

This bird I procured during the summer, but it is found on the fresh water courses and marshy lakes of California throughout the year. The nest, composed of a few loose straws or rushes, is placed on the ground, near the edge of the marsh, and contains four eggs of a dirty white color.

Description of four new species of Kinosternum.

By JOHN LE CONTE.

The genus KINOSTERNUM, as defined by the latest writers on Herpetology, is described as follows: Head subquadrangular, pyramidal; cranium with only one rhomboidal plate; jaws a little hooked, papillæ under the chin. Sternum oval, moveable, both anteriorly and posteriorly on a fixed piece, furnished with eleven plates, wings short, narrow, subhorizontal, the axillary plate very large, the inguinal still larger. Vertebral scuta slightly imbricate. Tail long, in the males unguiculate.

A comparison is made of this genus with *Staurotypus*, to which it in reality has some affinity, but not so much as M. Dumeril supposes. It, indeed, does not fall into the same group when the Testudinata are properly arranged, but the *Staurotypus*, as will be shewn hereafter, is extremely different and has a manifest relation with the *Emysaurus*. M. Dumeril states that the elastic ligaments which retain the two moveable portions to the fixed intermediate part of the sternum, are situated, one under the suture of the pectoral and abdominal scuta, and the other under these last and the pectorals. Now it must be observed that the moveable portions of the sternum are not in every species joined by a ligament to the middle or abdominal piece; in many it is only the anterior one which is, and which of course turns as upon a hinge; the posterior portion is joined by a suture, which is only moveable in the same degree as any other portion of the bony frame of other animals which is articulated in a similar manner, its moveability depending in a great degree on the length of the teeth of the joining surface, in others the anterior portion is joined partly by ligament and partly by suture, the posterior one by suture only, and therefore not so moveable as in other instances.

In young subjects this capacity for motion in the so-called valves of the sternum is more apparent, but as they advance in age it gradually diminishes, until in some the three pieces become, as it were, soldered together. In those species where there are really two valves with ligamentous junctions, the box of the shell can be entirely closed, and this connects them in some degree with *Cistudo*, but this has the sternum joined to the shell by a membrane, whereas in *Kinosternum* the same thing is effected by bony commissures from prolongations of the abdominal portion.

The peculiarities of the sternum will allow the species of this genus to be arranged in three groups. 1st. Those in which it is truly bivalved, and closing entirely the aperture of the cell. 2d. Those in which although the sternum is wide, it by no means closes up the carapace, and is only furnished with an anterior valve joined to the abdominal portion, partly by ligament and partly by suture, yet fully moveable as if the ligament was extended along the whole of the hinder margin, the posterior valve united by a suture which admits of more or less motion. 3d. The sternum with two joints, both of them completely sutural. In these the different parts are frequently as immoveable as in an *Emys*.

The following description of the genus *Kinosternum* is offered with the hope that it contains all the distinguishing characteristics possessed by the animals, and that it will be sufficient to separate them from all others of the Testudinata.

KINOSTERNUM.—Chin with from two to six papillæ or warts. Vertebral scuta more or less imbricate; marginals twenty-three, sternal eleven in number. Sternum composed of three separate pieces, of which the abdominal or intermediate one is immoveable, the anterior one turning on a partially or entirely ligamentous hinge, and the posterior articulated to the same piece either by a ligament or by a suture, and consequently either freely and entirely moveable, or only more or less imperfectly so. The wings which connect the sternum to the

shell are sometimes long and narrow, sometimes short and broad, but always proceeding only from the abdominal piece. The shorter the wings the more nearly can the shell be closed up by the sternum. The inguinal plate is long and generally tolerably wide; the axillary much smaller and narrowed anteriorly. The feet are palmate, the fore feet with plicæ or folds or transverse scales on the outer side, the hind feet with as many on the inner side and a few smaller scales near the heel. The tail is sometimes furnished with papillæ and sometimes naked, often with a nail at the end and as often unarmed: this nail in no instance being distinctive of sex.

The species embraced in the last group would by some be considered as belonging to the genus *Staurotypus*, and by others to *Sternothærus*, to neither of which does it bear but a very slight resemblance.

The sternum of *Staurotypus* is, as it were, cruciform and pointed before and behind, the anterior portion consisting of but two plates, formed of the gular, the brachial, and the pectoral united, and joined to the abdominal by a ligamentous hinge, the two anal ones likewise being united into one so that the sternal scuta are only seven in number. The whole contour of the animal reminds one of the *Emysaurus*. As for the *Sternothærus* it is exclusively an African genus, and is remarkable for having no nuchal plate, and thirteen sternals, there being three gulars, those with the brachial and pectoral forming an anterior valve, which is joined to the abdominal piece by a ligament, and of course is moveable, the rest of the sternum is as fixed and immoveable as that of an *Emys*. The figure of an animal of this genus in Dumeril's *Herpetologie* represents the wings as projecting from the pectoral and abdominal scuta, in which case the anterior portion of the sternum would not be moveable.

I shall now proceed to describe all the species of *Kinosternum* which I have been able to examine, giving minute details of those which I consider new, and shorter or diagnostic descriptions of such as have been described before.

Group 1st. Consisting of those with bivalved sterna, the valves joined to the abdominal piece by ligamentous hinges.

