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NORTH AMERICAN HERPETOLOGY;

OR,

A DESCRIPTION

OF THE

REPTILES INHABITING THE UNITED STATES.

BY JOHN EDWARDS HOLBROOK, M. D.

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TO

GEORGE EDWARDS, ESQ.,

OF

CHARLESTON, SOUTH CAROLINA,

THIS WORK IS RESPECTFULLY DEDICATED,

BY HIS NEPHEW,

JOHN EDWARDS HOLBROOK.

PUBLISHER'S NOTICE.

In consequence of the great number of new Reptiles received by the Author, and the demand for the first three volumes, it became necessary either to reprint them, or to make a new edition—the latter course has been preferred, thus enabling the Author to introduce the new animals in their proper places, and to add a number of *new plates;*—it may be added, that many of the Plates have been re-engraved and improved.

J. DOBSON.

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PREFACE.

In undertaking the present work I was not fully aware of the many difficulties attending it—indeed they could hardly have been anticipated. With an immense mass of materials, without libraries to refer to, and only defective museums for comparison, I have constantly been in fear of describing animals as new that have long been known to European Naturalists. In no department of American Zoology is there so much confusion as in Herpetology. This is to be traced partly to the earlier Naturalists, partly to the practice of describing from specimens preserved in alcohol, or from prepared skins. I have endeavoured to avoid error in this respect, by describing in almost every instance from the living animal, and often after a comparison of many individuals.

I consider myself fortunate in having secured the assistance of so good an artist as Mr. J. Sera, an Italian by birth, but long resident in the United States, who has caught the character and attitude of the animals with singular felicity. The colouring of the plates may be fully relied on, as almost every one was done from life; and when coloured from dead animals, it is always mentioned in the description, so that no one may be deceived.

In presenting the first volume of North American Herpetology, I have to return my thanks to those gentlemen who have aided me in the undertaking—and especially to my colleague, Dr. Ogier, of Charleston, who is associated with me in my dissections, the result of which will be given in the Anatomy of the Genera.

To Dr. Wurdeman and Dr. Baron, of Charleston, for many beautiful anatomical preparations, especially of the Chelonian and Saurian animals.

To my friend Dr. Geddings, Professor of Surgery in our Medical College, I am greatly obliged for many curious observations on the Reptiles of the low country of Carolina.

To Dr. Harlan, of Philadelphia, for the use of his library and private notes on Reptiles, and for a fine specimen of Cistuda Carolina.

To Dr. Binney and Dr. Storer, I owe many thanks for numerous specimens of Reptiles of the northern states, with observations on their habits.

To Professor Troost, of Nashville, Tennessee, for many of the Reptiles of the west, accompanied with valuable observations, as will appear in the progress of the work.

Thomas M. Logan, M. D., formerly of Charleston, now residing in New Orleans, I have to thank for a number of beautiful drawings of Serpents, Salamanders, &c., which will appear in the progress of the work.

To Miss Martin, of Charleston, my thanks are also due, for some accurate and very spirited drawings of Carolina Reptiles.

To the Reverend John Bachman, of Charleston, I am indebted for many interesting remarks on the habits of our Reptiles, particularly those of the Alligator.

I have to thank Professor Jacob Green, of the Jefferson Medical College of Philadelphia, perhaps more than any of my friends, for observations on the Ecaudate Batrachian animals, the habits of which family he has investigated with great success; and also for the use of his notes on the Reptiles generally.

Charles Hammond and Ogden Hammond, Esqs., of West Chester, New York, have also furnished me with beautiful specimens of the Emys picta, with remarks on their hibernation.

Major Leconte has, with a liberality that distinguishes the true lover of nature, rendered me essential service in placing at my disposal his notes on Reptiles, accompanied with beautiful drawings, the labour of many years.

But, above all, I am indebted to Dr. Charles Pickering, of Philadelphia, who has aided me with his accurate knowledge at every step of this work.

The work will be arranged in two parts:—

Part I. treats of the external forms, colour, habits, geographical distribution, &c.

Part II. will embrace the anatomy and physiology of each genus, illustrated with drawings of the different organs.

It would have been better, perhaps, to have given the special anatomy of the animal at the same time with the description of its external characters; but as the work is published by subscription, the plan adopted was thought most advisable, as either part may be had separately.

For the arrangement of the order Chelonia, I have followed that of Dumeril and Bibron, and have adopted the genera that they have either received or established in their work, as far as our reptiles are concerned, with one or two exceptions, which will be found in the body of the work.

For the order Sauria I have also chosen the classification of Dumeril and Bibron, in preference to that of any other naturalists, and have consequently adopted it as far as it applies to the Saurian animals of the United States, with a few exceptions, and the addition of one new genus, Crotophytus, for a western Lizard, which could not be referred to any of theirs.

For the order Ophidia, I have preferred the classification of Cuvier, though I have been obliged to deviate from it in some particulars, either adding such genera as seemed to me necessary, from other naturalists, as Wagler, Boie, Kuhl, &c., or establishing new ones.

For the order Batrachia, and class Ecaudata, I have followed generally the classification of Dumeril and Bibron, and have received most of their genera as far as they embrace our Reptiles.

For the class Caudata I have adopted in part the arrangement of Cuvier, and in part that of Fitzinger.

A word or two with respect to the use of specific names.—I have endeavoured invariably to retain, with the name of the Naturalist describing it, that by which the animal was first made known. These should always be retained, even if bad, though the generic names may, indeed must, often be changed, according to the light thrown by anatomical investigation upon the affinities that animals bear to each other in their structure and organization. Thus in assigning the Emys Floridana to Leconte, I only mean to retain the specific name given by him to a certain animal which he first described; and it is not to be supposed that he established the genus Emys, any more than the genus Testudo, (Testudo Floridana,) to which he refers it.

I have only here to do with species and specific names; in the anatomical part of this work it will be shown why one generic name is preferred to another. In the catalogue of synonymes will be seen not only the different specific names, but also those of the genera under which different Herpetologists have arranged our Reptiles.

The habit adopted by several late Naturalists, of changing the names by which animals were first described, even though for better and more characteristic denominations, has already led to great confusion, and must lead to greater, since few persons are likely to agree in the characters they think most important.

"The discoverers of new species have the undoubted right of imposing the names, (specific,) and these ought never to be altered. They may have a harsh sound, be barbarous, or even absurd; yet all these objections are as nothing when compared with the evils accompanying the multiplication of synonymes. Even without any good reason many Naturalists have presumed to change the names which the discoverer of the species imposed upon them, in order to obtain what appears to them uniformity of nomenclature, or rather for the purpose of increasing their own importance.

"The period is probably not very remote, when this mischievous spirit of innovation shall receive an effectual check, in consequence of credit being attached only to those who develop new characters, and not to those who disturb science by the fabrication of new names."

It was my intention on beginning this work, to have included in it descriptions of several new Reptiles, brought from the Oregon Territory and country south of the Columbia river, by Mr. Townsend the Ornithologist, which he kindly placed at my disposal; but having brought them in alcohol, their colours are so much altered, that they cannot be relied upon for truth; I have, therefore, thought it best to publish them separately, uncoloured, in the Journal of the Academy of Natural Sciences of Philadelphia.

As it is, the work will, with a few exceptions, embrace descriptions of such Reptiles only as inhabit the United States, from the Atlantic Ocean to the Rocky Mountains, and from Canada to the confines of Texas.

Whatever merit the work may possess, must be determined by Naturalists; my own wishes will be gratified, if I have either restored or given order to North American Herpetology.

JOHN EDWARDS HOLBROOK.

Medical College, Charleston, South Carolina, 1842.

NORTH AMERICAN

HERPETOLOGY.

INTRODUCTION.

Reptiles form the third great class of vertebrated animals. They are beings provided with lungs, a simple heart, low temperature, slow digestion, and oviparous generation; having neither hair, feathers, nor mammæ.

Naturalists have experienced much difficulty in giving an appropriate name to this great class of animals. Linnæus, observing some of the most remarkable phenomena in the economy of Reptiles—as their being able to live on land or in water—called them amphibia. The term is inappropriate; for it can be applied but to a very small number; as many never approach the water, and few, like the Sirens, can respire in this element;—breathing with lungs, others must approach its surface for atmospheric air. The respiration of young Batrachia is indeed only in water; but they have gills, and when the animal arrives at its perfect state of development, these disappear, and are succeeded by lungs. An animal, to respire equally well on land or in water, must have both gills and lungs; gills to breathe in the water, as Fishes, and lungs to respire atmospheric air, as Birds and Mammalia. The Sirens of our rice-fields, and the Menobranchi of the great northern lakes, are the only North American Reptiles that have this structure;

and are consequently our only really amphibious animals. However inapplicable the term amphibia may be to these animals, many writers have followed the example of the great Swedish naturalist. Brisson* was the first who arranged them under the name Reptiles;† which term will be adopted in this work as more indicative of their habits than the word amphibia.

The science which treats of the form, organization, habits, and history of Reptiles, is named Herpetology;‡ and has been more neglected than all other branches of Zoology; for the study of Reptiles offers difficulties more numerous and insurmountable than those presented by any other class of vertebrated animals. Inhabiting, for the most part, deep and extensive swamps, infected with malaria, and abounding with diseases during the summer months, when Reptiles are most numerous, time is wanting to observe their modes of life with any prospect of success. Regarded, moreover, by most persons as objects of detestation, represented as venomous, and possessed of the most noxious properties, few have been hardy enough to study their character and habits.

Though wanting the gracefulness of form of some Mammalia,—though without the beauty of plumage of some Birds, or the intelligence of others,—though they lack the brilliancy of colour and wonderful instinct of the insect tribe,—still the Reptiles offer many striking points of interest to the student of nature. To one who would trace the chain of organized bodies, their connexion, their relation with each other, and with the great whole, the study of Herpetology is highly interesting and important. The Reptiles occupy a prominent place in the scale of creation. Neither the highest, nor yet the lowest of vertebrated animals, they fill a space between the Birds and Fishes, and without them a vast link in the chain of animated beings would be wanting. Elevated above the Fish by the

* Regne Animal. divisé, &c. Paris, 1756.

† Dumeril observes the term had been previously used by Lyonnet. Hist. Nat. des Rept., tom. i. p. 2.

‡ From ἑρπετον, a reptile, λόγος, a discourse.

presence of lungs and articulated members, yet inferior to Birds from having cold blood, a simple heart, and a less degree of sensibility, these animals, by their multiplied and extremely diversified forms, make the medium of connexion between beings of the most opposite character. The Testudo connects them with the inferior Mammalia, as with the Armadillo, on the one hand, while the Siren approximates them to the cartilaginous Fishes on the other. Serpents form a link of another series, connecting this class with osseous Fishes, as with the Eel; and the Flying Lizard connects them with the Birds.* In order to estimate properly the rank these animals hold in the scale of creation, it is necessary to examine the general and principal points of their organization—to study the number of their senses, and their degree of perfection. Without this, we cannot understand the diversified forms and the shades of life that present themselves in such infinite variety among them. Their conformation and modes of life are so different—some being organized for creeping, others for walking, for swimming, and even for flying, that it would be impossible to generalize their anatomical forms or structure. We cannot give the structure of one as the type of organization in all the others; for their variation in shape and figure is attended with modifications of their internal organs. These differences of structure will be fully described in the anatomical part of this work; at this time, according to the plan proposed above, it can only be said that the difference of organization observed in different species, led Brogniart to arrange them all in four great orders—I. Chelonia. II. Sauria. III. Ophidia. IV. Batrachia.

* Carus, Vergleich. Zoot. Erst. Theil., p. 25.

Order I. CHELONIA. *Brogniart.*

CHARACTERS.

1. The body is protected by a bony covering formed of the vertebræ of the thorax, back and loins, and by the ribs, of which there are eight pair, greatly developed, and joined to each other by suture; under this shell or carapace are placed the bones of the shoulder and pelvis, and beneath it can often be retracted the head and anterior extremities in front, and the posterior extremities and tail behind.

2. This bony box is completed below by a broad sternum or plastron formed of several pieces joined solidly to each other, and most commonly also to the carapace or shell.

3. The head, neck, and tail, are the only movable parts of the spinal column.

4. The jaws are covered with a horny substance; and are always destitute of teeth, properly speaking, though their cutting margins are often serrated.

5. The nostrils are anterior, approximated, and are simple or tubular.

6. The eyes are always furnished with three lids.

7. The external meatus of the ear is covered with the skin.

8. The tongue is fleshy, short, thick, depressed, and covered with fleshy filaments.

9. The lungs are extensive, and are placed in the same cavity with the other viscera.

10. The heart is composed of two auricles, and of one ventricle, subdivided in two unequal cavities that communicate with each other, so that the current of blood from the lungs and that from the body generally, are more or less mingled in passing through the ventricle.

11. The stomach is simple and very strong, with thick walls. The intestines are of moderate length and destitute of a cœcum.

12. The eggs are round, and the shell more or less firm.

13. The young undergo no metamorphosis, but resemble the parent in general form, from the time they leave the shell.

This order, in the twelfth edition of the Systema Naturæ of Linnæus, comprised only fourteen species, all united in one genus Testudo; it now includes about eighty, distributed in several different families and genera.

Family I. CHERSITES. *Dumeril et Bibron.*

CHARACTERS.

1. The body is short, oval, convex, and protected above by a shell or carapace, covered with plates, of which there are thirteen dorsal, never imbricated, and from twenty-three to twenty-five marginal. Under this carapace the animal can retract the head, neck, extremities and tail.

2. There is a bony sternum or plastron below, which is most commonly covered with twelve plates, sometimes with eleven only.

3. In some the anterior part of the sternum is movable; (Pyxis, Bell;) in others the posterior; (Chersus, Wagler;) and in others again both anterior and posterior sections are movable; (Cistuda.)

4. The head in all is small, short, and quadrilateral.

5. The nostrils are anterior, closely approximated, and just above the median border of the horny covering of the upper jaw.

6. The eyes are lateral, and are always nearer the snout than the occiput. They are small, with the lids opening obliquely, so that the anterior canthus is on a plane with the nostrils, while the posterior is much more elevated. The inferior lid is most movable.

7. The membrane of the tympanum is always apparent, circular and large.

8. The mouth is small, with the horny or cutting margin of the jaws often serrated.

9. The tongue is thick and papillated, and fills the concavity of the lower jaw.

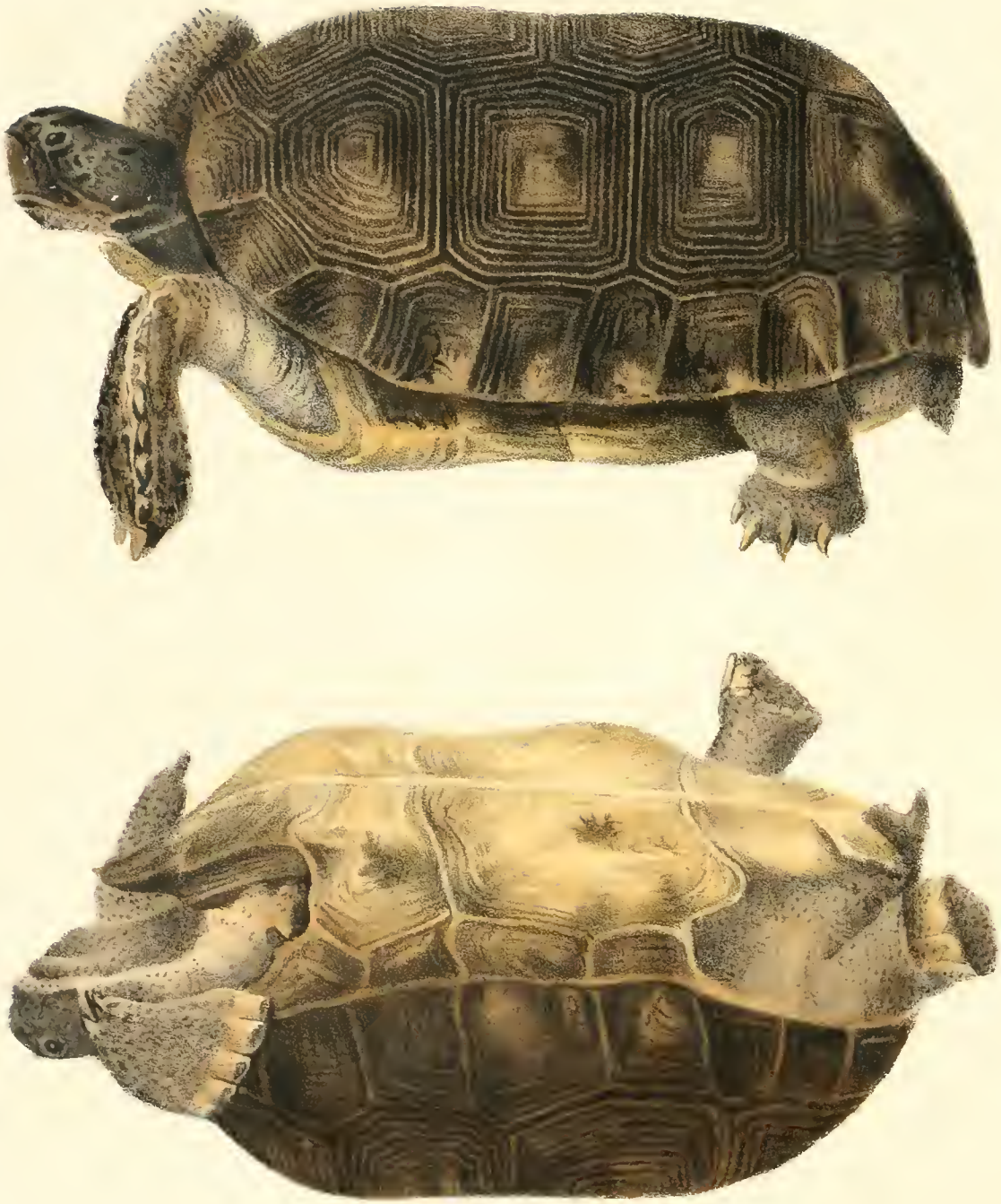
10. There are never barbels at the chin, or cutaneous appendages at the neck.

11. The extremities are of equal length; the hand is confounded with the fore-arm, having only a slight fold at the carpus; the fingers are not in general distinct, but are united in a mass and covered by a thick skin. With one exception, all have five nails, which correspond with the phalanges. The posterior extremities are elavate, and often resemble much the legs and feet of the elephant, and have four nails.

12. The tail is short and conical.

13. The eggs are round, and have a hard shell.

Of Chersites, only two genera inhabit the United States, Testudo and Cistuda; which last genus I have thought best to unite with this family, because it is really a land animal and agrees perfectly with that tribe in its habits. In some parts of its organization, however, as in the extremities, the genus Cistuda approaches that of Emys so much, that it may fairly be considered a connecting link between the land and fresh-water forms of Tortoises; yet it stands much better at the termination of the Chersites, than at the head of the Emydæ. Its proper place I consider to be after the genus Pyxis, of Bell; which is the beginning of the transition. In this the anterior portion only of the sternum is movable; and here for the first time is seen in the extremities "an approach to the palmated conformation of the Emydæ, and the claws are observed to assume somewhat of the length and sharpness that characterize the fresh-water family." In Cistuda, both valves of the sternum are movable, and the extremities still more depressed.



Testudo polyphemus

On Stone by S. Cichowski

P.S. Duval Lith. Phila.

TESTUDO.—*Brongniart, Dumeril et Bibron.*

Genus Testudo.—Characters. Body protected by a horny covering; shell (carapace) solid; sternum (plastron) solid and immovable; jaws without teeth; extremities short, thick, and clavate; toes short, closely joined, and covered by the integuments as far as the nails; anterior extremities with five, posterior with four short strong conical nails; head and extremities retractile within the shell.

TESTUDO POLYPHEMUS.—*Daudin.*

Plate I.

Characters. Shell subround, entire, depressed, ecarinate; supra-caudal plate single and incurvated below; sternum elongated, projecting beyond the shell in front, and deeply emarginate behind; colour of the shell brown, tinged with obscure yellow, clouded with darker brown; sternum yellow.

Synonymes. Gopher, *Bartram*, Travels in the Floridas, Carolinas, &c., p. 182.
Testudo polyphemus, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 256.
La Tortue Gopher, *Bose*, Nouv. Dict. d'Hist. Nat., tom. xxii. p. 269.
Testudo polyphemus, *Say*, Jour. Acad. Nat. Scien., vol. iv. p. 207.
Testudo carolina, *Leconte*, Lyc. Nat. Hist. N. Y., vol. iii. p. 97.
Testudo polyphemus, *Harlan*, Jour. Acad. Nat. Scien., vol. vi. p. 21.
Testudo depressa, *Cuvier*, Reg. Anim., tom. ii. p. 10.
Testudo polyphemus, *Gray*, Synop. Rept., p. 11.
Testudo polyphemus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 102.
Gopher and Mungöfa, *Vulgo.*

Description. The shell is remarkably depressed, nearly flat above, with its margin entire, slightly revolute in front, and incurvated posteriorly. The vertebral plates are five in number; the anterior is pentagonal, presenting an obtuse angle forward; the remaining four are hexagonal, the posterior irregularly so. The first lateral plate is irregularly triangular, with its basis rounded and joined to four marginal plates; the second and third are pentagonal, with an acute angle above, passing in between the vertebral plates; the posterior is irregularly quadrilateral, the longest border directed downwards. The marginal plates are twenty-four in number; the intermediate or nuchal is irregularly quadrilateral, and largest behind, where it joins the first vertebral; the supra-caudal plate is single, very large, having twice the extent in the horizontal that it has in the vertical direction, its lower border is incurvated, which gives this plate a remarkable bulging appearance. The first marginal plate is pentagonal, the second square, the third irregularly quadrilateral, and the fourth pentagonal; the four succeeding plates are quadrilateral, and of greater elevation than breadth, slanting a little backwards; the ninth, tenth, and eleventh are irregularly quadrilateral; the tenth having its posterior and superior angle truncated, where it joins the posterior vertebral plate. All these plates are marked with concentric striæ, which are most remarkable on the lateral and marginal, and are often wanting on the vertebral plates. In many old individuals these disappear entirely, and leave the shell perfectly smooth.

The sternum is thick and firm, prolonged beyond the shell in front, and deeply emarginate behind. The gular plates are quadrilateral, and unite to form a spade-like process, with its anterior extremity generally entire, but occasionally emarginate; the brachial plates are quadrilateral, with their outer and anterior angles rounded, the anterior border shortest and oblique in direction to receive the gular plates; the thoracic are very irregularly pentagonal, narrow, and of great extent in the transverse direction; the abdominal are quadrilateral and very large; the femoral are also irregularly quadrilateral, with the longest border directed forwards; the subcaudal plates represent oblong squares, and are most

extensive in the transverse direction. Of the supplemental plates, the axillary are oblong, and the inguinal, semicircular in shape.

The head is short, thick, obtuse, and covered with small plates on the superior parts, and with larger plates in front, which are disposed in rows; one, between the anterior parts of the orbit, consisting of two very large central plates and two external, smaller. In front of this is a second row of six smaller plates, and still anterior to this row are others of smaller size. The nostrils are small and near together. The eyes are large and open; the iris dark; the pupil almost black; the lower lid more extensive than the upper, and both covered with small plates. The jaws are covered with horny plates, grooved, and having their margins serrated: the grooves allow the jaws to be received reciprocally within each other when the mouth is closed. The neck is short, and the skin granulated.

The anterior extremities are very large, thick, compressed in the antero-posterior direction, and terminating in five fingers, each furnished with a thick and strong nail; along the outer margin of the forearm is a row of projecting horny points, resembling nails, large below, and decreasing gradually in size to the humerus. Another remarkably large horny tubercle exists near the internal and anterior part of the elbow. The anterior surface of the forearm and carpus is covered with large plates; the posterior surface of the carpus and lower portion of the forearm with smaller plates; in other parts, the forearm and arm are granulated.

The posterior extremities are rounded, less compressed, short, thick and clavate, ending in four toes, each furnished with a strong nail. The sole of the foot, the lower and posterior part of the leg, and the posterior part of the thighs, are protected by large plates; two remarkably horny points are placed at the posterior and superior part of the thigh; the other parts of the posterior extremities are granulated, and covered with smaller plates.

Colours. The general colour of the shell is brownish-yellow, clouded at times

with a darker brown, which latter colour predominates in some individuals;* the sternum is dirty yellow; the head is darker than the shell, sometimes almost black; the upper jaw is brown, the lower jaw yellowish; the neck and anterior extremities are dusky above, dirty yellow below; the posterior extremities simply dusky in colour.

Dimensions. Length of shell, $14\frac{3}{4}$ inches; sternum, $12\frac{1}{4}$ inches; thigh, $2\frac{1}{2}$ inches; leg, to the centre of the sole of the foot, $2\frac{3}{4}$ inches.

Geographical Distribution. The most northern limit of the Gopher is the western border of South Carolina. They are numerous in Edgefield and Barnwell districts, whence they extend through Georgia, Alabama, and the Floridas. According to Le Sueur, they are brought to the New Orleans market, though probably not from the immediate neighbourhood.

Habits. They select dry and sandy places, are generally found in troops, and are very abundant in pine barren countries. They are gentle in their habits, living entirely on vegetable substances. They are fond of the sweet potato, (Convolvulus batatas,) and at times do much injury to gardens, by destroying melons, as well as bulbous roots, &c. &c. In the wild state they are represented as nocturnal animals, or as seeking their food by night: when domesticated, and I have kept many of them for years, they may be seen grazing at all hours of the day. When first placed in confinement, they chose the lowest part of the garden, where they could most easily burrow; this spot being once overflowed by salt water in a high spring tide, they migrated to the upper part, nearly eighty yards distant, and prepared anew their habitations. They seldom wandered far from their holes, and generally spent part of the day in their burrows. They delighted in the sun in mild weather, but could not support the intense heat of our summer noons; at those hours they retreated to their holes, or sought shelter

* This colour was remarkable in the specimen from which the accompanying drawing was taken.

from the scorching rays of the sun under the shade of broad-leaved plants. A tanyer, (Arum esculentum,) that grew near their holes, was a favourite haunt. They could not endure rain, and retreated hastily to their burrows or to other shelter at the coming on of a shower. As winter approached they confined themselves to the immediate neighbourhood of their holes, and basked in the sunshine. As the cold increased, they retired to their burrows, where they became torpid; a few warm days, however, even in winter, would again restore them to life and activity. The adults are remarkably strong, sustaining and moving with a weight of two hundred pounds or more. The female is generally larger than the male, with the sternum convex; the sternum of the male is concave, especially on its posterior part. The eggs are larger than those of a pigeon, round, with a hard calcareous shell: they are much esteemed as an article of food.

General Remarks. This is the only species of Testudo hitherto observed in the United States; and was first described by Bartram, under the name of Gopher. Daudin subsequently called it Testudo polyphemus; which name has since been generally adopted by Naturalists. Leconte has endeavoured to prove this animal to be the Testudo carolina of Linnæus; which is considered by most authors as the Box Tortoise. From the very short description of the Testudo carolina contained in the twelfth and last edition of the Systema Naturæ, by Linnæus himself, it is not so easy at first sight to determine the point; but if we consult the earlier editions, and compare the descriptions with the plates to which he refers, his meaning becomes evident. In the tenth edition he says, "Testudo pedibus digitatis, testa gibba, cauda nulla;" and the only reference given is to the figure of the Testudo tessellata minor caroliniana of Edwards,* which is certainly the Box Tortoise. Indeed, the figure given by Edwards is so correct and so well coloured, that Shaw afterwards copied it into his General Zoology, observing "that there is no particular necessity for any other description than that given by Edwards himself."†

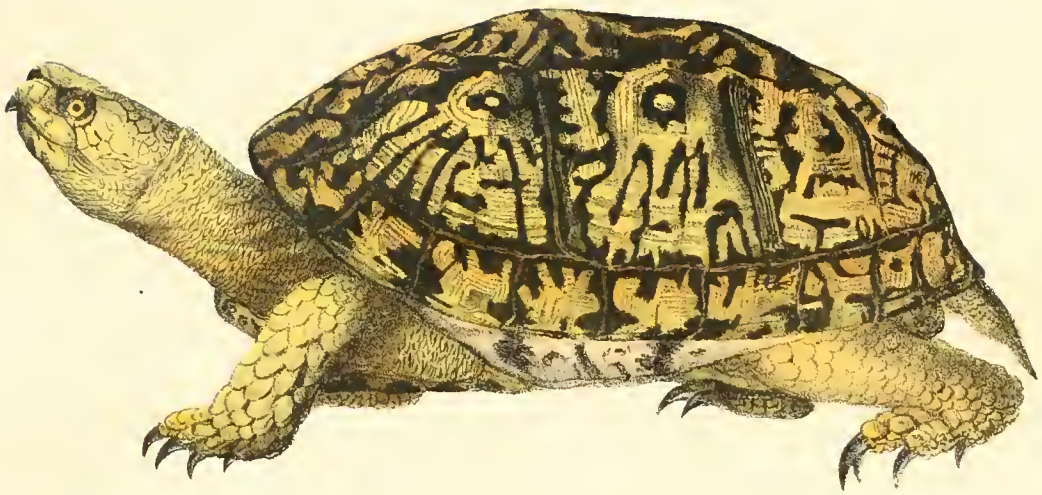
* Edwards, Av. p. 205.

† Shaw, Gen. Zool., vol. iii. part i. plate 7.

In the twelfth edition, Linnæus quotes in addition Gronovius,* "Testudo pedibus digitatis," &c., which description agrees better with the Box Tortoise than with the Gopher; and it is not improbable that Gronovius received it from Clayton, of Virginia, with whom he was in constant correspondence. Why Linnæus should have given an additional reference to Seba,† at the same time retaining the reference to Edwards, is not known; especially as Seba's plate bears no resemblance to that of Edwards, being a larger animal and drawn with a tail.

Gmelin, in his edition of the Systema Naturæ, besides retaining the description and reference of Linnæus, adds a longer description of his own; and here, perhaps, Leconte is right, in supposing that he (Gmelin) may have had our animal in view, as the description corresponds more nearly with it, and cannot be applied to the Box Tortoise. Still, however, the name Carolina could not be retained, as it has been previously applied by Linnæus to another species.

* Gron. Zooph. 17. n. 17. † Seba, Mus. i. t. 80. f. 1.



Cistuda Carolina.

2.

[illegible] from life by A. Newsom

[illegible] Lith. [illegible]

CISTUDA.—*Fleming, Gray, Dumeril et Bibron.*

Genus Cistuda.—Characters. Shell gibbous, strong; marginal plates twenty-five; sternum oval, covered with twelve plates, bivalve, both valves movable on the same axis, and joined to each other, and to the shell by ligamento-elastic tissue; anterior extremities with five, posterior with four nails.

CISTUDA CAROLINA.—*Edwards.*

Plate II.

Characters. Head elongated, narrow; upper jaw with a broad hook in front; shell gibbous, carinate, entire; sternum with an entire margin, oval, bivalvular, the two valves joined to each other and to the shell by a ligamento-elastic tissue, and movable on the same axis.

Synonymes. Land tortoise from Carolina, *Edwards*, Glean. Nat. Hist., p. 205.
Testudo carolina, *Linnæus*, Syst. Nat., ed. x., vol. i. p. 198.
Testudo carolina, *Linnæus*, Syst. Nat., ed. xii., vol. i. p. 352.
Dösen schildkröte, *Bloch*, Schrift. der Berl. Natürf., fr. vii. p. 131.
Checkered tortoise, *Pennant*, Arct. Zool. suppl., p. 79.
Testudo clausa, *Gmelin*, Syst. Nat., Lin., tom. i. pars iii. p. 1042.
Testudo carolina, *Gmelin*, Syst. Nat., Lin., tom. i. pars iii. p. 1041.
Testudo clausa, *Schoepff*, Hist. Test., p. 32, tab. vii.
Testudo clausa, *Latreille*, Hist. Nat. Rept., tom. i. p. 139.

Testudo carolina, *Latreille*, Hist. Nat. Rept., tom. i. p. 127.
Testudo virgulata, *Latreille*, Hist. Nat. Rep., tom. i. p. 100.
Testudo virgulata, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 201.
Testudo carolina, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 207.
Testudo clausa, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 207.
Testudo clausa, *Shaw*, Gen. Zool., vol. iii. part i. p. 36, pl. 7.
Terrapene clausa, *Merrem*, Versuch. eines Syst. der Amphib., p. 28.
Emys clausa, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 315.
Emys virgulata, *Schweigger*, Loc. Cit., p. 316.
Emys Schneiderii, *Schweigger*, Loc. Cit., p. 317.
Emys clausa, *Wagler*, Naturlich. Syst. der Amphib., p. 138.
Cistuda clausa, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 214.
Testudo clausa, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 124.
Terrapene carolina, *Bell*, Zool. Jour., vol. ii. p. 309.
Terrapene maculata, et nebulosa, *Bell*, Loc. Cit., p. 309–310.
Cistuda carolina, *Gray*, Synop. Rept., p. 19.
Cistuda clausa, *Harlan*, Med. and Phys. Res., p. 149.
Cistuda carolina, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 210.
Box tortoise, *Vulgo*.

