TURTLES OF THE CHICAGO AREA

BY

KARL P. SCHMIDT

CURATOR OF AMPHIBIANS AND REPTILES

ZOOLOGY

LEAFLET 14

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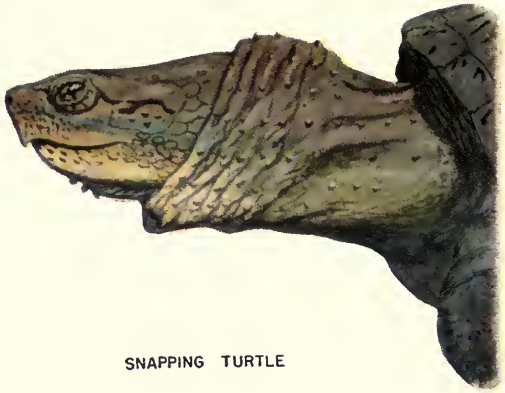
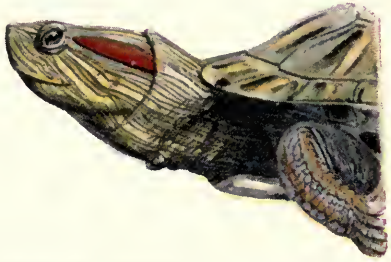
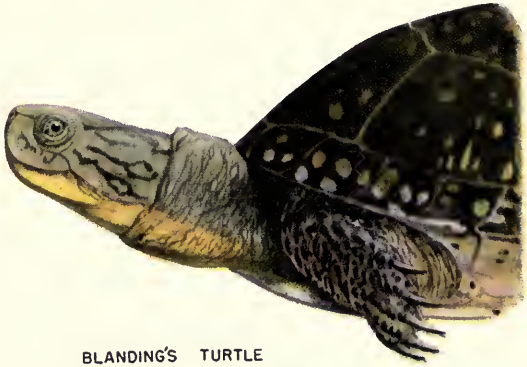


SNAPPING TURTLE

BOX TURTLE



CUMBERLAND TERRAPIN



BLANDING'S TURTLE

HEAD PATTERNS OF TURTLES OF THE CHICAGO AREA

FIELD MUSEUM OF NATURAL HISTORY
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LEAFLET NUMBER 14

TURTLES OF THE CHICAGO AREA

The turtles found within fifty miles of Chicago offer an excellent subject for one of several leaflets designed as introductions to the systematic study of local animal life for the use of students, teachers, and naturalists, in the territory surrounding Chicago. The Chicago amphibians have been covered by two leaflets, one on the frogs and toads, and one on the salamanders.

In the preparation of the present leaflet, I am especially indebted to Mr. Leon L. Pray, of the taxidermy staff of Field Museum, for the preparation of the accurate color sketches which illustrate the characteristic head coloration of nine of our species of turtles, and for the stippled drawings in black and white to illustrate "recognition characters" of each species. With the aid of these figures the identification of any specimen from this region is much simplified.

The turtles belong to the great group of reptiles, of which they form one of the major divisions, the order Testudinata. Turtles are distinguished among reptiles by the fact that few persons regard them with fear or aversion. They are scarcely less remarkable for the want of popular confusion as to their name or definition. There are, to be sure, three current names for these creatures: turtle, tortoise, and terrapin. An Englishman is likely to restrict "turtle" to the marine turtles, which include the edible "green turtle," employing "tortoise" for all the other land and fresh-water forms. An American is likely to think of "tortoise" as applying to the land or desert forms,

and to give a wider application to the word "turtle," but with the addition of the term "terrapin" to his vocabulary for certain of the fresh-water forms which abound in the eastern United States. It seems preferable to adopt the word "turtle" for the group as a whole and to distinguish sea turtles, land turtles, soft-shelled turtles, and others, by means of a suitable prefix; such forms as "snapping turtle" and "spotted turtle" are already fixed in the language in America; "snapping tortoise" and "spotted tortoise" are not current.

