

This specimen was found by J. C. Schenk for Capt. Clarence King, at Castle Creek, Idaho. No. 9790 Smithsonian Collections. The other specimens are from Catharine's Creek, Idaho; Nos. 9785—9786. A portion of a maxillary of one of these forms indicates a fish half as large again as the one above described.

GENERAL OBSERVATIONS.

The six genera of fishes above described, present interesting relations to existing ones. One of them, *Semotilus*, is recent, while three are closely allied to existing genera; viz.: *Rhabdofario*, *Anchybopsis*, and *Oligobelus*. *Distichus* and *Mylocyprinus* are less nearly related to living genera. The five representing the Cyprinidæ can be referred to the groups into which the existing members of the family fall; thus *Semotilus* and *Oligobelus* are carnivorous, and *Anchybopsis* and *Mylocyprinus* herbivorous and molluscivorous. Accompanying these fossils are three species of the recent genus *Astacus*, (*A. subgrundialis*, etc.) which I describe in the Proceedings of the American Entomological Society for 1870.

The molluscs of this formation have already been described by F. B. Meek, and they, like the fishes, determine it to be lacustrine and fresh, as already stated by Prof. Newberry. The species are stated by Meek* to be distinct specifically, and in some cases generically, from all others hitherto described from the West. Leidy observes,† that Mammalian Remains received from Capt. King's expedition include portions of *Mastodon mirificus* and *Equus excelsus*, which indicate an age similar to that of the bad lands of the Niobrara, which Hayden calls Pliocene.

The remains described in this paper furnish few means of determining the age of the deposit. There is, however, a great probability of their being later than Miocene, and nothing to conflict with their determination as of Pliocene age.

It may be added that numerous portions of skeletons of fishes remain to be identified, in Capt. King's collection

ON THE ADOCIDÆ.

BY E. D. COPE.

ADOCUS. Cope.

Proceed. Acad. Nat. Sci., Phila., 1868, 235. Proceed. Amer. Philos. Soc., 1870, 295; Transac. Am. Phil. Soc., 1869, 232.

Additional material enables me to add important characters to this genus, and to define its position with something like precision.

In the first place I find that it possesses a large intergular plate. This I have verified on *A. beatus* and *A. syntheticus*, sp. nov. Having also perfect xiphisternal bones of these two species, I can show that there is no sutural attachment for the pelvic bones. The coexistence of these two characters has been hitherto universal, and the present deviation from it is a point of much interest. Instead of sutural surfaces, there

* Proc. Acad. Nat. Sci., Phila., 1870, 56.

† l. c. 1870, 67.

is an obtuse ridge corresponding to the pubis, and a knob answering to the extremity of the ischium, both more prominent than is usual in genera of Emydidæ.

This exceptional combination of characters points to the propriety of separating Adocus as the type of a family equally distinct from the Emydidæ and the Hydraspididæ, to be called the Adocidæ.

Further characters of the genus have been already pointed out in the later essays above quoted. They are: the free lobes of the plastron narrowed and shortened, furnishing extensive posterior and anterior entrances to the carapace. A series of intermarginal scuta on the bridge. Costal capitula reduced or wanting.

No recent or even tertiary form of the Testudinata has yet been discovered, which possesses the remarkable combination found in this genus, and I think it must be regarded as a generalized group, and as such of much interest to the student of palæontology.

The determination of the presence of the intergular plate in this genus enables me to isolate from it the *Baptemys* of Leidy, which is otherwise very similar. This being the case, there is reason to believe that the latter is a Tertiary genus, and not Cretaceous one, as I had before been inclined to suspect.

The species then are:

I. With mesosternum deeply received.

Plastron very thick.

A. PECTORALIS.

Plastron thin.

A. PRAVUS.

II. With transverse mesosternum.

a. Posterior lobe of plastron contracted, long as wide.

Plastron of medium thickness.

A. BEATUS.

aa. Posterior lobe broader than long, rounded.

Plastron thick, sparsely punctate.

A. SYNTHETICUS.

Plastron thin, closely punctate.

A. AGILIS.

ADOCUS SYNTHETICUS. Cope.

Spec. nov.