Kinosternum longicaudatum. Testa indistincte 3-carinata, elliptica, convexa, dorso depressiusculo, postice retusa, margine angusto, nullo modo dispanso, sterno cistam omnino occludente, postice profunde sed anguste emarginato, scuto vertebrali primo ad nuchale, marginale primum, et secundi partem anteriorem appositum, vertebrali postremo solum ad marginale postremum. Cauda unguiculata, ungue lato et obtuso.

Habitat in America meridionali. Spix, Rept. Bras. p. 17, tab. xii.

The carinæ on the back of the shell are rather indistinct, and without doubt, in older individuals, are not perceptible at all. This species is considered by Dumeril as the *Testudo scorpioides* of Linnæus, which determination we shall presently see is erroneous.

K. scorpioides. Testa ovali modice convexa, dorso fortiter, lateribus modice carinata, margine declivi, scutis posterioribus vix latioribus. Sterno utrinque rotundato, integerrimo. Cauda acute unguiculata.

Hab. in America meridionali Surinami: unde a Dom Dr. Hering receptum.

Head and neck grey, mottled and reticulate with black, upper jaw slightly hooked. Shell oval, moderately convex, strongly carinate, on the vertebral line, slightly so on each side, margin obliquely declivous except in the middle, where it is perpendicular. First vertebral plate triangular, with the apex truncate and the base angled; second, third and fourth hexagonal, with all the sides nearly straight; fifth triangular, with the outer posterior angle obliquely truncate, and applied to the penultimate marginal, which is scarcely wider than that which precedes it, in consequence of which the posterior lateral is nearly trapezoidal. Margin acute all round, the plates oblong. Sternum elliptical, rounded at each end, entire, not closing up the shell entirely; wings short, inguinal plate large, scarcely narrowed anteriorly. Tail furnished with a sharp nail.

Length 5.7, height 1.6, width 4 inches, sternum 4.8 long.

The above description appears to me to answer better to the *Testudo scorpioides* than any other which I have seen. On account of the many varying opinions concerning it, I have given a more detailed description than would

otherwise have been necessary. The species is thus described in Gmelin's edition of the *Systema Naturæ*, vol. 1, p. 1041. *T. scorpioides*. Palmis unguibus, 5 plantis 4, fronte callosa triloba, cauda unguiculata. Hab. Surinami.

Testa nigra, ovali, oblonga, dorso quasi angulis 3 obsoletis, scutellis dorsi figura clypeorum nobilium (*heraldic shields*). Caput anterius tectum callo, qui posterius trilobus est, plantarum digitis externis muticis, ungues acuti, cauda incurva.

The indistinctness of the dorsal carinæ makes me conclude that by the expression "quasi angulis tribus obsoletis" is meant their rather imperfect development. I may not be right in this, for the description is scarcely sufficient to decide the question. Were it not for the great respect every naturalist ought to feel for the great master,

"Qui cunctos superat quod aut fuerunt

Aut sunt, aut aliis erunt in annis,"

it would be as well to strike out of our books this name, as well as many others scattered through his works.

M. Dumeril considers the longicaudatum of Spix, as well as his brevicaudatum, synonymous with this species. The two above-mentioned species are very different from each other, and have but a slight resemblance to the *scorpioides*. An attentive perusal of the tedious and *oratorical* descriptions of the Brazilian traveller shows this.

K. Mexicanum. Testa ovali valde convexa fusco-lutescente vel nigricante; dorso fortiter tricarinato, margine undique declivi, scutis vertebralibus secundo, tertio, et quarto elongatis. Sterno utrinque rotundato, integerrimo. Cauda unguiculata.

Hab.—Mexico; whence it was brought by Mr. Pease. Considered by Shaw in his general zoology as a variety of *K. Pennsylvanicum*, vol. iii., p. 61, pl. 15.

Head and neck above black, beneath yellow reticulately spotted with black, jaws yellow, the upper one hooked and entire. Chin with four small warts, only visible in young individuals. Fore legs above dusky, spotted on the anterior side with yellow, beneath brown inclining to dusky, with four plicæ or large transverse scales on the upper side. Hind legs of the same color, with four large and broad scales and numerous small ones near the heel. Tail short, dusky, naked, with a rather sharp and long nail. Shell brownish dusky varied with yellowish or altogether yellowish, the plate with a few indistinct, concentric striæ, which in young ones are more numerous and more distinct, and accompanied by others radiating from behind, regularly oval, very convex and elevated, strongly tricarinate, so as to form two deep and wide channels on the back: very declivous on the sides and on the margin all round. Vertebral plates elongated and imbricate, the first triangular, with the apex truncate, and the base somewhat angled, applied to the nuchal and first marginal only; the second, third, and fourth urceolate-hexagonal; the second and third emarginate behind; the fourth with the anterior lateral faces twice as long as the posterior lateral, and the posterior side bearing the same relation to the anterior; the fifth heptagonal, the two anterior faces very long, the posterior lateral short and perpendicular to the two basal, which are straight; in young specimens this plate is simply triangular, with the apex truncate. The first lateral plate is unequally triangular, the lower side curved, second and third very long, pentagonal, the fourth quadrangular with the posterior base widely emarginate, so as to give the figure another side, which thus becomes pentagonal. Nuchal plate small, wider at base; all the other plates oblong and four-sided, except the penultimate, which is twice the height of the others, with its upper face rounded, so as to emarginate the posterior basal angle of the last lateral, and is applied on the upper half of its posterior side to the last vertebral, giving that plate its pentagonal form. Sternum large, yellow, the sutures black: oval, entire, rounded at both ends, the plates in young ones concentrically and radiatingly striate, entirely closing up the box: gular plate large, triangular; pectorals irregularly four-sided, the anterior face longer than the lateral; brachials triangular; abdominals nearly square; femorals triangular with the apex truncate, and the base rounded;

caudals right angled triangular; wings very short; inguinal plate long and narrow, not joining the axillary.