Turtles are widely used as food. The marine green turtle, which grows to large size, is famous for the soup made from it in all maritime countries. In the United States the fresh-water turtles are frequently eaten, including the forms indiscriminately known as "terrapin" or "sliders," the snapping turtle, and the soft-shelled turtles. In the eastern United States the diamond-backed terrapin of the salt marshes enjoys an extraordinary reputation as a delicacy. Diamond-backed terrapins formerly brought eight to ten dollars each in the larger cities. This artificial price has its counterpart in China, where certain species of soft-shelled turtles are especially valued. Turtle-raising for the market is extensively practiced in Japan. Considerable success has attended experiments with diamond-backed terrapin culture in this country under the direction of the United States Fish Commission, at Beaufort, North Carolina.

Young specimens of several of our common turtles are familiar as aquarium pets. The giant land turtles afford an especial attraction in zoological gardens, where their longevity makes them favorites with their keepers. One of the large tortoises of the islands in the Indian Ocean, transported when it was already full-grown from its native home to the Island of Mauritius, in 1766, lived until 1918. This known span of more than 152 years is perhaps the greatest age reached by any vertebrate for which authentic records are available. It is believed that many

of the smaller species of turtles are also very long-lived, and it is certain that many have a possible length of life of more than 50 years.

The turtles quite plainly represent the most ancient type of reptile now living. They are more ancient, indeed, than most of the dinosaurs and related reptiles that flourished in the "Age of Reptiles." They appear as fossils at the beginning of that period and even the earliest known forms are already unmistakably turtles, with the principal characters of the group well developed. These characters are primarily the presence of a boxlike bony shell, within which the head and limbs can be withdrawn; and the absence of teeth, the jaws being provided with sharp-edged horny sheaths. The solidly built skull shows the relationship of the turtles to the most primitive of the ancient reptiles of the Permian Age. The bony box which composes the shell is made up of numerous dermal bones (bones formed in the skin), which are fused with the much flattened ribs in the upper shell, and with the sternum in the ventral shell. The upper shell is the carapace, the lower the plastron. The bony shell is covered with soft skin in the soft-shelled turtles, in all others with a series of symmetrically arranged horny plates. The horny plates and the underlying bones of the shell do not correspond. The neck and limbs are usually covered with soft skin, but scales like those of other groups of reptiles may be present, as in the sea turtles and in the large land turtles.

The dependence of turtles on a bony armor carries with it a loss of activity and accounts for the proverbial slowness of turtles. The extent to which they rely on this defensive protection is extremely variable. The snapping turtles and the swift-moving soft-shelled turtles are aggressive forms scarcely dependent on their shells for protection. Throughout the turtle group, however, we find adaptations for closing the shell completely. Our common box turtle is one of the most perfect examples of this tendency,

while the Blanding's turtle, with a much less perfectly hinged plastron, exhibits a halfway stage in the development of the same principle. In these turtles the plastron closes the shell at both ends by motion on a single crosswise hinge. Many turtles from other regions and from other countries have two hinges in the plastron, closing the front and rear lobes separately. A widespread group of African turtles closes the rear of the shell by means of an imperfect hinge in the posterior part of the upper shell. In the land tortoises, which include the giant forms of the Galapagos Islands and the islands in the Indian Ocean, the openings at the front and rear are tightly blocked by the limbs, which are covered by heavy scales underlaid by bone.

The habits of turtles offer an interesting field for investigation. All turtles lay eggs and lay them on land, usually in sandy locations. There are considerable differences in the manner of egg-laying, and in the number in a clutch, the size of the egg, and the nature of the eggshell, in the various groups of turtles. Some of our turtles have a peculiar kind of courtship in which the male faces the female and strikes her head and forelimbs actively with his much elongated claws. Careful observations of this performance are much wanted for our species. By far the most remarkable problem in turtle life-histories relates to the fertilization of the eggs, which apparently takes place three or four years before they are laid. There are consequently three or four sets of developing eggs constantly present in the body of an adult female, since eggs are deposited annually.

Most reptiles shed their skins in the process of growth and at intervals during adult life. This is conspicuously true of snakes, in which the epidermis is shed in a single piece. Skin shedding in turtles is very little understood and evidently differs radically in different kinds of turtles. The soft skin of neck and limbs is presumably renewed by constant loss and replacement, as it is in mammals.

The ringed appearance of the horny shields of the shell is due to annual growth periods, and these growth rings make it possible to determine the age of most turtles in temperate latitudes. As the normal adult size is reached, the rate of growth decreases, and the original growth rings are gradually effaced by the shedding of thin layers of the horny epidermis.