Description. The shell is extremely gibbous, nearly hemispherical, carinated, and slightly oval, the narrowest part in front. Of the five vertebral plates, the anterior is slightly urceolate and pentagonal, with two of its borders directed forward and outwards; the second, third and fourth are all hexagonal, with their anterior margins a little angular and projecting, and their posterior slightly concave; the fifth vertebral plate is pentagonal, smaller above, larger below, and joined to four marginal. The anterior lateral plate is trigonal, narrow above, broader and rounded below; the second and third are hexagonal; the fourth is quadrilateral and much smaller; sometimes all these plates, vertebral as well as lateral, are marked with concentric striæ. There are twenty-five marginal plates, forming an entire border; the nuchal or intermediate is very small, oblong and narrow, often projecting beyond the rest. The first marginal plate is irregularly pentagonal; the others are all quadrilateral, those over the thighs being broadest;

frequently the eighth, ninth, tenth and eleventh marginal plates, and sometimes the twelfth, are revolute, and form a gutter.

The sternum is oval, with an entire margin, and consists of two sections, of which the posterior is larger. These sections are joined to the shell and to each other by a ligamento-elastic structure, so that both valves are movable on the same axis, and can be brought in contact with the carapace, and thus conceal the head, neck, extremities and tail of the animal. The gular plates are triangular, with their bases forwards; the brachial and thoracic are quadrilateral, the former the more regularly so; the abdominal are quadrilateral and large; the femoral and sub-caudal plates are triangular, the former with their apices truncate.

The head is small; the nostrils anterior and closely approximated. The eyes are large; the pupil black, the iris varying from golden to red or grey. The upper jaw has a broad hook, and the lower is furnished with a small one in front.

The anterior extremities are short, rounded, and covered with large scales in front and smaller behind; there are five fingers, slightly palmated, and each furnished with a short, thick, curved nail. The posterior extremities are rounded above, but flattened at the tarsus, and covered with small scales, having only a few large ones behind; there are five toes, semi-palmated, four only of which are furnished with nails. The tail is very short and thick.

Colour. In no other tortoise is there such a great variety in the colour and markings of the shell. I have seen more than one hundred living specimens together, and could not select two precisely alike. Perhaps the most ordinary colour of the shell is yellowish-brown, with spots or stripes of bright yellow; sometimes these are sub-radiating, or even radiating; at others they are disposed without order; occasionally there is an entire vertebral line of bright yellow, but most frequently it is interrupted with black. This arrangement of the colours often gives to the carapace the appearance of tortoise shell.

The sternum varies quite as much as the carapace in colour; sometimes it is nearly black; most commonly, however, it is yellowish, with blotches of black or dusky brown.

The head is dark brown above, and marked with yellow spots or lines. The jaws are horn colour, dotted with yellow spots or traversed by yellow lines. The neck above is dusky, below it is dirty yellow, with a few red or yellow spots or stripes.

The anterior extremities are dusky in front, with several large yellow scales; behind they are clouded-yellow. The posterior extremities are coloured like the anterior, but have fewer yellow spots in front, and are frequently entirely yellow behind. The tail is dusky above, and marked with yellow spots or stripes; beneath it is clouded-yellow or reddish-brown.

Dimensions. Length of shell, $6\frac{1}{2}$ inches; breadth of shell, $4\frac{1}{2}$ inches; elevation, $2\frac{3}{4}$ inches; length of sternum, 5 inches 10 lines.

Habits. The Cistuda carolina is entirely a land animal; indeed, it is so bad a swimmer, that it will drown at the end of a few days if thrown into water. In the southern states it is always found in dry places, and is very numerous in the immense pine forests of that country, and is hence frequently called pine-barren terrapin, or *cooter*, by the negroes—a word probably of African origin, and applied to some similar animal. It feeds on insects, crickets, &c., and according to Leconte, on fungous plants, as the Clavaria, &c. When in confinement, and it can easily be domesticated, it eats readily whatever is offered, as bread, potatoes, apples, &c. It may well be doubted whether it destroys mice or serpents for its food, as was believed by Bosc and Muhlenberg; yet it is not impossible that an unwary snake or mouse might, by approaching too near the animal, be accidently caught and held between the sternum and carapace, as the animal will close itself upon anything that annoys it. We must not suppose, however, that objects thus caught are its natural food.

Geographical Distribution. The Cistuda carolina is found from one extremity of the Union to the other. I have seen it in all the Atlantic states, even as far north as Maine, and have received specimens from Florida, Alabama and Louisiana. Dr. Pickering observed it in Ohio, and Say as far west as Engineer cantonment on the Missouri river.

General Remarks. The first notice of this animal is to be found in the "Gleanings of Natural History," by George Edwards; who has given a very good figure of it, done from a living specimen sent him by Alexander Light, Esq., of South Carolina. He observes that the sternum is "divided in two at the middle of the belly;" and that "these two pieces are attached to the shell by a skin, strong, tough, and flexible," which gives to the animal "the power to close itself as firmly as an oyster." The figure of Edwards is only faulty in being drawn without a tail; although in his description he speaks of a tail "very short, with the vent opening near the extremity." Linnæus next gave it a place in the tenth edition of his Systema Naturæ, under the name Testudo carolina; of this there can be no doubt, as his only reference is to the Testudo tessellata carolina, &c. of Edwards.

Gmelin did great harm to the science of Herpetology by receiving, in his edition of the Systema Naturæ, as a new species, under the name Testudo clausa, the tortoise described by Bloch,* which is certainly the Testudo carolina of Linnæus. He has thus unnecessarily increased the catalogue of synonymes, by describing the same animal twice under different names. Schoepff is still more to blame for adopting this name of clausa; the more so, as he was fully aware, as may be seen by his own remarks and references, of the identity of the Testudo carolina of Linnæus, and the Testudo clausa of Gmelin. Thus, he gives as references, in the description of the Testudo clausa of his work, the Testudo carolina of the tenth edition of the Systema Naturæ of Linnæus; and furthermore, he excludes the references to Gronovius and Seba, given in the twelfth edition.

* Schrift. der Berl. Natürf., fr. 7, p. 131, tab. i.

After all, the name of clausa is no more characteristic than that of carolina, though apparently so at first sight; for the power of closing the shell as firmly, belongs equally to the Cistuda amboinensis and Cistuda trifasciata of Gray, as to the Cistuda clausa (Testudo carolina of Gmelin); yet from Schoepff's high authority as a Herpetologist, most authors have in this followed his example. I am glad, however, to see lately such excellent Herpetologists as Gray and Bell in England, and Dumeril and Bibron of Paris, adhere to the old specific name "carolina" for this animal.

Although the form of the Cistuda carolina, as well as the colour and markings of its shell, differ so much, as has been said above, yet they can all be arranged under certain varieties. Leconte has them as follows:

"α. Very dark brown, obscurely spotted with yellow, with a few radiating lines of the same; sternum very dark brown, with a few blotches of yellow; top of the head yellow; jaws varied with yellow and black; neck yellowish-cinereous, spotted with yellow.

"β. With larger and more distinct spots of yellow, some of them confluent and sub-radiating. Sternum yellow; jaws yellow, striped with black; top of the head mostly yellow; sides of the neck black, striped with yellow; throat yellow, varied with black.

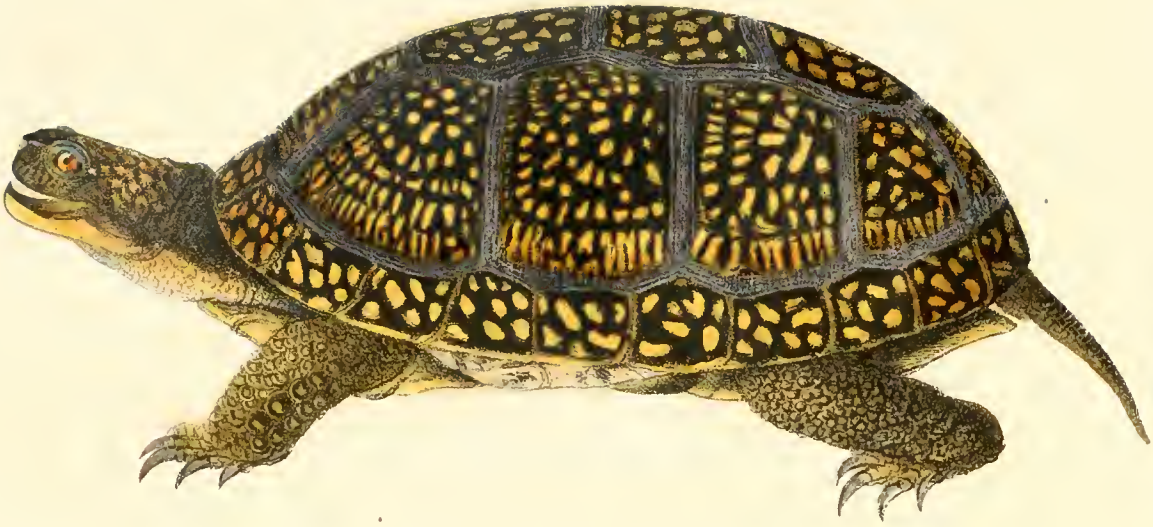
"γ. Shell brown, the plates marked with concentric striæ, and with numerous round and oblong spots of yellow; keel yellow; sternum yellow, unspotted; head and neck black, spotted above, and varied on the sides with orange; chin and throat yellow; jaws yellow, the upper one slightly marked with brown. This is the Testudo virgulata of Daudin.

"δ. Smooth, yellowish-brown, with a few indistinct spots of dark brown; sternum yellow, unspotted; skin cinereous-brown; fore legs darker; top of the head yellowish; jaws orange, the lower one marked with one or two dusky spots,

sometimes unspotted; chin and throat yellowish, rarely marked with a few spots of dusky; hind legs and tail unspotted.

"ε Shell and sternum entirely very dark brown, without spots; plates deeply marked with concentric striæ."

Though Fleming first separated the genus Cistuda from Emys, yet he united in it several animals that have no affinity with each other, as Sternothærus odoratus, Kinosternon pennsylvanicum, &c. To Mr. Gray, a celebrated Herpetologist of London, is due the merit of having restricted this genus within its present limits.



Cistuda Blandingii.

From Nature on Stone by A. Newsom

3

F. S. Duval, Lith. Phil.

CISTUDA BLANDINGII.—*Holbrook.*

Plate III.

Characters. Head moderate, upper jaw emarginate in front, lower jaw with a small hook; shell sub-round, elongated, smooth, ecarinate, with an entire margin; sternum entire in front, deeply emarginate behind, bivalvular, posterior valve but slightly larger.

Description. The head is rather small, smooth above, and slightly pointed at the snout; the nostrils are anterior, and closely approximated; the eyes are large and prominent, the pupil black, the iris light grey. The upper jaw is broad, the cutting edge sharp and deeply emarginate in front; the lower is strong and firm, and furnished with a small hook. The neck is long and slightly contracted at the back of the head.

The shell is oblong, rounded, very nearly as broad before as behind, smooth and ecarinate, with an entire margin. Of the vertebral plates, the anterior is broad, pentagonal, with two of its articulating surfaces directed forwards and outwards, and meeting at an angle in front; the second and third are very regularly hexagonal, broadest in the transverse direction—the former very slightly concave in front, and the latter as slightly concave behind; the fourth is regularly heptagonal, rather concave posteriorly; the fifth is octagonal, smaller above and larger below. The anterior lateral plate is irregularly quadrilateral, larger and rounded below, smaller and straight above; the second and third are pentagonal; the fourth is smaller and quadrilateral. There are twenty-five marginal plates, making an entire cutting border; the intermediate or nuchal is

of moderate size and nearly a parallelogram, being only slightly notched on its posterior margin to receive the point of the first vertebral plate; the first marginal plate is regularly quadrilateral, the second pentagonal, the third and fourth quadrilateral, the fifth pentagonal, the sixth quadrilateral, the seventh pentagonal, the eighth quadrilateral, the ninth pentagonal, the tenth quadrilateral, the eleventh pentagonal, and the twelfth quadrilateral: these forms are constant. All these plates are smooth in the centre, and but indistinctly marked with concentric striæ near their borders.

The sternum is oblong, full, and rounded in front, deeply emarginate behind, and composed of two valves, of which the posterior is rather the larger. These valves are united to each other and to the sternum by ligamento-elastic tissue, so that both sections are movable on the same axis. The gular plates are very regularly triangular, with their apices backwards; the brachial are elongated, quadrilateral, rounded and broader externally, straight and narrower within. The thoracic and abdominal plates are regularly quadrilateral, and of nearly the same size. The femoral are similar in form to the brachial plates, and the sub-caudal are rhomboidal. All these plates are marked with concentric striæ.

The anterior extremities are strong, rounded, and covered with imbricated scales in front, and with smaller scales and granulations behind; the fingers are five, slightly palmated, and furnished each with a short curved nail. The posterior extremities are round above, flattened at the leg and tarsus, and covered in front and behind with small scales and granulations; the toes are five in number, semi-palmated, the four internal are furnished with short curved nails. The tail is long, thick at the root, but soon becomes cylindrical and small.

Colour. The entire ground of the shell is jet black, marked with numerous yellow spots, oblong and round, sometimes arranged in concentric or radiating lines, at others disposed without order.

The sternum is dusky yellow, each plate with a large quadrangular dark spot

on their outer and posterior angles; these blotches involve about one-fourth of the plate.

The head above and at the sides is black, marked with oblong yellow spots. The upper jaw is dark, with transverse waving lines of dirty yellow, and the whole lower jaw yellow. The neck above is granulated and dusky; the chin bright yellow; the throat yellow, but more clouded, especially towards the sternum.

The anterior extremities are yellow in front, with the margin of many of the scales dusky; the posterior surface is dusky, and marked with yellow spots. The posterior extremities are dusky above, and dirty yellowish-white below. The tail is black above, with two obscure yellowish longitudinal lines, and dusky below.

Dimensions. Length of shell, 8 inches; breadth of shell, 5 inches 4 lines; length of sternum, $7\frac{1}{2}$ inches; elevation, 3 inches; length of tail, $2\frac{3}{4}$ inches.

Habits. It is known to be a land animal, and found about the meadows and prairies of the west.

Geographical Distribution. The sole locality that can at this moment be assigned to the Cistuda Blandingii, is the prairies in the state of Illinois and territory of Wisconsin, where they are said to be abundant. The only specimen I have seen came from Fox river, a tributary of the Illinois.

General Remarks. This animal was first observed by Dr. William Blanding, of Philadelphia, an accurate Naturalist, whose name I have given to the species. For a long time I had believed there was but one species of Cistuda in the United States, and am greatly pleased to find a second; the more so as it makes another step in the transition of forms from land to fresh-water tortoises. The Cistuda Blandingii is very fairly the representative here of the Cistuda Europea of the old world, and belongs to that section of the genus Cistuda that Dumeril

and Bibron have called "Hiantes," as it cannot close the shell as perfectly as the "Clausiles," which section includes the Cistuda carolina.

Dr. Blanding says, the animal from which this description was taken was a female, and had, when examined, sixty eggs in different stages of development. He furthermore observes that he was struck at first view with the difference of form of this animal and the common Cistuda, and on further examination he found it could never bring the sternum in contact with the shell so as to conceal the head, neck, extremities and tail completely, as can the Cistuda carolina.

There can then be no doubt of its being a new species of Cistuda, for

1. The head resembles that of an Emys, and has the upper jaw deeply emarginate in front; while in the hundreds of the common box tortoise that I have examined, all had a broad flattened hook in front, although not recurved.

2. The form of the carapace is that of an Emys, the anterior margin, or that corresponding to the anterior section of the sternum, but slightly elevated; while in the Cistuda carolina the same margin rises at an angle of 45° or nearly.

3. It differs in the form of its sternum, deeply emarginate behind, which I have never seen in the Cistuda carolina.

4. In the proportionate size of the two sections of the sternum, thus the posterior is to the anterior as 43.39, while in the Cistuda carolina it is as 31.22.

5. In its inability to bring the sternum completely in contact with the shell.

Family II. ELODITES.*

CHARACTERS.

1. The shell is always solid, more or less depressed, and covered with horny plates, of which there are thirteen dorsal, and from twenty-three to twenty-five marginal.

2. The sternum is solid, never longer than the shell; it varies in form, and in its mode of union with the carapace; in some (Emys) it is solidly united; in others (Chelonura) it is joined by cartilage; it is always covered with horny plates, varying in number from eight to thirteen.

3. The head differs much in size and form, in different genera.

4. The eyes may be lateral or not. The two eyelids are nearly of the same extent, and open obliquely downwards and forwards.

5. The tongue is shorter, thinner, and less fleshy than in Chersites.

6. The jaws vary in form; and their cutting margins may be simple, or more or less serrated.

7. The tympanum is visible.

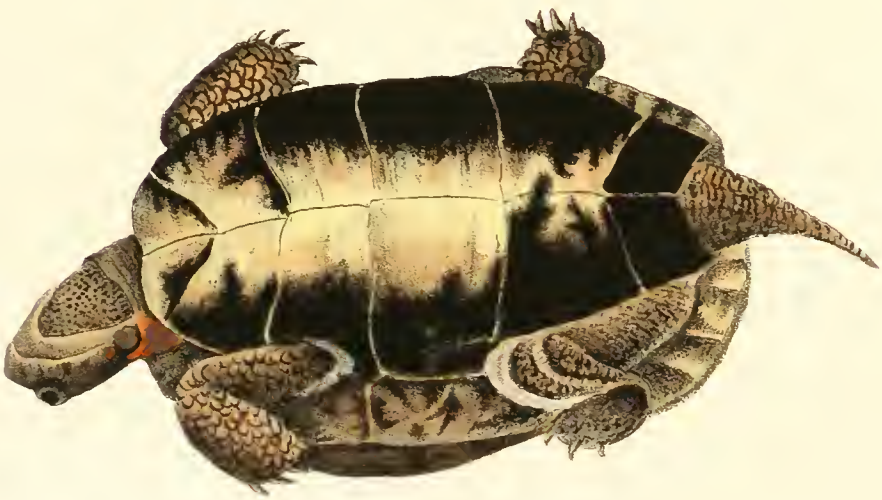
* Ελος; ελωδες. Palus; palustris.

8. The neck is long, covered with a loose skin, and is often furnished with barbels or small warts.

9. The tail varies much in length.

10. The extremities are depressed vertically; there are five fingers, and as many toes more or less palmated; and in general five nails before and five behind; sometimes five to each extremity, (Pentonyx;) at others only four, (Tetronyx.)

Dumeril and Bibron subdivide this family into fourteen genera, one of which (Cistuda) I have thought best to refer to Chersites; the remaining genera include about eighty species.



Emys Muhlenbergii

n Stone Dr. L. Brechemin

P.S. Duval Lith. Phil.

4.

E M Y S.—*Brongniart, Dumeril et Bibron.*

Genus Emys.—Characters. Shell depressed, solid; sternum broad, solid, immovably joined to the shell, and covered with twelve plates; extremities palmated, anterior with four, posterior with five nails.

Remarks. The animals of this genus are exceedingly numerous in the United States, fifteen different species having already been described by Naturalists. The reason for this great abundance, must be sought for in the physical geography of the country, covered as it is with great lakes and rivers, with their tributaries, and abounding in smaller ponds and marshes, the favourite haunts of the Emydes. In countries that are dry or elevated, these animals are seldom seen.

EMYS MUHLENBERGII.—*Schoepff.*

Plate IV.

Characters. Shell oblong, a little contracted at the sides, entire, slightly carinate, dark brown, with blotches of obscure yellow and sub-radiating lines on the lateral plates; sternum emarginate behind; a large orange spot behind the head, on each side.

Synonymes. Testudo Muhlenbergii, *Schoepff*, Hist. Test., p. 132, tab. 31.
Chersine Muhlenbergii, *Merrem*, Syst. der Amphib., p. 30.
Emys Muhlenbergii, *Schweigger*, Prod. Arch. Königsb., tom. i. p. 310.
Emys biguttata, *Say*, Jour. Acad. Nat. Scien., vol. iv. p. 212.

Testudo Muhlenbergii, *Leconte*, Ann. Lyc. N. Y., vol. iii. p. 119.
Emys Muhlenbergii, *Gray*, Synop. Rept., p. 25.
Emys Muhlenbergii, *Harlan*, Jour. Acad. Nat. Scien., vol. v. p. 25.
Emys Muhlenbergii, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 304.

Description. The shell is oblong, arched, and slightly carinate. The first vertebral plate is pentagonal, with an acute angle directed forwards; the second, third, and fourth are hexagonal; the fifth is irregularly pentagonal, with its inferior border joined to four marginal plates. The first lateral plate is irregularly triangular, with its apex truncated and joined to the second vertebral plate; its basis is rounded and joined to four marginal plates; the second and third lateral plates are pentagonal. There are twenty-five marginal plates; the nuchal is very narrow, almost linear; the first marginal plate is irregularly quadrilateral, the remainder, very regularly quadrilateral; the fourth, fifth, sixth and seventh are narrow and inclined backwards; all these plates are marked with radiating striæ and concentric furrows in the young animal. The sternum is oblong and deeply emarginate behind; the gular plates are convex, triangular, each with the apex directed backwards, the lateral angles and the sutures straight, projecting a little; the brachial plates quadrilateral, the internal border short and straight, the external longer and rounded; the thoracic, femoral, and abdominal plates are quadrilateral, and more extensive in the transverse than in the antero-posterior direction; the sub-caudal are rhomboidal. The supplemental plates are unusually small; the axillary circular, and the inguinal sub-triangular.

The head is short and broad; the tip of the snout pointed; the nostrils are small and near together; the eye is large, the pupil dark, with the iris brown, and surrounded by an orange coloured circle. The jaws are strong and cutting; the upper deeply notched, with a tooth on each side; the lower is furnished with a single tooth.

The extremities approach in their structure those of Cistuda carolina, in being but slightly compressed, and in having the nails short and slightly curved. The

anterior extremities are covered with scales, larger in front and smaller behind; the fingers are five in number, and but slightly palmated, each furnished with a nail. The posterior extremities are flattened, and covered with small scales; the toes are five in number and imperfectly palmated; the four internal ones only are provided with nails. The tail is large and nearly conical, thick at the base and pointed at the extremity; its superior surface is covered with scales.

Colour. The shell is very dark brown, almost black; all the plates are relieved by blotches of obscure yellow, mingled with pale brown; in some individuals the plates are marked by sub-radiating lines, of the same colour as the blotches. The sternum is almost black at the margin, and bright yellow, approaching to orange, in the middle, sometimes varied with red. Black, however, often predominates both on the shell and sternum.

The head is black; a short indistinct yellow line runs from the snout to the orbit of the eye, which is partially surrounded by a circle of the same colour; the upper jaw is yellow, mingled with brown, and marked with blotches of a darker shade of brown and occasional spots of orange; the lower jaw is brownish-yellow, with a few spots of orange. The neck is dark brown above, with two very remarkable spots on each side behind the occiput, varying in different individuals from bright yellow to deep orange, or almost red; these spots vary also in size and shape, they are sometimes small with regular margins, at other times they resemble blotches. The inferior surface of the neck is yellowish-brown, studded with small black spots.

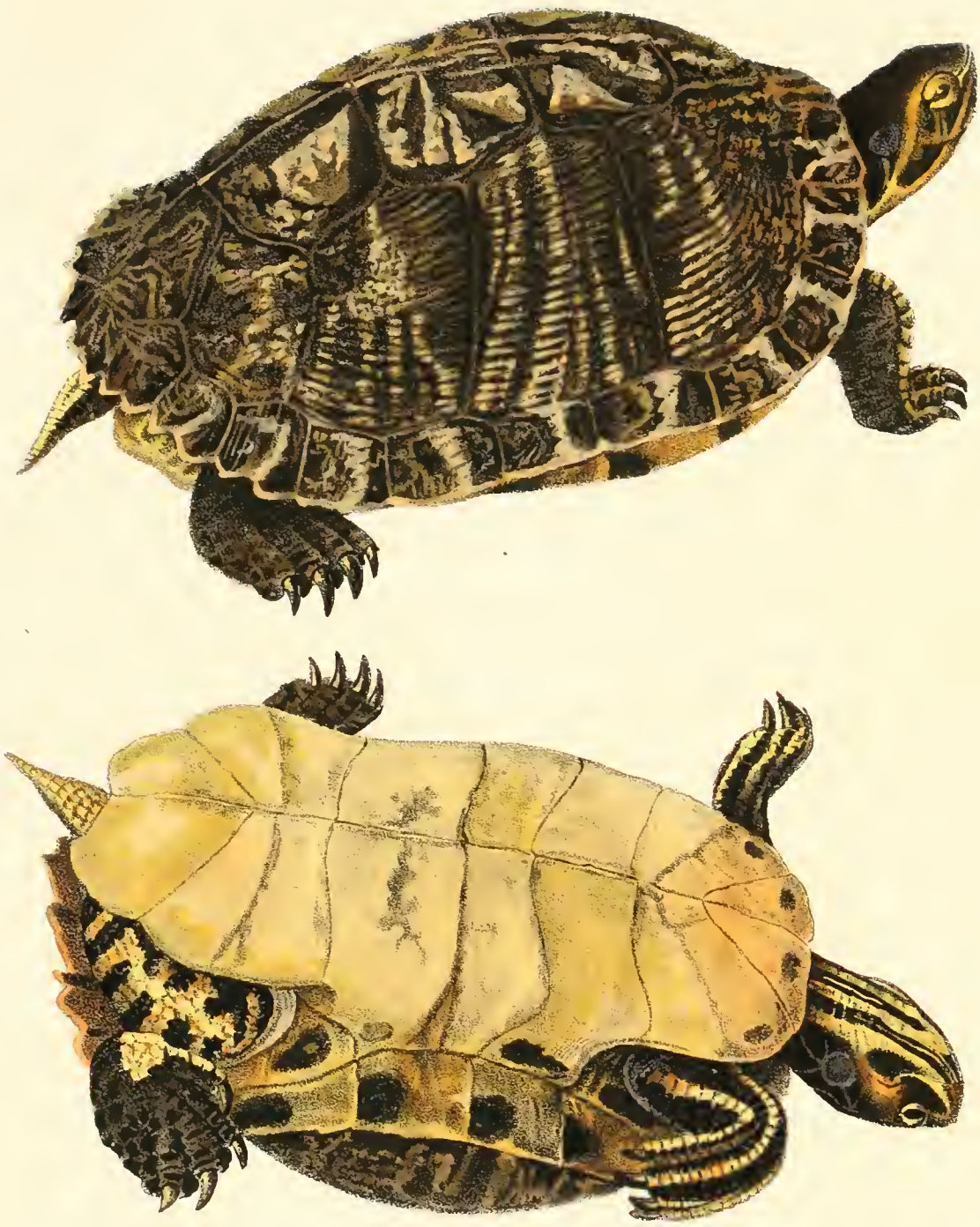
The anterior extremities are brownish-yellow; many of the scales are tinged with orange; a dark line runs along the outer margin of the fore-arm. The posterior extremities are dark brown on the upper surface, with occasional spots of orange about the foot; the inferior surface is brownish-yellow, with one or two lines of lighter yellow. The tail is dusky yellow above, and yellow, tinged with orange, below.

Dimensions. Length of shell, $3\frac{3}{4}$ inches; sternum, $3\frac{1}{4}$ inches; elevation, $1\frac{3}{8}$ inches; tail, $1\frac{1}{8}$ inches.

Geographical Distribution. Its range is very limited; it being only found in New Jersey and eastern Pennsylvania, and rarely even in these districts.

Habits. The Emys Muhlenbergii lives in small brooks or streams of running water.

General Remarks. This animal was first described and figured by Schoepff, in his Historia Testudinum, from specimens furnished him by the Rev. Mr. Muhlenberg of Pennsylvania. Schoepff, however, mistook it for a variety of the Box Tortoise, and gave a drawing of the shell and sternum only. Say next described it in detail, under the name Emys biguttata, from the two remarkable orange spots on the neck; he was probably not aware that Schoepff had previously given it another name. Leconte has since described this animal with an accuracy that leaves nothing to be desired.



Emys serrata

5

Lehman & Duval Lith. Phila.

EMYS SERRATA.—*Daudin.*

Plate V.

Characters. Shell sub-round, convex, carinate, longitudinally rugous, deeply serrated posteriorly; dark brown, with sub-radiating yellow lines; jaws entire.

Synonymes. Testudo serrata, *Daudin*, Hist. Nat. des Rep., tom. ii. p. 148, pl. xxi. figs. 1 and 2.
La Tortue à bords en scie, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 264.
Emys serrata, *Merrem*, Versuch eines Syst. der Amphib., p. 26.
Emys serrata, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 301.
Testudo serrata, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 105.
Emys scripta, *Gray*, Synop. Rept., p. 29.
Emys serrata, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 267.
Yellow-bellied Terrapin, *Vulgo.*

Description. The shell is nearly round, very convex, emarginate in front, and deeply serrated behind, longitudinally wrinkled, of a dark brown colour, almost black, with yellow lines and marks. The vertebral plates are five in number; the first is tetragonal, narrowest in front, with its lateral borders arched outwards, which gives it an urceolate form; the second, third and fourth, are hexagonal, the latter very irregularly so, with its posterior border re-entering; the fifth is triangular, with its apex truncated, and received into the fourth, and its basis rounded and cut into four sides. Each vertebral plate has a marked prominence, elongated in the antero-posterior direction; these protuberances, when united, form a strong carina along the spine; besides these prominences, each plate, lateral as well as vertebral, is strongly marked by longitudinal

wrinkles. Of the lateral plates, the anterior is irregularly trigonal, with its basis rounded and joined to five marginal; the second and third are irregularly pentagonal, larger and broader below; the fourth is regularly quadrilateral. Of the twenty-five marginal plates, the intermediate, or nuchal, is very narrow, almost sub-cylindrical acuminate, and projecting; the first and second are pentagonal, with the two shortest sides directed backwards; they are notched in front, the first deeply, the second less so, and both project beyond the other marginal plates, the external point extends farthest. All the remaining plates are quadrilateral; and the five posterior are so deeply notched, as to give that sharply serrated appearance to the posterior margin of the shell that characterizes this species of Emys.

The sternum is oblong, full in front, but emarginate behind, and covered with twelve plates. The gular plates are triangular, their bases forwards, and their apices backwards; on the outer angle, each has a knob or process looking forwards and upwards; between these points the plates are concave, which leaves space for the neck; the brachial plates are triangular, with their apices truncated and directed inwards; the thoracic are irregularly quadrilateral; the abdominal are pentagonal; the femoral are quadrilateral, broadest and rounded at their external margins, which project considerably beyond the sub-caudal, narrow and straight at their internal; the sub-caudal are trapezoid in form.

The head is of moderate size; the snout short, but rather pointed; the nostrils are anterior and near together; the upper jaw almost entire, very slightly emarginate in front. The eyes are large, the pupil black, the iris golden, with a broad black stripe extending horizontally through it. The anterior extremities are of moderate extent, covered with transverse rows of large scales in front, and a few large scales and granulations behind. The fingers are five in number, each furnished with a short, strong, slightly curved nail. The posterior extremities are flattened and scaly above, and scaly and granulated below; the tarsus is broad, and sustains five toes fully palmated, four only having nails. The tail is short, thick at the root, and small, narrow, and conical at the top.

Colour. The colour of the shell is dark brown, approaching to black; each plate is marked with irregular yellow stripes or bands; those on the lateral plates are sub-radiate.

The sternum and inferior surface of the marginal plates is yellow. The gular, the brachial, and generally all the marginal plates are marked with a large, round, or oblong black spot; those on the marginal, are situated on the posterior part, near the suture of the adjoining plate. In some specimens these spots exist only on the gular plates, where they are very constant.

The head is black, marked with yellow lines, the largest beginning at the tip of the snout and running to the occiput. The jaws are horn colour, traversed by a yellow line, which begins at the nostrils and descends downwards and backwards, increasing in its descent, and continued all along the neck; a second line extends from the snout to a large yellow spot situated behind the cheek. The neck is dark coloured above, with stripes of yellow, which begin indistinctly about the head. At the back of each eye is a large yellow spot, whence begin two lines of the same colour, one runs along the upper surface of the neck, the other passes below the tympanum to the throat. The throat is dusky and marked with broad yellow stripes or bands; the central is broad but not very regular; sometimes it divides and then reunites, but soon breaks again into blotches.