Length 4.4, breadth 3.0, height 2.3, sternum length 4.2, tail 1.4.

Shaw's figure and description referred to above are both very bad.

K. integrum. Testa fusca, regulari-ovali, convexa, carinata, declivi, margine postice dispanso, laterali perpendiculari, sterno magno bivalvi, cistam omnino occludente, antice rotundato, postice paulo emarginato. Cauda brevissima mutica. *Hyposter*

Habitat. Mexico.

Head and neck brown spotted with yellow; front pale brown, a large orange spot behind the eye, somewhat varied with black. Jaws yellow, upper one very slightly hooked. Chin with four small warts. Legs above dusky, beneath pale brown; fore legs with two folds on the upper side; hind legs beneath squamose with four folds. Tail very short, unarmed. Shell brown, regularly oval, very convex and elevated, without any carina, very declivous on the sides and behind, the lateral margin perpendicular, the posterior expanded. Vertebral plates imbricate; the first triangular with the apex truncate, applied to the nuchal the first marginal and half the second; second, third, and fourth urceolate; the second and third hexagonal; the fourth four-sided, the anterior side one-third the length of the base, which is rounded; the fifth triangular, the apex broadly truncate, the base angled, and applied only to the last marginal. First lateral unequally four-sided, the base rounded, with four facets, second and third pentagonal, fourth four-sided, the posterior basal angle deeply and roundly emarginate by the penultimate marginal. Nuchal plate small, linear, all the other marginals oblong and four-sided, those on the sides perpendicular, the four last on each side wider and expanded, the penultimate one being higher than all the rest, and rounded on the upper side. Sternum yellow, varied with dark brown, with numerous diverging striæ on the hinder plates, and concentric ones on the anterior, rounded at both ends and a little emarginate behind; bivalved, entirely closing the box. Gular plate small, triangular, nearly equilateral; pectorals irregularly four-sided, the anterior face very short; brachials four-sided, the interior side half the length of the exterior; abdominals exactly quadrate, wings short, axillary scutum long and narrow, joining by a point to the inguinal, which is likewise very long but much wider; femorals four-sided, the interior side one-third the length of the exterior; caudals right angled triangular, with the base rounded.

Length 4.6, breadth 3.0, height 1.7, tail 1.3, sternum length 3.0, breadth 2.0. Brought by Mr. Pease from Mexico.

K. leucostomum. Testa elliptica, convexa, postice subcarinata. Scutis vertebralibus elongatis, primo ad nuchale, primum marginale et secundi partem apposito, quinto ad marginale postremum solo apposito; margine medio subcompresso, postice dispanso. Sterno integro medio paulo angustato, cistam pæne occludente. Cauda late et obtuse unguiculata, maxillis albidis superiore valde hamata.

Habitat. ——. A fine specimen in the collection of the Academy, received from the Jardin des Plantes of Paris. It is described under the name of *leucostomum* by Dumeril, Cat. Reptil. Mus. I. des.

Group II. Anterior valve of the sternum joined to the abdominal portion partly by a ligament and partly by a suture, the posterior by suture alone; wings tolerably long, with a deep and wide groove on the anterior part.

K. pennsylvanicum. Testa elliptica, convexa, dorso depressiuscula, postice retusa; margine angusto, minime dispanso. Scutis vertebralibus subimbricatis, primoad nuchale et primum marginale apposito, quinto ad marginale postremum solum apposito; scuto marginali penultimo multo cæteris latiore et altiore. Sterno testa angustiore, postice emarginato. Cauda acute unguiculata.

Hab. From Canada to Florida. Has a musky odor.

A young one of this species, about an inch long, had the shell perfectly round, dark brown, with a yellow spot on each of the marginal scuta, scuta of the shell a little roughened with transverse wrinkles and short elevated spots. Sternum yellowish, black in the middle. Another one much younger and smaller was of an oval form, with three very obscure and slightly developed carinæ.

K. sonoriense. Testa modice convexa, postice latiore, antice et postice declivi, margine antice et postice dispanso, medio declivi; dorso indistincte tricarinato, carina intermedia vertebrali evidentiore, alarum canali leviter exarata, prope rudimentali. Cauda unguiculata.

Hab. In the northern part of the province of Sonora.