The classification and distribution of the turtles of the world is a highly interesting but complex subject, too extensive for the present essay. It must be mentioned that there are two very distinct marine types, the true leatherback, and the green turtle with its allies, both of which have the limbs transformed into flippers. The remaining nine families of turtles are aquatic and terrestrial in varying degree. The soft-shelled turtles of our fresh waters are almost as completely aquatic as the sea turtles, while at the other extreme the land turtles include true desert forms which are entirely independent of water.

North America is rich in turtles, with no less than 62 distinct forms north of Mexico out of a total of some two hundred species in the world. Ten of these 62 species are found in the Chicago area. Their names and arrangement according to families are as follows:

THE SNAPPING TURTLE FAMILY (Chelydridae)

1. Snapping Turtle (*Chelydra serpentina*)

THE MUSK TURTLE FAMILY (Kinosternidae)

2. Musk Turtle (*Sternotherus odoratus*)

THE TERRAPIN AND LAND TURTLE FAMILY (Testudinidae)

3. Spotted Turtle (*Clemmys guttata*)
4. Painted Turtle (*Chrysemys picta marginata*)
5. Map Turtle (*Graptemys geographica*)
6. Cumberland Terrapin (*Pseudemys troostii*)
7. Blanding's Turtle (*Emys blandingii*)
8. Eastern Box Turtle (*Terrapene carolina carolina*)
9. Ornate Box Turtle (*Terrapene ornata*)

THE SOFT-SHELLED TURTLE FAMILY (Trionychidae)

10. Soft-shelled Turtle (*Trionyx spinifera*)

There are a number of possible additions to this list, for several other species approach the limits of the Chicago area. Single specimens, however, no longer indicate the natural occurrence of a species, for turtles, like other reptiles, are subject to being casually picked up and transported by automobile from one part of the country to another.

KEY TO THE TURTLES OF THE CHICAGO AREA

A. Shell covered with soft skin, margin not bony.
Soft-shelled Turtle (*Trionyx spinifera*).

AA. Shell covered with horny shields which overlie a bony boxlike framework.

B. Plastron relatively small.

C. Tail long and strong, carapace rough.
Snapping Turtle (*Chelydra serpentina*).

CC. Tail short, carapace smooth.
Musk Turtle (*Sternotherus odoratus*).

BB. Plastron well developed.

C. Plastron with a hinge, the front and rear lobes nearly closing the shell.

D. Plastron perfectly hinged; carapace highly arched; color of lower part of head and neck not sharply separated.

E. Plastron with a conspicuous pattern of light lines on a dark ground color, carapace without a keel.
Ornate Box Turtle (*Terrapene ornata*).

EE. Plastron with irregular markings, or unmarked carapace with a low keel.
Eastern Box Turtle (*Terrapene carolina carolina*).

DD. Plastron with an imperfect hinge, color of lower side of head and neck sharply separated (pl. 1).
Blanding's Turtle (*Emys blandingii*).

CC. Plastron without hinge.

D. Carapace black, with small round yellow spots.
Spotted Turtle (*Clemmys guttata*).

DD. Carapace without round yellow spots.

E. Carapace with broad, light markings bordering the horny shields.
Painted Turtle (*Chrysemys picta marginata*).

EE. No broad light lines on carapace.

F. Plastron unspotted.
Map Turtle (*Graptemys geographica*).

FF. Plastron with pairs of large black spots.
Cumberland Terrapin (*Pseudemys troostii*).

SNAPPING TURTLE (*Chelydra serpentina*)

The snapping turtle is one of the most familiar of North American turtles. It is easily recognized by its rough shell, large head and limbs, and long tail. It reaches a large size, with a recorded length of shell of 14 inches and a maximum weight of about 30 pounds. Shell length in turtles is measured in a straight line, not over the curve