The anterior extremities are black in front, with two or three yellow bands; these sometimes bifurcate near the toes, and are often continued into the web, which is also yellow, or they run along the convex part of the nails, giving them a yellow tinge. The yellow stripes are less regular on the inferior surface, but generally there is one large band along the posterior border. The posterior extremities are dark above, varied with yellow; the latter colour prevails on their inferior surface; many transverse bands and blotches of yellow are seen about the nates. The tail is black above, with a yellow line bifurcating near the basis; below it is yellow, with the margin of the vent black.

Dimensions. Length of shell, 12 inches; breadth, 7½ inches; length of sternum, 11½ inches; greatest elevation, 11¼ inches.

Habits. The Emys serrata lives in ponds and pools of stagnant water, in the neighbourhood of which they hibernate. During the spring and summer season they are seen by hundreds basking in the sun, apparently asleep. They rest on the margins of the pond, or on some little islet, or on the trunks of fallen trees, from which, when disturbed, they plunge suddenly into the water, and disappear. They live chiefly on such small reptiles as they can seize and devour; when in confinement, however, they will eat vegetable substances, of which the purslain (Portulacca oleracea) appears to be their favourite food.

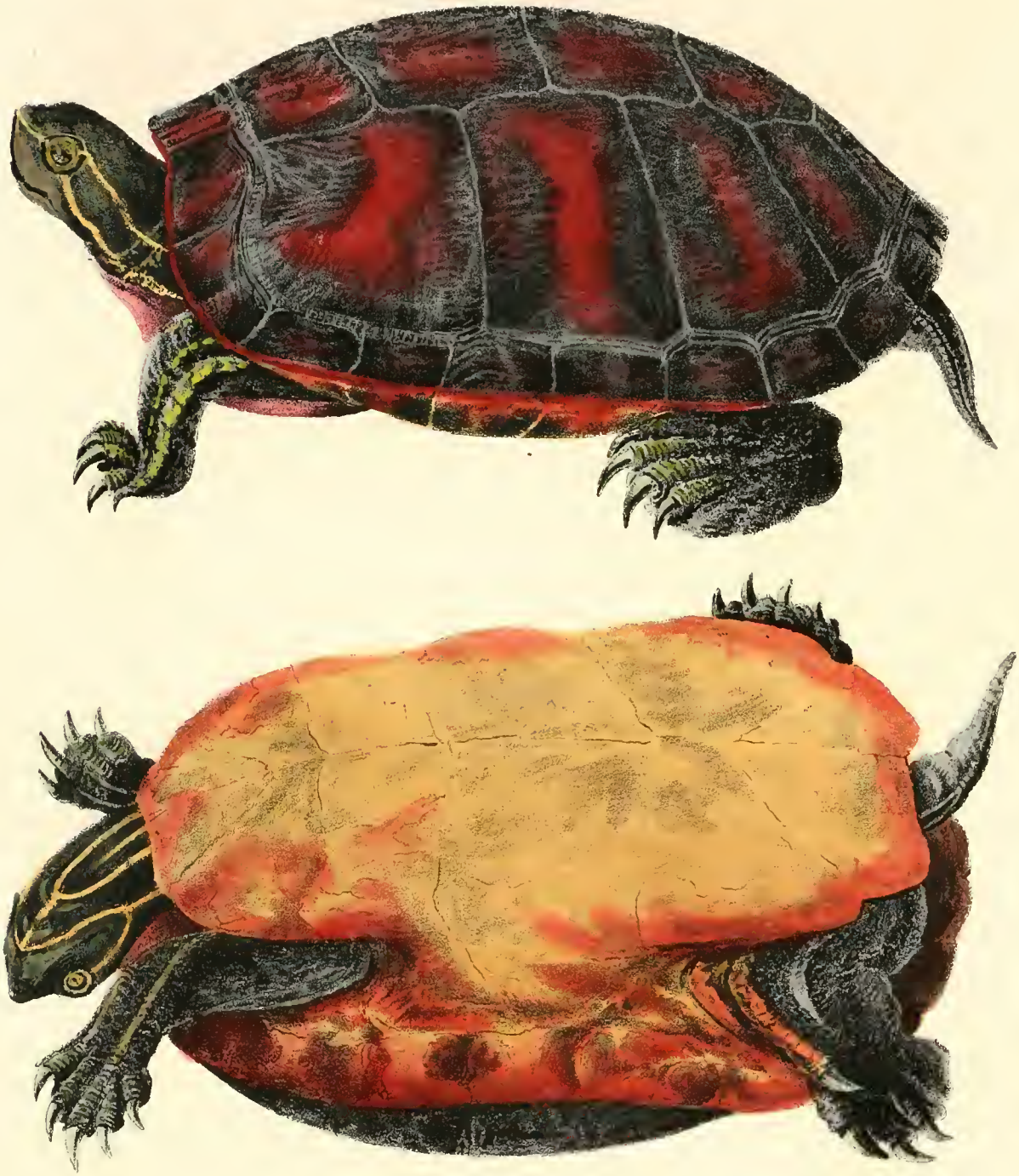
Geographical Distribution. The range of this animal is very limited, reaching only from Virginia to Georgia. I have never seen them beyond these points; south, its place is supplied by the Emys Floridana; north, it is represented by the Emys rubriventris; nor does it reach far into the interior of the country—I am not aware of its existence two hundred miles from the coast. In the neighbourhood of Charleston they are abundant, and are brought to market in great numbers; their flesh is considered good, but it is by no means as delicate as the Emys terrapin, or the Emys reticulata.

General Remarks. Daudin* was the first to describe this species of Emys under the specific name serrata, from a specimen furnished him by Bosc, accompanied by a tolerable plate, at least of the sternum. He speaks of it as follows:—"Bosc, the naturalist, has lent me two Tortoises he brought with him from North America, which are closely allied. He has described one under the name Testudo reticulata, and I shall give the other the name of Testudo serrata, the marginal plates having each two incisions." To the list of synonymes already given, may be added perhaps the Testudo scripta of Schoepff,† which many naturalists consider the young of this species. This cannot be positively determined, for

* Hist. Nat. des Rept., tom. ii. p. 144.

† Hist. Test., p. 16, tab. iii. fig. 2.

though the colour and markings of the shell agree tolerably well with Schoepff's animal, yet its form is not precisely the same, it is more elongated; and even in the very young specimens, of which I have seen many, the posterior border is more or less serrated. And further, Bosc, to whom the young of the Emys serrata must have been familiar during his long residence in Carolina, seems to have had no suspicion that the Testudo scripta was the young of any of our tortoises, inasmuch as he describes it as a distinct species.



Emys rubriventris.

P.S. Duval, Lith. Phila

EMYS RUBRIVENTRIS.—*Leconte.*

Plate VI.

Characters. The shell is oval, elongated posteriorly; entire in front, emarginate behind; ecarinate and longitudinally rugous; sternum red; jaws denticulated.

Synonymes. Testudo rubriventris, *Leconte*, Ann. Lye. Nat. Hist. N. Y., vol. iii. p. 101.
Emys serrata, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 204.
Emys serrata, *Harlan*, Med. and Phys. Res., p. 154.
Emys serrata, *Gray*, Syn. Rept., p. 29.
Emys irrigata, *Bell*, MS.
Emys rubriventris, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 281.
Emys irrigata, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 276.
Potter or Red-bellied Terrapin, Vulgo.

Description. The shell is oval, elongated, and broadest at its posterior part; convex and ecarinate; full and entire in front, but emarginate behind. There are five vertebral plates; the anterior is urceolate, hexagonal, and smallest in front; the second, third and fourth are also hexagonal, the later irregularly so, with its posterior margin re-entering; the fifth is heptagonal, its anterior margin convex and projecting into the fourth plate. The first lateral plate is triangular, its basis rounded and directed downwards; the second and third are pentagonal; the fourth is sub-rhomboidal, with its inferior margin angled; all these plates are longitudinally rugous. There are twenty-five marginal plates; the nuchal is quadrilateral, elongated, narrowest at its anterior margin, where it is sometimes finely serrated. The first marginal plate is irregularly quadrilateral, broadest in front, narrow and rounded behind; the second is also quadrilateral, with its internal and superior

angle greatly elongated; all the other plates are regularly quadrilateral, those over the thighs broadest; the posterior and external angle of the ninth projects very slightly beyond the tenth, which in turn extends as little beyond the eleventh.

The sternum is oblong, entire in front, but emarginate behind. The gular plates are triangular, with their apices turned backwards; the brachial are also triangular, with rounded bases externally, their apices truncate, and directed inwards; the thoracic are quadrilateral; the abdominal broad and pentagonal; the femoral are irregularly quadrilateral, with their narrowest border directed internally, and their posterior and external borders projecting beyond the sub-caudal plates, which are triangular, with their bases rounded and directed backwards. Of the supplemental plates, the femoral are trapezoid in shape, prolonged and pointed anteriorly; the axillary are irregularly triangular and largest in front.

The head is of moderate size, a little enlarged posteriorly, and slightly pointed at the snout; the jaws are strong, the upper so deeply emarginate as to present the appearance of having two teeth. The inferior is serrated at the sides, and has three teeth in front, of which the middle or hook, is most prominent, as if made to pass into the deep notch of the upper jaw. The eyes are large and prominent; the pupil black; the iris pale golden, with a black band passing longitudinally through it.

The anterior extremities are rather long, and covered with transverse rows of scales in front, and with scales and granulations behind; there are five fingers, palmated with five short, slightly curved nails. The posterior extremities are round at the thighs, but much flattened towards the tarsus; the toes are five, and fully palmated, but only four of them are furnished with nails. The tail is short, and large at its base, but becomes suddenly pointed.

Colour. The shell is dusky brown, marked with blotches or confluent spots, and irregular bands or lines of red; each marginal plate has a line of the same colour passing vertically through it.

The sternum is red, generally clouded with a dusky shade. The inferior surface of the marginal plates is also red, with dusky spots running into one, at the junction of the plates. The wings are sometimes barred with black.

The head and neck are dark brown above, with obscure red lines; the jaws are horn colour, with a red line beginning below the nostrils, and running through the upper to the lower jaw; two others begin at the back of the orbit of the eye—one extends to the neck above the tympanum, the other passes beneath it. The throat is dark, marked with large bands of red; one of these begins midway between the chin and the articulation of the jaw; another begins at the chin, but soon bifurcates; and between this bifurcation is a third and shorter line.

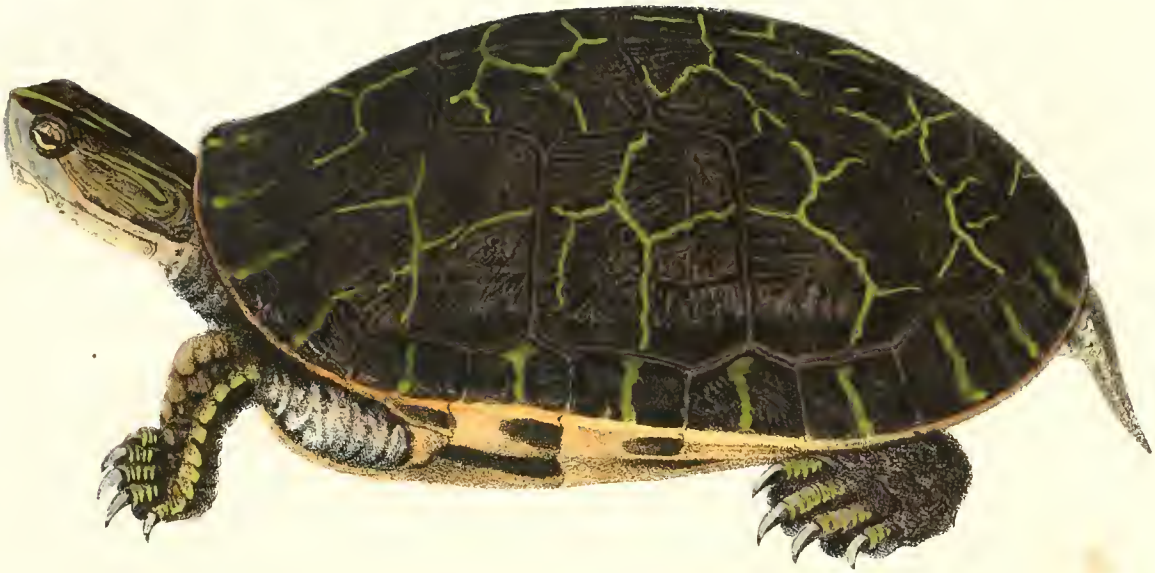
The anterior extremities are dusky brown, with two reddish lines on the superior surface, these lines are in some individuals yellow; the inferior surface is dusky, with similar red or yellow lines. The posterior extremities are dusky, with interrupted lines of red or yellow; the webs are tinged with red, both on the upper and lower surface.

Dimensions. Length of shell, 11 inches; greatest breadth, 7 inches; length of sternum, $10\frac{1}{2}$ inches; greatest elevation, $4\frac{3}{4}$ inches; length of tail, 2 inches. They are sometimes found of greater dimensions.

Habits. The Emys rubriventris inhabits streams and rivers of running water, generally preferring those with rocky beds.

Geographical Distribution. Its geographical range is very limited; as yet it has not been found north of the Delaware river, nor to the south of Chesapeake Bay. It is common in the Susquehanna and its tributaries, but is much more abundant in the Delaware, especially in the neighbourhood of Trenton. It is frequently brought to the Philadelphia market, from both these localities, though its flesh is not greatly esteemed.

General Remarks. Leeonte was certainly the first who described this animal under the name it now bears; for although it is referred to in the works both of Say and Harlan, yet it is evidently confounded with the Emys serrata of Bose, to which it bears but little resemblance, as it is ecarinate, and the posterior border of the shell is not serrated. There can be no doubt that this is the Emys irrigata of Bell, and of Dumeril and Bibron; for I have seen, through the kindness of Mr. Bell, his specimen under this name, as well as those in the Garden of Plants at Paris, from which Dumeril and Bibron took their description, and I could discover no difference between them and the Emys rubriventris. The difference of colour in the shell and sternum, given by Dumeril and Bibron, cannot determine the animal, for their description was taken from dried specimens, and it is well known that the red both of the shell and sternum becomes of a dusky yellowish-white in specimens that have been preserved for any length of time.



Emys reticulata

Sera pinx.t

P.S. Duval Lith. Phil.a

EMYS RETICULATA.—*Bosc.*

Plate VII.

Characters. Shell ovate, gibbous, ecarinate, entire, longitudinally rugous; dusky brown, reticulated with yellow lines.

Synonymes. Testudo reticulata, *Bose*, Manuscript Notes, communicated to Daudin.
Testudo reticulata, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 144, pl. xxi. fig. 3.
Testudo reticularia, *Latreille*, Hist. des Rept., tom. i. p. 124.
La Tortue reticulaire, *Bose*, Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 265.
Emys reticulata, *Schweigger*, Prod. Arch. Königsb., tom. i. p. 300.
Emys reticulata, *Merrem*, Versuch eines Syst. der Amphib., p. 26.
Emys reticulata, *Say*, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 204.
Testudo reticulata, *Leconte*, Ann. Lyc. Nat. Hist. N. Y. vol. iii. p. 103.
Emys reticulata, *Fitzinger*, Neue Class. der Rept., p. 45.
Emys reticulata, *Harlan*, Med. and Phys. Res., p. 152.
Emys reticulata, *Dumeril* et *Bibron*, Hist. Nat. des Rept., tom. ii. p. 291.
Chicken Tortoise, *Vulgo.*

Description. The shell is oval, broadest posteriorly, very convex, ecarinate and entire, or but slightly sub-emarginate behind, and longitudinally rugous. There are five vertebral plates; the anterior almost pentagonal and broadest in front; the second and third are hexagonal; the latter concave on its posterior border; the fourth hexagonal, broader, and rounded on its anterior surface to fit the posterior margin of the third vertebral plate, and is narrow and sometimes emarginate behind; the fifth is heptagonal, rounded inferiorly and posteriorly, and joined to two whole and two half marginal plates. The first lateral plate is

large and sub-rhomboidal; the second and third are pentagonal, the superior angle most acute; the fourth is quadrilateral. There are twenty-five marginal plates, which form a simple cutting border, in general without serræ, though there is sometimes a small notch between the supra-caudal plates; the nuchal, or intermediate, is very small, oblong, or nearly a parallelogram in shape. The remaining plates are quadrilateral; those situated in front, or those over the thighs, are largest.

The sternum is oblong, nearly of the same size at both extremities; full and rounded in front, emarginate behind. The gular plates are triangular, with their bases forward and rounded, and their apices directed backwards; each has a remarkable prominence on its upper surface, near the outer angle of the base; between these knobs the plates are hollow for the neck; the brachial are quadrangular, broader and rounded externally, narrow and straight within. The thoracic plates are quadrilateral, elongated in the transverse direction; the abdominal are broad and pentagonal; the femoral large and quadrilateral; the sub-caudal hexagonal, with rounded bases directed posteriorly. Of the supplemental plates, the axillary are small and triangular, with their apices turned backwards; the inguinal are larger, rhomboidal, broadest behind, narrow and pointed before.

The head is small, long and narrow, with the snout a little pointed; the nostrils are anterior. The upper jaw is slightly emarginate; the lower is entire, and furnished with a hook in front. The eyes are prominent and large, the pupil black, the iris golden, with a black band passing longitudinally through it. The neck is of great length.

The anterior extremities are rather short and rounded; the fore-arm covered with large scales, disposed in transverse lines, and a row of square fleshy folds along the superior border; its posterior surface is scaly and granulated; there are five fingers, palmated, sustaining five short, strong, slightly curved nails. The posterior extremities are also covered with scales, but they are smaller than those of the anterior; the tarsus is flattened, and sustains five fully palmated toes, four

only of which are furnished with nails. The tail is short, thick, scaly, and pointed at the tip.

Colour. The shell is dark brown, with a yellow vertebral line from its anterior to its posterior extremity. All the plates of the shell are marked with yellow lines; those of the vertebral and lateral plates run frequently into each other, and finally descend perpendicularly through each of the marginal plates, dividing them into anterior and posterior portions. These lines communicate so frequently as to give a reticulated appearance to the shell; they are often less distinct on the vertebral and lateral plates than is represented in the accompanying figure, which was drawn from a specimen of great beauty. On old shells these lines are nearly obliterated, or are only brought into view when the shell is moistened; nor can they be traced as continuous with those of the marginal plates.

The sternum is yellow, as well as the inferior surface of the marginal plates, the fourth and fifth of which, and sometimes the sixth, are marked with an oblong or round black spot; below these spots on the wings is a broad black bar. Much variety, however, exists in this marking; frequently only two of the marginal plates have the black spots, and a third is placed on the posterior part of the wings; at others the wings are marked with a black bar alone, and there are no spots on the marginal plates.

The anterior extremities are black above or dark brown, marked with a broad longitudinal yellow band continued to the toes, the webs of which are also yellow; the inferior surface is dusky, and marked with transverse yellow bands and bars; these are by far the more numerous and distinct about the shoulder. The posterior extremities are dusky above, with large bands and blotches of yellow; the posterior surface of the thigh is yellow, with transverse black bars. The tail is black, with three longitudinal yellow lines; the margin of the vent is yellowish.

The skin of the head and neck is dark brown on the superior surface, with

numerous small longitudinal yellow lines. These lines vary in extent; some reach the whole length of the neck; others are intermediate, less distinct, and shorter; a remarkable one begins at the snout and runs between the eyes, terminating at the occiput; another and still larger begins at the snout, below the nostrils, descends to the angle of the mouth, increasing in size to the neck; other lines are also seen to begin at the back of the eyes and run along the neck; a distinct line begins above the orbit and runs to the tympanum. The jaws are horn-colour, marked with yellow lines that traverse them obliquely. The throat is dusky yellow, with three longitudinal lines of brighter yellow and waving lines of a dingy brown.

Dimensions. Length of shell, $9\frac{1}{2}$ inches; breadth, $5\frac{1}{2}$ inches; length of sternum, 8 inches 10 lines. The head and neck, taken together, are nearly as long as the sternum.

Habits. The habits of the Emys reticulata are very similar to those of the Emys serrata. They inhabit ponds and stagnant waters, where they may be seen slowly swimming from place to place; and as the head and neck alone are visible, they might easily be mistaken for the water-snake, which belongs to the same locality; or they may be observed in great numbers basking on the trunk of some fallen tree, from whence they plunge into the water on the slightest alarm—the noise of the splash of one disturbs his neighbours, who all rapidly disappear. Being of so timid a nature, taking them is a work of some difficulty; they are, however, frequently brought to our markets, where they are more prized than the Emys serrata.

Geographical Distribution. The Emys reticulata has a range of small extent. Leconte gives Fayetteville, North Carolina, as its northern limit, and I would assign Georgia as its southern, as I have no evidence of its existence in Florida; nor do they ever appear at any great distance from the seaboard.

General Remarks. There can be no doubt that Bosc first observed this

animal in Carolina, and that he furnished a manuscript description of it to Daudin,* under the name it now bears, which has been very generally received by naturalists. In fact, the very specimen from which Daudin took his description is still preserved in the Garden of Plants at Paris.† I have no hesitation in putting the Emys reticulata of Say among the synonymes of this animal, although Leconte, Dumeril and Bibron suppose it to refer to the Emys concinna. The very description of Say is sufficient to show the animal he meant: "shell ovate, posterior marginal plates entire, lateral ones beneath with three black spots over the suture; sternum very narrow, elongate and oval."‡ Furthermore, he says,§ the only specimen he ever saw was in the Philadelphia Museum, and that it corresponds well with the figure of Daudin. Besides this, Mr. Peale, the Director of the Philadelphia Museum, shewed me the identical specimen from which Say took his description, on which was marked, in his (Say's) own handwriting, Emys reticulata.

* Hist. Nat. des Rept., tom. ii. p. 144.

† Leconte, Ann. Lyc. Hist. Nat. N. Y., vol. iii. p. 108.

‡ Say, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 204.

§ Jour. Acad. Nat. Scien., vol. iv. p. 209.

Emys Floridana.

8

Sculpt. On Stone by G. Lehman Lehman & Duval Lith.rs Philad.a

EMYS FLORIDANA.—*Leconte.*

Plate VIII.

Characters. Shell sub-oval, entire, compressed at the sides; longitudinally rugous; nuchal plate triangular, entire; jaws without teeth.

Synonymes. Testudo floridana, *Leconte*, Ann. Lyc. Hist. N. Y., vol. iii. p. 100.
Emys floridana, *Harlan*, Med. and Phys. Res., p. 155.
Emys floridana, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 285.

Description. The shell is moderately gibbous, most so in the centre; it is sub-oval, more or less compressed at the sides, with the margin entire; or it may be sometimes very slightly emarginate behind, with a small carina along the third, fourth and fifth vertebral plate. The anterior vertebral plate is urceolate, irregularly quadrilateral, with its sides anti-parallel; in front it has three articulating borders; behind it is convex, and received into the second vertebral plate; the second and third are hexagonal, with their lateral angles salient; the fourth is heptagonal, and projecting in front; the fifth is also heptagonal, but the sides are so disposed as to give it a triangular figure, with base and apex rounded. The first lateral plate is triangular, with a rounded base; the second and third are hexagonal, and have greater elevation than breadth; the fourth is quadrilateral; all these plates are slightly rugous longitudinally. There are twenty-five marginal plates; the nuchal or intermediate is nearly triangular, broadest behind; the anterior is pentagonal, and broadest before; the remaining plates are all very regularly quadrilateral, except the fifth, seventh, and ninth, which are pentagonal.

The sternum is oblong, entire in front, and emarginate behind. The gular plates are triangular, a little projecting at their outer angles; the brachial are also triangular, their bases rounded, and their apices truncated and turned inwards; the thoracic, abdominal and femoral plates are large, oblong, and quadrilateral; the sub-caudal are rhomboidal.

The head is of moderate size; the snout rather obtuse; the nostrils anterior; the eyes prominent, large, and very beautiful; the pupil black; the iris golden, with a black band passing longitudinally through it. The jaws are strong, with their cutting margins entire, without serræ, or teeth; the inferior is very slightly hooked.

The anterior extremities are large, covered with scales in front, and with scales and granulations behind; there are five fingers, palmated, and each furnished with a stout, strong and nearly straight tail. The posterior extremities are rounded at the thigh, but greatly spread out at the tarsus; the toes are five, fully palmated, four only of them are furnished with nails. The tail is short.

Colour. The shell is brown, with numerous lines and bands of yellow; those of the vertebral plates run longitudinally; of those on the lateral plates, some radiate, while others descend vertically. All the marginal plates are traversed by vertical bands or lines of the same yellow colour.

The sternum, as well as the inferior surface of the marginal plates, is pale yellow; the latter have each a black spot, including one of yellow.

The head and neck are dusky above, and striped with yellow; one very distinct line begins at the snout, runs under the eyes, and terminates at the occiput. The jaws are horn colour; a yellow line begins below the nostrils, and reaches to the angle of the mouth; two others begin back of the orbit, and run to the neck, one above and the other below the tympanum. The throat is cinereous, striped with yellow lines; a broad line begins at the chin, and bifurcates a short

distance from its origin; a second, narrower and shorter, line is included in the bifurcation, and others are situated on the outer side of it.

The anterior extremities are dark above, with cuticular folds along the outer margin, tinged with pale yellow; the inferior surface is rather lighter and marked with longitudinal bands of a pale yellow. The anterior extremities are dark above and striped with pale yellow bands, both above and below. The tail is striped with pale yellow above, and is dirty yellow below.

Dimensions. Length of shell, 15 inches; greatest breadth, 10 inches; length of sternum, 14 inches; elevation, $7\frac{1}{4}$ inches.

Habits. The Emys floridana inhabits rivers and lakes of fresh water, but of its food I am ignorant.

Geographical Distribution. As yet, this animal has been found only in East Florida. It is common in the St. John's river, from whence I have received a good many specimens.

General Remarks. The Emys floridana is the largest of the genus with which I am acquainted; this beautiful animal was first observed by Leconte in Florida, who gave an excellent description of it in his Monograph on the North American Tortoises. I am gratified in being able to give very accurate drawings of the four last species of Emys; the more so, because Harlan and some other naturalists have thought them not sufficiently distinct. Harlan* says he has not been able to distinguish the Emys serrata from the Emys reticulata, Emys scripta, Emys rubriventris, and Emys decussata; nor the Emys floridana from the Emys rubriventris; and yet they are all perfectly distinct species, as above described.

* Med. and Phys. Res., p. 155.

I. They differ so much in colour and markings, as may be seen in the accompanying plates, that this of itself would be almost sufficient to distinguish them in the living animals.

II. They differ greatly in size.

III. In geographical distribution.

IV. In the various characters of the head, jaws, and shell, as heretofore observed.

The Emys serrata has the jaws without serræ, the upper slightly emarginate in front; the posterior margin of the shell deeply serrate; inhabits the Carolinas.

The Emys rubriventris approaches nearest to it, but has the upper jaw so deeply emarginate in front as to present the appearance of two teeth; and the lower deeply serrated, and toothed in front; inhabits from Western Jersey to Virginia; these two animals are nearly of the same size.

The Emys reticulata is widely different; it has the upper jaw emarginate in front; lower one hooked; shell perfectly entire; inhabits the Carolinas.

The Emys floridana comes nearest the Emys reticulata, in its characters, but is still perfectly distinct; the upper and lower jaws are both entire, without hook or serræ; shell entire. This animal is six or eight times the size of the Emys reticulata; inhabits East Florida.

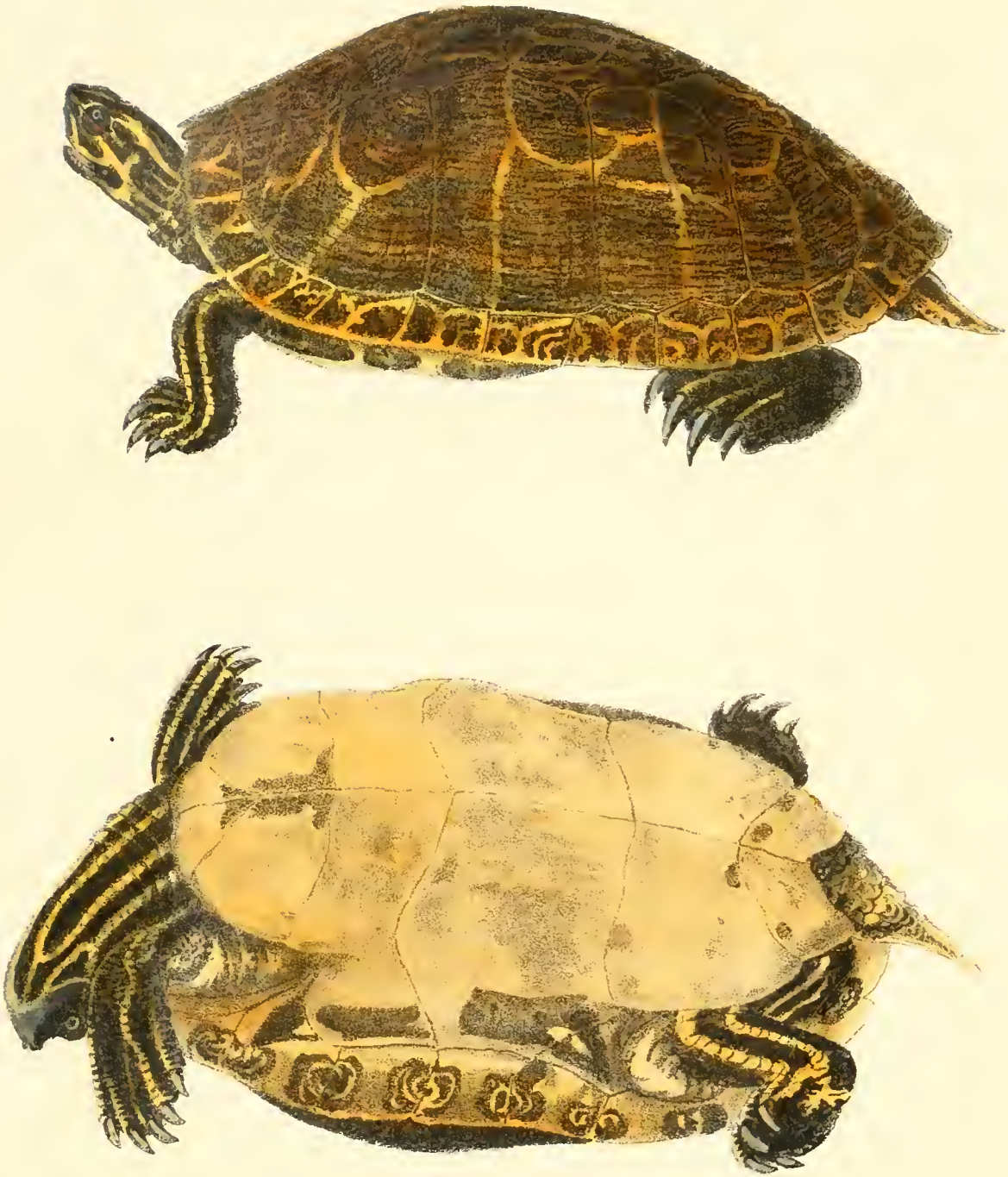
The Emys scripta, if a North American tortoise, is the young of the Emys serrata.

The Emys decussata (Bell and Gray*) has not been found in the United States,

* Gray, Synop. Rept., p. 28, spec. xxii.

but is common in the West India islands. Dr. Cocteau, an excellent herpetologist in Paris, shewed me numerous specimens from Cuba, whence they were brought by M. Ricord; and Mr. Bell, so well known by his great work on the Testudinata, gave me a specimen of it that he had received from one of the West India islands. It is very fairly the representative there of our Emys serrata, from which it differs, however, specifically, by the uniformity of its colour, and by the decussating rugæ of the shell.

If I were to add a synonyme to those already given, it would be the Emys ornata of Bell and other naturalists, for my friend Bibron shewed me the shell of an animal that served him in part for the description of the Emys ornata, which very much resembles the Emys floridana.



Emys Mobilensis

9.

EMYS MOBILENSIS.—*Holbrook.*

Plate IX.

Characters. Shell oval, ecarinate; convex anteriorly, depressed posteriorly, entire in front, emarginate and sub-serrate behind; jaws serrated; inferior furnished with a hook.