Skin black, head and neck large, above mottled and spotted with whitish, beneath whitish, varied in the same manner with dusky; jaws horn-color, varied with black, the upper jaw hooked and emarginate; irids dark brown; chin with two tolerably large warts on the fore part. Fore legs above greyish dusky, with three plicæ or large scales; feet beneath scaly; hind legs with three large scales near the heel; hind part with two large patches of rounded echinate scales. Tail sulcate beneath, with a large and strong, rather blunt nail, and six rows of small upright pointed papillæ, and a few smaller ones round the anus. Shell cinereous brown, with some very faint radiating marks of darker, and some indistinct concentric striæ on the plates: it is elongated oval, a little widened behind, moderately convex, declivous both before and behind, the anterior and posterior margin expanded, the middle declivous; very slightly tricarinate on the back, the intermediate carina more apparent, particularly before and behind, the lateral ones obsolete and scarcely to be traced except on the two last lateral plates. Vertebral plates imbricate, the first triangular, with its apex truncate, its base straight and applied only to the first marginal, second, third and fourth urceolate hexagonal, the second longer than either of the two others, the fifth heptagonal, the upper face short subtridentate, the anterior lateral one much longer than the others, the posterior lateral short and perpendicular to the basal, which are a little curved. First lateral unequally quadrilateral, the lower side curved and with four facets, second and third transverse, pentagonal, fourth quadrangular, the posterior lateral angle widely and deeply emarginate so as to give to the figure another curved side, by which it becomes pentagonal: margin narrow, expanded in front, declivous in the middle, the three last plates expanded and the caudal one again declivous, nuchal plate oblong four-sided, the second a little wider than the first, third and fourth, the fifth, sixth, seventh, eighth and ninth are wider and somewhat angled on the upper face; all these are oblong, the tenth or penultimate is wider than any, its upper face is rounded and deeply and widely emarginates the posterior basal angle of the fourth lateral, and is applied on the upper part of its posterior face to the last vertebral, giving to that plate its pentagonal form. Sternum jointed before by a ligament and behind by a suture, not entirely closing the box of the shell; before bluntly rounded, behind emarginate, the plates concentrically striate, gular plate large, equilaterally triangular, the base rounded, pectorals oblong quadrangular, outer side a little wider than the inner and curved, the two exterior angles right, the lower one projecting a little beyond the brachials, the anterior interior angle very obtuse, the remaining one very acute; brachials triangular, the apex blunt; abdominals quadrangular, the outer side a little curved; femorals quadrangular, the inner side much shorter than the outer, posterior side oblique, outer side curved, the anterior straight, the posterior exterior angle projecting a little beyond the caudals which are right-angled triangular with the base rounded.

Length 4.4, breadth 2.7, height 1.3: sternum length, 3.7. tail 1.4.

This species, which has the shell much less elevated than any other which I have seen, appears to be intermediate between this group and the next, so much so, that I long hesitated where to place it. The points of resemblance, however, which it had in common with the *pennsylvanicum* being more numerous than those which belong to the *odoratum*, led me at last to arrange it with the former. I may have been wrong in doing this, but if so, there is not much harm done. The *K. sonoriense* was brought by my son along with many other interesting animals from Tucson in Sonora; there can be but little doubt of its being found likewise in California.

Group III. Sternum narrow, subcruciform, valves joined to the abdominal portion of the chest by sutures, the lateral teeth of which are so large as to admit of but little motion, especially in the posterior one; wings long and narrow without any groove on the inner part, tail unarmed.

K. odoratum. Testa elliptica valde convexa, dorso plus minus carinato (interdum medio depresso plano) postice valde declivi, margine angusto minime dispanso, scutis vertebralibus imbricatis, primo ad nuchale et marginalis primi dimidium apposito, scuto postremo quinquangulati ad marginale postremum solum apposito, scutis marginalibus duobus postremis cæteris valde latioribus. Sterno testa multo angustiore, lobo anteriore posteriore mobiliore, interdum tamen ambobus fixis.

Hab. From New York to Florida. Smells of musk.

Test. pennsylvanica sterno immobili Schoepf. p. 110. *T. odorata* Daudin Hist. rept. vol. ii. p. 189. Test. glutinata ejusd. l. c. p. 194. *Emys odorata* Schweig. vol. i. sp. 37, p. 437. *Terrapene odorata* Merr. Amph. p. 26. Test. *Boscii* ejusdem l. c. p. 23. *Emys glutinata* ejusd. l. c. p. 24. *Cistudo odorata* Say, Journ. Acad. Sci. vol. iv. p. 206. *Sternothærus odoratus* Bell, Zool. Journ. vol. ii. p. 299. *Sternothærus Boscii* ejusd. l. c. spec. 4. *Kinosternum odoratum* Bonaparte, Obser. p. 188. *Staurotypus odoratus* Dumeril, Erpet. vol. ii. p. 299.

It is remarkable how this species has been shifted from one genus to another, until it may be found arranged under six different genera, and divided into four species. It does vary considerably as regards the mobility of the sternum, and the form of the dorsal portion of the shell, which although generally carinate is sometimes perfectly flat in the middle; specimens in all respects intermediate may be found. The anterior valve of the sternum cannot be moved more than so as to form an angle of 20° with the abdominal line, the posterior much less.

K. guttatum. Testa ovali, dorso subcarinato; flavida fusco maculata, margine undique, postice valde declivi, minime dispanso. Sterno flavescente, angusto, antice truncato, postice late emarginato, femoribus et cruribus seriebus papillarum latere interiore echinatis. Cauda mutica.

Hab. in Pennsylvania; Prof. Baird.