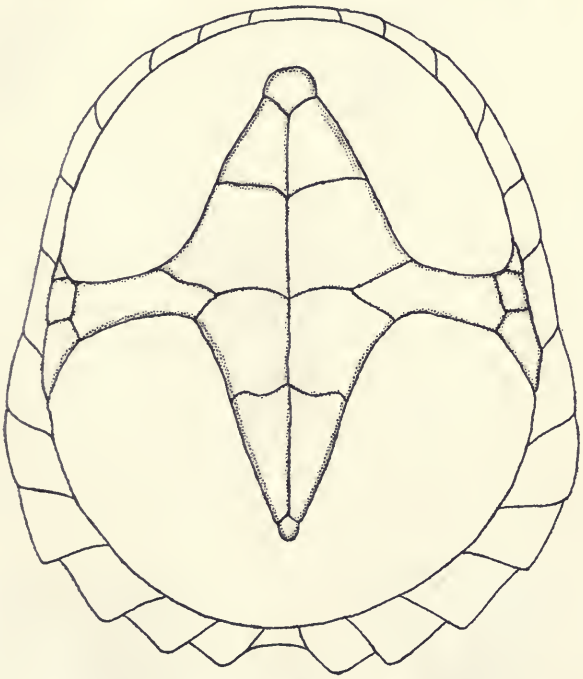


FIG. 1. The plastron of the snapping turtle is very small relative to the size of the opening of the upper shell.

of the shell. Its still larger relative, the giant snapping turtle of the Mississippi, is one of the largest of all freshwater turtles.

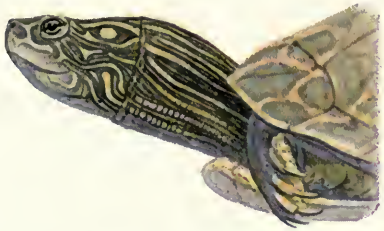
The snapping turtle ranges throughout eastern North America and is found in the Mississippi and Missouri drainage system west to the Rocky Mountains. It is

an aquatic form, feeding in the water, but coming ashore to bask in the sun. It inhabits streams and rivers of all sizes, as well as lakes and ponds. It is capable of extensive overland migration, during which it is likely to be killed on highways and railroad tracks.

The name gives a clue to its disposition, for it is aggressive, and, if cornered on land, does not attempt to withdraw into the shell, but lunges forward viciously with its powerful jaws. Tapping or scratching the shell with a stick causes the typical reptilian reaction of raising the opposite side. When the middle of the back is tapped, the snapping turtle will rise as high as possible on its feet, its shell ridiculously like the arched back of a petted cat. Snapping turtles feed on all kinds of small animals that come within their reach. They lie in shallow water with the limbs and shell embedded in the mud, and capture their prey by sudden lunges of the head and neck. They are still more concealed in such situations by the algal growth which frequently forms on the shell. Some vegetable matter may be eaten, and it is reported that young specimens feed freely on the floating duckweed in stagnant water. They frequently feed on dead fish. An extraordinary use is made of live snapping turtles in the search for the bodies of drowned persons, by attaching a line to a captive turtle and following its movements.

The eggs, to the number of thirty or more, are laid during June in holes excavated in sandy embankments or fields. They hatch in late August or early September, and the young turtles go into hibernation with very little increase in size. The eggs are nearly spherical, about an inch and a quarter in diameter, with a tough leathery shell.

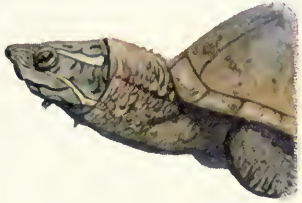
This species is widely used as food. It is captured in turtle traps, by seining, or with hook and line. It is shipped alive in crates. In the Washington and Philadelphia markets, snapping turtles are prepared simply by removal of the plastron and entrails.



MAP TURTLE

SOFT-SHELLED TURTLE

SPOTTED TURTLE



MUSK TURTLE

PAINTED TURTLE

HEAD PATTERNS OF TURTLES OF THE CHICAGO AREA

MUSK TURTLE (*Sternotherus odoratus*)

The musk turtle is a small, dull-colored turtle with a rather high and elongate shell, usually under four inches in length. The scales of the plastron are separated by whitish areas of skin in the adults, much more widely in male specimens than in female. There are two yellowish lines on the side of the head. This species is known as the musk turtle or stinkpot, on account of its strong and somewhat disagreeable smell.