Established on a plastron which lacks the mesosternal, one episternal, and one hyposternal; also on a marginal bone from the bridge, two imperfect costal bones, proximally complete, and some smaller fragments.

The bones of the plastron present that oblique junction of element with element diagonally across the point of crossing of longitudinal and transverse sutures, as has been observed in all the species of the genus, except A. pectoralis. Thus the right hyposternal, besides the usual union with the left, presents a considerable suture for the left hyposternal, and a lesser one for the left xiphisternal. The median dermal suture does not coincide with the osseous behind the hyposternal bone; but it is considerably to the left of it, dividing the xiphisternal bones unequally. The osseous suture is irregular and undulating. The hypo-xiphisternal suture extends abruptly backwards near the margin of the plastron. This margin behind the groin is thinned rather abruptly, with a marginal

groove inside near the bridge, but it descends abruptly at the median xiphisternal suture behind. The anterior extremity of the plastron is rather broadly truncate, but little excavated, and with thick margin. The form of the mesosternum is easily made out, from the fact of the preservation of at least one of all its corresponding marginal sutures. Its antero-posterior length is at least .75 less than its transverse. It had no posterior median process or spine, as in many Emydes.

As regards the scuta, the femoro-anal suture is directed backwards outwardly; the abdominal scuta are the longest. The pectorals, instead of narrowing medially, as in most Cryptodira, widen interiorly, their common anterior apex being on the mesosternal bone. The gulars are much reduced by the large intergular; each forms a spherical triangle—the apex outwards, the suture with the humeral, concave. The intergular is marginal, behind as wide as before, and convex; each half .66 wide as long.

The plastron is everywhere quite thick medially, but less so than in the *A. pectoralis*. The superior surface of the xiphisternal bone presents a curved ridge in the position of the pubic scar of the *Pleurodira*, which is nearer the margin than either suture, and slightly curved backwards. A marked sublongitudinal depression is seen between it and the median suture. Near the latter, more than one-fourth its length from the margin, thus farther from the latter than in *Taphrosphys* sp., is a smooth, low knob corresponding to the ischium.

The posterior lobe of the plastron is broad and regularly rounded, resembling thus the *A. agilis*. In the latter the pelvic ridges are scarcely developed at all, and the bone is everywhere thinner.

The axillary margin within presents a strong ridge, which becomes elevated as it rises with the axillary internal buttress of the carapace. This ridge is much weaker in *A. beatus* and the other species. The external surface of the bones is studded with impressed dots, which are separated by intervals posteriorly, but on the episternal bone are confluent, leaving the surface rugose with small elevations. The sculpture differs from that of *A. agilis* in being minuter, less distinct, and not disposed in regular rows. The fragment of the bridge displays the axillary and part of the anterior intermarginal plate. The former extends considerably in front of exterior to the axillary notch; the latter can only be compared with the same in *A. pectoralis*, as it is not preserved in the *A. agilis*. It is relatively broader than in the former, and with less oblique anterior border; the exterior angle which joins the suture of the marginal is situated more anteriorly. A considerable extent of a marginal scutum of the bridge is preserved. Its transverse exceeds its longitudinal extent, and its anterior margin is regularly convex.

One costal presents a rudiment of capitulum; the other none.

	M.
Length of plastron.....	0.484
Width “ to first marginal of bridge	0.33
Width posterior lobe at groin.....	0.23

	M.
Length posterior lobe from groin.....	0.155
“ median suture episternal.....	0.038
“ mesosternal.....	0.07
Width “.....	0.095
Thickness hyosternal behind medially.....	0.015
“ hyposternal “.....	0.020
Width intergular scute.....	0.053
Length gular (antero-posterior).....	0.003
“ caudal sentum.....	0.083
Width costal proximally No. 1.....	0.038
“ “ “ No. 2.....	0.055

This fine species was discovered by my friend, J. C. Voorhees, in the upper bed of cretaceous green sand, at Barnesboro, N. J. This gentleman is well known as the preserver of the unique and invaluable fossil of the *Laelaps aquilunguis*.

ZYGORAMMA. Cope.

Genus novum familiæ? Adocidarum.

Marginal bones of the carapace united with the costals by both suture and gomphosis: the suture existing on the free marginals, as well as on those of the bridge, the gomphosis inferior to and more distal than the suture. Hyposternals uniting with the marginals only, by gomphosis. Dermal scuta distinct.