Head and neck dusky brown, varied with yellow on the front and cheeks, jaws yellow with a few shades of dark brown; the upper one not hooked, the margin scarcely sinuate, chin with four small warts. Legs dusky, furnished with the usual plicæ and scales, the femora and tibiæ with a small area on the inner side of each, echinate with rows of small pointed papillæ. Tail with six rows of pointed papillæ, unarmed at the end. Shell yellowish, exactly elliptical, convex, declivous on all sides, nearly perpendicular behind, subcarinate on the vertebral line; spotted with dark brown particularly on the upper part. Vertebral scuta imbricate, the first triangular with the apex truncate and the base nearly straight, applied to the nuchal and more than half of the first marginal, second, third and fourth urceolate, hexagonal, the upper face emarginate, the lower rounded, the fifth pentagonal, the upper face narrow and emarginate, the two basal faces incurved and applied only to the last marginal. First lateral, large, unequally four sided, the lower side curved, and three times as long as the upper, second and third pentagonal, fourth quadrangular, the posterior lateral angle widely emarginate by the curved upper side of the penultimate marginal, so as to give the figure another side; nuchal plate small linear, the other marginals oblong four sided, nearly equal, except the two last which are much higher, and nearly equal. their upper faces curved. Sternum yellow, narrow, wings very much produced, before truncate and entire, behind widely emarginate, valved as in the last. Gular plate small, irregularly triangular, pectorals four angled, all the sides more or less curved, the posterior lateral angle projecting a little beyond the next scutum, brachials four sided, the upper side concave, the outer convex. Abdominals four sided, wings long and narrow, axillary and inguinal plates semi-oval, the first produced anteriorly, the other posteriorly to a point; femorals triangular, the apex widely truncate, the posterior exterior angle projecting beyond the next scutum which is four sided; the upper side oblique inwardly, the lower concave.

Length 3.8, breadth 2.7, height 1.45. Sternum length 2.6, breadth at the valve 1.4, tail 1.5.

Besides these, there are four species described by others which I have never seen, namely, *K. hirtipes* Wagler. descript. et icones. tab 630. *K. brevicaudatum* Spix. Rept. Braz. p. 18, tab. xiii. *K. cruentatum* Cat. Mus. Jardin des plantes, and *K. Doubledayii* Gray, Cat. Brit. Mus. *and hoblingum Gray, ib.*

In the imperfect monograph of the Tortoises of the United States, published in the Annals of the Lyceum of Natural History of New York for the year 1829, I complained that no arrangement of these animals had yet been offered to the world which I could consent to adopt. This defect has not yet been remedied, nor since then have the various suggestions offered by different naturalists been at all satisfactory. Every scheme for the arrangement into families and groups, has evidently not been founded on natural and philosophical principles. Most writers on Herpetology appear to have devoted their time, not to the discovery of the affinities of the objects they were describing, but to changing the names of the genera and the species, and to making species out of the slightest varieties; thus clogging the science with useless and absurd synonyms.

The simplicity of my arrangement, which divides the whole order into four great families, and these again, when necessary, into groups, will I hope recommend it to notice. I owe this arrangement, in a great degree, to the suggestions of my son.

FAMILIA PRIMA.

Pedes penniformes. *Sternum* osse episternali postice producto.

1. CHELONE Brog. Corpore scutato. *Sternum* scutellis pluribus a testa seiunctum. *Caretta* Merr. et Bon. *Coriudo* Flem. *Thalassochelys* Fitz.

2. SPHARGIS Merr. Cute coriacea. *Coriudo* Flem. *Dermatochelys*, Blainv. *Scytina* Wagl.

FAMILIA SECUNDA.

Pedes compressi, ungulati. *Sternum* scuto singulo (abdominali) alato, alarum marginibus non inflexis.

A.

Sternum osse episternali postice producto.

1. CHELYDRA Schw. Corpore scutato. Sterno scutis 10; abdominalibus luxatis alas formantibus. *Chelonura* Flem. *Rapara* Gray. *Saurochelys* Lat. *Emysaurus* Dum.

2. STAUROTYPUS Wagl. Corpore scutato. Sterno antice mobili, scutis septem, brachialibus et gularibus nullis, anali unico.

3. TRIONYX Geoff. Cute coriacea. Ossibus marginalibus nullis. *Gymnopus* Dum. *Amyda* Schw. *Playtpeltis* Fitz. *Pelodiscus* eiusdem.

4. EMYDA Gray. Cute coriacea; ossibus marginalibus distinctis. *Trionyx* Wagl. *Cryptopus* Dum.

B.

Sternum plus minus uni-vel-bivalve, osse episternali maximo, entosternali obsoleto (in pullis rudimentali) alis a scuto abdominali solum proiectis.

1. KINOSTERNUM Wagl. Alis scutellis duobus addititiis, sterno scutis 11.

Staurotypus in parte Dum. *Sternotherus* in parte Bell. *Cistudo* Say.

FAMILIA TERTIA.

Pedes ungulati plerumque compressi. *Sternum* scutis duobus alatis (pectoralibus abdominalique;) alarum marginibus, excepta Cistudine, fortiter inflexis; scutis caudalibus duobus distinctis.

§ a. *Sternum* scutis 11 s. 12 tectum; unguibus 5-5, 4-5, 4-4, vel 4-3.

1. EMYs. Sterno solido sutura laterali ossea, scutis gularibus duobus. Alis scutellis duobus addititiis. Unguibus 4-5 vel 4-4. Includitur genus Lessonianum *Tetronyx*. *Rhinoclemys* Fitz. *Terrapene* Bon. *Clemmys* Wagl. *Geomys* Gray.

2. PLATYSTERNUM Gray. Sterno solido, sutura laterali ossea, scutellis tribus addititiis a scutis marginalibus seiunctum.

3. TELEOPUS* Lec. Terrestris. Sterno solido, sutura laterali ossea, alis scutellis additiis duobus; scutellis brachialibus luxatis et quasi inter marginem pectoralis inferiorem et abdominalis superiorem propulsis, unguibus 5-5. Transistum facit ad familiam quartam.