Description. The shell is regularly oval, broadest and flattened posteriorly; convex, entire in front, but emarginate and sub-serrate behind. Of the five vertebral plates, the anterior is urceolate, smallest in front, with three articulating margins, larger behind and convex; the second, third and fourth are hexagonal; the third slightly concave on its anterior margin; the fourth smaller and concave on its posterior; the fifth is irregularly triangular, its apex rounded, and directed upwards, and its basis cut into four articulating margins. The lateral plates are very large, the anterior triangular, the second and third pentagonal, and the fourth quadrilateral; all these plates are longitudinally rugous. The marginal plates are twenty-five in number; the nuchal is a parallelogram; the first is irregularly quadrilateral, rounded posteriorly, broad and straight anteriorly; the second is also quadrilateral, with its superior internal angle greatly elongated, to enter between the first marginal and first dorsal plates; all the remaining marginal plates are quadrilateral, the posterior and internal angle of the three last are salient, which gives a slightly serrated appearance to the shell, at its posterior margin; all these plates, except the intermediate and anterior, are marked with one or more concentric striæ, at the junction of the lateral and vertebral plates.

The sternum is oblong, full, and entire in front, and emarginate behind. The gular plates are triangular, with rounded bases, and their external and anterior angles projecting; the brachial are quadrilateral, the smallest border directed inwards; the thoracic are quadrilateral, and elongated transversely; the abdominal are broad and hexagonal, narrowest externally; the femoral are quadrilateral, with the shortest border directed internally; the sub-caudal plates are rhomboidal, the anterior angle prolonged. Of the supplementary plates, the axillary are irregularly quadrilateral; the anterior angle elongated and pointed; the femoral is also quadrilateral, broadest posteriorly, with the anterior and external angle greatly prolonged.

The head is rather large, the snout pointed. The eyes are of moderate size; the pupil black; the iris reticulated, with black and yellow lines. The upper jaw is serrated throughout its whole extent, as well as the lower, which is furnished with a hook.

The anterior extremities are strong, covered with large scales in front, and scales and granulations behind; there are five fingers, palmated, and furnished each with a short, strong, nearly straight nail. The posterior extremities are long, round at the thigh, much flattened at the tarsus; the toes are five, palmated, but four only are furnished with nails. The tail is short, thick at the root, but soon becomes small and pointed.

Colour. The vertebral and lateral plates are brown, reticulated with yellow lines. The marginal plates are likewise brown, with each a yellow line, which begins at the centre of the inferior margin and runs to the middle of the plate, where it bifurcates: one portion runs forward, and the other backward, and as the lines of the neighbouring plates meet, the margin has the appearance of being festooned.

The sternum is yellow, as well as the inferior surface of the marginal plates; each of these is marked by a large black blotch, at its junction with the neigh-

bouring plate; in the centre of each blotch is a yellow spot, with two concentric lines of the same colour; below these is frequently a black bar; the supplemental plates are also marked by a black blotch.

The head is dusky brown above, marked with longitudinal yellow lines; one begins at the snout, and runs along the crown of the head to the occiput; smaller lines run on each side of this; another line begins at the superior and inferior border of the orbit; this increases till it becomes a band, and runs along the neck; two other lines come from the orbit, one runs to the neck, above, and the other below the tympanum, where it is continuous with a larger line that comes from the lower jaw. The throat is ash colour, marked with three broad, yellow lines; one begins at the chin, and soon bifurcates, and in this bifurcation is included the third line.

The anterior extremities are dusky in front, with longitudinal yellow lines; the margins of the web are yellow; the posterior surface is marked with blotches and bands of yellow. The posterior extremities are dark in front, with longitudinal lines of yellow; on the inferior surface the yellow colour prevails over the dusky. The tail is dusky, with longitudinal yellow stripes.

Dimensions. Length of shell, 15 inches; greatest breadth, 9½ inches; length of sternum, 14½ inches; greatest elevation, 6 inches.

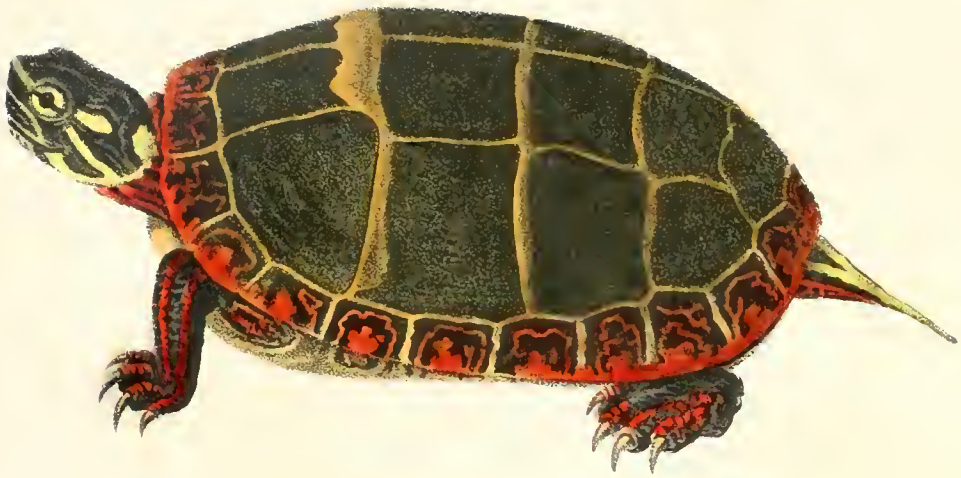
Habits. I have had no opportunity of observing the habits of this animal; but from the shape and form of the extremities, it would seem to be eminently aquatic.

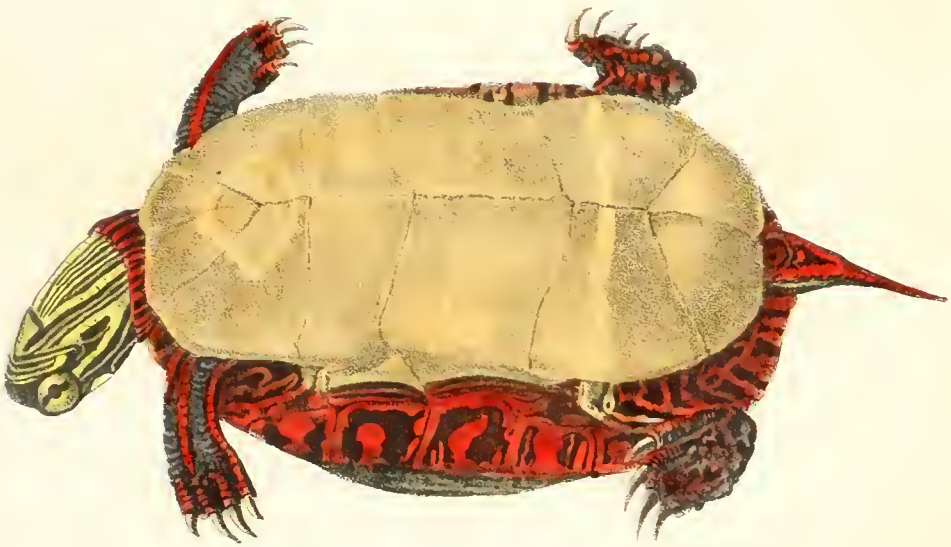
Geographical Distribution. As yet, Alabama is the only state in which this animal has been found, though it doubtless inhabits others. It is numerous in the neighbourhood of Mobile, where it is greatly esteemed as an article of food.

General Remarks. This is a fine species of Emys, being next to the Emys

floridana in size, and which in fact it almost equals. Leconte informs me that he observed it many years ago in Alabama, and proposed calling it Emys mobilensis, to which I have no objection, as I have been informed that it is not unfrequently sent to the New Orleans market, where it is known under the name Mobilianer.

This animal is perhaps most nearly allied to the Emys rubriventris, from which, however, it differs specifically; in this species both jaws are finely serrated; the shell is not compressed at the side, it is more elevated in front, and more depressed, and broader behind; the shell is brown, reticulated with yellow lines; it is twice the size of the Emys rubriventris, and has never yet been found within seven hundred miles of its locality.





Emys Picta

10

Serapinx.

On Stone by G. Lehman

Lehman & Duval Lith.rs Philad.a

EMYS PICTA.—*Schneider.*

Plate X.

Characters. Shell entire, sub-oval, depressed, smooth; dorsal plates black, bordered with yellow bands.

Synonymes. Testudo picta, *Schneider*, Schildk., p. 348.
Testudo picta, *Gmelin*, Syst. Nat. Lin., tom. i. pars iii. p. 1045.
Testudo picta, *Schoepff*, Hist. Test., p. 20, tab. iv.
Testudo picta, *Latreille*, Hist. des Rept., tom. i. p. 141.
Testudo picta, *Shaw*, Gen. Zool., vol. iii. p. 45, pl. x. fig. 2.
Testudo picta, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 164.
Emys picta, *Merrem*, Versuch eines Syst. der Amphib., p. 23.
Emys picta, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 306, 431.
Emys picta, *Say*, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 205.
Emys picta, *Fitzinger*, Neue Class. der Rept., p. 45.
Testudo picta, *Lèconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 115.
Emys picta, *Gray*, Syn. Rept., p. 26.
Clemys picta, *Wagler*, Natürlich. Syst. der Amphib., p. 137.
Emys picta, *Harlan*, Med. and Phys. Res., p. 151.
Emys picta, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 297.
Chequered tortoise, *Vulgo.*

Description. The shell is sub-oval or oblong, broadest behind, flattened, smooth, entire and ecarinate. There are five vertebral plates; the anterior is smaller than the second and third, and is quadrilateral, widest in front, with its margin arched outward; posteriorly it is elongated to enter a sinus of the

adjoining plate; the second, third and fourth are hexagonal, and the fifth heptagonal, with its borders of very unequal extent, and greatly dilated in the transverse direction. Of the lateral plates, the anterior are very regularly triangular, their bases being rounded and joined to five marginal plates; the second, third and fourth are quadrilateral. The marginal plates are twenty-five in number, and make one entire cutting margin; the nuchal, or intermediate, is nearly a parallelogram, slightly notched or serrated anteriorly; the anterior marginal is pentagonal, while the others are quadrilateral; the anterior, and those covering the thighs, being largest.

The sternum is oblong, broad, and of nearly equal length with the shell; full and rounded anteriorly, with the posterior border entire or but slightly emarginate. The gular plates are triangular, the bases forward, and the apices directed backward; the brachial are irregularly triangular, the bases being rounded and turned outward, the apices inwards and truncate; the thoracic and abdominal are quadrilateral, broad, and rounded externally; the sub-caudal are triangular, with rounded bases. Of the supplemental plates, the axillary are very small and triangular, with their apices forward; the inguinal are of the same form, but larger, and have their apices turned in the opposite direction.

The head is small, but full, and rounded in front; the snout being rather obtuse than pointed. The upper jaw is entire at the sides, but is notched anteriorly. The lower jaw is slightly hooked or turned upwards in front. The nostrils are anterior and near together. The eyes are large and brilliant; the pupil black; the iris golden, with a black band passing through it horizontally.

The anterior extremities are short, covered with large scales disposed transversely in front, and smaller scales, intermixed with granulations, behind; the fingers are five in number, slightly webbed, and each furnished with a short, delicate, and slightly incurvated nail. The posterior extremities are rounded above, but flattened at the tarsus, which sustains five fully palmated toes; the

four internal alone are provided with nails. The tail is moderately long, narrow, and covered with ranges of scales.

Colour. The Emys picta may be easily distinguished from all others of the genus, by the beautiful colour and markings of the shell. In general it is of a very dark brown, yet in some varieties it is much lighter, approaching to a dark olive; along the spine is a yellow line; the vertebral and lateral plates are bordered with the same colour. In old animals these are fawn colour; but in the young they are so bright, especially when seen under water, as to resemble golden bands. These bands vary in breadth; in some specimens they are narrow, almost linear; while in others they are more than two lines in breadth. The marginal plates are all marked both above and below with a bright red spot in the centre, which is surrounded by concentric lines of the same colour; at times the upper surface of the marginal plates appears clouded with red, resembling the mineral called blood-stone (Hæmatite).

The sternum is entirely yellow, except at the wings, where it is somewhat dusky.

The head above is dark, almost black, with several small yellow lines running from the snout to the orbit of the eye. The upper as well as the lower jaw is of dark fawn colour, marked with yellow lines; one of the lines passes through both jaws in its descent, and continues along the neck. Back of each eye is an oblong yellow spot; and another, of the same colour, but still larger, is situated behind the occiput; from each of these spots is continued a longitudinal line along the neck. The neck itself above is black, marked with longitudinal lines of orange and red; the throat is of the same colour, and marked with similar lines, though they are smaller and more numerous; one begins at the chin, and, after a short distance, subdivides; between this subdivision is a central line; on either side of these principal horizontal lines are others intermediate and less distinct.

The anterior extremities are black in front, with one or two red lines, the one

nearest the middle being the larger; the posterior surface is dark, and mottled with orange or red. The posterior extremities are black, both above and below, but the dark colour is relieved by orange lines; one begins near the anus, and runs along the posterior border of the thigh. The tail is dark above, and mottled at its base with red spots; a short longitudinal yellow line runs along the inferior surface, and a red line along the superior. The colours of this animal vary greatly in degree; they are always brightest in the young.

Dimensions. Length of shell, $6\frac{1}{2}$ inches; greatest breadth, $4\frac{1}{2}$ inches; length of sternum, 6 inches; elevation, $2\frac{1}{2}$ inches.

Habits. The Emys picta frequents ditches, ponds and pools, and is abundant in rivers, where the waters are sluggish; it spends almost the whole day basking in the sun on the banks of rivers, or on fallen trees or logs. It is very timid, and escapes rapidly when disturbed. It hibernates early, and is the first to be seen in spring. Its food is insects, tadpoles, young frogs, earth-worms, &c. It takes the hook readily, and is on that account very troublesome to anglers. Its flesh is sometimes eaten, but is not much esteemed.

Geographical Distribution. The Emys picta has perhaps as wide a range as any of the genus found in the United States. I have observed it along the Atlantic border, from Maine to Georgia—south of this I have no evidence of its existence. It is found in the north-western part of the country, as Dr. Pickering informs me that Mr. W. Cooper has seen it at the Saute de St. Marie, the outlet of Lake Superior.

General Remarks. This animal was first described by Schneider, under the name Emys picta, by which appellation it is now universally known to naturalists. The colour and marks of this animal being too remarkable to allow it to be confounded with any other, so is there less confusion in the synonymes than in those of any other of our Emydes.

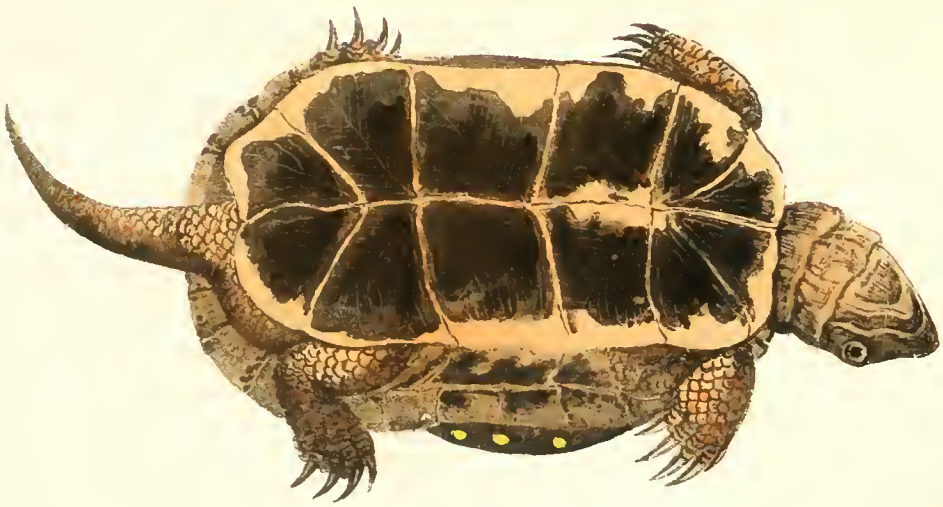
To the list of synonymes, however, I would add the *cinereous* tortoise of Brown,* the Testudo cinerea of Schoepff† and other naturalists, which is certainly the young of the Emys picta, as was first determined by Palissot de Beauvais, who had an opportunity of examining living specimens in Pennsylvania. It also seems highly probable to me that the Emys Bellii of Gray,‡ and of Dumeril and Bibron,§ is only a variety of this animal, as I have met with specimens of the Emys picta slightly depressed along the vertebral column, of a dusky-olive colour, and marked with bands, not unlike those described as belonging to the Emys Bellii.

* New Ill. Zool. p. 115, tab. xlviii. figs. 1, 2.

† Hist. Test., p. 18, tab. v. figs. 2, 3.

‡ Synop. Rept. p. 34.

§ Hist. Nat. des Rept., tom. ii. p. 302.



Emys guttata

Lithotint by J.P. Richard

P.S. Donald Lith.

EMYS GUTTATA.—*Schneider.*

Plate XI.

Characters. Shell oval, entire, smooth, ecarinate; black, with orange-coloured spots.

Synonymes. Testudo anonyma, *Schneider*, Schildk., 2 beytr. p. 30.
Testudo guttata, *Schneider*, Schrift. der Berl. Natürf. Fr., p. 264, b. iv. s. 3.
Testudo punctata, *Schoepff*, Hist. Test., p. 25, tab. v.
Testudo punctata, *Latreille*, Hist. des Rept., tom. i. p. 110.
Testudo guttata, *Shaw*, Gen. Zool., vol. iii. p. 47, pl. x. fig. 1.
Testudo punctata, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 159, pl. xxii.
Emys punctata, *Merrem*, Versuch eines Syst. der Amphib., p. 24.
Emys guttata, *Schweigger*, Prod. Arch. Königsb., p. 309.
Emys punctata, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 205.
Emys guttata, *Fitzinger*, Neue Class. der Rept., p. 45.
Testudo punctata, *Leconte*, Ann. Lye. Hist. N. Y., vol. iii. p. 117.
Clemys punctata, *Wagler*, Natürlich Syst. der Amphib., p. 137.
Emys guttata, *Gray*, Syn. Rept., p. 26.
Emys punctata, *Harlan*, Med. and Phys. Res., p. 151.
Emys guttata, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 295.
Speckled tortoise, *Vulgo.*

Description. The shell is ovoid, or sub-round, more or less flattened, smooth, ecarinate, with an entire margin, or is slightly emarginate behind. Of the five vertebral plates, the anterior is pentagonal, broadest in front, with two of its borders directed anteriorly; the second and third are hexagonal, their greatest

extent being in the transverse direction; the fourth is also hexagonal, with its posterior margin shortest, and often curved to receive the anterior border of the fifth vertebral plate, which is heptagonal, smaller in front and broader below. The lateral plates are four in number on each side; of these the anterior is irregularly triangular, with its apex truncated and turned upwards, and its basis rounded, directed downwards, and joined to five marginal plates; the second and third are pentagonal, with a short but acute point, which is received between two adjoining vertebral plates; the fourth is quadrilateral. The marginal plates are twenty-five in number; the nuchal or intermediate is very small, almost linear; the first is pentagonal, with its shortest border turned upwards and outwards; the remaining plates are quadrilateral, except the ninth, which is pentagonal, with its shortest border directed upward and forward.

The sternum is large, oval, entire anteriorly, emarginate posteriorly, and covered with twenty-four plates, generally marked with concentric striæ. The gular plates are triangular, with their bases directed forward and their apices backward; the brachial are also triangular, with their apices slightly truncated and turned inward; the thoracic and abdominal plates are quadrilateral, the former having their posterior and external angles elongated; the femoral are triangular, with their bases rounded, their apices truncate and directed inward; the sub-caudal are rhomboidal. The supplemental plates are very minute; the axillary are lozenge-shaped; the inguinal are quadrilateral.

The head is short, smooth, and rather pointed; the upper jaw is emarginate in front; the inferior is furnished with a tooth. The eyes are large; the pupil black, the iris reddish-gray, sometimes surrounded by a circle of brighter red.

The anterior extremities are short, covered with large scales in front, and smaller scales, together with granulations, behind; the fingers are five, slightly webbed, and sustaining five short, strong, curved nails. The posterior extremities are rounded at the thigh, but flattened at the tarsus, and granulated and scaly

on their upper surface; there are five toes, fully palmated, four only of which are furnished with nails. The tail is of moderate length, and slightly compressed.

Colour. The whole superior surface of this animal, the head as well as the extremities, is black, beautifully dotted with orange-coloured spots. These spots vary greatly in disposition and number, but are always present; generally there are three or four on the head and neck, and one on each marginal plate; they are most numerous on the lateral plates, varying sometimes from three to nine. The jaws are horn-colour, sometimes yellow. Besides the dark colour that prevails so universally, there is frequently a strong tinge of brick-dust colour or red on the throat and extremities. The under surface of the tail is reddish, spotted with brown; around the vent is red.

The sternum varies much in colour; in some it is yellow, in others dusky; in general the centre and borders are yellow, while the middle of each plate is marked with black blotches.

Dimensions. Length of shell, 4½ inches; greatest breadth, 3 inches; length of sternum, 4 inches; elevation, 1 inch 8 lines.

Habits. The Emys guttata is timid and gentle, and can be easily domesticated. It lives in ponds, brooks and rivers, feeding on such animals as it can seize, as tadpoles, young frogs, &c. It takes to the land frequently in search of food, devouring earth-worms, crickets, grasshoppers, &c.

Geographical Distribution. The Emys guttata, like the Emys picta, is widely extended. Leconte, who is good authority, says "over the whole United States." I have observed it on the Atlantic border, from lat. 43° to Florida, but have never seen a specimen from the western or south-western States.

General Remarks. Although in the specific character of this animal the shell is described as smooth, yet there is a variety where the lateral plates are marked

with longitudinal wrinkles; and this does not seem to depend on the age of the individual, as I have seen it both in the young and in the adult animal. Besides this, the form of the shell and distribution of the spots vary very much in different specimens. Leconte gives the following varieties:

α "Shell depressed, very little convex, wider behind; marginal plates above the hind legs very spreading; head with a few yellow spots, neck with many, particularly on the under side.

β "Shell more convex, spots on the shell large; marginal plates beneath sometimes reddish, those over the hind legs not spreading; sternum black, a little red on the middle and edges; sometimes the jaws, fore part of the throat, and a line running from the lower jaw along the side of the neck, orange.

γ "Shell convex like the last, not emarginate behind, fewer spots, rarely any on the lateral plates; plates of the disk with concentric striæ; marginal plates over the hind legs not spreading; sternum very dark brown, varied with yellow.

δ "Shell convex like the last; plates marked with concentric striæ, generally with but one orange spot on each; head with four yellow spots on the top; another at the corner of each eye, and a large one on the side of the hind part of the head, extending and growing narrower to the neck."

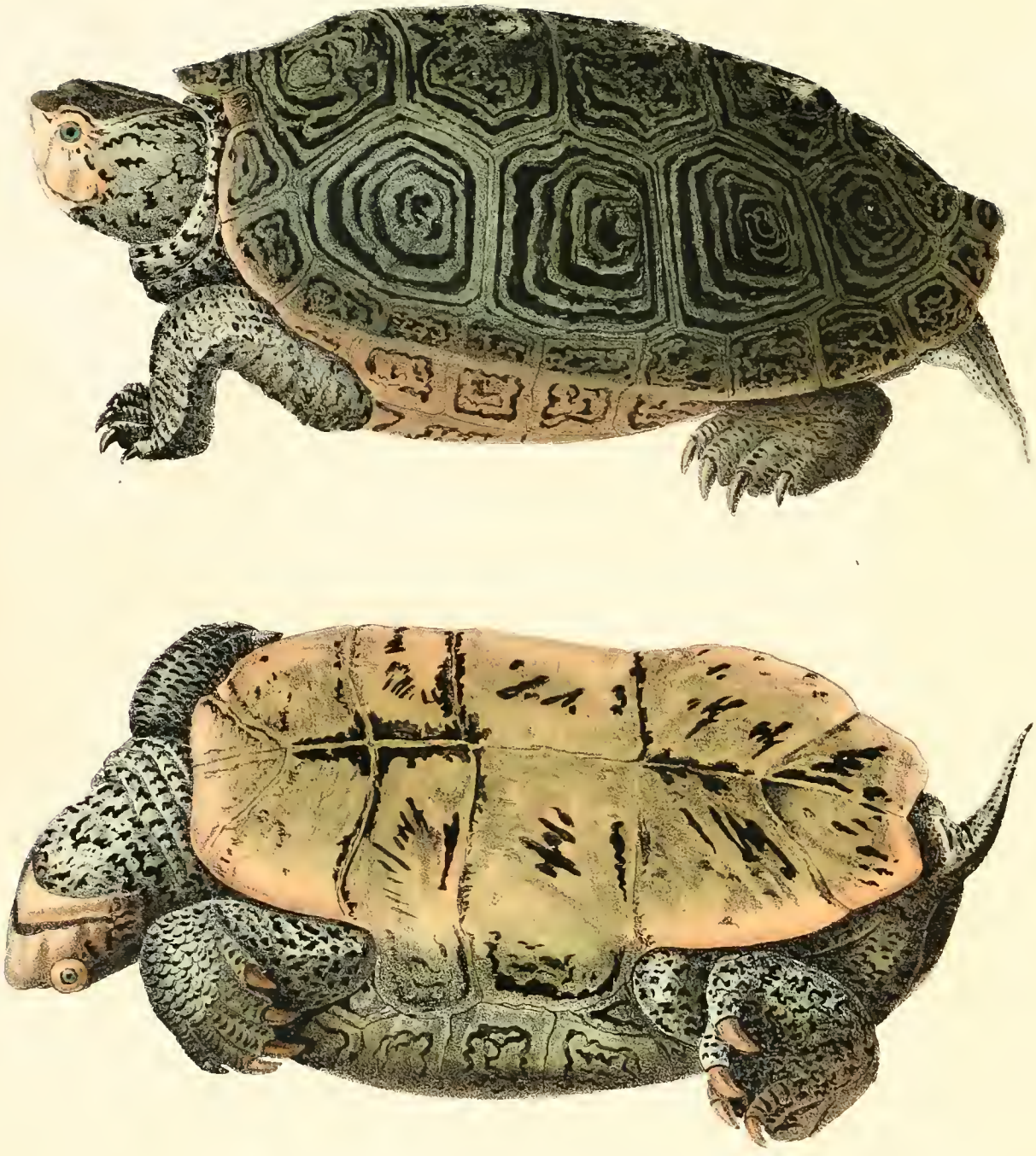
It is now certain that Seba* first gave a figure, and a tolerably good one too, of this animal, but unaccompanied by any description; he only says it came from Amboyna; but Seba is notoriously incorrect in the geography of his animals.

Schneider, (Jean Gottlob,) a celebrated Greek scholar of Frankfort on the Oder, appears to have been the first to describe this animal, under the name Testudo anonyma, in his Natürgeschicte der Schildkröten, a work I have never

* Thes., S. I. tab. 80, fig. 7.

been able to obtain. Yet there can be no doubt of it, for in the Transactions of the Society of the Friends of Natural History at Berlin, I find Schneider referring to this same tortoise, as well as to the figure of Seba, although he now calls the animal Testudo guttata. It may then be asked, why not retain the name Testudo anonyma, which seems to have the right of priority? The answer is this: Schneider at first was not aware that he had a new species, but seems to have regarded it as a variety of the common Testudo Europæa; but afterwards, when by comparison he had determined it to be a new and distinct species, then he called it Testudo guttata. Thus he says,* "I have received this species from the collection of Baron Bloch of Dresden, and sufficiently described it in the second supplement to the Natural History of Tortoises, p. 30–32. I was then somewhat doubtful whether or not to consider it as a variety of the common species, (Cistuda europæa,) from which it differed both in colour and in shape of the body. Now I look upon it as a new and separate species, differing from the common water tortoise principally through the firm adhesion of the sternum to the shell." Why Schoepff should have changed the specific name of this animal to punctata, with all these facts before him, and referring at the same time, as he did, to Schneider's work, cannot now be determined. To the name punctata there can be no objection; it is equally applicable with the other, and has been adopted by many excellent naturalists; guttata, however, has the right of priority.

* Schrift. der Berl. Naturf. Freunde, b. iv. s. 3, p. 264. Ich habe diese Art aus der Sammlung der Hrn. Baron Von Bloch erhalten, und im zweiten Nachträge zur Naturgeschichte der Schildkröten, s. 30–32, genau beschrieben; ich war damals noch zweifelhaft, ob ich sie als eine Abart von der gemeinen ansehen und stellen sollte, ob ich gleich die abweichungen im Farbe und Körperbau deutlich bemerkte. Yezt sehe ich deutlich ein, dass es eine neue eigene Art ist, welche sie von der gemeinen Wasserschildkröten vorzüglich durch die vestere Verbindung des obern und untern schildes unterscheidet.



Emys terrapin

12

[illegible] Stone by C. Lehman Lehman & Duval Lith^rs Phila

EMYS TERRAPIN.—*Schoepff.*

Plate XII.

Characters. Shell oval, nearly entire, slightly emarginate posteriorly; depressed; obtusely carinate; dusky olive-green, or dark brown, and marked with darker concentric lines.

Synonymes. Testudo terrapin, *Schoepff*, Hist. Test., p. 64, tab. 15.
La Terrapène, *Lacépède*, Quad. Ovip., tom. i. p. 129.
Testudo centrata, *Latreille*, Hist. des Rep., tom. i. p. 145.
Testudo concentrica, *Shaw*, Gen. Zool., vol. iii. p. 43, pl. ix. fig. 1.
Testudo centrata, *Daudin*, Hist. Nat. des Rep., tom. ii. p. 155.
Emys centrata, *Merrem*, Versuch. eines Syst. der Amphib., p. 26.
Emys centrata, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 301, 426.
Emys centrata, *Say*, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 205.
Emys centrata, *Fitzinger*, Neue Class. der Rep., p. 45.
Emys centrata, *Harlan*, Med. and Phys. Res., p. 153.
Testudo palustris, *Leeonte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 113.
Emys concentrica, *Gray*, Synop. Rep., p. 27.
Emys concentrica, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 261.
Salt-water Terrapin, *Vulgo.*

Description. The shell is oval, almost entire, or slightly emarginate behind, depressed, and obtusely carinate. The vertebral plates are five in number; the anterior is the largest, pentagonal, with its two shortest margins directed forwards; the second, third, and fourth, are hexagonal, the latter very irregularly so, its posterior margin being much the smallest; the fifth is heptagonal; each of these

vertebral plates has a protuberance; that of the fourth is the most prominent; these tubercles, taken together, give an obtusely carinated appearance to the shell —some varieties have the prominences but slightly developed. Of the lateral plates, the anterior is irregularly quadrilateral, largest at its lower and anterior border, where it is joined to four marginal plates; the second and third are pentagonal; and the fourth very irregularly quadrilateral. The marginal plates are twenty-five in number; the nuchal, or intermediate, varies in shape—sometimes triangular, with its apex truncate and directed anteriorly; at others it is almost quadrilateral; the remaining marginal plates are nearly quadrilateral; the five posterior are slightly revolute, and thus form at times a sort of gutter.

The sternum is sub-oval, entire in front, and extending even as far as the shell; it is emarginate behind, does not reach the length of the carapace, and is covered with twelve plates marked with concentric striæ. The gular plates are triangular, with their apices directed barkward; the brachial are nearly quadrilateral, the lateral margins most extensive; the thoracic and abdominal plates are oblong squares, and the sub-caudal lozenge-shaped. Of the supplemental plates, the axillary are irregularly quadrilateral and broadest before, while the inguinal are triangular and broadest behind.

The head is very large, broadest posteriorly, narrow, and almost pointed in front; above, it presents a smooth surface, as if the head were covered with a single large rhomboidal plate, differing in some degree in colour from the rest of the animal. The jaws are strong and cutting, the superior slightly emarginate; the inferior curved in front, and furnished with a hook. The eyes are small, the pupil black, the iris gray, approaching the colour of the skin. The neck is short and thick.

The anterior extremities are moderately long, and scaly before; scaly and granulate behind; the fingers are five in number, webbed, and each furnished with a short strong nail. The posterior extremities are rounded above, but flattened at the tarsus; scaly in front and granulate behind; there are five toes, fully webbed,

but four only are furnished with nails. The tail is short, thick at the root, but small and pointed at the tip, and covered above with a row of scales, which gives it a sharp ridge.

Colour. The colour of this animal varies a good deal, more perhaps than that of any other Emys; generally speaking, it is dusky brown, though frequently it is greenish, or dark olive colour. The marginal plates are all yellowish beneath, each with a ring of dark grey colour; in the centre of this ring occurs frequently a dark spot: sometimes we find two or three of these rings placed one within the other, with intermediate yellow lines, and a yellow spot in the middle.

The sternum also varies in colour; it is generally yellowish, marked with concentric striæ and dusky lines; seldom more than two on a plate, forming squares, which are sometimes single, sometimes double, the inner line always following the figure of the outer; at other times the sternum is entirely yellow.

