

A Synopsis of the Genera of Reptiles and Amphibia, with a Description of some new Species. By John Edward Gray, Esq. FGS. &c.

(To the Editors of the *Annals of Philosophy*.)

GENTLEMEN,

British Museum, July 12, 1825.

THE reptiles have been comparatively neglected by recent zoologists, perhaps on account of the popular prejudices against this interesting and curious class of animals which Linnæus designates "*Animalia pessima tetra nuda*." It is only necessary to overcome these prejudices, and to examine them even superficially, and we cannot but be struck with the beauty of their colours, the wonderful nature of their structure, and the peculiarities of their habits and manners. Indeed I do not know any class of animals better calculated to excite the wonder and astonishment of a student of nature.

With the hopes of inducing some inquiry into, and examination of, this department of natural history, I have attempted to bring together into the form of a synopsis, the labour of the preceding writers on this class, and have also thrown into it my own notes formed on an examination of the specimens at present under arrangement in the British Museum, which are exceedingly interesting to me in several points of view, first, as containing several undescribed species, and specimens of interesting or obscure genera; and secondly, the older specimens having been examined, and most carefully named by my late uncle, who paid great attention to this department of zoology, and several of whose manuscript species still remain unpublished.

I need not dwell on the distinctness of the two classes of reptiles.
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tiles and amphibia, or of the scaly and naked-skinned groups, as they are allowed to be perfectly distinct by all modern naturalists, although they do not agree with regard to the rank of the latter group. I am inclined to follow the opinion of Macleay, Blainville, and others, in considering them both as classes, and consequently of equal rank.

Class III.—REPTILIA.

Body covered with scales or hard plates imbedded in the skin; heart with two auricles and one ventricle respiring by lungs. The blood is cold; the windpipe ringed; the ribs are perfect, and there are several vertebrae; the penis is distinct, sometimes double. The egg is covered with a shell, mostly hatched in the body of the mother.

SYNOPSIS OF THE ORDERS.

Body covered with imbedded hard plates; legs distinct.

Ears closed with a valve. EMYDOSAURI.

Ears naked, valveless SAURI.

Body covered with scales, or two large shields.

Legs 2-4 weak; ears naked SACROPHIDIÆ.

Legs 0; ears 0 OPHIDIÆ.

Legs 4; body covered with two shields. CHELONII.

Mr. Macleay, in his excellent *Horæ Entomologicae*, has observed that the order of this class appears to assume a circular disposition; the most visible break in this arrangement is in the passage between the snakes and the tortoises; for the connexion between the latter order and the crocodiles must be visible to every one, if they only consult Shaw's figure of the *Testudo serpentina*, and compare it with that of the crocodile, for it is in fact a crocodile with a shortened body, covered with united instead of distinct shields, and a bird's beak. The passage from the crocodiles to the lizards by means of the *Minitors*, has long been known to naturalists, who have often considered the latter as species of the former genus; and even Linnæus placed them in the same section of his genus *Lacerta*. The *Sincus* have always been placed in the same genus or group with the lizards; but their affinity with the slow-worms did not escape the penetrating eye of Linnæus, who observes that the *Lacerta Chalcides*, is "Media inter Lacertas et Angues;" and the union of the genera *Sincus*, *Anguis*, and *Amphisbena*, into an order, although it has not been done by any zoologist that I am aware of, appears to be strictly natural, for the feet in this order exist in such various degrees of development, that the being with or without them appears to be only a family or generic character, and not ordinal. Linnæus placed the genera *Tortrix* and *Eryx* of the true serpents as species of his

genus *Anguis*, thus showing that he considered them as nearly allied. So far the passage from one order to the other has been very easy and gradual; and indeed sometimes I have been doubtful, as in the last case, to which order I should refer the genera. There is every reason to believe from general structure, that there exists an affinity between the tortoises and the snakes, but the genus that exactly unites them is at present unknown to European naturalists, which is not astonishing when we consider the immense number of undescribed animals which are daily occurring.

Mr. Macleay thought these two orders might be united by means of *Emys Longicollis* (the long-necked tortoise) of Shaw; but the family to which this animal belongs appears to be the one which unites this class to the crocodile: if I may be allowed to speculate from the peculiarities of structure which I have observed, I am inclined to think that the union will most probably take place, by some newly discovered genera, allied to the marine or fluviatile soft-skinned turtles, and the marine serpent.

§ 1. *Body covered with imbedded hard plates; legs distinct, fit for walking.* Loricata, Gray; not Merrem.

Order 1. EMYDOSAURI, *Blainv.*

Ears closed by two longitudinal valves; anus longitudinal; body covered with large imbedded plates; tongue short adnate; legs four; toes four before, five behind; sternum long; clavicles none; lungs not extended to the abdomen; *living in or near water.*

Fam. I. CROCODILIDÆ.

