palmate, and with a free outer web supported by a clawless toe. There are six curved scuta on the inferior outer face of the base of the lower leg, of which the first and third reach the external margin, and the others are more internal except the lowest, which is very small. The tail is very short, depressed, and incurved, with a terminal compressed corneous scale. It is smooth, or without tubercles, above and below, but anterior to the anus above are three pairs of very small tubercles, one on each side of the median line.

Color of soft parts dirty white below, dark brown above; sides of head with close yellow reticulations behind. Throat and lower jaw yellow; a dark spot on each side of the symphysis con-

tinued towards the angles of the jaws, where yellow reticulations appear above it.

Measurements.		M.
Length of carapace (straight)		0.18
“ “ “ (over all)		.23
“ “ plastron		.126
“ “ “ anterior lobe from hyo-hyosternal suture		.056
“ “ “ posterior lobe from same point		.069
Width “ “ at ano-femoral suture		.018
“ “ “ anterior lobe at anterior abdominal suture		.058
“ “ bridge (least)		.018
“ “ head at tympana		.051
Length of “ “ (straight)		.053
“ “ tail from anus		.024
Width of palm (greatest)		.030
“ “ sole “		.035

This species was found at Santa Efigenia, on the western side of the Isthmus of Tehuantepec, Mexico, by Francis Sumichrast, and sent by him to the collections of the Smithsonian Institution. (Coll. No. 485.) I am indebted to the secretary, Prof. Henry, for the opportunity of making an examination of it. Prof. Sumichrast says of it in his notes, that it is rare, and only lives in muddy pools. In the young the dorsal crests are more distinct. During life the anterior lobe of the sternum possesses a slight mobility, which disappears on drying.

CLAUDIUS PICTUS, Cope, sp. nov.

Staurotypus salvinii, Bocourt, Miss. Sci. Mex. Rept. 22, tab. v., fig. 3, 1870; nec Grayii Proc. Z. S. Lond., 1864.

This fine species has been identified by MM. Duméril and Bocourt with the species described by Dr. Gray, as above cited; but it appears to me to be very distinct and perhaps pertinent to another genus. Dr. Gray describes the anterior lobe of the sternum in *S. salvinii* as narrowed like the posterior, while it is broadly rounded in this animal. He also states that in his species the tail has a median crest of compressed tubercles, as in *Chelydra*, with a lateral series on each side. In this species there are four series of minute warts, as in the other *Claudii*, and in no way resembling those of *Chelydra*. This is evidently not Gray's species, and it remains to compare it with the *Claudii*, and especially with *C. severus*. It differs from this tortoise in the cara-

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pace with more nearly parallel sides, with three stronger or more elevated keels above. It differs in the possession of an emargination between the anal scuta. The plastron differs in the shorter and less acuminate posterior lobe with shorter bridge. The femoral scuta extend behind the abdominals on the bridge, while the latter cover its entire width in *C. pictus*. The infra-marginal plates are longer than wide in this species; in *C. pictus* they are transverse. The tail of this species exhibits the usual four rows of tubercles, while in *C. severus* it is smooth. The head is narrower in *C. pictus*, and the colors more varied. Thus the top of the head is pale spotted on a brown ground, the jaws are yellow with brown cross-bands; a yellowish band extends from their angle over the tympanum to the side of the neck. Carapace yellowish-brown with a dark brown spot on the posterior part of each scutum; limbs brown above; plastron yellow with a brown spot on each scutum. Length of carapace, .136 m.

From Vera Paz.

This species is beautifully figured by Bocourt, as above cited.

CLAUDIUS MEGALOCEPHALUS, Boc.

Ann. Sci. Nat. Zool., 1868, X. p. 122. *C. angustatus*, "Cope," Bocourt, Miss. Sci. Mex. Zool. Rept., p. 20, tab. iv.

This species and the *C. angustatus* constitute the typical and smaller forms of the genus, distinguished by the very slender bridge of the plastron and single inguinal or intermarginal. The present animal, after being described as distinct by Bocourt, was subsequently referred to the longer described *C. angustatus*, but I am disposed to regard his first conclusion as the more correct, having received from Sumichrast a second specimen of the latter, which confirm its characters.