The crown of the head is sometimes very dark; sometimes greenish, or olive. The jaws are horn colour, mottled with dark spots, or crossed by transverse dark lines or bars. The side of the head, the neck, as well as the extremities, are dusky or greenish-white, studded with innumerable black dots; these are sometimes so disposed as to give a marbled appearance to the skin.

Dimensions. Length of shell, $7\frac{1}{2}$ inches; length of sternum, 7 inches 2 lines; elevation, 2 inches 10 lines.

Habits. The Emys terrapin lives in salt water and in salt marshes, where it hibernates; far from these it is never seen. It is a timid animal, easily disturbed, and hiding itself on the least alarm. It swims with great rapidity, and, unlike its tribe in general, moves quickly even on land.

Geographical Distribution. This is a widely extended animal, abounding in marshy places, from Rhode Island, where they have been observed by Dr. Mauran,

to Florida. They exist also along the northern shores of the Gulf of Mexico, according to Dr. Binney, who saw them at New Orleans, and I have received living specimens from its southern shore. This seems to be the only Emys common to North and South America, and it is not singular, when we consider, that all others of the tribe live in fresh water—this alone in salt; consequently it might be driven by currents from island to island, and from one shore of the Gulf to the other, like the Chelonia or sea tortoises; and yet I have never received them from any of the West India islands, nor have I any evidence of the existence of the Emys terrapin among them.

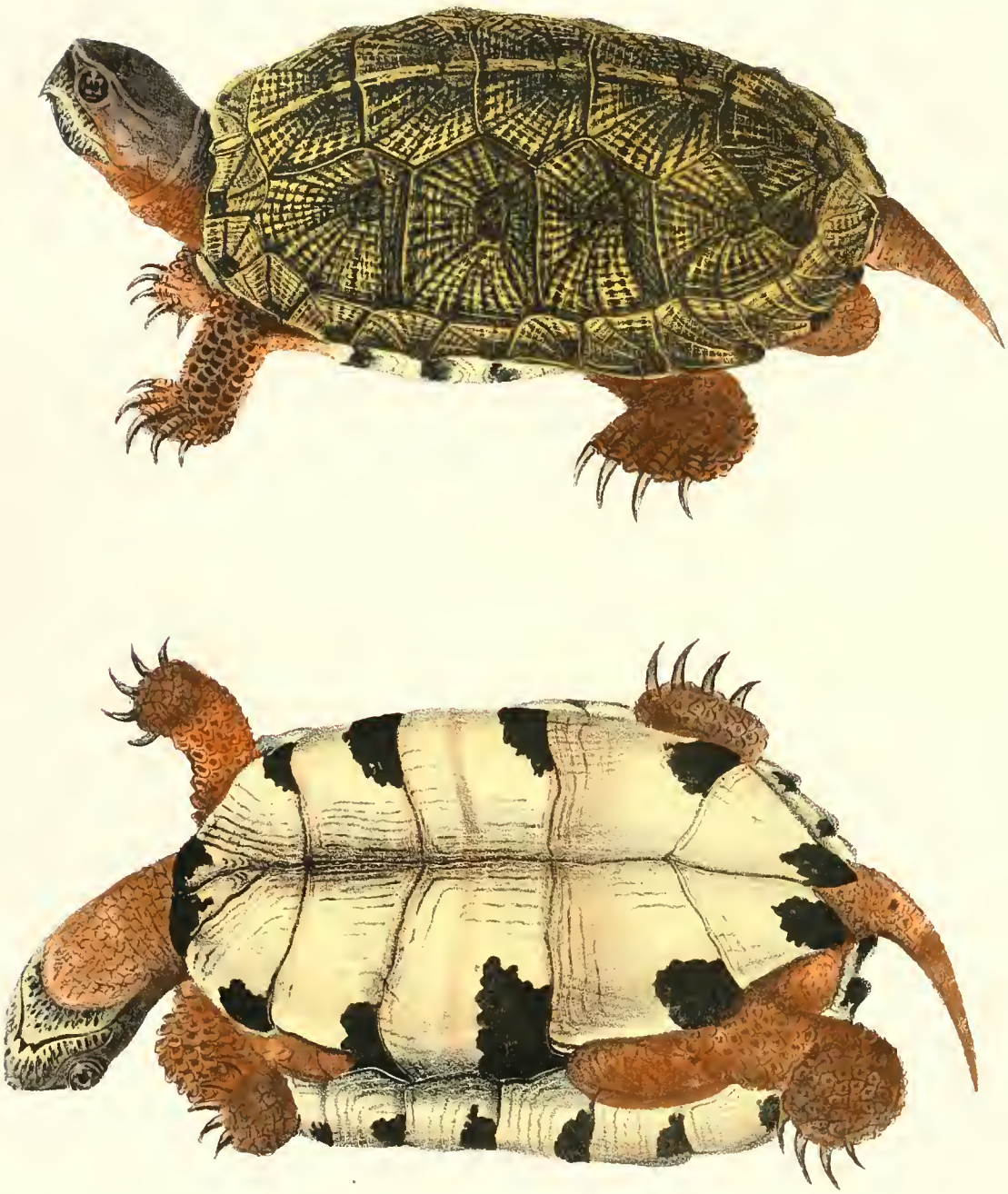
They are very abundant in the salt marshes around Charleston, and are easily taken when the female is about to deposit her eggs, in the spring and early summer months. They are then brought in immense numbers to market; yet, notwithstanding this great destruction, they are so prolific that their number appears undiminished. Their flesh is excellent at all times, but in the northern cities, it is most esteemed when the animal has been dug out of the mud in its state of hibernation. The males are smaller than the females, and have the concentric striæ more deeply impressed.

General Remarks. This animal was certainly first described by Schoepff in his Historia Testudinum, and accompanied with an excellent figure. Schoepff observed it in the United States himself, where he was surgeon to a German regiment during the war of the revolution; and he also received it from Muhlenberg, who sent him specimens of many other animals. He called it Testudo terrapin, a name I have retained in this work, not because I like it—on the contrary, it is inappropriate, being in common parlance applied to the whole genus —but on account of its priority, which in every instance should rigidly be adhered to. The specific name centrata of the French Naturalists, or, better still, concentrica of the English, is the one I should prefer, but cannot adopt either, for the reason above given.

It is possible this may be the animal mentioned by Brown,* but nothing can be

positively determined from his description: "anterior extremities with five, posterior with four toes; body of a compressed oval form, and seldom exceeds eight or nine inches in length: is often served up at gentlemen's tables, and looked upon by many as good food: frequents the lagoons and morasses of Jamaica." Yet this is all that Gmelin had to establish the species Testudo palustris, in his edition of the Systema Naturæ of Linnæus. The name is well enough, and Leconte, in his excellent Monograph on the North American Tortoises, has retained it. Yet I cannot agree with him, in considering the Testudo palustris of Gmelin, and the Testudo terrapin of Schoepff as identical, and must therefore adopt the name of the latter, as he first accurately described it.

* Civil and Natural History of Jamaica, p. 465.



Emys insculpta

EMYS INSCULPTA.—*Leconte.*

Plate XIII.

Characters. Shell oval, carinate, emarginate posteriorly; reddish-brown, with radiating yellow lines; sternum full in front, emarginate behind; all the plates deeply marked with radiating and concentric striæ.

Synonymes. Emys scabra, *Say*, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 210.
Testudo inseulpta, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 112.
Emys scabra, *Harlan*, Jour. Acad. Nat. Scien. Phil., vol. vi. p. 76.
Emys pulchella, *Schweigger*, Prod. Arch. Königsb., tom. i. p. 303.
Emys speciosa, *Gray*, Synop. Rept., p. 26.
Emys inseulpta, *Harlan*, Med. and Phys. Res., p. 152.
Emys pulchella, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 251.

Description. The shell is oval, carinate and emarginate posteriorly. There are five vertebral plates; the anterior is pentagonal, broad, with an acute angle and two borders in front, narrow behind, with its posterior margin slightly concave, to fit the adjoining plate; the second and third vertebral plates are hexagonal; the fourth is heptagonal, and very narrow posteriorly; the fifth is again hexagonal, with four of its articulating facets directed backwards. Of the lateral plates, the anterior is triangularly hexagonal, and united to four marginal plates; the second and third are hexagonal, the latter very irregularly so; the fourth is quadrilateral; the fifth is hexagonal, smaller above, larger below. All of these plates, as well as those of the vertebral range, have a well developed prominence in the centre, from whence pass radiating striæ, which are again crossed by concentric striæ, giving a

beautiful sculptured appearance to the shell. The marginal plates are twenty-five; the nuchal, or intermediate, is small and narrow, but elevated like a carina or ridge above the adjoining plates; the anterior marginal is pentagonal, with its outer and anterior angle prolonged; all the others are quadrilateral; those along the flanks are revolute and form a groove; the ninth and tenth are convex, while the eleventh and twelfth are again revolute and form a deep gutter; the posterior and external angles of the ninth, tenth and eleventh are each prolonged, and give a sub-serrate appearance to the posterior margin of the carapace.

The sternum is oblong, full and entire in front, but deeply emarginate behind; the gular plates are triangular, with their apices directed backwards, and projecting beyond the brachial at their external border; the brachial are also triangular, with truncate apices; the thoracic are oblong, quadrilateral; the abdominal are pentagonal, large and broad. The femoral plates are quadrilateral, very large, and project beyond the sub-caudal at their posterior and external angles; the sub-caudal are lozenge-shaped. The surfaces of all these, as well as the inferior surface of the marginal plates, are marked with deep, radiating and concentric striæ. Of the supplemental plates, the axillary is triangular, with its basis turned backwards; the inguinal is quadrilateral and very small.

The head is large, but elongated; the upper jaw is so emarginate in front as to form two teeth, and the lower is furnished with a strong hook; the cutting edges of both are strong and sharp. The nostrils are anterior, and near together. The eyes are large, with a black pupil, and a dark brown iris, surrounded by a yellow circle.

The anterior extremities are covered with scales, both before and behind, those in front being the largest; there are five fingers, palmate, each furnished with a short, strong, and slightly curved nail. The posterior extremities are rounded at the thigh, but flattened at the leg and tarsus; there are five toes, fully palmate, but four only are furnished with nails. The tail is long, thick at the root, but soon becomes slender, and is covered with scales.

Colour. The shell above is brown, marked with radiating yellow lines. The marginal plates beneath are yellow, with each a black spot, and most commonly with concentric dusky lines. The sternum is also yellow, with a very large black blotch and concentric striæ to each plate.

The head is dusky brown, lighter below, and speckled with red, or has a general tinge of brick-dust colour. The jaws are horn-colour; the chin reddish-brown, with a transverse white line near the posterior extremity of the lower jaw.

The extremities, anterior and posterior, as well as the tail, are reddish-brown above and brick-dust colour below.

Dimensions. Length of shell, 8 inches; breadth of shell, 5 inches; elevation, $2\frac{3}{4}$ inches; length of sternum, 7 inches 5 lines; length of tail, $2\frac{1}{4}$ inches.

Habits. The Emys insculpta lives in ponds and rivers, and is, according to Leconte, much more fond of leaving its natural element than any other aquatic species, remaining even for months uninjured in dry places. This it does, according to Haldeman, to rid itself of a parasitic animal, (Clepsina scabra,) by which it is infested when in water. The living individuals that have fallen under my observation were all from New Jersey; they were very lively and active, and moved rapidly either on land or water. They were very restless, constantly in motion, and seemed disposed on all occasions to attack their fellow prisoners. (Emys serrata and Emys terrapin.)

Geographical Distribution. The geographical range of the Emys insculpta is much more extended than was at first believed. It inhabits the Atlantic states from Maine to Pennsylvania; the largest specimen I have ever seen was from the former state, and is now in the Museum of the Boston Lyceum of Natural History.

General Remarks. To Leconte is due the merit of having first accurately described this animal, in his Monograph on the North American Tortoises, under

the name Testudo insculpta. Dumeril and Bibron, however, give the credit to Schweigger, and have consequently adopted his specific name, pulchella, excluding at the same time the pulchella of Schoepff. Let us see how Schweigger's account agrees with the animal now under consideration, and in what respect it differs from that of Dumeril and Bibron. Schweigger says:* "The sternum is truncate in front, obtuse or but slightly sinuous behind, and is joined to the shell by cartilage." All this agrees perfectly well with the Cistuda Europea, (Testudo pulchella of Schoepff,) of which Dumeril and Bibron also remark:† "The sternum, which is oval, &c., has its anterior extremity truncated and its posterior hardly emarginate;" and again, "this sternum, which is, &c. &c., to be united with the shell by means of cartilage." But look for a moment at their account of the Emys insculpta of Leconte, which they suppose identical with the Emys pulchella of Schweigger, and we shall see that they do not agree in the most important particulars. Thus, in their characters of the genus Emys, under which they have very properly arranged the animal in question, they say, "sternum immovable, and solidly articulated to shell;" which is correct; but it neither agrees with Schweigger's description of his pulchella, as may be seen above, nor with their own characters given to the genus Cistuda, under which they arrange the pulchella of Schoepff, (Cistuda Europea.) And again, as regards the form of the sternum—Dumeril and Bibron say with truth of the Emys insculpta, "deeply notched behind like the letter V;" while in Schweigger's account of the pulchella it is "hardly sinuous."

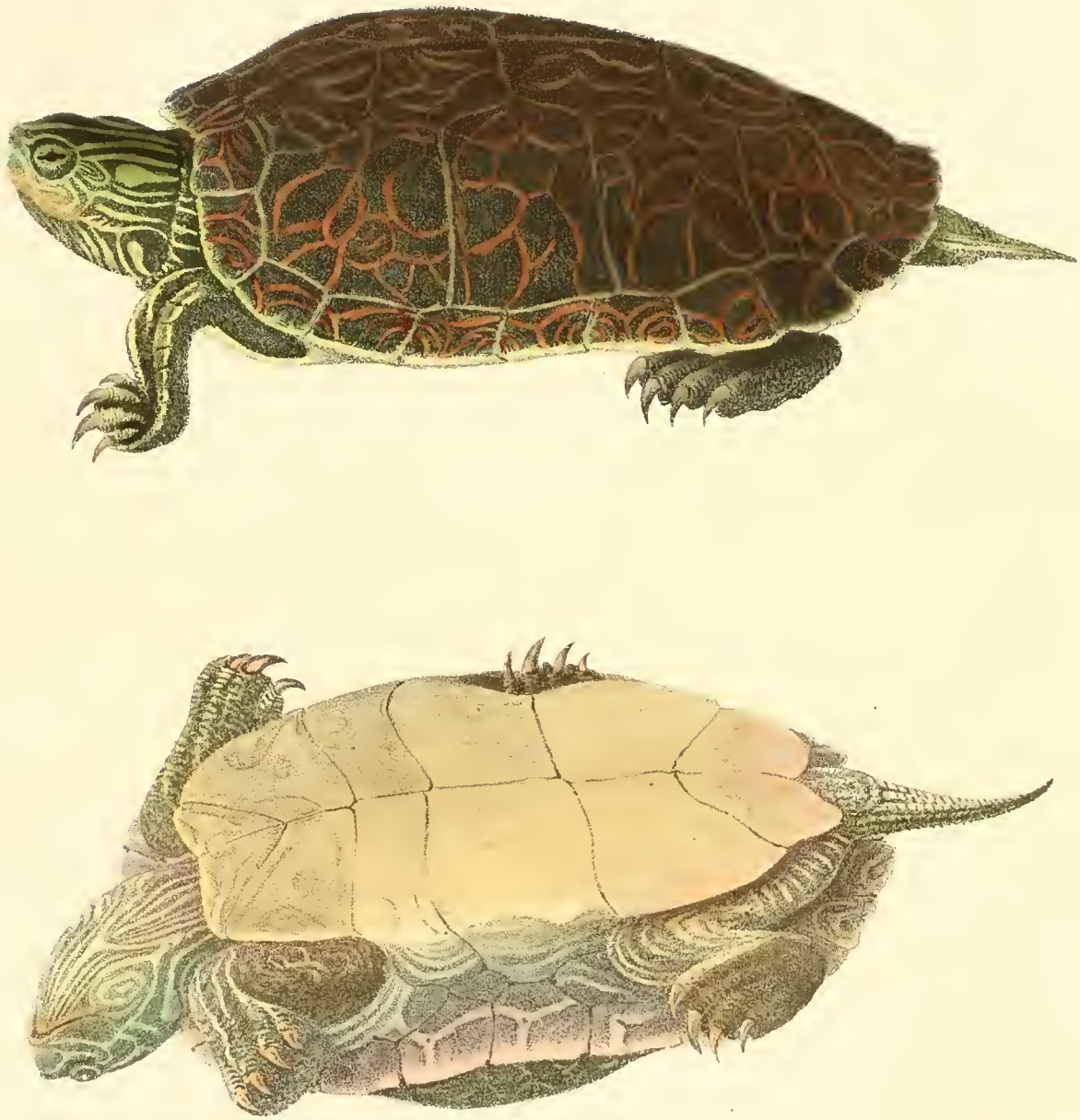
Schweigger had no notion that he was describing a new species of Emys when drawing up the specific characters of the Emys pulchella; on the contrary, he supposed that he was continuing the species Testudo pulchella of Schoepff, to whose description he refers; and although he may have seen individuals of the Emys insculpta in the Garden of Plants at Paris, as he avers, still his description

* Sternum duodecim areis; antice truncatum; postice obtusum, levissime sinuatum; cartilagine testæ adnexum, &c. Prod. Arch. Königsb., p. 305.

† Le sternum qui est ovale, &c. &c., a sa partie anterieure comme tronquée et son extremité posterieure à peine echancrée. And again: Ce bouclier inferieure, &c. &c., de chaque coté pour s'unir à la carapace au moyen d'un cartilage, &c. Hist. des Rept., tom. ii. p. 232 et 234.

does not correspond with it in any of the most remarkable points, while it is perfectly applicable to the Cistuda Europea or Testudo pulchella of Schoepff, which is only the young animal. It may even be doubted whether Schweigger ever saw the real Emys insculpta, for he visited Paris in 1809, and published his Prodromus in 1812; while the specimens in the Garden of Plants are said to have been sent by Milbert, Lesueur and Leconte, from New York, which could only have happened some years after.

It follows, then, from these considerations, that the Emys pulchella of Schweigger, is not identical with the Testudo insculpta of Leconte, and that the Emys pulchella of Dumeril and Bibron is; yet their name cannot be retained, as Leconte's has the right of priority.



Emys geographica

P.S. Duval Lith.r Philad.a

EMYS GEOGRAPHICA.—*Lesueur.*

Plate XIV.

Characters. Shell sub-oval, flattened, carinate, serrated posteriorly; dark or olive-brown, reticulated with reddish-brown lines; sternum oblong, deeply emarginate behind, dingy yellow; head very large; jaws entire.

Synonymes. Testudo geographica, *Lesueur*, Jour. Acad. Nat. Scien. Phil., vol. i. p. 85, pl. v.
Testudo geographica, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., p. 108.
Emys geographica, *Harlan*, Med. and Phys. Res., p. 152.
Emys geographica, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 257.

Description. The shell is sub-oval, slightly emarginate in front, serrated behind, and flattened above, with a marked carina throughout its whole extent. The vertebral plates are five in number and smooth; the first irregularly hexagonal, with its posterior border curved and projecting into the anterior margin of the second plate, which is also hexagonal, with its anterior margin excurvated; the third and fourth plates are hexagonal, with their lateral angles acuminate; the latter with a deep sinus on its posterior face for receiving the fifth plate, which is heptagonal. The first lateral plate is triangular, with its basis rounded and connected with five marginal plates; the second and third are hexagonal, with an acute angle above, passing in between the vertebral plates; the fourth is pentagonal: all these plates are smooth above and have only a few longitudinal wrinkles near the marginal plates. Of the twenty-five marginal plates, the nuchal or intermediate is triangular, with its apex pointing forward, and marked with three minute teeth, and its basis backward and having an angular depression for

receiving a small point of the first vertebral plate; the first marginal plate is pentagonal, broadest in front; the remaining plates are quadrilateral; the fourth, fifth, sixth and seventh have revolute margins; the eighth, ninth, tenth and eleventh have each a notch in their external margins, and have their posterior and inferior angles lengthened, which gives the posterior margin of the shell a serrated appearance; the two supra-caudal are slightly elevated (en toit).

The sternum is oblong, entire in front, deeply emarginate and concave behind. Of its twelve plates, the gular are very regularly triangular, having the apex of the triangle directed backwards; the brachial plates are irregularly quadrilateral, with the external and posterior angle prolonged; the thoracic are quadrilateral, extensive in the transverse, and narrow in the antero-posterior direction; the abdominal plates are hexagonal and broad; the femoral, irregularly quadrilateral, broad and rounded externally, narrow and straight within; the sub-caudal plates are very irregularly quadrilateral, their outer and posterior angles rounded. Of the supplemental plates, the axillary is triangular, with its external and posterior angle truncated; the inguinal is regularly triangular.

The head is extremely large, narrow before, very broad behind, and placed on a short, thick neck; the snout is rather pointed. The nostrils are in front, and near each other. The eyes are large and prominent, placed near the snout; the pupil is dark, and the iris golden. The upper and lower jaw have their cutting margins entire, and are very strong.

The anterior extremities are short, with transverse rows of large scales on the anterior part, and a very remarkable row on the posterior surface, above the carpus; a range of large fleshy folds extends along the superior border of the fore-arm to the humerus; the fingers are five in number, each furnished with a short, curved nail. The posterior extremities are long, flattened, and covered with scales, and end in five toes, broadly palmated, and furnished with four nails. The tail is small, minutely carinated, and pointed.

Colours. The shell is very dark or olive-brown, with a tinge of green, only perceptible in a strong light, and margined with a border of obscure yellowish-brown. All the plates are marked with distinct anastomosing lines of brownish-orange, which gives a reticulated appearance to the whole shell. The sternum is of a dingy yellow colour; the wings and supplemental plates marked with waving brownish lines, interspersed with lines of yellow.

The head and neck are dark brown, or black, striped with yellow; the jaws are horn colour; a longitudinal line of yellow begins at the snout, and is continued backwards, between the orbits, and terminates at the occiput; two other lines, of nearly the same size and colour, begin behind the orbits on each side, and are continued along the superior surface of the neck; at the distance of a fourth of an inch posterior to each orbit is a dirty yellow blotch; the inferior surface of the neck is dusky, and marked with yellowish lines; one of these begins at the chin, and soon subdivides, the branches running towards the articulation of the lower jaw, whence it is continued along the neck. Beginning where the latter line subdivides is another longitudinal and larger line, running along the middle of the throat; on each side of these principal lines are many others, both on the cheek and throat; near the angle of the mouth is a remarkable yellow blotch, surrounded by yellowish concentric lines; another blotch is found in front of the tympanum, whence it descends, terminating in a line that runs along the lateral and inferior borders of the neck.

The anterior extremities are coloured like the neck, with two or three longitudinal lines of dirty yellow. The general colour of the posterior extremities is like the anterior, with transverse bands of dirty yellow on the nates. The superior surface of the leg and foot are dusky, with some yellow spots and lines; the inferior surface is of the same colour, and marked with blotches and longitudinal lines of yellow. The tail is dusky brown, marked with longitudinal lines of dingy yellow; these lines are distinctly marked only as far as the vent.

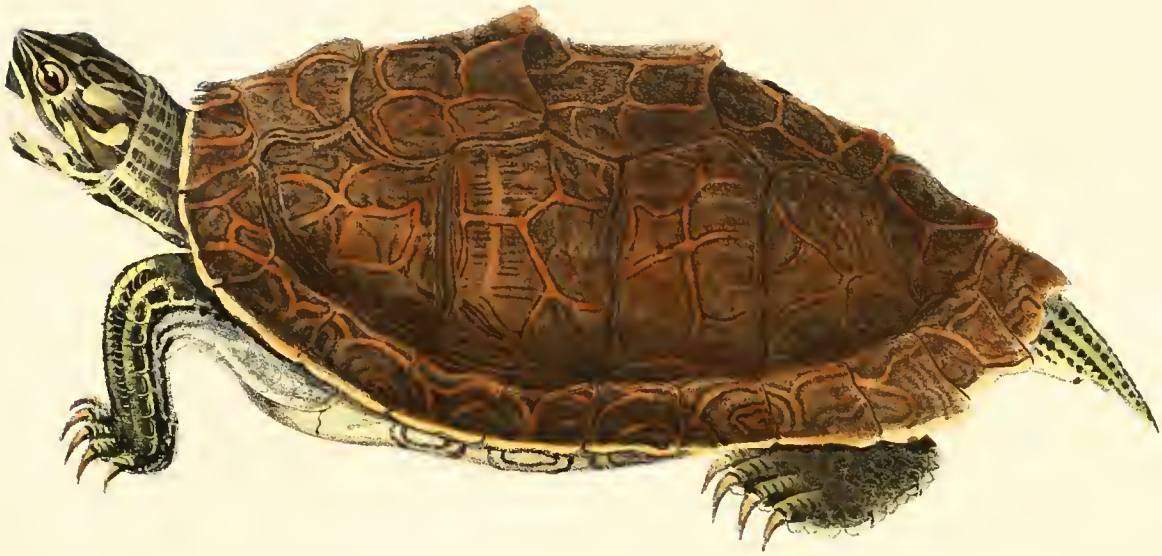
Dimensions. Length of shell, $8\frac{1}{4}$ inches; of sternum, 7 inches; height, 3 inches;

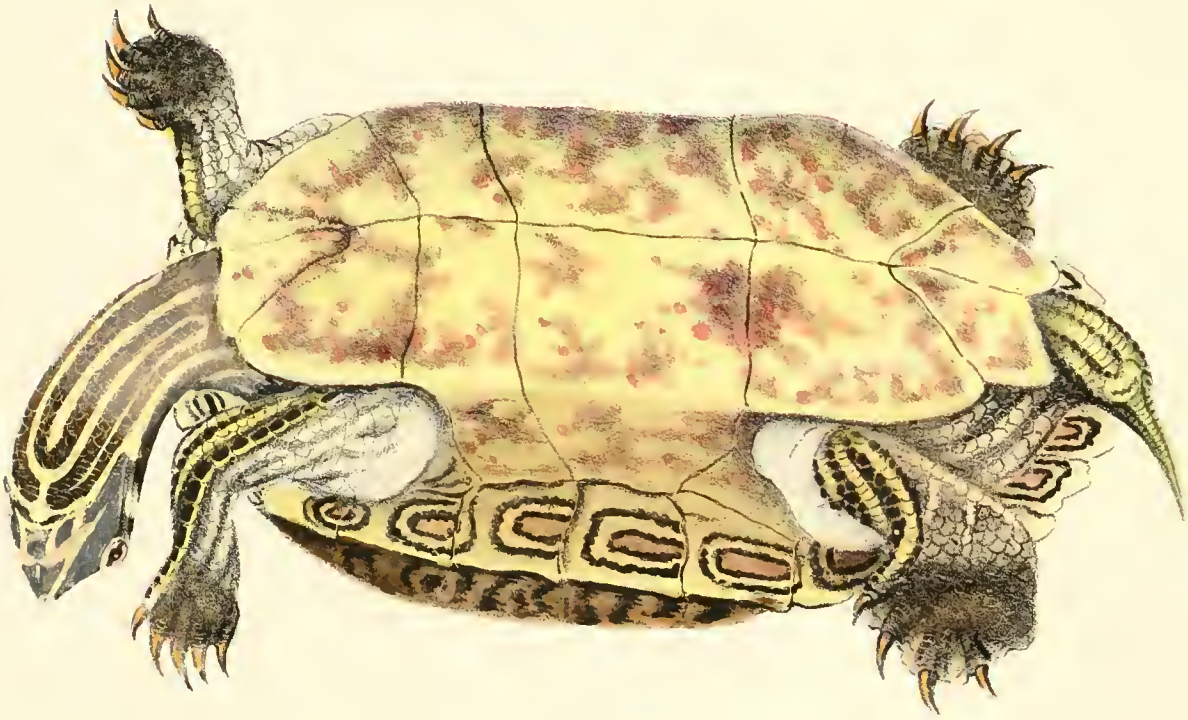
breadth of shell, 6 inches; length of tail, $2\frac{1}{2}$ inches; length beyond the vent, $1\frac{1}{4}$ inches.

Habits. The Emys geographica is bolder and more active than the animals of this class generally; those that I have seen approaching even the Chelonura in their disposition to bite when disturbed.

Geographical Distribution. This animal was first observed by Lesueur in the marshes about Lake Erie; and Troost has since seen them abundantly in Cumberland river, Tennessee, and other western waters. And recently, Mr. Haldeman has furnished me specimens of the Emys geographica from the Susquehanna river, so that the animal has a much wider geographical range than was at first supposed.

General Remarks. When this animal first came into my possession, I believed it had never been described, and called it Emys megacephala, from the great size of the head. My error arose from having at that time seen only one individual, and that with the lines on the shell very indistinct—almost imperceptible. I am now, however, satisfied, after the examination of many specimens, that it is the real Emys geographica of Lesueur, and have, consequently, restored to it its proper appellation. Indeed, the plate first given has only been altered, in having the lines on the shell added, which were so indistinct in the specimen I first received from Troost; and this alteration has been done from a beautiful animal furnished by my friend Haldeman. It will now be seen that it bears the greatest resemblance to the plate of the Emys geographica of Lesueur, done by himself—in form of shell—shape and colour of jaws—lines and marking on the carapace; and that it agrees equally well with his description. And furthermore, I have now in my possession an animal that agrees in the minutest particulars with the one here described, that was found in the state of New York, sent to the Garden of Plants in Paris many years ago, and marked Testudo geographica—done, as I was informed, by Lesueur himself.





Emys pseudogeographica

H. Richard del.

P. S. Duval, Lith. Phil.a

EMYS PSEUDO-GEOGRAPHICA.—*Lesueur.*

Plate XV.

Characters. Head small, oval; upper jaw emarginate; lower jaw hooked; shell elongated, oval, emarginate anteriorly, serrate posteriorly, with a tuberculated carina above, and a few horizontal striæ on the lateral plates.

Synonymes. Testudo geographica, variety, a, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 110.

Emys pseudo-geographica, *Lesueur*, manuscript, Dumeril et Bibron, Hist. Nat. des Rept., tom. ii. p. 256, (*Synonymes.*)

Description. The shell is elongated, oval, emarginate before and serrate behind, with a remarkable tuberculated crest at the vertebral region. The first vertebral plate is hexagonal, with its posterior border convex or arched, to be received in a concavity of the second, and with a small point in front that enters the nuchal; the second and third vertebral are hexagonal; the anterior border of the second concave; the fourth vertebral is also hexagonal, but irregularly so, being very narrow behind; the fifth is pentagonal, with an acute angle directed backwards, and received between the two posterior marginal plates; the four anterior of these plates have each an elevated knob or tubercle; the fifth has only a ridge; all these give a remarkable tuberculated vertebral carina; of the lateral plates the anterior is irregularly triangular, with a rounded basis directed downwards and forwards, and joined to five marginal; the second and third lateral plates are pentagonal; the fourth is irregularly quadrilateral, broader below and joined to three marginal. The anterior lateral plate is irregularly triangular, with its basis rounded and directed downwards and forwards, and joined to five marginal; the

second and third are pentagonal, the fourth is quadrilateral, larger below and joined to three marginal. Of the marginal plates the nuchal, or intermediate, is trigonal, with the apex truncated and directed forwards, and the basis backwards, with a small triangular notch to be received on the point of the anterior vertebral; the anterior marginal is pentagonal, with its anterior and external border projecting beyond the second; the remaining plates are quadrilateral; those on the flanks are revolute, and make a groove or gutter; and the five posterior are slightly notched, with their posterior and external angle projecting so much as to give a serrated appearance to the posterior margin of the shell.

The sternum is full and entire in front, and deeply emarginate behind; the gular plates are short and triangular, their bases before, their apices behind, with a projecting spine or knob at their outer and anterior angle; the brachial are also triangular, with bases rounded and turned outwards, and apices turned inwards and truncated; the thoracic are oblong, quadrilateral, narrow in the antero-posterior direction; the abdominal are nearly square, their outer margin offering three facets for joining the marginal and supplementary plates; the femoral are irregularly quadrilateral, broader without and rounded, with their posterior and external angle lengthened out beyond the sub-caudal in a point; the sub-caudal are trapezoid in form. Of the supplementary plates the axillary are large, oblong and pentagonal; the inguinal are also large and rhomboidal.

The head is small; the snout is pointed; the nostrils are anterior, small and closely approximated; the jaws are entire or without serræ; the upper is slightly emarginate in front, and the lower is provided with a small tooth; the eyes are moderately large, the pupil black, the iris of a rich golden colour, with a small black horizontal band, not however extending completely through it.