This genus is represented by a single species, which has left us but few remains. These do not furnish positive indications for its reference to the Cryptodire or Pleurodire divisions. The mode of union of the plastron and carapace is, however, much more likely that of the Emydes and Adoci; and I therefore suspect it to be Cryptodire. The character of its sculpture is also that of the last named genus, rather than of Taphrosphys.

ZYGORAMMA STRIATULA. Cope.

Sp. nov.

Represented by five marginal bones, three incomplete costals, and both hyposternals with their external margins broken off. These bones indicate a species of light and elegant construction. The hyposternals are thin, and of nearly equal thickness transversely. Their sutures are very coarse, and present but little irregularity at an intersection, in those of opposite corners, excluding the other pair from contact, as is usual in Adocus sp. The gomphosis of the hyposternal rises very obliquely. The posterior lobe of the plastron has an acute margin, which continues as an angle beyond the inguinal notch anteriorly. The fracture of the surface prevents my ascertaining the existence of a series of intermarginal scuta. The suture between the femoral and abdominal scuta divides the hyposternals about equally.

The marginals at and near the bridge are nearly twice as deep as long. The posterior of the bridge is gently convex, with the margin a little

recurved. The two following (posterior to the bridge), are nearly plane without recurved margin, which is slightly prominent at the point of contact of the dermal suture of the marginal scuta. The posterior marginal bones are concave superiorly, the margin not otherwise recurved. These marginals are, as usual, thickened underneath beyond the proximal suture; and into this the free end of the rib is inserted into a deep, oval pit. On the terminal marginals of the bridge the pit is more distal, and round. The free end of the rib springs from the costal bone at the suture, and its length varies from an inch to a half an inch. The pit for the hyposternal is chiefly in the last bridge marginal, partly in the first free marginal. It extends along the edge of the inner thickening, as the latter descends on the bridge.

The sculpture of the costal bones consists of longitudinal shallow grooves, which are more or less confluent (they are thus transverse to the costal axis). On the marginals, the same ornamentation is varied by the grooves being impressed punctate; behind the dermal suture, they are directed slightly upwards; anterior to it, they rise more obliquely. On the posterior marginals, they are still more oblique. The sculpture of the plastron is obliterated.

	M.
Inguinal width of plastron.....	0.124
Length hyposternal08
First free posterior marginal width.....	.067
“ “ “ length.....	.046
“ “ “ greatest thickness.....	.011
Corresponding costal, width037
“ “ thickness.....	.0045

From the upper bed of cretaceous green sand, Burlington County, New Jersey. Discovered by my friend, Judson C. Gaskill.

The size of this species is about that of a snapping-tortoise (*Chelydra*).

HOMOROPHUS. Cope.

Genus novum Adocidarum.

Costal capitula wanting or rudimental. Vertebral bones of the carapace co-ossified with the costals, sometimes, outlined on the inner surface, where they appear to be lanceolate in form. The original costo-vertebral suture, when traceable, very oblique; the superior face of the vertebral much wider than the inferior. Vertebral scuta often narrower than the supposed outline of the vertebral bones; on the posterior portions of the carapace wanting.

This genus is evidently allied to *Adocus* by the character of its costal capitula, but not having the episternal nor xiphisternal bones, nor the outer part of the median sternals, I cannot add other points of resemblance or difference. The coössification of carapacial elements is without parallel in the order, and the form of the vertebral bones prior to this union, probably at an early period of life, was very peculiar. Their

transverse section would be that of a broad wedge with slightly truncate inferior apex. The neural spine lamina is attached in a strong inferior groove of these pieces. The groove becomes wide and shallow posteriorly. At the extremity of the vertebral series there are two isolated rugose elevations, perhaps for the last neural spines. On each side of the last a shallow concavity marks the point of contact of the ilium.

HOMOROPHUS INSUETUS. Cope.

Species nova.

The mesosternal bone is joined by an openly concave sutural margin of the hyosternals on the lower surface. On the superior face the sutural margins are straight, projecting further posteriorly and forming an obtuse angle. The pectoro-abdominal dermal suture crosses the hyosternals near their middle; the abdomino-femoral, which is rather obscure, at the posterior third.