4. LUTREMYS Gray. Terrestris. Sterno diviso antice mobili, sutura laterali ligamentosa, alarum marginibus inflexis. *Cistudo* Auct.

5. †CISTUDO Fleming. Sterno diviso antice et postice mobili sutura laterali ligamentosa, alis nullis unguibus 4-5 vel 4-3. *Terrapene* Merr., &c., *Pyxidemy* Fitz., *Onychotria* Gray, *Emys* Schw.

§ β. Sternum scutis 13 tectum.

6. CHELYS Dum. Labiis carnis. *Matamata* Merr.

7. CHELODINA. Labiis sicut, in omnibus sequentibus, corneis. Alis scutellis additiis nullis, scuto gulari intermedio luxato et inter scuta brachialia et pectoralia, infraque gularia duo reliqua posito; unguibus 4-4. *Chelidonia* Bon. *Hydromedusa* Wagl., *Emys* Schw., *Hydraspis* Bell et Gray.

8. STERNOTHÆRUS Bell. Sterno diviso antice mobili. Alis scutellis additiis nullis, scuto nuchali nullo, marginalibus 24. *Emys* Schw., *Terrapene* Merr., *Pelusios* Wagl.

9. PENTONYX Dum. Sterno solido, alis scutello additio posteriore: scuto nuchali nullo, marginalibus 24; unguibus 5-5. *Emys* Schw., *Pelomedusa* Wagl., *Hydraspis* Gray.

10. PLATEMYS. Alis scutello additio parvo anteriore. Testa scuto nuchali, marginalibus ideo 25. *Rhinemys* Wagl., *Phrynops* eiusdem, *Emys* Schw., *Hydraspis* Gray.

11. PODOCNEMIS Wagl. Alis sine scutello additio. Testa scuto nuchali magno lato. *Peltocephalus* Dum., *Emys* Spix, *Hydraspis* Gray.

* *Teleopus luxatus*. Shell very dark brown, almost black, somewhat flattened along the vertebral line, declivous behind, a little expanded in front, nearly perpendicular on the sides. First vertebral plate six-sided, of the form of a heraldic shield, with the point truncate, the posterior side recurved, 2d, 3d and 4th six-sided, the lateral faces half the length of the anterior or posterior sides; 5th four-sided, the anterior face recurved, the posterior incurved, very wide with four facets. First lateral three-sided, the anterior side with four facets: the rest four-sided, superior and inferior sides angled, the inferior side of the third with three facets, the superior side of the fourth oblique backwards, the inferior curved. Marginals, nuchal oblong rectangular, the rest nearly square, the 2d, 6th, 7th, 9th and 11th superiorly angled. Caudals two. Sternum emarginate at both ends, posteriorly more deeply and widely; gulars triangular, blunt and somewhat rounded at the point; pectorals irregularly four-sided, the posterior lateral angle cut off and emarginate by the displaced brachial; this last is of an oblong shape, the superior face emarginate, the inferior straight, and the two lateral rounded; abdominals very wide, irregularly eight-sided, the posterior exterior side short and emarginate; supplementary scutellæ small; femorals four-sided, the exterior lateral face oblique inwardly; anals right angled triangular, the hypothernuse curved. Upper jaw with three rows of serrate teeth, the lower with two, the outer ones the finest. Toes and claws 5-5, fore claws long and rather sharp; hind feet clavate, claws nearly globular, the innermost one wide and flat, the edge rather sharp. Length 17 in., width 11.5, height 6.5.

Inhabits Java; must, from its shape, be terrestrial in its habits.

It possesses a strange mixture of the characters of this family with those of the next.

† Etiam si in hujus generis animalibus adultis alia sterni iunctura cum testa non apparet præter ligamentosa sine alis, tamen pullorum sternum evidentur alis est instructum, quæ testa scutellis quatuor seiunguntur. Nares subtubulosæ sunt, aliis rebus ad Emydes respiciunt. *Cistudo* clausa omnino et præcipue terrestris. Dubito revera num natare potest. Pulli in aqua iacti semper merguntur. Hæc natura terrestris cum cute squamosa apte ad Testudines iungit.

FAMILIA QUARTA.

Terrestres. Corpus scutatum. Sternum alatum, sutura laterali ossea, alarum marginibus fortiter inflexis. Pedes clavati, unguati; scutum caudale nunquam divisum, sed stria superiore perpendiculari fortiter impressa, qua in partes duas secari videtur.

1. TESTUDO. Alis scutellis addititiis nullis, scuto gulari in partes quatuor diviso, dorso osse penultimo vertebrali V-formi. *Chersine* Merr., *Chersus* Wagl., *Psammobates* Fitz., *Geochelone*, *Chelonoides* et *Cylindraspis* eiusdem.

2. PYXIS Bell. Sterno articulado, antice mobili. Alis scutellis addititiis duobus.

3. HOMOPUS Dum. Sterno solido, alis scutello additio anteriore; unguibus 4-4. *Chersine* Merr., *Testudo* Bell et aliorum.

4. KINYXIS Bell. Sterno solido, alis scutellis addititiis duobus. Testa postice articulata et mobili, scuto nuchali nullo.

I add a list of American species of Testudinata, as far as they have yet been described; many undoubtedly yet remain to be added to it, as few have been received from Texas, California and Oregon. I have omitted the sea tortoises because we know nothing about such as are found on our coasts. All the synonyms which I have been able to collect are here set down. This will serve to show the state in which the science of this branch of Herpetology is at present, as far as relates to our country.