Feet three clawed; hinder ones; palmate or semi palmate tail compressed.

1. ALIGATOR, *Cuv.*

Head blunt; hind feet semi-palmate. *America.*

A. lucius, Gray. *Crocodylus lucius*, *Cuv.*

2. CROCODYLUS, *Cuv.* Champse, *Merrem.*

Head blunt; hind feet palmate. *Old and New Continent.*

C. biscutatus, *Cuv.*

3. GAVIAL, *Oppel.* Gavials, *Cuv.*

Head very long; hind feet semi-palmate. *Old Continent.*

G. gangeticus, Gray. *Crocodylus gangeticus*, *Cuv.*

Fam. II. ICTHIOSAURIDÆ.

Feet paddle-shaped; toes five; cervical vertebra 18. *Marine.*

1. ICTHIOSAURUS, *Kanig.* Proteosaurus, *Home.*

Teeth in a groove.

Latreille applied the name Ichiosaurus to the larva of a sala-

5. *ERYX*, Daud. *Erix*, Cuv.

Head distinct from the trunk ; body covered above with hexagonal scales, below with small narrow subquadrate shields ; tail short, blunt, with one row of scales beneath.

E. turicus, Daud.

6. *CLOTHONIA*, Daud.

Head distinct from the trunk ; body covered above with hexagonal scales, below with small narrow subquadrangular shields ; tail short, blunt, with simple and double shields.

C. anguiformis, Daud.

Order V: *CHELONII*, Latreille. Cheloniens, Brogniart. Testudinata, Oppell.

Body short, inclosed between two horizontal shields, with the head, neck, tail, and four legs, passing out between ; mouth toothless, often covered with a horny bill ; tongue short.

The upper shield, or *Carapace*, is formed by the ribs (eight pair) enlarged and united together, and to the annular part of the dorsal vertebra, by toothed sutures, so as to be immovable ; the lower shield, or *plastron*, is formed of the pieces which represent the chest bone (usually nine), and a circle of bones analogous to the sternal cartilages of quadrupeds. The vertebra of the neck and tail alone are movable. The two bony envelopes are immediately covered with the skin or scales, and surround the muscles of the extremities.

§ 1. *Feet and head retractile into the carapace ; carapace solid, covered with horny scales.* Cryptopodi.

Fam. I. TESTUDINIDÆ.

Body covered with horny shields ; carapace convex solid ; sternum, attached by the greater part of its sides to the carapace ; legs horny ; feet club shaped ; toes indistinct, bluntly clawed ; dorsal plates, 13 ; sternal, 12. Terrestrial.

TESTUDO, Dumaril. *Chersini*, Merrem.

T. græca, Lin.

Fam. II. EMYDIDÆ, Bell MSS.

Body covered with horny shields ; carapace depressed ; sternum attached to the carapace by a small surface ; lips horny or soft ; feet digitate ; fingers distinct ; claws sharp ; fluviatile or lacustral.

**Beak horny ; sternum entire.* Emydina.

1. *EMYS*, Brogn.

Toes 5-4, or 4-4 ; depressed elongated, palmated ; sternum immovable.

**Sternum very narrow.* *Rapara*, *R. serpentina*, Gray.

Testudo, *Lin.* **Sternum 11 or 12 scaled, broad. *E. centrata*, *Merrem.* *T. concentrica*, *Shaw.* ***Toes 4-4; sternum 13 scaled. *E. longicolis*, *Gray.* *Testudo*, *Shaw.*

The plastron of the last subgenus is covered with 13 scales; that is six pair marginal, and an unequal sided hexangular, one in the middle of the anterior lobe. I have only observed an approximating distribution of the plates in a species of *strenotherus*; all the other *Emyda* that I have seen have had only the six pair of marginal plates, the first pair sometimes soldered so as to form only 11 plates.

Beak horny; sternum transversely sutured. Terraphenina.

2. TERRAPHENE, *Merrem.* *Cistula*, *Say.* *Tortuis a boit*, *Cuvier.*

Body convex; sternum of 11 or 12 plates, moveable; the two central plates united to the carapace by ligament; the posterior lobe broad fixed, the anterior one, of five or six plates, separated by a transverse ligamentous hinge.

T. clausa, *Merrem.* *Testudo*, *Gmelin.*

This genus forms the pass between the *Emyda* and the *Testudinida*, for it has the convex form and solid shell of the latter, and the feet and general characters of the former. It is also intermediate in point of habits, for it is often found in hot dry places.

Mr. Bell observes, that *Testudo Europea* is a species of this genus; if so the name of it should be changed, as that was certainly the *Emys* of the ancients.