The anterior extremities are rounded at the shoulder, flattened at the carpus, and covered with large scales in front and smaller behind, with a series of scales on the ulnar margin of the fore-arm; there are five fingers, palmated and furnished with five slender nails, moderately long and slightly curved. The posterior

extremities are rounded at the thigh, and greatly expanded at the tarsus; scaly above, and scaly and granulate below; the toes are five in number, extensively palmated, but furnished with only four nails. The tail is moderately long, granulated and scaly, with a slight ridge of scales above.

Colour. The head is dusky, marked with yellow lines; one begins at the tip of the snout, and runs to the occiput; others from the same place, and on each side, run over the orbit; others again, having the same point of departure, pass beneath the orbit to a yellow spot which is there placed; several lines of similar colour begin behind the orbit, and run down to the throat, while others pass over the tympanum and along the side of the neck; a yellow spot, triangular and of large size, is situated on the posterior part of the head; and at the cheek is another remarkable spot of similar colour, included in a circle of black, which is in turn surrounded by a yellow line. The jaws are horn-colour, marked with black and yellow. The throat is marked with a great many yellow longitudinal lines, several of which are bordered with black, or are included between two black lines.

The vertebral and lateral plates are chestnut or cinereous-brown, marked with lines of yellow or light brown; these run in all directions, and give a reticulated appearance to the shell; the marginal plates are of similar colour, each with one or more perpendicular yellow lines, and with their outer margin yellow; the sternum is beautifully marbled with white and reddish-brown; the wings are marked with oblong black blotches, surrounded by concentric dusky lines.

The superior surface of the anterior extremities is black, with broad, yellow, longitudinal lines, which run to the toes, and even tinge the webs and convex part of the nails; the inferior surface is dusky, marked with irregular blotches and bars of yellow. The posterior extremities are black above, with a few interrupted, yellow, longitudinal lines, and with a remarkable band of similar colour along the posterior border of the thigh and leg; the nates are brown, with yellow bands. The tail is dusky above, with yellow longitudinal lines at the side, and yellow below.

Dimensions. Length of head, 14 lines; length of shell, 6½ inches; of sternum, 6 inches; length of tail beyond vent, 1 inch.

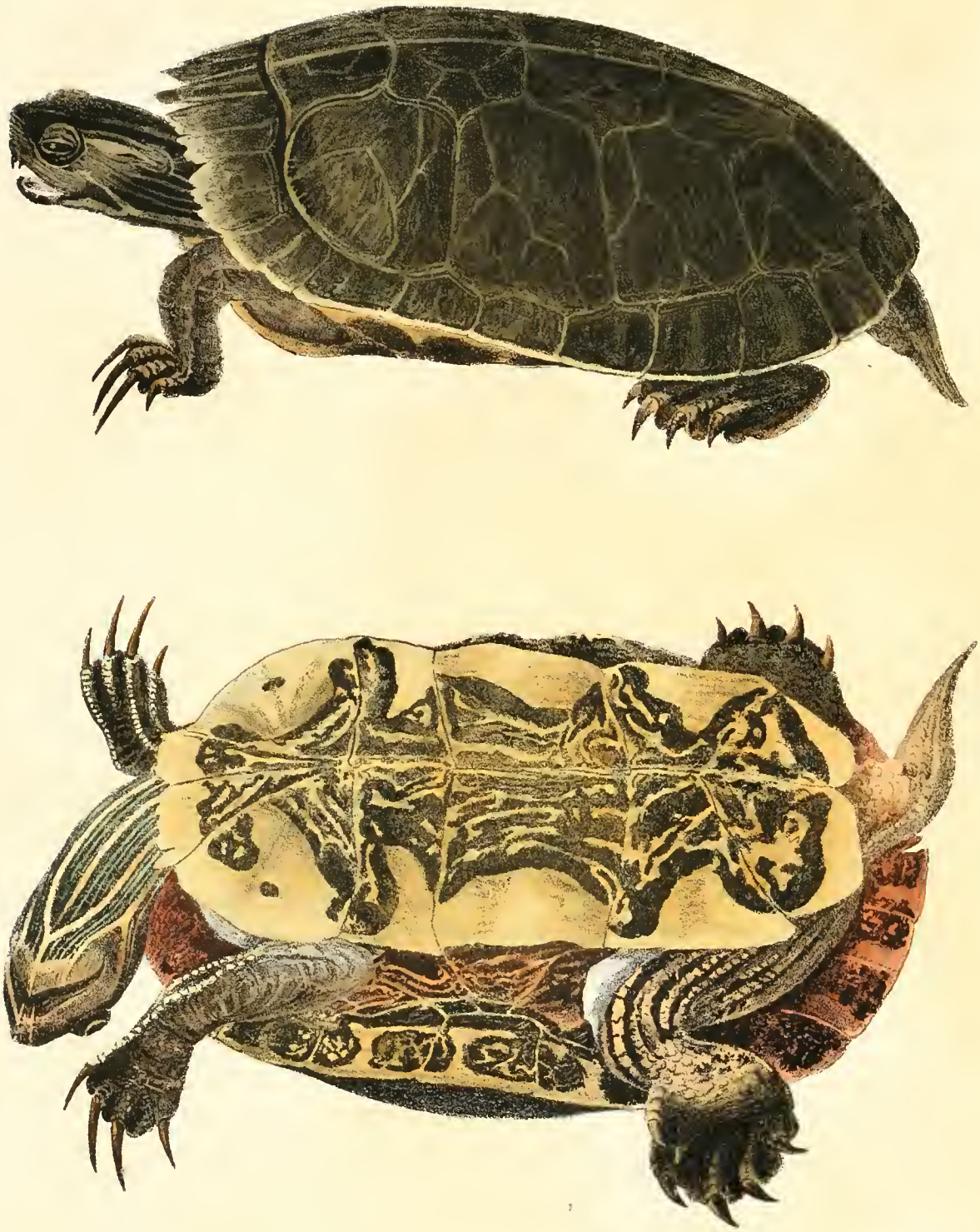
Habits. This animal is entirely aquatic; and though frequently seen on fallen trees or rocks that rise above the water, yet it only seeks the land in the breeding season. It feeds on various small fish, reptiles, &c.

Geographical Distribution. The Emys pseudo-geographica inhabits many of the rivers that empty into the Mississippi, and is abundant in some, but has never yet been found to the eastward of the Alleghany range of mountains.

General Remarks. The first account of this animal was given by Lesueur in the "Memoires du Musèum d'Histoire Naturelles,"* and his description is good, though he considered it a variety of the Emys geographica, in which opinion he has been followed by most naturalists, while others consider it only as the young animal; yet that it is entirely a different animal, may be seen by a reference to the tubercles on the vertebral line, to the form of the jaws, to the small size of the head, which is not more than one half as large as in the Emys geographica, though the carapace may be longer and more elevated; to its geographical distribution, &c.; and Lesueur seems lately to have come to the same conclusion.†

* Vide tom. xv. p. 267.

† Dum. et Bib. tom. ii. p. 256.



Emys oregoniensis.

EMYS OREGONIENSIS.—*Harlan.*

Plate XVI.

Characters. Shell sub-oval, greatly depressed, serrated in front, slightly emarginate behind; sternum broad, oblong, serrated anteriorly, emarginate posteriorly; with a large black blotch extending to all the plates. Head small, elongated; upper jaw bidentate.

Synonyme. Emys Oregoniensis, *Harlan*, Amer. Jour. of Arts and Scien., vol. xxxi. p. 382, plate 31.

Description. The shell is sub-oval; broadest behind, and very slightly emarginate; anteriorly it is narrowed, and presents a serrated border; it is greatly depressed, almost flattened along the vertebral line. Of the five vertebral plates, the anterior is irregularly quadrilateral, with its two anterior angles much prolonged, its lateral margin curved, and its posterior border convex and projecting; the second is hexagonal, with its anterior margin concave, to receive the posterior border of the anterior plate; the third and fourth are also hexagonal; the latter with its posterior margin concave; the fifth is heptagonal, its anterior margin shortest, rounded, and received into the concavity of the posterior margin of the fourth, and with its posterior border more extensive, and joined to four marginal plates. Of the lateral plates, the anterior is irregularly triangular, with its basis rounded, directed forwards, and joined to five of the marginal; the second and third are pentagonal; the fourth is nearly quadrilateral. The marginal plates are twenty-five in number, those in front are longest; the nuchal, or intermediate, is elongated, narrowed posteriorly, and projecting anteriorly; the first are quadrilateral, broadest behind, and serrated in front; the second and third are also

quadrilateral, and serrated anteriorly; but they are broadest in front. All these plates are marked with three concentric lines posteriorly, and are longer than in any other species of Emys that has fallen under my observation. The fourth, fifth, sixth and seventh plates are quadrilateral, smaller, and revolute to form a small groove. The remaining plates are also quadrilateral, broader, but not revolute.

The sternum is broad, slightly contracted in the middle, serrated in front, and emarginate behind. The gular plates are triangular in shape, with their bases directed forwards, and serrated; at their outer angles is a process, prominent, pointed, and projecting beyond the rest of the plate: between these two protuberances is a concavity for the neck. The brachial plates are triangular, their bases round, their apices truncated and directed inwards; the thoracic are narrow, quadrilateral, with their posterior and external angles elongated; the abdominal are pentagonal, and very broad; the femoral are irregularly quadrilateral, and broadest externally; the sub-caudal are rhomboidal. Of the supplemental plates, the axillary are triangular, with their apices turned backwards; the inguinal are larger and quadrilateral, with an anterior angle prolonged.

The head is moderately large and elongated; the snout pointed. The upper jaw is furnished in front with two remarkable teeth, and the lower has a well developed hook.

The anterior extremities are rather long, flattened, and covered with large transverse rows of scales; there are five fingers, palmated, and furnished with five strong nails. The posterior extremities are round at the thigh, but greatly flattened at the tarsus; the toes are five in number, and fully palmated, but only four are furnished with nails. The tail is long.

Colour. The shell is dusky brown; the vertebral and lateral plates are marked with pale yellow lines; these communicate with each other, and give a reticulated appearance to the carapace; the marginal plates have each a vertical line

subdividing them equally; the intermediate and two anterior on each side are mottled with pale yellow. The sternum is yellow, with a large black blotch in the centre, which is very beautiful, as may be seen in the accompanying plate, but cannot be described; besides this, each brachial plate is marked in the centre with a small circular spot of black. The wings are black, marked with yellow; the under surface of the marginal plates is yellow, with a black spot, mottled with yellow, at the junction of each plate.

The head is dusky above, with small pale yellow lines. The jaws are horn-colour; a yellow line begins at the posterior and superior margin of the orbit, and runs along the lateral and superior border of the neck; another begins at the posterior and inferior margin of the orbit, and descends to join a third and still larger band that arises about the middle of the lower jaw; after the junction, they extend along the lateral and inferior margin of the neck. The throat is dark brown, with several longitudinal yellowish lines; one of these is remarkable—it begins at the chin, soon splits, and forms two larger lines; between these two is another and shorter line of the same colour.

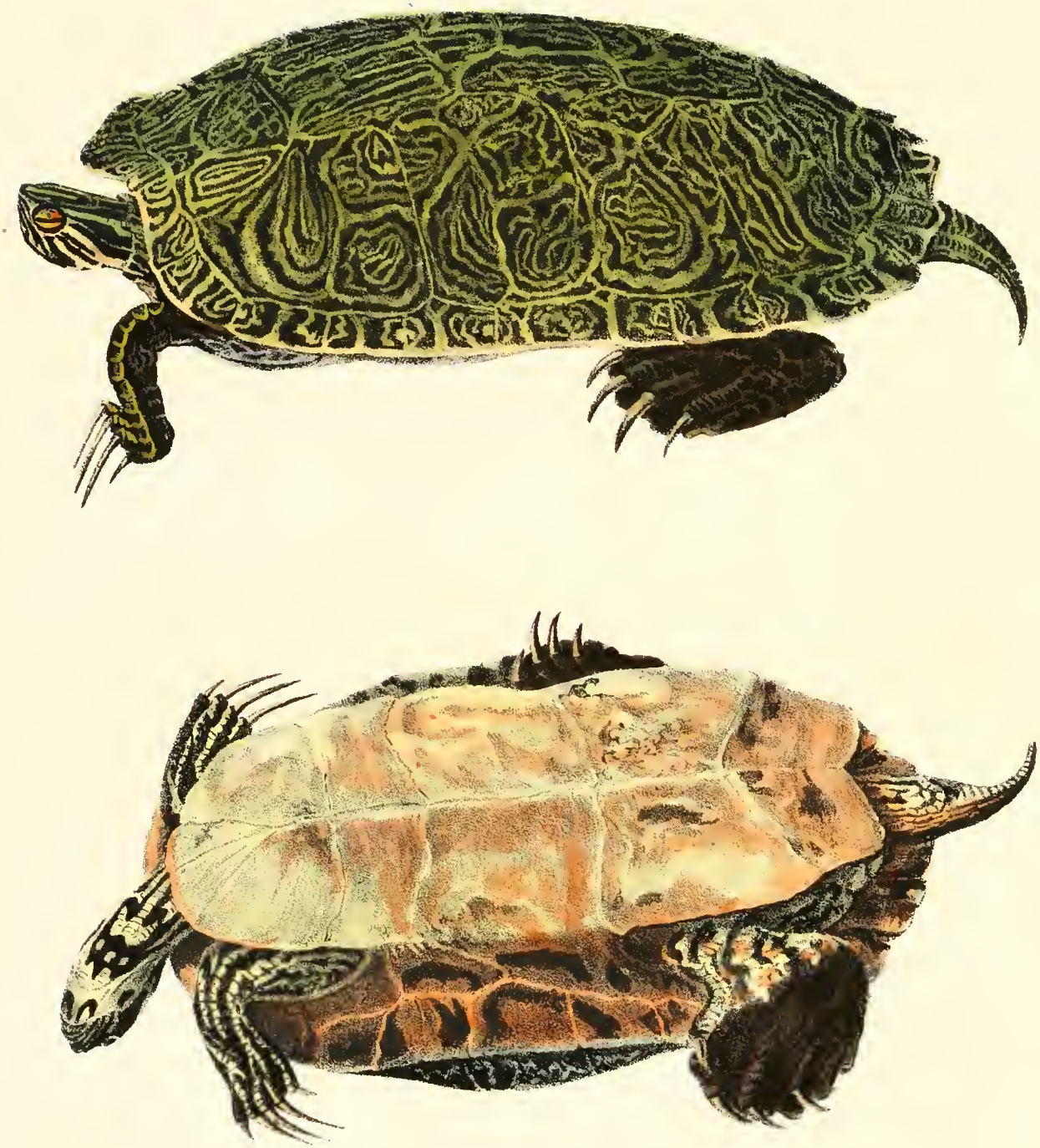
The anterior extremities are dark brown in front, with two longitudinal lines of pale yellow; one runs near the middle, the other along the superior margin: these lines are continued to the nails and to the webs, which are also yellow; the inferior surface is dusky. The posterior extremities are dusky above, irregularly marked with yellow; the convexity of the toes and the web being of the same colour. The tail is dusky above, with three yellow longitudinal lines; below, it is mottled with yellow.

Dimensions. Length of shell, 7 inches 2 lines; breadth, 5 inches; sternum, $6\frac{1}{2}$ inches; elevation, 2 inches 1 line; length of tail, $2\frac{3}{4}$ inches.

Habits. Of the habits of the Emys Oregoniensis not much is known: it is said to prefer clear and running waters.

Geographical Distribution. The only locality at present ascertained of this beautiful animal is the Oregon river, and even there it is not abundant.

General Remarks. The Emys Oregoniensis was brought from beyond the Rocky Mountains by Mr. Nuttall, an ardent naturalist and excellent botanist. He informs me that it is the only species of Emys he observed during a long journey, from the western border of the Rocky Mountains to the Pacific Ocean. Dr. Harlan first described this animal from the specimen now in my possession, under the name it here bears.



Emys hieroglyphica.

EMYS HIEROGLYPHICA.—*Holbrook.*

Plate XVII.

Characters. Shell oval, depressed, ecarinate, smooth, entire in front, elongated and imperfectly serrated behind; sternum oblong, emarginate posteriorly, dingy yellow; head very small; upper jaw slightly emarginate, lower jaw furnished with a tooth.

Description. The shell is oblong-oval, very flat, smooth, ecarinate, entire in front, and imperfectly serrated behind. The first vertebral plate is urceolate; the second and third are hexagonal, the former with its anterior, the latter with its posterior margin, concave; the fourth vertebral plate is very irregularly hexagonal, with the lateral angles prolonged; the fifth is heptagonal. The first lateral plate is irregularly triangular, with the basis rounded, and joined to four marginal; the second and third are hexagonal, with an acute angle above, received between the vertebral plates; the fourth is pentagonal. The marginal plates are twenty-five in number; the nuchal, or intermediate, is nearly a parallelogram, the anterior is irregularly quadrilateral, with its anterior and external angle projecting beyond the second, which is also very irregularly quadrilateral, with its posterior and internal angle much elongated. The remaining marginal plates are all nearly quadrilateral; the posterior and external angle of the ninth, tenth, and eleventh project so much as to give a serrated appearance to the shell.

The sternum is full and entire in front, emarginate behind; the gular plates are regularly triangular, the apex of the triangle directed backwards; the brachial plates are irregularly quadrilateral, the outer margin being rounded and most

extensive; the thoracic are quadrilateral, and narrow in the antero-posterior direction; the abdominal are hexagonal and broad; the femoral and sub-caudal plates are irregularly quadrilateral and large. Of the supplemental plates, the axillary is elongated and quadrilateral, the inguinal is triangular.

The head is remarkably small and narrow; the snout a little pointed; the nostrils are in front, and near together; the eyes are large, and placed near the snout; the pupil dark, the iris golden. The upper jaw is slightly emarginate in front; the lower furnished with a small tooth.

The anterior extremities are long, with a row of large square folds of skin along the superior border of the fore-arm, beginning at the humerus; the anterior surface of the fore-arm is covered with large scales, the posterior surface with smaller; the carpus is broad; the fingers five in number, and palmated, furnished with five nails; the three intermediate are straight, and of very great length; the posterior extremities are long and very flat; the tarsus and metatarsus greatly expanded; the toes are remarkably palmated, and furnished with four long nails.

Colour. The shell is olive-brown, tinged with green, and is subdivided by broad yellowish lines into spaces of various shapes and sizes, each space being occupied by narrower concentric lines of the same colour. The marginal plates have each a broad yellowish band extending through the middle in a vertical direction; at each extremity of the plates are yellowish spots, and one or more semicircular lines of the same colour; these meeting with the lines of the adjoining plates form a complete circle, in which are enclosed two yellowish spots. The colour of the sternum is a dirty yellow, with a dusky blotch at the external border of the thoracic and abdominal plates.

The head is dark brown; a yellow line begins at the snout, runs between the eyes, increasing in breadth, and terminates behind the orbit; another line of the same colour begins behind the orbit, small at first, but increasing in size till it forms a large yellow blotch, out of which issues another line, which runs along

the neck. Below these lines are two broad yellow bands, also beginning behind the orbit; these communicate by a vertical band passing over the anterior part of the tympanum, and are afterwards continued along the neck. A small yellow line begins on each side, beneath the nostrils, and is continued to the middle of the upper jaw; another line of similar colour goes from the centre of the chin and extends across the throat, from the posterior part of which is extended, along the lower jaw and neck, another broad band, continuous at the articulation of the jaw with the band passing down from the orbit; on the throat is another large blotch, from which are extended posteriorly one or two yellow lines.

The colour of the anterior extremities is dark brown in front, with a large yellow longitudinal band above, extending throughout, and one or two smaller and less extensive below. The posterior extremities are dark brown, with large longitudinal yellow bands along the nates and posterior part of the thighs, and smaller ones on the superior surface of the thigh and leg; on the inferior surface of the thigh and leg are several very extensive yellow bands and blotches, all ending at the tarsus; the membrane between the toes is marked with a longitudinal yellow line; the tail is dark brown above and below, with two longitudinal yellow lines.

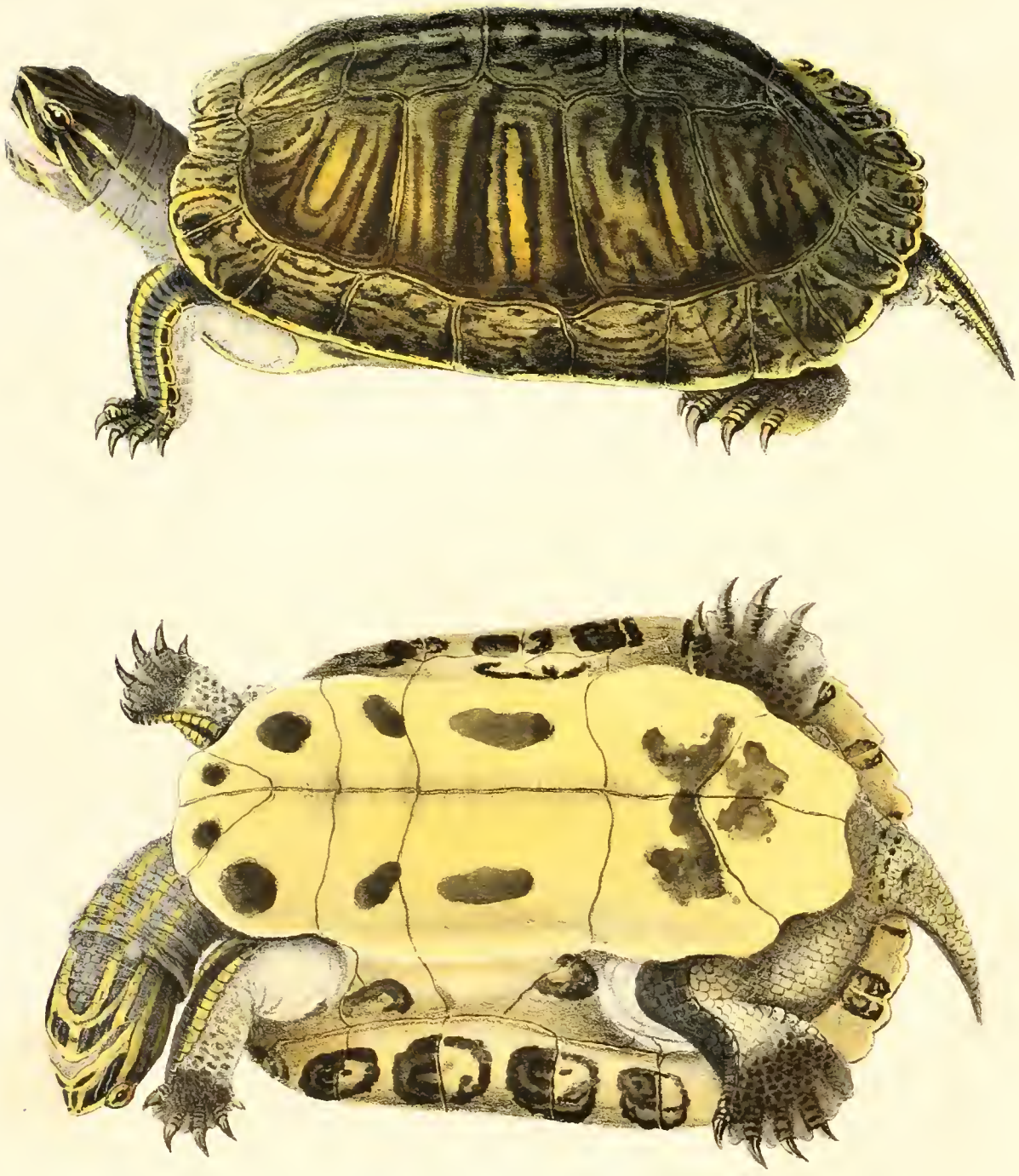
Dimensions. Length of shell, 12 inches; of sternum, $9\frac{1}{2}$ inches; breadth of shell, 7 inches; elevation of shell, 3 inches; length of tail, 3 inches; length beyond the vent, $1\frac{1}{2}$ inches.

Geographical Distribution. It is found in our western waters. Professor Troost, of Nashville, Tennessee, furnished me with a beautiful living specimen from the Cumberland river.

Habits. I know but little of the habits of this animal, but from the form of its extremities, it appears to be eminently aquatic.

General Remarks. I have been led to give the specific name hieroglyphica, to

this Emys, from the peculiar disposition of the yellow lines and spots on the marginal plates, which at a first view bear a strong resemblance to hieroglyphic characters.



Emys cumberlandensis.

On Stone by J H Richard

P.S. Duval, Lith. Phila

EMYS CUMBERLANDENSIS.—*Holbrook.*

Plate XVIII.

Characters. Head of moderate size; upper jaw slightly emarginate; lower jaw furnished with a small hook in front; shell sub-round, indistinctly carinate, slightly notched anteriorly, and beautifully serrated posteriorly; sternum full, entire in front, truncated behind.

Description. The shell is much flattened and sub-round in form, having a distinct though slightly elevated carina throughout its whole extent; the anterior margin is slightly notched, while its posterior is beautifully serrated. The first vertebral plate is hexagonal, elevated into a small prominence at the centre of its posterior part, where the carina begins; its greatest extent is in the antero-posterior direction, with its posterior margin projecting at the centre, and its anterior marked by three small articulating facets; the second vertebral plate is also hexagonal, with acute lateral angles, its anterior margin concave, to receive the first vertebral; its posterior straight, and with its greatest extent in the transverse direction; the third vertebral is nearly of the same form, but has a small pike on its posterior margin, to be received in the fourth vertebral plate, which is also hexagonal, but shorter, and has a notch both on its anterior and posterior margins. These plates are smooth, except the first and fifth, which are marked near the marginal plates with a few slight, concentric striæ. The first lateral plate is nearly an equilateral triangle, with its basis downwards and forwards, and joined to five marginal; the second is pentagonal, with three facets on its lower and larger border; the third is irregularly hexagonal, and the fourth quadrilateral. These plates are also slightly marked with five or six longitudinal, concentric striæ near their junction with the marginal. There are twenty-five

marginal plates; the intermediate, or nuchal, is an oblong square, a little rounded and projecting anteriorly; the first marginal is pentagonal, dentated in front, its external point most prominent, reaching beyond the second; these three plates give the notched appearance to the anterior margin of the shell; the second marginal is quadrilateral, and broadest in front; the remaining plates are all quadrilateral; the fourth, fifth, sixth and seventh regularly so, with their external margins slightly revolute; the eighth, ninth, tenth, eleventh and twelfth are all notched in the centre of their outer borders; the eighth least, and the twelfth most deeply; these notches, as well as the projection of the posterior and external angle of each plate, give the beautiful serrated margin already mentioned. The marginal plates are slightly marked near their upper border with two or three concentric lines; all these lines on the marginal, as well as on the vertebral and lateral plates, disappear with age, and the shell becomes perfectly smooth.

The sternum is large, full, entire, and rounded in front, and truncated behind; the gular plates are regularly triangular, with their bases before and their apices behind; at their anterior and external angles is a remarkable tooth or process, extending forwards and upwards; the brachial plates are also triangular, with their bases outwards, and their apices inwards and truncated; the thoracic are oblong-quadrilateral, and the abdominal pentagonal and broad; the femoral plates are irregularly quadrilateral, rounded and large without, narrow and straight within; the sub-caudal are triangular, with rounded bases directed posteriorly; the supplemental plates are two in number on each side; the axillary is triangular and large, with its basis forwards; the inguinal is also large, oblong, round behind and before.

The head is of moderate size; the snout short and rather pointed; the nostrils are anterior and closely approximated; the upper jaw has a thin cutting border, slightly emarginate in front, and the lower is furnished with a small hook; the eyes are bright; the pupil black; the iris pale golden, with a black spot before and behind the pupil; the neck is rather long and slender.

The anterior extremities are short, covered with a warty skin, and furnished with large scales placed transversely both above and below; a remarkable range of large scales extends along the ulnar border of the fore-arm to the fingers, which are five in number, webbed, and each furnished with a long delicate, and nearly straight nail. The posterior extremities are large, well developed and flattened at the tarsus, covered like the anterior, and sustain five fully palmated toes, four only of which are furnished with nails. The tail is of moderate size, thick at its root, but soon becomes conical and pointed.

Colour. The plates of the shell are brown, more or less dark, each being beautifully marked with a waving blotch, or with radiating lines of yellow or fawn colour.

The sternum is yellow in the centre, each plate being marked with a dusky oblong blotch, placed nearest the outer margin.

The head above is dusky; the jaws are horn-colour, with dusky bars; from the mouth to the neck run some small longitudinal yellow lines, the central one most distinct; a long lemon-coloured spot begins behind the superior part of the orbit, and runs horizontally for half an inch along the neck, increasing in size, and finally sends off one branch which continues in the same direction, and another that descends along the side of the neck; a second line, of similar colour, and of the same size at its commencement, though it does not increase like the last, descends from the posterior and inferior part of the orbit of the eye to the posterior extremity of the lower jaw, where it terminates in a blotch, with a line nearly of the same size that begins midway between the angle of the mouth and chin; finally another line of equal size begins at the chin, and soon subdivides in two others, between which is placed an intermediate line; all these are continued on the throat, which is dusky, and has some indistinct smaller lines of yellow.

The anterior extremities are dusky above, with a brown longitudinal lemon-coloured line reaching even to the nails; in front and behind are similar lines, but

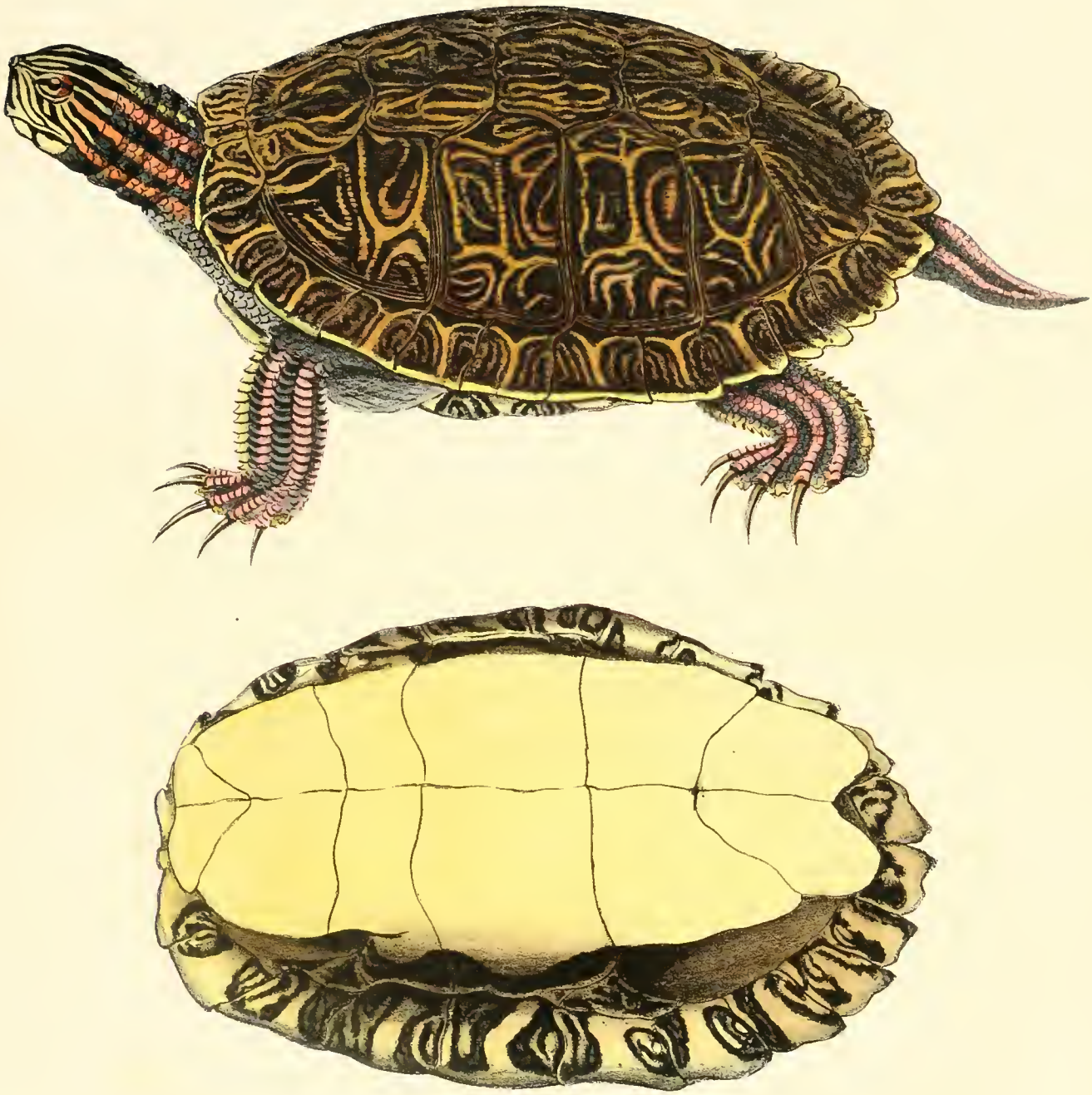
smaller; below the limb is dusky, with a line or two and some blotches of yellow, especially near the carpus; the web between the fingers is yellow; the posterior extremities are banded transversely with lemon-colour and black alternately at the nates and posterior part of the thighs; the legs and tarsus are very dark, with a few yellow lines, and below blotched with yellow; the webs between the toes are yellow; the tail is dusky above, with a lateral line along the borders of the upper margin; these lines unite towards the top, and run along its centre; the tail beneath is dusky yellow.