In *C. megaloccephalus*, according to Bocourt, the head is very wide and the muzzle short, with hooked beak. Its upper surface does not display the oval horny scute seen in *C. angustatus*, and though there is a convexity of the edge of the maxilla below the front of the orbit, it is not an acute tooth as in the type of *C. angustatus*. This appearance may perhaps be due to age.

The carapace is three keeled above, the median keel fissured in its length. The keels traverse all the costal and vertebral scuta, except perhaps the last vertebral. The plastron is rather wide with the anterior lobe a little longer; neither lobe is much nar-

1872.]

rowed, and there are two anal scuta whose average length equals that of the femorals. The median suture of the abdominals is only one-third that of the pectorals (three-fifths in *C. angustatus*). Tail very short, with four series of minute tubercles above. Length of carapace .118 m., width .079.

Color above dark brown; plastron light reddish-brown (Bocourt), neck yellowish below.

From Mexico.

CLAUDIUS ANGUSTATUS, Cope.

Proceed. Acad. Nat. Sci. Phila., 1865, p. 187; Proceed. Amr. Phil. Soc., 1869, tab. ix.

This species is rather more slender than the last; the head is narrower, and the posterior lobe of the plastron narrower and more acute. The horny plate on the nose, and the undivided dorsal keel, constitute other distinctions, the last of which are noticed by Bocourt. In one of our specimens there is a single anal scutum, in another there are two.

STAUREMYS, Gray.

Proc. Zool. Soc. London, 1864, p. 127; Supplement to Catal. Shield Rep., 1870, p. 65, f. 22.

This name was applied by Dr. Gray as a subdivision of *Staurotypus*, Wagl., which belongs to the *Kinosternidæ*, a family defined by the absence of the mesosternal bone. If this arrangement expresses the true affinities of the species referred to it, it is unnecessary to introduce it here. Dr. Gray states that the anterior lobe of the sternum is movable as in *Staurotypus triporcatus*, but is more acute than in that species, being in this respect like the posterior lobe. This difference is only specific, and the supposed genus *Stauremys*, as defined by Gray, would not appear to stand on any foundation. Should, however, it turn out to embrace a species of *Chelydrinæ*, it will rest on the character given above, as distinguishing it from *Claudius*, viz., the movable anterior lobe of the sternum. M. Bocourt appears to believe it to be one of this group, from his referring to it a species of *Claudius* (*C. pictus*, Cope), and as he may be correct, I introduce it into the present synopsis.

Dr. Gray's descriptions render it plain that the only known species is quite distinct from those described above.

STAUREMYS SALVINII, Gray.

Loc. cit.

Shell brown; temple and side of neck pale marbled; below pale, about the size of *Claudius severus*.

Haumanchal, Guatemala.

ON AN EXTINCT WHALE FROM CALIFORNIA.

BY PROF. E. D. COPE.

GEORGE DAVIDSON, of the United States Coast Survey, recently presented the Museum of the Academy of Natural Sciences, the proximal portion of the left ramus of the mandible of a whale-bone whale. The specimen was found in digging a well at San Diego, on the coast, in the southern part of the State, at a depth of seventy-four feet below the surface, July 27th, 1871.

The angle and condyle are broken from the specimen, and the distal extremity was not preserved. It possessed a coronoid process, the apex of which has been lost. The inner face is plane, somewhat convex above, behind the basis of the coronoid process. Anteriorly it becomes more convex, the surface turning inwards to the superior and inferior margins. The exterior face is convex, so that at the posterior foramen its diameter above the middle is greater than that below the middle. The inferior outline, from below the coronoid process to below the last external foramen, is straight, not decurved. It is obtuse most of this distance, but becomes narrowed at the anterior point. The superior margin is obtuse anteriorly, narrowed acute for ten inches anterior to the coronoid process; it is not truncate anteriorly. The internal foramina are large, and form a series below the upper margin, without distinct groove. The external foraminal series terminates much anterior to the interior, that is, the last external is opposite the sixth from behind of the inner row. There is no internal Meckelian groove. The Meckelian cavity of the ramus is large behind the coronoid, but small and in the upper part of the ramus at the last exterior foramen. The dental foramen is large and above the base of the Meckelian cavity, to that its inner wall descends to the floor of the latter. Below the base of the
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