The superficial sculpture of carapace and plastron is destroyed. The inferior surface of the costal, displays a marked concavity exterior to the position of the rudimental costal capitulum. The curvature of the costals is well marked. When separated from each other, a fine sutural face forms the inferior third of the thickness, the superior two-thirds being fracture only. There are three vertebral dermal scuta more or less completely preserved. The outline is coffin-shaped anteriorly; in one the lateral margins are convex, in another concave, and then expanding again posteriorly, the whole being fiddle shaped (*panduratus*). The two posterior costal scuta meet on the middle line, and the last pair embraces a pygal which is elliptic in front.

The shell is every where stout, and excessively thick; neither hypo nor hyosternals being thickened medially. The left hyosternal joins the right hyposternal at the intersection of the sutures.

	M.
Length hyosternal on median suture.....	0.095
“ hyposternal “ “105
Thickness “ “015
“ median costal proximally.....	.011
“ anterior vertebral.....	.014
Length “ “06
Width do. anteriorly.....	.0285
“ “ posteriorly.....	.91
“ anter. vertebral scute anteriorly.....	.035
Length “ “06

The free edge of the hyposternal is thinned to an edge rather abruptly. The last distinct vertebral scutum is wider than the others, a costal suture going off near its posterior margin.

The slight enclosure of the mesosternal bone gives the plastron a resemblance to those of *Adocus syntheticus*, *A. beatus*, and *A. agilis*. The last is much thinner; the second differs entirely in the characters of the vertebral scuta, &c. It is nearer the *A. syntheticus*, but besides the

generic differences in the carapace, the abdomino-femoral dermal suture crosses at the posterior third of the hyposternal bones, instead of at their middle, as in the *Adocus syntheticus*.

This species, like the last, was found in the upper bed of the Cretaceous green sand, at the works of the Pemberton Marl Company, New Jersey, by Judson C. Gaskill, the director. The name of this gentleman frequently occurs in my contributions to the paleontology of the Cretaceous, and I take the present opportunity of expressing my indebtedness for the constant liberality with which he has aided in the advance of the science. Without his attention to and enlightened interest in the subject, many interesting points in the history of the life of the Cretaceous periods would not have come to light. Those desirous of seeing one of the fine sections of the middle marl bed to be found in the state, will be repaid by a visit to the opening made under the direction of Mr. Gaskill.

EIGHTH CONTRIBUTION TO THE HERPETOLOGY OF TROPICAL AMERICA.

Read before the A. P. S., September 16, 1870.

BY E. D. COPE.

The materials whose examination has furnished the following additions to zoological science, consist of four collections. These are, first: one from Pebas, Equador, on the Amazon, from John Hauxwell; second, that made by Prof. Agassiz, of the Thayer Expedition to Brazil; third, a collection from Turk's Island, West Indies, obtained from Prof. Adrian J. Ebell; and fourthly, a small collection made by Dr. R. E. van Rijgersma at St. Eustatia.

The first collection furnished the following species in addition to those already determined by me from the same locality, in two papers, viz: in *Proceedings Ac. Nat. Sciences* 1868, 96, and *do. of the American Philosophical Society* 1869, 156.

OPHIDIA.

Erythrolamprus æsculapii.

Lygophis nicagus, Cope, *Proc. Ac. Nat. Sci. Phil.* 1868, p. 132.

Oxyrhopus petolaris, var. *G.* (Günther)

Oxyrhopus plumbeus. L.

Xenodon angustirostris? Peters.

Hydrops callostictus, Günth., *Ann. Mag. N. H.* tab.

Helicops chrysostictus, Cope, (*Tachynectes*) *Pr. A. N. S. Phil.* 1862, 71.

Thrasops abaetulla. L.

Rhinobothryum lentiginosum Scopoli.

LACERTILIA.

Anolis nasicus.

Polychrus marmoratus.

Doryphorus castor, Cope, sp. nov.

Hyperanodon ochrocollaris Spix.



Cope, E. D. 1869. "On the Adocidæ." *Proceedings of the American Philosophical Society held at Philadelphia for promoting useful knowledge* 11(81), 547–553.

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