Dimensions. Length of head, 1 inch; of shell, 5½ inches; sternum, 4½ inches; length of tail beyond the vent, 1 inch.

Habits. This animal, so far as I know, does not differ in its habits from the Emydes in general.

Geographical Distribution. Tennessee is the only state in which this animal has been observed, though it doubtless inhabits many others of our western country.

General Remarks. It is again to Professor Troost that I must return my thanks for having procured me a living specimen of this beautiful Emys; which he says is the most abundant of all in Cumberland river.



Emys concinna.

EMYS CONCINNA.—*Lecontc.*

Plate XIX.

Characters. Shell oval, smooth, ecarinate, emarginate behind, dusky brown, varied with yellow lines, more or less sub-reticulate.

Synonymes. Testudo concinna, *Leconte,* Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 106.
Emys concinna, *Dumeril et Bibron,* Hist. Nat. des Rept., tom. ii. p. 289.

Description. The shell is oval, entire in front, and emarginate behind, smooth and ecarinate. The first vertebral plate is hexagonal; the second and third are also hexagonal, with their lateral angles projecting; the fourth is hexagonal and less oblong than the others; the fifth is heptagonal, and broadest behind. Of the lateral plates, the first, second and third are pentagonal, and the fourth quadrangular. There are twenty-five marginal plates, the nuchal, or intermediate, is small and oblong; the first is somewhat pentagonal, and projects a little beyond the second: all the rest are more or less square or oblong; the ninth, tenth and eleventh each projecting its posterior face beyond the succeeding plate. The sternum is entire in front and emarginate behind; the brachial plates are triangular, with their apices truncate; the rest are more or less oblong or square; the jaws are firm, thin and cutting, with their edges sharp; the upper very slightly emarginate in front; the lower is furnished with an indistinct hook.

The anterior extremities are covered with scales above, and with scales and warts below. The fingers are five in number, palmate, and each armed with a nail. The posterior extremities are well developed, and covered with scales and granulations above and below. The tarsus is flattened, and sustains five fully

palmated toes, of which only the four internal are furnished with nails. The tail is moderately long, and broad at the root, but soon becomes slender.

Colour. The shell is dusky, varied with differently formed and differently disposed lines of yellow; those on the lateral plates are somewhat reticulate, and the spaces formed by them are frequently filled with short lines of yellow, all more or less confluent. The marginal plates are all marked either with a straight line or a sub-quadrangle of yellow. The sternum is yellow, as well as the marginal plates below, each having a large black spot at the junction; the wings have a dark longitudinal line.

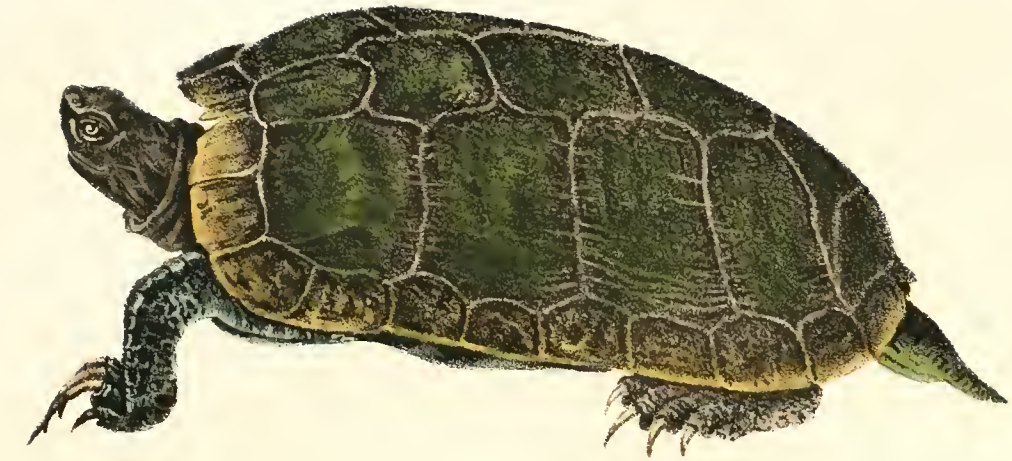
The head and neck are black, striped with red or orange; the stripe on the neck bifurcates on the fore part, one branch running to the eye, the other to the chin, so that the jaw is embraced between them; the stripe on the chin bifurcates posteriorly a short distance from its origin, and running along the throat, includes a shorter stripe between its branches. The jaws are striped with yellow. The eyes are yellow, with a broad black stripe through the middle. The anterior extremities are dusky, striped with red or orange above, and below with three transverse and two horizontal lines of the same colour. The posterior are dusky, obscurely striped with red above, and irregularly marked with orange and yellow beneath. The tail is striped with red above and yellow below.

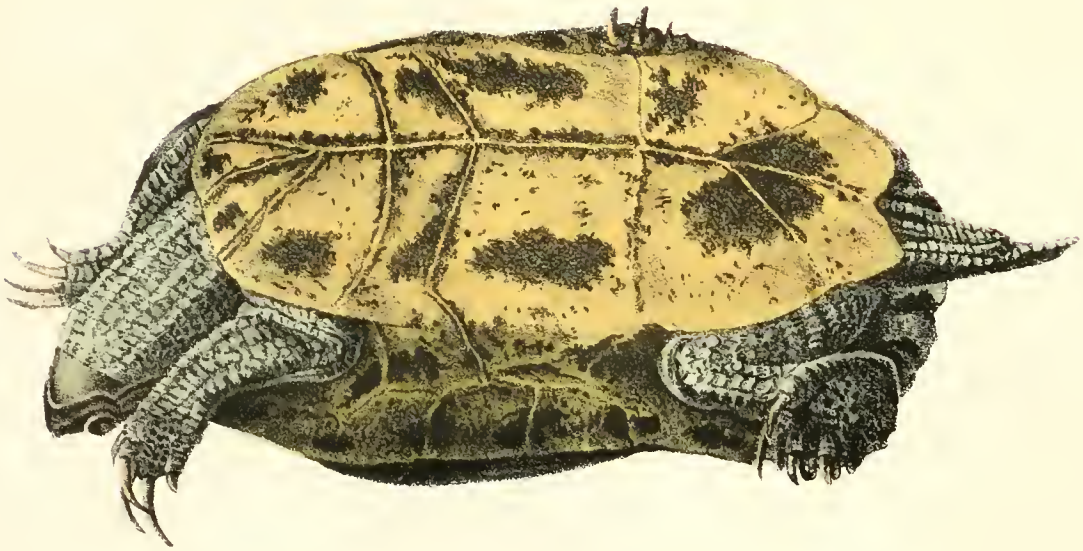
Dimensions. Length, 8½ inches; elevation, 3¾ inches.

Geographical Distribution. This species is found in the Savannah and Congaree rivers, where their beds are rocky, and are not seen below Augusta on the one, nor Columbia on the other river.

General Remarks. This is another fine species of Emys, first observed and described by Leconte, and as I have never yet had an opportunity of examining the entire animal, I have in this place done no more than reproduce his observations, and to him I am indebted for the beautiful plate that accompanies this

description. Some herpetologists appear to be in doubt about this animal. Harlan supposes it to be the Emys reticulata, to which it bears no resemblance, as may be seen by comparing the figures of the two animals; the shell of one is gibbous, that of the other flattened; the one is strongly wrinkled or rugous, the other is smooth, and the colour and marking are entirely unlike each other. Dumeril and Bibron, although they describe it as a distinct species, place among their synonymes the Emys reticularia of Say, which is none other than the Emys reticulata of Daudin. Most of all, perhaps, it resembles the Emys hieroglyphica, but the head is much larger—the shell is smooth and differently coloured—the posterior extremities are less flattened, &c.





Emys Troostii

Ducatel Lith Phil

EMYS TROOSTII.—*Holbrook.*

Plate XX.

Characters. Shell sub-round, much depressed, ecarinate; posterior part of the margin very slightly serrated; lateral and marginal plates marked with blotches or lines of horn-colour; sternum broad, dirty yellow, each plate having a large black spot near its centre; head long, narrow; upper jaw emarginate; lower jaw furnished with a tooth.

Description. The shell is greatly depressed, ecarinate, sub-round, and slightly serrated behind: its surface is smooth above, and slightly wrinkled on the sides, more particularly at the junction of the lateral and marginal plates. Of the five vertebral plates, the anterior is pentagonal, the second, third and fourth hexagonal; the second has its anterior, and the fourth its posterior margin re-entering, to receive the borders of the adjoining plates; the fifth vertebral is triangular, with a rounded basis. The first lateral plate is irregularly triangular, with its basis united to four marginal plates; the second and third are pentagonal, with an acute angle passing upwards between the vertebral plates; the fourth is quadrilateral. The marginal plates are twenty-five in number; the nuchal, or intermediate, is almost linear, with its anterior extremity pointed; the adjoining plates are pentagonal, with their anterior border emarginate, the outer and anterior angle extending beyond the second marginal plate, which, like all the others, is quadrilateral; the four posterior plates are very slightly serrated.

The sternum is oblong, full and entire in front, and slightly emarginate behind. The gular plates are triangular, with the apex of the triangle directed backwards; the brachial are irregularly quadrilateral, broad without and narrow within, where

they unite in the mesial line; the thoracic and abdominal plates are both quadrilateral, the former very narrow; the latter broad; the femoral are shaped like the thoracic, but are larger; the sub-caudal plates are triangular, with their posterior and external angles rounded. Of the supplemental plates, both the axillary and the inguinal are quadrilateral; the former has its posterior and internal, and the latter its anterior and internal angle elongated.

The head is small, oval, and pointed. The eyes are large and prominent; the pupil black, the iris dark gray, with a very narrow gilded border surrounding the pupil; the lower lid is large and very movable; the nostrils are small and near each other; the upper jaw is emarginate in front; and the lower jaw is furnished with a tooth.

The anterior extremities are covered in front with small scales; on their posterior surface is a remarkable transverse row of four large scales; the fingers are five in number, palmated, and furnished each with a nail; the three intermediate are long and curved. The posterior extremities are long and flattened; the toes, five in number and broadly palmated; the four internal only are furnished with nails. The tail is short, conical and obtuse.

Colours. The shell is dusky, tinged with green, with a lighter shade of horn colour in the central part of each lateral plate, from whence lines of the same colour extend downwards and outwards. The marginal plates have each a slight dash, and sometimes a line of the same colour. The sternum is brownish-yellow, with a large black blotch on each plate, and also on the outer margin of the thoracic and abdominal plates; at each extremity of the inferior surface of the marginal plates is a black spot, uniting with those of the adjoining plates. The spots on the sternum are, however, liable to become blended, or altogether obsolete, perhaps the effect of age.

The head is dusky above, relieved with very obscure rays of brownish-yellow; an oblong mark of the same colour begins at the back of the orbit of the eye, and

is lengthened out into a narrow line along the lateral and superior part of the neck; another and more distinct greenish-yellow line is observed along the lateral and inferior part of the throat, increasing in size to the junction of the jaws, where it subdivides into two branches; the one going to the upper jaw, terminates at its posterior part, that running to the lower jaw, ends midway between the condyle and symphysis. Beginning at the chin is another broad pale straw-coloured line, which subdivides after a short distance, the branches continuing along the inferior surface of the neck; a third line begins near the point of subdivision of the last, small, but increasing in breadth, and running nearly in the middle of the inferior surface of the neck; between these lines are many intermediate ones, smaller and less distinct.

The anterior extremities are dusky in front, with a broad palish straw-coloured band near the lower part; the inferior border is yellow; the posterior surface blackish-brown. The posterior extremities are dusky above, with a yellowish line along the posterior margin of the thigh, and dusky below, with two or three interrupted yellow lines. On the lower extremity of the thigh is a large triangular spot; the apex of which triangle is continued into a line along the anterior and inferior border of the leg to the root of the first toe. The tail is dusky above, and blackish-brown beneath, with blotches of greenish-white; towards the extremity on each side is a lateral yellowish-green line.

Dimensions. Length of shell, 8 inches; greatest breadth, $7\frac{1}{4}$ inches; length of sternum, $6\frac{1}{4}$ inches; length of tail, $2\frac{3}{4}$ inches; length beyond the vent, $1\frac{1}{4}$ inches; height of the animal, $2\frac{3}{4}$ inches.

Geographical Distribution. These animals abound in our western rivers. The accompanying plate was taken from a fine specimen sent me from the Cumberland river by Professor Troost, who has done so much to elucidate the natural history of that part of the United States, and to him I have dedicated the species.

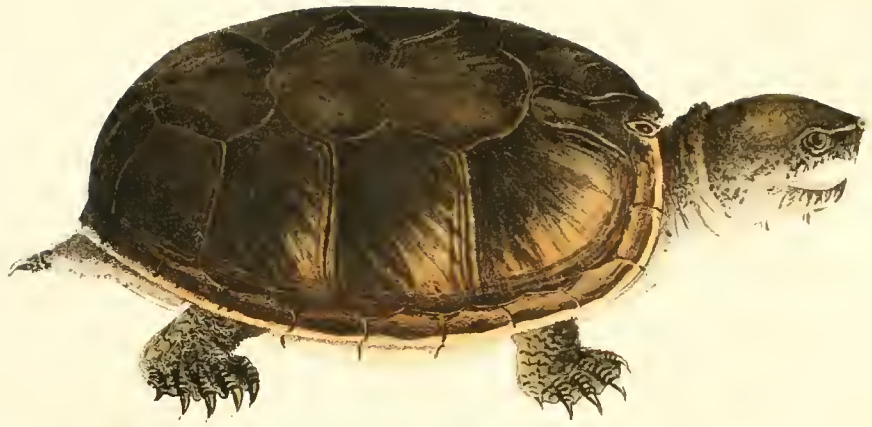
Habits. I am not aware that the Emys Troostii differs in its habits from the other animals of its tribe.

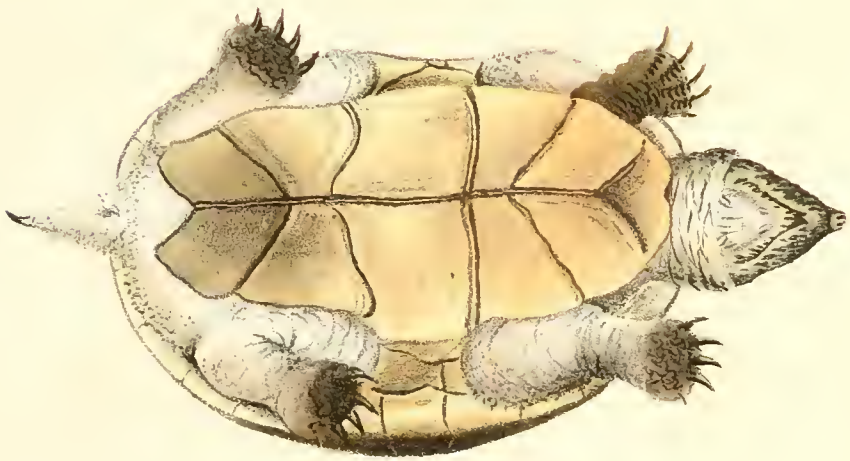
General Remarks. It is remarkable that the animal from which the accompanying figure was taken had six vertebral plates, and that apparently not the result of injury. Another specimen possessed the usual number, and the shell was broader in proportion.

Schlegel,* an excellent herpetologist of Leyden, who probably never saw this animal, supposes it identical with the Emys rugosa, (Shaw,) as published by Cocteau in the herpetological part of Lasagra's "Histoire de l'Isle de Cuba,"† from which, however, it is perfectly distinct. I have now before me a specimen of the Emys rugosa, given me by Mr. Bell, as well as the Emys Troostii; they are about the same length, yet the shell of the former has nearly twice the elevation of the latter; the one is as arched as the Emys serrata, while the other is the most depressed of all our terrapins, with the exception perhaps of the Emys Oregoniensis. Besides, the shell of the Emys rugosa is strongly carinated, and, as its name imports, deeply marked with longitudinal wrinkles, while the Emys Troostii is flattened along the vertebral line, and the shell is perfectly smooth, with the exception of some slight wrinkles on the most inferior part of the lateral plates.

* Revue-Zoologique, No. xii., 1838, p. 319.

† Rev., table ii.





Kinosternon Pennsylvanicum

J.H. Richard del. [illegible] Lith. [illegible]

21.

KINOSTERNON.—*Spix. Dumeril et Bibron.*

Genus Kinosternon.—Characters. Head sub-triangular, pyramidal, covered with a single plate; jaws hooked, warts at the chin; marginal plates twenty-three; sternum subdivided into three sections, anterior and posterior movable, central fixed; plates of sternum, eleven; supplemental plates very large; tail long.

KINOSTERNON PENNSYLVANICUM.—*Edwards.*

Plate XXI.

Characters. Head large, upper and lower jaw hooked; shell oval, smooth, ecarinate, entire; vertebral plates depressed, sub-imbricate; sternum of three pieces, anterior and posterior sections movable, central section fixed.

Synonymes. Testudo lutaria Pennsylvanica, *Edwards*, Glean. Nat. Hist., part ii. p. 77, tab. cclxxxvi.

Testudo Pennsylvanica, *Gmelin*, Syst. Nat. Lin., tom. i. pars iii. p. 1042.

La tortue rougeâtre, *Lacépède*, Quad. Ovip., tom. i. p. 132.

Mud tortoise, *Pennant*, Arc. Zool., suppl. p. 80.

Testudo Pennsylvanica, *Schoepff*, Hist. Test., p. 107, tab. xxiv. fig. A.

Testudo Pennsylvanica, *Latreille*, Hist. Nat. des Rep., tom. i. p. 133.

Testudo Pennsylvanica, *Daudin*, Hist. Nat. des Rep., tom. ii. p. 182.

Testudo Pennsylvanica, *Shaw*, Gen. Zool., vol. iii. p. 60, pl. xiv. fig. 2.

Terrapene Pennsylvanica, *Merrem*, Versuch. eines Syst. der Amphib., p. 27.

Emys Pennsylvanica, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 436.

Cistuda Pennsylvanica, *Say*, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 216.
Testudo Pennsylvanica, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 120.
Kinosternon Pennsylvanicum, *Bell*, Zool. Jour., vol. ii. p. 304.
Kinosternon Pennsylvanicum, *Gray*, Synop. Rep., p. 35.
Cinosternon Pennsylvanicum, *Wagler*, Natürlich Syst. der Amphib., p. 137.
Emys Pennsylvanica, *Harlan*, Med. and Phys. Res., p. 155.
Cinosternum Pennsylvanicum, *Dumeril et Bibron*, Hist. Nat. des Rep., tom. ii. p. 367.
Mud tortoise, *Vulgo.*

Description. The shell is oval, gibbous, though a little flattened along the vertebral line, with an entire or slightly notched margin posteriorly. There are five very large vertebral plates; the anterior is long, narrow and triangular, with its basis forward, and its apex truncate and directed backwards, and having a slight prominence in the middle; the second, third and fourth are hexagonal, with their anterior angles rounded and their lateral angles acuminate; the fifth is irregularly quadrilateral, smaller above and larger below, where it joins four marginal plates: all these vertebral plates are more or less imbricate posteriorly. Of the lateral plates, the anterior is irregularly quadrilateral; the second and third are pentagonal and acuminate where they join the vertebral plates; the fourth is pentagonal. The marginal plates are twenty-three in number; the nuchal or intermediate is an oblong square, small and narrow; the first, second and third are quadrilateral, narrow and elongated; the remaining marginal plates are quadrilateral and broader; the tenth with unequal margins.

The sternum is shorter than the carapace; it is oval, rounded, full in front, and emarginate behind. The gular plates are consolidated to form a single plate, which is triangular, with its apex posterior; the brachial are quadrilateral, and sometimes reach the suture that joins the thoracic and abdominal plates; the thoracic are triangular, with their apices turned inwards; these five plates are all united firmly together and form the anterior section of the sternum, which is so joined by ligamento-elastic tissue to the abdominal plates as to form a hinge joint. The abdominal plates are large, quadrilateral, and fixed to the shell; the femoral are triangular and the sub-caudal are quadrilateral: these four latter

plates are united to each other and form the posterior section of the sternum, and are joined to the posterior border of the abdominal plates by a ligamento-elastic tissue, which allows of certain motions. The supplemental plates are triangular; the posterior very large.

The head is large and rather pointed at the snout; the nostrils are anterior. The eyes are large, the pupil dark, the iris dark grey, with a very narrow border of light grey around the pupil. The upper and lower jaws are very strong, and both are furnished with a hook in front. The neck is long, rather slender; the skin above is covered with small warts, and the throat with larger. There are four very remarkable warts about the lower jaw; two of these are placed at the chin, and two under the angle of the mouth.

The anterior extremities are short, rounded, and covered with a warty skin, and have two transverse rows of large scales in front, with several large scales near the tarsus behind; there are five fingers, palmate, each furnished with a short nail. The posterior extremities are elongated, much flattened at the tarsus, and covered with a minute warty skin, and eight or ten large scales near the ankle and tarsus; there are five toes, fully palmate, the four internal ones only are furnished with nails. The tail is very short, thick at the root, pointed and horny at the tip.

Colour. The shell is of a universal dusky brown colour above. The sternum varies a good deal; sometimes it is dusky, with a yellowish tinge, and has darker lines at the junction of the plates; at others it almost approaches a dark chestnut colour.

The head is nearly black above, and dusky at the sides, freckled with minute yellowish spots. The jaws are horn colour, with delicate waving dusky lines. The neck is dusky above; the chin and throat are of dirty yellow, with the larger warts of brighter yellow.

The extremities and tail are dusky above, and clouded or dirty yellowish-white below.

Dimensions. Length of shell, $3\frac{1}{2}$ inches; breadth of shell, 2 inches 10 lines; elevation, $1\frac{3}{4}$ inches; length of sternum, 3 inches 2 lines.

Habits. The Kinosternon Pennsylvanicum abounds in ponds or muddy pools, feeding on small fish and such other aquatic animals as it can secure. It takes the hook readily, and is therefore very troublesome to anglers; seizing the bait so cautiously, that it is frequently some minutes before it is fairly hooked, when it struggles violently. The living animal has a slight odour of musk that is not disagreeable.

Geographical Distribution. The Kinosternon Pennsylvanicum is found in the Atlantic states from Cape Florida to latitude 41°; beyond this I have not heard of its existence; and Hitchcock, in his Geology of Massachusetts, probably mistook the Sternothærus odoratus for the Kinosternon Pennsylvanicum. It is also abundant in the west; Troost observed it in Tennessee and Kentucky, and Say saw it high up the Missouri.

General Remarks. Edwards first described this animal from a specimen furnished him by John Bartram, of Pennsylvania, and gave of it three figures in his Gleanings of Natural History. These figures were done from life; and though not very beautiful, yet they are sufficiently accurate, and have been copied by several Naturalists. Although this may be considered as the earliest notice of the animal, yet the first full and accurate description is in the Historia Testudinum of Schoepff, taken from an individual sent him by Muhlenberg.

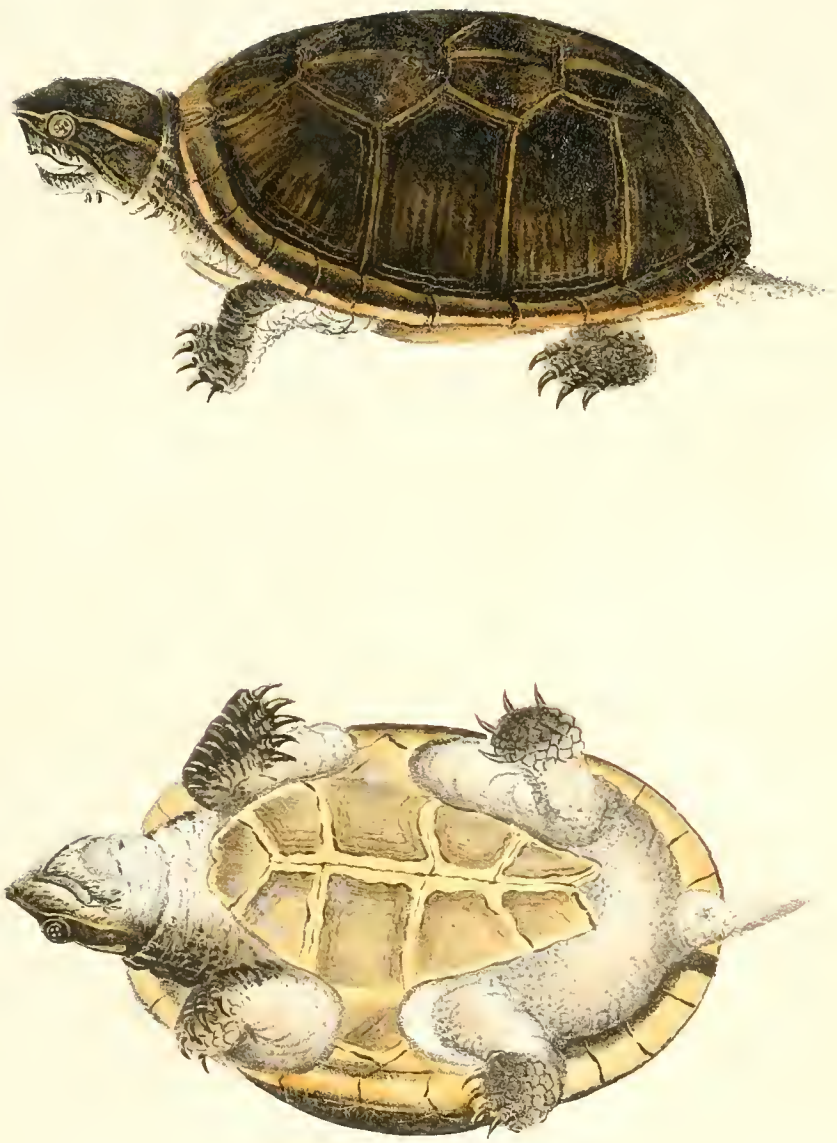
Naturalists have experienced some difficulty in assigning the Kinosternon Pennsylvanicum to its proper place. Brogniart first separated it from the genus Testudo and referred it to that of Emys, to which it certainly does not belong.

Fleming* next placed it in the genus Cistuda, established by himself, with the Cistuda Carolina, &c.; but here the anatomical characters are greatly at variance;† for in the Kinosternon Pennsylvanicum, as seen above, the sternum consists of three parts, the central section fixed, the anterior and posterior movable; while in the genus Cistuda the sternum has but two valves, both equally movable on the same axis.

Spix afterwards established the genus Kinosternon upon the characters given above for a South American tortoise, under which the animal here described ranges very well.

* Philosophy of Zoology, vol. ii. p. 270.

† See the anatomical part of this work for a full description of the anatomy of this genus.



Sternotherus odoratus

STERNOTHÆRUS.—*Bell.*

Genus Sternothærus.—Characters. Head sub-quadrangular, pyramidal, covered in front with a single plate; warts on the chin; marginal plates twenty-three; sternum cruciform, with eleven plates, bivalve, anterior valve only movable; supplemental plates contiguous, placed on the sterno-costal suture; anterior extremity with five nails, posterior with four.

STERNOTHÆRUS ODORATUS.—*Bosc.*

Plate XXII.

Characters. Head large, snout pointed; shell oval, entire, slightly carinate; sternum rounded in front, emarginate behind, covered with eleven plates, bivalve, the anterior valve movable, posterior fixed.

Synonymes. Testudo Pennsylvanica, sterno immobile, *Schoepff*, Hist. Test., p. 110.
Testudo odorata, *Bosc*, MSS. communicated to Latreille.
Testudo odorata, *Latreille*, Hist. Nat. Rept., tom. i. p. 122.
Testudo odorata, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 189, tab. xxiv. fig. 5.
Testudo glutinata, *Daudin*, Loc. Cit., tom. ii. p. 194, tab. xxiv. fig. 4.
La tortue odorante, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 267.
Terrapene odorata, et Boscii, *Merrem*, Versuch eines Syst. der Amphib., p. 27.
Cistuda odorata, *Say*, Jour. Acad. Nat. Scien. Phil., vol. iv. p. 216.
Emys odorata, *Schweigger*, Prod. Arch. Königsb., vol. i. p. 437.
Testudo odorata, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 122.

Sternothærus odoratus, et Boscii, *Bell*, Zool. Jour., vol. ii. p. 307, 308.
Kinosternon odoratum, *Gray*, Syn. Rept., p. 55.
Emys odorata, *Harlan*, Med. and Phys. Res., p. 156.
Staurotypus odoratus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 358.
Musk tortoise, or mud tortoise, *Vulgo*.

Description. The shell is oblong-oval in form, entire, gibbous, more or less carinate and compressed at the sides. Of the five vertebral plates, the anterior is very long, narrow, triangular, with its basis down and its apex upwards and truncate; the second, third and fourth are hexagonal, with their lateral borders acuminate where they join the lateral plates, the two latter with their anterior borders concave and their posterior rounded; the fifth vertebral plate is pentagonal, narrow above and broader below: all these plates are more or less imbricate posteriorly. The anterior lateral plate is quadrilateral, smaller above, large and rounded below; the second, third and fourth are pentagonal, the latter very irregularly so. There are twenty-three marginal plates; the intermediate, or nuchal, is nearly triangular, and extremely small; the remaining plates, to the tenth, are oblong-quadrilateral, this and the eleventh are regularly quadrilateral. All these plates are separated from the shell by a groove, more or less distinct, as far as the two last on each side, which are closely united to the posterior lateral and posterior vertebral plates.

The sternum is very small, compared with the shell, and is oblong-oval, rounded in front, and very deeply emarginate behind. The gular plates are consolidated into one, which is small and triangular, with its apex directed backwards; the brachial plates are also small, triangular, and project beyond the thoracic at their outer and posterior angles. The thoracic are quadrilateral, and joined to the abdominal by a ligamentous substance, to allow certain motions, but far less even than in the Kinosternon Pennsylvanicum; and in very old animals this joint at times becomes anchylosed, and motion ceases. The abdominal plates are quadrilateral, largest and firmest of all, and are so closely joined to the shell as to admit of but little if any motion. The femoral vary a good deal: sometimes they are

nearly quadrilateral, at others they approach a triangular form. The sub-caudal are quadrilateral. Of the supplemental plates, the axillary are very small and triangular; the inguinal are twice as large, and of variable form.

The head is very large, with the snout elongated and pointed; the nostrils are anterior and near together. The eyes are large, the pupil black, the iris dark hazel, with an inner circle of yellow. The upper jaw is strong and sharp; the lower jaw is equally strong and recurved anteriorly. There are several warts or barbels near the chin, varying in size; the most remarkable are two at the chin, and two near the posterior extremity of the lower jaw.

The anterior extremities are short and rounded, granulated in front, with two or three large scales near the carpus; there are five fingers, palmate, with each a short nail. The posterior extremities are flattened near the tarsus, and are granulated both before and behind, with a few small scales near the tarsus posteriorly; there are five toes, fully palmate, the four internal alone are furnished with nails. The tail is very short, thick at its root, narrow at its extremity, and terminating in a small horny point. The skin of the tail is granulate and covered with small warts, disposed in a row along the upper surface like a ridge.

Colour. The shell is black or dusky, mixed and clouded with brown, and at times with a few radiating lines of lighter brown.

The sternum is dirty or clouded yellowish-white, and each plate is sometimes bordered with dusky.

The head is black above and dusky at the sides, with occasional spots of dirty yellow; a yellowish-white line extends, with certain interruptions, from the snout over the eye along the neck; a second line, of the same colour, runs from below the orbit to the throat. The jaws are horn colour, with waving lines of dusky or dark brown. The skin of the neck above is warty and dusky; the throat is dirty yellow, with many of the larger warts of brighter yellow.

The extremities are dusky above, dingy white below. The tail is dark above, and with its under surface coloured like the extremities.

Dimensions. Length of shell, 3½ inches; greatest breadth, 2 inches 4 lines; elevation, 1½ inches; length of sternum, 2 inches 7 lines.