3. STERNOTHERUS, *Bell, MSS.* *Tortues a boit* ***Cuv.*

Body depressed; sternum of 11 or 12 plates; the central part of two plates united to the carapace by two long processes fixed; the anterior lobe moveable, separated by a transverse ligamentous hinge; the posterior lobe narrow, fixed.

S. odorata, *Gray.* *Testudo*, *Latr.* *S. pennsylvanica*, *Testudo*, *Gmelin.*

Obs. *Cuvier* describes the anterior and posterior lobes of the sternum of these species to be moveable; but the hinder was fixed on the specimens which I have examined, which were all dry.

4. KINOSTERNOM, *Spir.*

Body depressed; sternum central part fixed; anterior and posterior lobes moveable; throat bearded.

K. longicaudatum.

**Beak soft.* *Chelidina.*

5. CHELYS, *Dumeril.* *Matamata*, *Merrem.*

Claws 5-4; body depressed; lips soft; nose produced.

C. fimbriata. Testudo matamata, *Brug.*

This genus is allied by its soft lips to the next family.

§ 11. Feet and head not or only partly retractile into the carapace; carapace mostly soft. Gymnopodi.

Fam. III. TRIONICIDÆ.

Body covered with a coriaceous skin; lips fleshy; feet digitate palmate; five toed, three clawed. *Fluviatile*.

1. TRIONIX, *Geoff.*

Nose produced.

T. ferox, *Geoff.* Testudo ferox, *Pennant.*

Fam. IV. SPHARGIDÆ.

Body covered with a coriaceous skin; lips horny; feet fin-shaped. *Marine*.

1. SPHARGIS, *Merrem*

S. mercurialis, *Merrem.* Testudo coriacea, *Lin.* Luth, *Daubenton.*

Fam. V. CHELONIIDÆ.

Body covered with horny shields; lips horny; feet fin-shaped. *Marine*.

1. CHELONIA, *Brogn.* Caretta, *Merrem.*

C. Mydas. Testudo Mydas, *Lin.* Caretta cephalo, *Merrem.*

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A Table of the Affinity of the Orders of Reptiles.

Normal Groups.

Annectant Groups.

Order I.—*Sauri.*

1. Stellionidæ.

2. Geckotidæ.

3. Lacertinidæ.

4. Chamælionidæ.

5. Tupinambidæ.

Order II.—*Emydosauri.*

1. Crocodilidæ.

2. _____?

3. Plesiiosauridæ.

4. Icthiosauridæ

5. _____?

Order III.—*Chelonii.*

1. Testudinidæ.

2. Emydidæ.

3. Trioncidæ.

4. Sphargidæ.

5. Carettidæ.

Order IV.—*Ophidii.*

1. Crotalidæ.

2. Viperidæ.

3. Hydridæ.

4. Colubridæ.

5. Boidæ.

Normal Groups.

Annectant Groups.

Order V.—*Saurophidii*.

1. Sincidæ.
2. Anguidæ.

3. Typhlopsidæ.
4. Amphisbænidæ.
5. Chalcidæ.

The last family agrees with some of the Sauri, in having four legs and plates.

The first of these columns represents the natural groups which have the characters of the order in the most perfect state, and consequently are not directly allied to the other order, except through the medium of the annectant families, which are the first (No. 3) and last (No. 5) of the right hand column which are themselves united together by the central (No. 4) family of each group.

The two fossil families may be the type of *Emydosauri*, but the group is so imperfectly known at present, that it is impossible to determine it.

Class IV.—AMPHIBIA.

Body with a soft naked skin; heart with one auricle and one ventricle; respiring by lungs and gill, and often by lungs only when perfect; claws none; head articulation to the vertebra by two condyles. Blood cold; windpipe membranaceous; ribs none, or very short and imperfect; egg skin membranaceous. Animal often changes its form and habit during growth; egg fecundated after they are deposited, hatched in the water where they are laid. They do not only differ from the perfect animal by having gills, but they often change their external and internal conformation, and generally gain legs.

This class contains so few genera that it is scarcely necessary to divide it into orders. I shall, therefore, for the present merely divide it into families, which may be considered as either,

§ 1. *Undergoing transformation; gills deciduous; eyelids three distinct; spiracule none.* Mutabilia, Gray. The larva elongated, respiring by deciduous gills.

Order 1. ANOURA, Dumeril. Salientia, Laur. Batrachein, Blainv.

Fam. I. RANAÆ.

Body short, thick; feet four, long; tail none; drum of the ear apparent; sternum and clavicles distinct. Larva elongate tailed, apodous; gills turfed on four cartilaginous support, covered by the skin, pierced with one or two lateral spiracules.

†Skin shining.

*Hylina.

HYLA, Laur. Calamita, Schneid.

Body slender; skin mostly smooth; toes all dilated at the end, the fourth one of the hind feet, of a moderate length.