I have in the following Catalogue considered the *Testudo polyphemus* as the T. Carolina of Linnæus and Gmelin, and the T. Carolina of authors as the T. clausa of the latter. My reasons are these: The original description in the 12th edition of the Syst. Naturæ, vol. i. p. 352, is as follows:

TESTUDO CAROLINA. Pedibus subdigitatis, testa gibba, cauda nulla. Test. pedibus digitatis, calloso-squamosis; testa ovali, subconvexa, scutellis planis, striatis, medio punctatis. Gron. Zooph. 17, No. 77. T. tessellata minor caroliniana. Edw. Av. tab. 205, (undoubtedly the Clausa;) Seba. Mus. 1 tab. 80 figs. Test. major terrestris americana, (which is represented as 9 inches long.)

To this Gmelin adds: Caput subobtusum, squammis obtusis undique tectum. Pedes squammis orbiculatis obtecti, antice unguibus 5 postice 4 subulatis, acuminatis validis armati. Cauda brevissima. Scutum ovale, subconvexum antice lunulato-excisum margines acuti nec serrati. Scutella lata ad margines striis cincta, centro punctis excavata. Sternum acuminato-truncatum postice bifidum. Erasing the words in italics, this is a tolerable description of the large American land tortoise, and Gmelin certainly had it in view when he made his addition to the original description. His expression, "Sternum antice truncatum postice bifidum," together with the scaly head, prove this. The scuta of young animals of this species are deeply marked with concentric striæ, and have a nearly square area in the centre of each, which is deeply and coarsely punctate. The name of *Polyphemus* which has been given to it, means nothing; that of *Carolina* is much more fitting; and as for the other species which has been called *Carolina*, nothing can be more appropriate than *Clausus*.

It will be observed likewise that I have called the *Cistudo Blandingii* of Holbrook, *Lutremys meleagris*. About the generic name there can be no dispute; but as for the specific name, my reasons for referring it to a species already described are these. The *Testudo meleagris* of Shaw, Naturalist's Miscellany, vol. iv. p. 144, has been considered as identical with the *Lutremys Europæa*, and is always quoted as a synonym of it. Shaw tells us that his animal came from America; the other is, I believe, exclusively European. Both species are remarkable for having the shell more or less covered with small yellow spots; in the first these are irregularly scattered over the surface, in the latter they regularly radiate from a centre on each scutum; the shell is also less convex.

CATALOGUE OF AMERICAN TESTUDINATA.

CHELONURA SERPENTINA. *Emysaurus aliorum*.

CH. TEMMINCKII Holbrook, vol. i. p. 134.

TRIONYX FEROX Auct. *T. Bartrami*, Geof. Ann. Mus. vol. xiv. p. 18. *T. georgicus* ejusd. l. c. p. 7. *T. spiniferus* (spinifer,) Lesueur, Mem. Mus. vol. xv. p. 255. *Aspenodectes ferox* Wagl. p. 134. *Gymnopus spiniferus* (spinifer,) Dumeril, Erpetol. xi. p. 477.

T. MUTICUS Lesueur. l. c. p. 263.

KINOSTERNUM PENNSYLVANICUM. *Terrapene penns.* Merrem, Syst. p. 27. *Emys id.* Schw. vol. i. p. 437. *Cistuda id.* J. A. N. S. vol. iv. p. 204.

K. SONORIENSE Lec.

K. ODORATUM. *Terrapene odorata et Boscii* Merrem, l. c. p. 27. *Cistudo odorata* Say, l. c. *Emys odorata* Schw. l. c. p. 437. *Test. glutinata* Daudin, vol. xi. p. 194. *Sternotherus odoratus* Bell, Zool. Journ. vol. xi. p. 307. *Staurotypus odoratus* Dumeril, l. c. p. 358.

K. GUTTATUM Lec.

CISTUDO CLAUSA. *Cistudo carolina* alior. *Test. virgulata* Lat. Hist. Rep. vol. i. p. 100. *Emys clausa* Schw. vol. i. p. 315. *Emys virgulata* ejusd. ib. p. 316. *E. Schneideri* ejusd. ib. p. 317. *Terrapene carolina maculata et nebulosa* Bell, Zool. Journ. vol. xi. p. 309. Var.? *Onychotria mexicana* Gray, Proc. Zool. Soc. vol. 17, p. 16.

LUTREMYS MELEAGRIS Turton's Lin. Syst. Nat. vol. i. p. 645; Nodder and Shaw, Nat. Miscel. vol. iv. p. 144. *Cistudo Blandingii* Holbr. vol. i. p. 39.

EMYS MUHLENBERGII Schæpf. p. 132. *Chersine Muhlenbergii* Merrem. *E. biguttata* Say, l. c. p. 212.

E. SERRATA Daudin, l. c. p. 145. *E. scripta* Gray, Rep. p. 29, who quotes Schæpf, where is figured a young animal which it is impossible to refer to any species.

E. RUGOSA Shaw, Zool. vol. iii. p. 28. *E. rubriventris* Lec. Ann. Lyc. vol. iii. p. 101. *E. irrigata* Dum. l. c. p. 276. *E. serrata* Say, l. c. p. 204. Varies very much, but the essential character is in the dentation of the jaws.