Habits. The habits of this animal are much like those of the Kinosternon Pennsylvanicum; it chooses slow moving or muddy waters, and is very abundant in the ditches of our rice fields in Carolina, where it feeds on small fish or on smaller reptiles, as the various kinds of tadpoles that inhabit the same localities. It is, however, a much bolder animal than the Kinosternon Pennsylvanicum, and bites very severely if provoked. When taken alive, it emits a strong and disagreeable odour of musk.

Geographical Distribution. Its geographical range is more extended than that of the last described animal; it is found as far north as the state of Maine, abounds in middle Florida and Alabama, and along the western border of the Alleghany mountains, even as far as the Cumberland river in Tennessee, according to the observations of Troost, and is probably found in all the western states.

General Remarks. This is evidently the animal described by Schoepff, in his Historia Testudinum, as a variety of the Testudo Pennsylvanica, with an immovable sternum. The individual, he says, was sent him by Muhlenberg, of Pennsylvania, together with a specimen of the true Testudo Pennsylvanica, (Kinosternon,) of which he (Schoepff) believed it to be a variety.

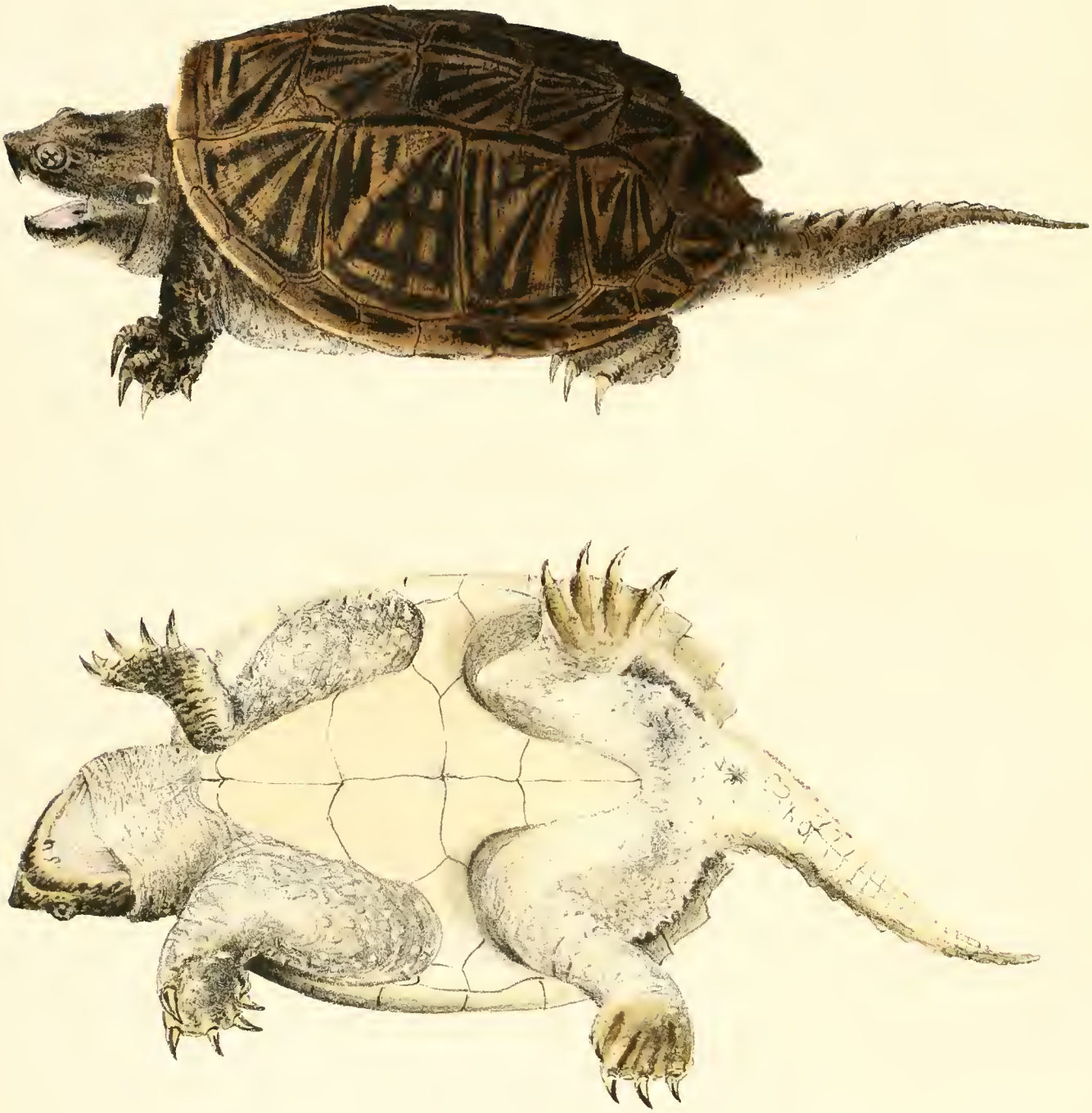
The next notice of the animal now under consideration, is in the work of Latreille, where it is called Testudo odorata, for the first time by Bosc, who furnished the description, drawn from living specimens that he had observed in Carolina, and the name, no doubt, was given from the odour of musk it emits when alive. Latreille, though he describes the animal on the authority of Bosc,

seems rather to regard it as a variety of the Testudo Pennsylvanica, (Kinosternon Pennsylvanicum,) than as a distinct species.

Daudin next describes this animal, and from the same authority, but more fully; he places it among those Testudines where the anterior section of the sternum alone is movable. He says, however, that he "suspects" it is only a simple variety; yet "he describes it as a distinct species, in deference to the opinion of Bosc and Beauvais."

Daudin again reproduces the same animal as the Testudo glutinata, which is synonymous with the Testudo Pennsylvanica sterno immobile of Schoepff; but still believing it to be a variety of the Testudo Pennsylvanica, (Kinosternon Pennsylvanicum,) from which, however, the animal is not only specifically but generically distinct.

Say and many naturalists have referred this animal to the genus Cistuda of Fleming, with which its anatomical characters are at variance; and Dumeril and Bibron have lately arranged it under that of Staurotypus of Wagler; but, I see no good reason for removing it from that of Sternothærus of Bell.



Chelonura serpentina

J. Queen del.

P.S. Duval, Lith. Phil.ª

CHELONURA.—*Fleming.*

Genus Chelonura.—Characters. Head large, both jaws strongly hooked; two barbels under the chin; sternum small, cruciform, immovable, covered with twelve plates; supplemental plates, three; tail very long, surmounted with a scaly or tuberculated crest; anterior extremities furnished with five nails, posterior with four.

CHELONURA SERPENTINA.—*Linnæus.*

Plate XXIII.

Characters. Head large, snout very short, but pointed; shell oblong or subquadrilateral, depressed, more or less tricarinated, entire in front, deeply emarginate behind, with three points on each side of the central notch.

Synonymes. Testudo serpentina, *Linnæus*, Syst. Nat., tom. i. p. 351.
Testudo serpentina, *Lacépède*, Quad. Ovip., tom. i. p. 131.
Testudo serrata, *Pennant*, Arc. Zool. suppl., p. 79.
Testudo serpentina, *Schoepff*, Hist. Test., p. 28, tab. vi.
Testudo serpentina, *Gmelin*, ed. Syst. Nat. Lin., tom. i. part iii. p. 1042.
Testudo serpentina, *Shaw*, Gen. Zool., vol. iii. p. 72, pl. xix.
Testudo serpentina, *Latreille*, Nat. Hist. Rept., tom. i. p. 159.
Testudo serpentina, *Daudin*, Hist. Nat. des Rept., tom. ii. p. 98, tab. xx. fig. 2.
La Tortue serpentine, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxii. p. 261.
Chelonura serpentina, *Fleming*, Phil. Zool., vol. ii. p. 268.

Emys serpentina, *Merrem*, Versuch eines Syst. der Amphib., p. 23.
Chelonura serpentina, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 206–217.
Testudo serpentina, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 127.
Chelydra serpentina, *Fitzinger*, Neue Class. der Rept., p. 45.
Chelydra serpentina, *Wagler*, Natürlich. Syst. der Amphib., p. 136.
Chelydra serpentina, *Gray*, Synops. Rept., p. 36.
Chelonura serpentina, *Bonaparte*, Osser. Sul., 2nd ed. Reg. An., p. 174.
Chelonura serpentina, *Harlan*, Med. and Phys. Res., p. 157.
Emysaurus serpentinus, *Dumeril et Bibron*, Hist. Nat. des Rept., tom. ii. p. 350.
Snapping Turtle, *Vulgo*, or Alligator Couta, or Cooter, by the negroes.

Description. The shell is sub-quadrilateral, smaller and entire in front, larger behind, and deeply emarginate and serrate. The first vertebral plate is octagonal, broadest in the transverse direction, pointed anteriorly, and passes into the nuchal, or intermediate, marginal plate, and is slightly notched posteriorly for receiving the second vertebral, which is nearly quadrilateral, with a point in the centre of its anterior margin and a minute notch on its posterior that fits it to the adjoining plate; the third vertebral is also nearly quadrilateral, with its posterior border slightly concave; the fourth is octagonal, with its two anterior margins meeting at an obtuse angle in front, while its posterior border presents a slight concavity for the fifth vertebral plate, which is urceolate and irregularly octagonal, narrow in front, and passing into the fourth, and broader behind, where it is joined to four marginal plates, with a prolonged angle that runs in between the supra-caudal: superiorly the shell along the vertebral line is so flat that these plates are situated nearly on an horizontal plane, the anterior dipping almost imperceptibly forwards, and the posterior dipping a little more downwards and backwards. The first lateral plate is irregularly triangular, with is external border rounded and joined to five marginal, and its internal straight where it joins the second, and concave where it is united to the third vertebral plate; the second and third lateral are very regularly quadrilateral, each with an indistinct point that runs up between two adjoining vertebral plates, and each with three articulating facets below; the fourth is very irregularly quadrilateral, narrow above and broad below, with three facets, and its inferior anterior angle prolonged: each of these plates

is surmounted with a prominent knob or tubercle; those of the vertebral range are placed at the centre of the posterior border of each plate, except the fifth, which is very prominent, and occupies the middle of the plate; these knobs present the appearance of a tuberculated carina, more or less prominent, along the vertebral line; each lateral plate has in like manner a knob or tubercle still more developed, but differently situated, here they occupy the superior and posterior corner of the plate; these tubercles make a lateral carina, which gives the shell a tricarinated appearance, differing, however, in different specimens, as the tubercles are more or less elevated. From each tubercle, lateral as well as vertebral, run, like radii, ridges and depressions, which make the shell beautifully radiated; these ridges are very distinct near the tubercles, but become less so as they approach the margin of the plates, which all have their lateral and anterior borders distinctly marked with four or five concentric ridges and depressions; the fifth vertebral plate alone has all its margins, posterior as well as lateral and anterior, thus marked, for in this plate the tubercle stands nearly in the centre. The marginal plates are twenty-five in number; the nuchal, or intermediate, is oblong-quadrilateral, with its posterior border waving, but concave in the centre for receiving the anterior point of the anterior vertebral plate; the first pair of marginal plates are elongated, narrow and pentagonal; the second, third, fourth, fifth, sixth, seventh, eighth, ninth and tenth, are elongated, quadrilateral, those in front narrow, but gradually increasing in breadth to the tenth, which is largest of all, and has its posterior and external angle projecting in a strong point; the eleventh marginal plates are very irregularly pentagonal, each with a similar strong point projecting backwards; the twelfth are in like manner very irregularly pentagonal, with their longest borders in front, and their internal borders very narrow, where they join each other, while their posterior external and posterior internal margins terminate in a strong pointed process; these points and notches give a deeply serrated border to the shell: the marginal plates are generally smooth to the ninth pair, which have concentric striæ on their superior borders; the tenth and eleventh have similar striæ, as well as additional ones on their external and internal margins.

The sternum is cruciform, narrow, rather rounded anteriorly and pointed posteriorly. The gular plate is single, and of rhomboid form, rounded in front and pointed behind, where it is received between the brachial, which are elongated and triangular, with their apices forward and truncate. The thoracic plates are largest of all, and are very regularly pentagonal, with their posterior and external border shortest where they join the abdominal plates, which are irregular in form as well as in position; they are shaped somewhat like an hour-glass, broader internally, where are two articulating facets for junction with the thoracic and femoral plates; they are narrow in the middle, and again expand at the wings to join with two supplemental plates; the femoral are similar to the thoracic in form, but are smaller and narrower on their anterior and external border, where they unite with the abdominal plates; the sub-caudal have the form of regular isosceles triangles, with their bases forward and their apices backward. There are three supplemental plates at the wings; the inguinal is broad, very irregularly four-sided, with its posterior and external angle greatly prolonged; the axillary is also broad, and is regularly quadrilateral: these two unite the abdominal with the marginal plates by means of a cartilaginous substance. The third supplemental plate is situated in front of the axillary; it is long, narrow, and pointed anteriorly, but is in no way connected with the abdominal plates.

The head is very large, yet the animal can draw it under the carapace; it is broad behind and flattened above, with the snout short, though pointed, covered posteriorly with warty integuments, and anteriorly with the same and occasional small plates at the sides, all adhering firmly to the cranium. The nostrils are anterior and near together. The eyes are large, prominent, and placed near the snout; the pupil is dusky, the iris grey, with a few specks of yellow. The upper jaw is strong, with a sharp cutting edge and a well developed hook in front, on each side of which is a depression or notch. The lower jaw is equally firm, with a similar cutting edge, an equally well developed hook in front, and is received within the upper. The neck is long, but thick, and covered both above and below with a granulated or warty skin, and occasional warts of larger size, two of which, at the chin, are of great length, like barbels.

The anterior extremities are large, and covered with a granulated and warty skin, with transverse rows of large scales both above and below, a remarkable range of which exists along the ulnar margin of the fore-arm; there are five fingers, each furnished with a strong, short, and curved nail, like those of a bird of prey. The posterior extremities are equally strong, well developed, and covered in like manner, but with larger scales beneath, and have a remarkable fold of skin along the fibular margin of the leg; there are five toes, well palmated, four only are furnished each with a strong, pointed nail, less curved than those of the anterior extremities. The tail is very long, thick at the base, but soon becomes smaller and ends in a pointed tip; it is covered about the vent with a warty and granulated skin, while along the superior border is placed a series of wedge-shaped tubercles, decreasing in size towards its tip, which gives to the tail a strongly marked serrated crest; on either side of these tubercles is a series or two of smaller spiny warts or processes, much less regular, the upper being the larger; the inferior surface of the tail behind the vent is covered with bifid plates, as in the genus Coluber.

Colour. The head above is dusky; the jaws are horn colour, marked with dark waving lines; the neck above is also dusky, but lighter than the head; the throat and chin are dingy yellowish-white; the shell is dusky or dark cinereous; the sternum is yellow, as well as the inferior surface of the marginal plates; the extremities and tail are dusky or dark cinereous above, and dingy yellowish-white below.

Dimensions. Length of head, $3\frac{1}{2}$ inches; length of neck, $3\frac{1}{2}$ inches; circumference of neck, $7\frac{1}{2}$ inches; length of shell, 9 inches; breadth of shell, 8 inches; elevation, $3\frac{1}{4}$ inches; length of sternum, 7 inches; length of tail beyond the vent, $6\frac{1}{2}$ inches; space from shell to vent, 2 inches; total length, $24\frac{1}{2}$ inches. This was the size of the animal here described, but they not unfrequently arrive at dimensions much greater. Dr. Pickering assures me that he met with one near Salem, in Massachusetts, which from its great size he was induced to measure, and he found it to exceed four feet in length.

Habits. The Chelonura serpentina is found in stagnant pools, or in streams where the waters are of sluggish motion. Generally they prefer deep water, and live at the bottom of rivers; at times, however, they approach the surface, above which they elevate the tip of their pointed snout, all other parts being concealed, and in this way they float slowly along with the current, but if disturbed, they descend speedily to the bottom. They are extremely voracious, feeding on fish, reptiles, or on any animal substance that falls in their way. They take the hook readily, whatever may be the bait, though most attracted by pieces of fish; in this way many are caught for market. It is, however, necessary to have strong hooks and tackle, otherwise they would be broken, for the animal puts forth great strength in his struggles to escape, both with his firm jaws and by bringing his anterior extremities across the line. When caught, they always give out an odour of musk, more or less distinct; sometimes in very old animals it is so strong as to be disagreeable.

Occasionally the Chelonura serpentina leaves the water, and is seen on the banks of rivers or in meadows, even at a distance from their accustomed element. On land, his motions are awkward; he walks slowly, with his head, neck, and long tail extended, elevating himself on his legs like the Alligator, which at that time he greatly resembles in his motions; like the Alligator also, after having walked a short distance he falls on his sternum to rest for a few moments, and then proceeds on his journey. In captivity, they prefer dark places, and are exceedingly ferocious; they will seize upon and bite severely any thing that is offered them, and their grasp upon the object with their strong jaws is so tenacious, that they may even be raised from the ground without loosing their hold.

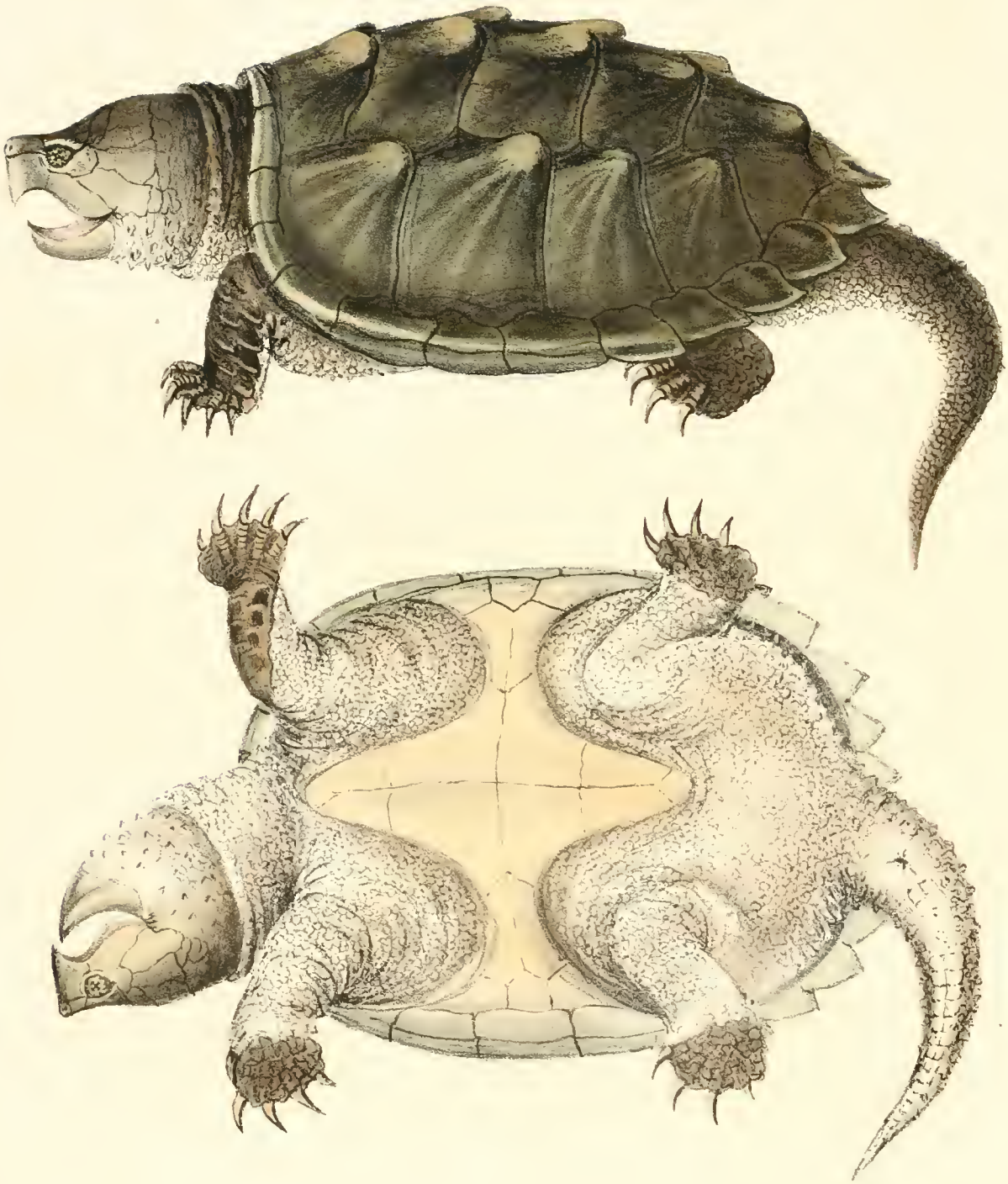
In many of the northern cities they are brought in numbers to market, and are esteemed excellent food, though I think they are far inferior to the Green Turtle, the Soft-shelled, or even several of the Emydes. They are kept for months in tubs of fresh water, and feed on such offal as may be given them, though they never become fat or increase much in weight.

Geographical Distribution. The Chelonura serpentina is found in nearly all parts of the United States, from Maine to Georgia, and from the Alleghanies far towards the Rocky Mountains.

General Remarks. Although the description of the Testudo serpentina of Linnæus is short and incomplete, yet it doubtless refers to the animal now under consideration, which is the first trace of it, and the specific name applied by him has been almost universally adopted by naturalists. The next notice is in Pennant's Arctic Zoology, whose description agrees perfectly well with our animal, with the exception of the "small head;" and he alone calls it Testudo serrata.

To Schoepff, however, is due the merit of having first clearly described this animal, and his description is accompanied with an excellent figure.

Some naturalists, Schweigger among others, have described a Chelydra (Chelonura) lacertina; this I regard as only a variety of the common serpentina, in which the carina along the back was unusually depressed; and those excellent herpetologists, Dumeril and Bibron, are of the same opinion.



Chelonura Temminckii

J. H. Richart, del. P. S. Duval, Lith. Phil.

CHELONURA TEMMINCKII.—*Troost.*

Plate XXIV.

Characters. Head enormously large, triangular, broad behind, pointed before, covered above and on the sides with plates; upper jaw strong, "*vulturiform*," hooked in front, cutting margin waving; lower jaw with a strong tooth in front, received in a fossette of the upper; shell tricarinate, sub-round, considerably concave in front, deeply emarginate and dentate behind; marginal plates thirty-one, placed in two rows at the flanks; tail without a crest.

Synonymes. Chelonura Temminckii, *Troost*, manuscript.

Description. The shell is sub-quadrangular, with its angles rounded, considerably concave anteriorly over the neck, and deeply emarginate and dentate posteriorly. Of the vertebral plates, the anterior is sub-trapezoidal, a little rounded in front and convex behind, with a prominent tubercle above, which commences the vertebral carina; the second is hexagonal, concave in front, carinated, and with a tubercle at the centre of the posterior margin; the third is quadrilateral, with a similar tubercle, but higher; the fourth is shaped like the third, but with a notch behind; the fifth vertebral plate is sub-pentagonal, narrower above and broader below, with its anterior border projecting into the posterior margin of the fourth, and is surmounted with the highest tubercle; these prominences make an elevated and tuberculated vertebral carina. The first lateral plate is sub-triangular, with its anterior and inferior border rounded, and joined to five marginal plates; the second and third are quadrilateral, and the fourth very irregularly hexagonal: each of these plates is surmounted by a knob or tubercle, as in the vertebral range, but placed at the superior and posterior part of the

plate; that of the fourth is most elevated; these prominences make on each side a tuberculated lateral ridge, quite as high as the vertebral, so that the shell is tricarinate. There are thirty-one marginal plates, of which the nuchal, or intermediate, is short, sub-quadrangular, and very extensive in the transverse direction; it is concave anteriorly, and slightly so at its lateral borders, with a prominence on its superior posterior face; the first marginal is irregularly pentagonal, with an elevated prominence at its outer and anterior part, at which begins the lateral carina; the second is sub-trigonal, with its base before and rounded, and its apex truncated and turned backwards; the third and fourth are elongated, quadrilateral, with their anterior margins slightly convex; the fifth, sixth and seventh are also quadrilateral, but are much more elongated and narrow; the eighth is quadrilateral and broad; the ninth sub-rhomboidal; the tenth, eleventh and twelfth are also sub-rhomboidal, each with a strong projecting point backwards, which gives the serrated and dentated appearance to the posterior margin of the shell. On the sides of the shell, and between the lateral and marginal plates, are interposed three supernumerary plates on each side. There seems, however, to be some variety in their number, for Troost, whose accuracy no one doubts, observed in his specimens four, whereas in the only specimen that I have ever seen there were but three; the anterior large, pentagonal, with an acute angle above, passing in between the lower margins of the first and second lateral plates, and straight below, where it joins the fifth, and slightly the sixth marginal plates; the second supplementary marginal plate is regularly quadrilateral, and is interposed between the second lateral and sixth marginal, touching also slightly the seventh; the third of these plates is also quadrilateral, and situated between the second and third lateral and seventh marginal plates.

The sternum is narrow and cruciform in shape, and resembles that of the last described animal, though there the wings descend a little from the sternum, while here they pass off at a right angle. Troost says it is covered with plates, similar in form and number to those found on the sternum of the Chelonura serpentina; yet in the specimen that I saw, the abdominal plates were subdivided, and it

differed in some other respects; but, as the sternum was dried, such observations cannot be relied on.

The head is enormously large, and regularly triangular if seen from above, its basis behind and its apex before; it is covered superiorly and laterally with polygonal plates; the vertical plate is beautifully urceolate, pentagonal, broadest behind, narrow before; the superior orbital plates are elongated, quadrilateral, and project over the eye, as in Crotalus; the frontal is irregularly quadrilateral, smaller before, where it projects over the nares, and broader behind, descending to form a portion of the orbit of the eye; the occipital plate is very large, covering most of the head, is of polygonal form, and joined to many of the plates of the head, in front to the vertical and superior orbital, and in all other places is surrounded by smaller plates; the first of these is placed behind the superior orbital, and is of an irregular oblong form, joining also with the posterior orbital and superior temporal plates; the second is larger, and situated between the occipital and superior temporal; and still behind this are several smaller polygonal plates; the central one is largest; the posterior orbital plate is regularly pentagonal, concave in front and above for the orbit, straight in front and below where it touches the corneous part of the lower jaw; there are four or five temporal plates, of which the two anterior are largest, the upper quadrilateral, and joined to the corneous covering of the upper jaw in front. The snout is pointed, the nares anterior and close together. The eyes are large and very brilliant, the pupil dark grey, the iris golden, with angular dark projections surrounding its outer margin. Each jaw is protected by a firm horny covering. The upper jaw is strong, sharp, and pointed at its extremity, extends beyond the lower, and is furnished with a remarkable hook in front, projecting beyond the lower, and descending at right angles to the frontal plane, behind which the cutting margin is waved or notched, as in some birds of prey. The cutting edge of the under jaw is equally firm, and has an equally well developed hook or tooth in front, which is received in a fossette of the upper jaw. The mouth, though large, is less so in proportion than in the Chelonura serpentina. The neck is short, large, sub-cylindrical, and covered with a tough, abundant, loose, folded,

and granulated skin, with large warts here and there interspersed, both above and below; many of these warts have horny points, though flexible at their base.

The anterior extremities are large, stout, broad, covered with a granulated skin and a few large scales placed transversely on the fore-arm, especially towards the lower and posterior part; there are five fingers, palmated, and a narrow fold of skin extends from the little finger along the fore-arm on its outer and posterior margin; the nails are strong, stout, and slightly curved, and nearly two inches in length. The posterior extremities are equally large in proportion, but more flattened towards the tarsus, and covered with a granulated scaly skin, with some larger warts about the nates, and a few large scales on the tarsus; the toes are five in number, fully palmated, with the web continued broad, like a fringe, along the posterior border of the extremity; there are four long horny nails. The tail is long, round, covered with a warty skin, and three rows of circular or oval plates, more or less elevated in their centre; here and there they may be seen raised into a round tubercle; these plates or scales are placed one on the vertebral line, and one on each side. Whether the tail below is covered with bifid plates, as in the Chelonura serpentina, I cannot say, as the only specimen that I have seen was dried, so that this arrangement was not perceptible.

Colour. The head is dusky above; the upper jaw is dingy-yellow, mixed with grey and white; the lower jaw is darker grey, and yellowish near the base. The neck is dusky above and dingy-yellow beneath. The shell is greyish or horn coloured, a little darker near each prominence. The sternum is yellow, more or less dingy. The superior surface of the extremities and tail is dusky, the inferior dirty yellowish-white.

Dimensions. Length of head, 8 inches; length of neck, $3\frac{1}{2}$ inches; circumference of neck, 1 foot 10 inches; length of shell, following the curve, 1 foot 10 inches; length of sternum, 1 foot 4 inches; length of tail beyond the anus, 1 foot $2\frac{1}{5}$ inches.

Habits. As far as is known, the habits of this animal are similar to those of the Chelonura serpentina, found in the same waters, and living on similar food. Troost observed in the intestines of one the remains of fish bones, fragments of a large species of unio, &c. Troost kept a Chelonura Temminckii in confinement for several weeks; it remained chiefly in the same place; only once or twice it crossed the little yard in which it was placed, and that was during a rain; if the heat of the sun was intense, it retired to the shade of a tree, where it fixed its residence, or sometimes it preferred the protection of the fence that surrounded the yard. In this way several days were passed, without its moving more than three or four feet, though frequently teazed by children. The flesh is much esteemed as food, and is said to be not inferior in delicacy to the Green Turtle, which, I think, is much to be doubted.

Geographical Distribution. The Chelonura Temminckii inhabits the Mississippi river and its tributary streams, as well as some of the rivers of Alabama that open into the Gulf of Mexico.

General Remarks. A good deal of obscurity has hitherto hung over the history of this animal, which is now perfectly removed. Troost was undoubtedly the first person who distinguished it from the allied species, Chelonura serpentina, and sent drawings and descriptions of it to some European naturalists; but they never having seen the animal, supposed it to be only an overgrown specimen of the Chelonura serpentina,* which indeed it does resemble in many respects; it is found in the same localities west of the Alleghany mountains, and is known by the same name, Snapping Turtle or Loggerhead; yet, on minute examination, there will be observed differences enough to make it a distinct species, if not even to place it in a new genus, as will be seen in the anatomical part of this work. Troost has collated the following specific characters of each, which are constant, whatever be the age of the animal, and he has seen them of all ages.

* Vide Dumeril et Bibron, tom. ii. p. 349; also Temminck and Schlegel, in Seibold's Japan, partie Erpetologique, &c.

CHELONURA TEMMINCKII.	CHELONURA SERPENTINA.
1. Head very large, triangular, covered with plates; upper mandible "vulturiform," hooked in front, the hook descending at a right angle from the frontal plane, and with a fossette for the tooth of the lower jaw.	Head smaller, oval, covered with closely adherent skin above and a few small plates at the sides; hook of the upper mandible recurved; no fossette for the tooth of the lower jaw.
2. Skin of neck is granulated, and has warty excrescences, horny at their tips.	Skin of neck granulated, no spiny warts, but with two flexible long warts at the chin.
3. Marginal plates thirty-one; a double series at the sides.	Marginal plates twenty-five, single series.
4. Tail round, and covered with three rows of circular or oval plates, more or less prominent in the centre.	Tail more or less oval, surmounted with a crest of wedge-shaped tubercles, diminishing in size towards the tip.
5. Dimensions—Length of head, 8 inches. Length of neck, $3\frac{1}{2}$ inches. Circumference of neck, 1 foot 10 inches. Length of shell, 1 foot 10 inches. Length of sternum, 1 foot 4 inches. Length of tail beyond anus, 1 foot $2\frac{1}{5}$ inches.	Dimensions—Length of head, $3\frac{1}{2}$ inches. Length of neck, $3\frac{1}{2}$ inches. Circumference of neck, $7\frac{1}{2}$ inches. Length of shell, 9 inches. Length of sternum, 8 inches. Length of tail beyond anus, $2\frac{3}{4}$ inches.

ERRATA.

Vol. I, p. 36—fourth line from top, for "cistuda clausa," read "*Cistuda Carolina.*"

" 65—thirteenth line from top, for "tail" read "*nail.*"

" 94—second line from top, for "narrew" read "*narrow.*"

" 120—sixth line from bottom, for "are" read "*is.*"

" 125—fourth line from bottom, for "reticularia" read "*reticulata.*"

SYNONYMES.

Emys Muhlenbergii, p. 45, for Vol. IV. read Vol. VI., Harlan.

Cistuda Pennsylvanica, p. 127, for page 210 read page 206, Say.

Sternothærus odoratus, p. 133. for page 53 read page 35, Gray.

Chelonura serpentina, p. 139, for page 351 read page 354, Linnæus.

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Length of tail beyond anus, 1 foot $2\frac{1}{5}$ inches.	Length of tail beyond anus, $2\frac{3}{4}$ inches.