E. RETICULATA Latr. vol. i. p. 124.

E. FLORIDANA Lec. Ann. Lyc. l. c. p. 100.

E. MOBILIENSIS Holbrook, l. c. p. 71.

E. CONCINNA Lec. l. c. p. 106.

E. OREGONENSIS Holbr. l. c. p. 107.

E. HIEROGLYPHICA Holbr. l. c. p. 111. *E. ornata* Gray, Rept. p. 50. *E. annulifera* ejusd. ib. p. 52.

E. CUMBERLANDENSIS Holbr. l. c. p. 115.

E. TROOSTII Holbr. l. c. p. 123.

E. INSCULPTA Lec. Ann. Lyc. vol. iii. p. . *E. scabra* Say, l. c. p. 210. *E. speciosa* Gray, l. c. p. 26.

E. GEOGRAPHICA Lesueur. *E. pseudogeographica* ejusd. Holb. vol. i. p. .

E. PALUSTRIS Linn. *E. terrapene* alior. *E. centrata et concentrica* quorund.

E. PICTA. *T. cinerea* Schæpf. tab. iii. f. 2 and 3, is a young one.

E. GUTTATA. *E. punctata* Schæpf.

TESTUDO CAROLINA. *T. polyphemus* aliorum.

In the Catalogue of Amphibia in the collection of the British Museum, and in that of the Jardin des Plantes, the following species of tortoises are mentioned as coming from the United States. In the English Catalogue are described *Emys rivulata*, *E. scripta*, *E. Holbrookii*, *E. macrocephala*, and *E. Bennetii*. Not having these, and knowing that the descriptions must have been taken from dried and faded specimens, or from such as were bleached by long immersion in

alcohol, I do not hesitate to pronounce them as having no real existence as distinct species, or at most as being slight variations from others well known and long ago determined.

The *Kinosternum Doubledayii*, however, forms an exception. It appears to be certainly a new and hitherto undescribed animal, although what Mr. Gray says of it is scarcely sufficient to distinguish it. M. Dumeril's *E. labyrinthica* seems to be nothing more than *E. hieroglyphica* of Holbrook, slightly varying in the disposition of the marks and lines on the shell; his *Kinosternum cruentatum* is probably not from this country; it is a well marked and distinct species.

The following species, retained in most of our books, ought to be struck out. In Schæpff, *Testudo tricarinata*, a young animal of some *Kinosternum*; *T. cinerea*, a young *picta*; *T. scripta*, a young *serrata* or *reticulata*; *T. rostrata*, a young *Trionyx*. And from Linnæus, *Syst. Nat.*, *T. membranacea*, which is likewise a young *Trionyx*; *T. scabra*,—the description has been made from an immature specimen, which, if full grown, might have been smooth; *T. carinata*; *T. sulcata*; and, finally, *T. squamosa*, which is not a Chelonian.

Observations on the Vespertilio leporinus of Linnæus.

By JOHN LE CONTE.

Our associate Dr. Woodhouse, some time ago gave me for examination a species of Bat found by him in the province of Honduras, which is undoubtedly the *Noctilio dorsatus* of Geoffroy de St. Hilaire, the *Vespertilio leporinus* of Linnæus, i. p. 47, although the description of "the illustrious Swede" is rather short and imperfect. Schreber vol. i. p. 163 tab. 60 describes and figures it as a *Noctilio* retaining the Linnean specific name. Wagner, in his supplement to the work of this last author vol. 1 p. 451, calls it *N. dorsatus* and considers it the same as the *albiventris* of Spix. Sim. et Ves. Brazil tab. xxxv. fig. 2 and 3, and the *N. affinis* of D'Orbigny Voy. vol. iv. p. 42 p. 12. The *N. unicolor* of Wagner is probably the same. Indeed the author observes, that it only differs in color from the other species which he describes; which is a matter of very little consequence in any of the *Vespertilionidæ*. Every species of this family is so variable in this respect as to forbid its being taken as a criterion of difference. There will therefore be but one species of this genus, and for the name of this we must revert to Linnæus and resume the old name of *leporinus*, although this appellation was founded in error, the upper lip not being cleft, but in recent specimens covering the incisors. In dried animals it shrinks and becomes drawn up in such a manner as to leave the upper fore teeth exposed, and to represent a very bad case of hare lip.

The animal from which the following description was taken, was in its most perfect state of development; at that period of its life when it would be called neither young nor old. It certainly had but two upper incisors nor was there any appearance of there ever having been any others; in their shape they resemble canines, and like them are furnished with an interior lobed calcaneum. The lower incisors are deeply emarginate and may in some instances be taken for four distinct teeth.

The upper fore teeth of Cheiropters offer a very interesting subject for investigation, whether what are so-called are in reality incisors, or not more properly canines. It is now generally allowed that no teeth ought to be called incisors unless they spring from the intermaxillary bone; now whether in those animals where there is no nasal bone and the front of the upper jaw is excavated, and this excavation reaching to the end of the *os frontis*, they can be said to have any *os intermaxillare*, I have not been able to determine. In the frugivorous bats which have regular incisors in the upper jaw, the cranium entirely wants this frontal excavation, and is furnished with nasal bones in as much perfection as any other mammal. The determination of this point must be left to others; it is sufficient that I have hinted at the circumstance. It appears to me that some species of *Taphizous* may belong to this genus; not however having specimens to compare I cannot pronounce positively. The generic essence of our animal,



Le Conte, John. 1854. "Description of four new species of Kinosternum."
Proceedings of the Academy of Natural Sciences of Philadelphia 7, 180–190.

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