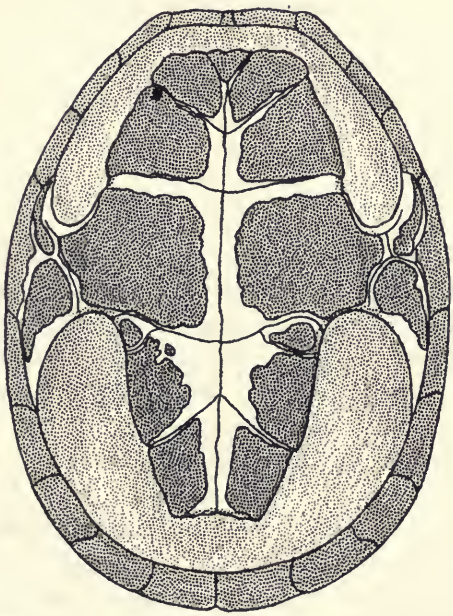


FIG. 2. Whitish areas of skin connect the shields of the plastron in the adult musk turtle.

The musk turtle family is confined to the Americas, with a wide variety of peculiar forms in Central America. Our musk turtle is found throughout northeastern North America. There are two related species in the southern states, besides the numerous species of the allied *Kinosternon*. The musk turtle is strictly aquatic, coming ashore

for egg-laying or occasional migration, but otherwise keeping to the sluggish streams and ponds which it inhabits. A pair of opposing pads of horny spines on the hind limbs in the males of this species have been referred to as a "stridulating apparatus," but observations on the production of sounds by this means are still much to be desired. These turtles are the scavengers of lakes and ponds, feeding on any animal matter alive or dead that they may find while walking about on the bottom. The eggs are laid in middle or late June and hatched in late August or September. They are few in number, three to five in a clutch, elongated, and with a hard shell, about an inch in length and three-fourths of an inch in the smaller diameter.

SPOTTED TURTLE (*Clemmys guttata*)

The spotted turtle is a very easily recognized species, for its color pattern of small orange yellow spots on an almost solid black ground color is unique among American turtles. The plastron is reddish brown with black blotches on the ends of the plates. The shells of adult specimens are four to five inches in length. The coloration of the sexes is different, the figure on our plate representing a female. The jaws of the male are darker and the stripes behind the jaw and eye less distinct.

The genus *Clemmys* is world-wide in the northern hemisphere, with four species in North America, two in Europe, and four in China and Japan. The spotted turtle is the most abundant of the three species in eastern North America, ranging throughout the eastern United States with the exception of peninsular Florida. In the Chicago area it is fairly abundant in the Indiana dune region, but, except for a doubtful record from Wolf Lake, does not occur west of the Illinois-Indiana line.

The spotted turtle lives in swamps, ponds, and small streams. It is found abundantly on land during the

breeding season in early spring, but after egg-laying time is rarely seen. Little else is known about the habits of this species. Its eggs are few in number, three or four at most. They are relatively elongate, about an inch and a quarter in length by three quarters of an inch in the smaller diameter. The eggs are laid in the latter half of

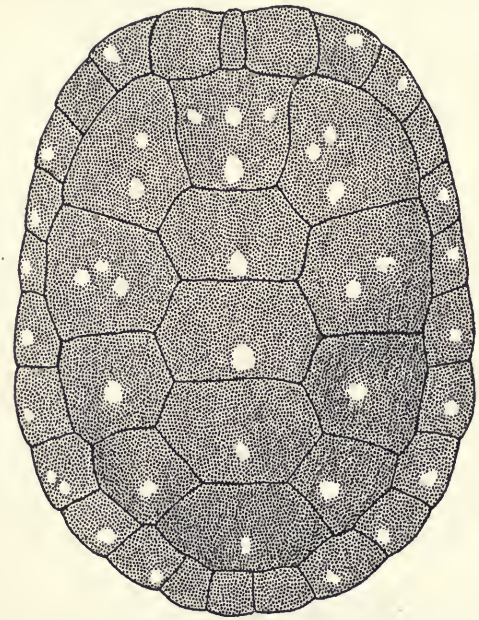


FIG. 3. The dark carapace of the spotted turtle is dotted with small orange spots.

June in our latitude, and apparently do not hatch until some time in September.

PAINTED TURTLE (*Chrysemys picta marginata*)

The painted turtle may be recognized by the rather broad light bands which border the sutures of the shields of the carapace. The plastron is yellow or red with an elongate central black marking, and the marginal shields are brightly marked with red. The average length of shell in full-grown specimens is between five and six inches.

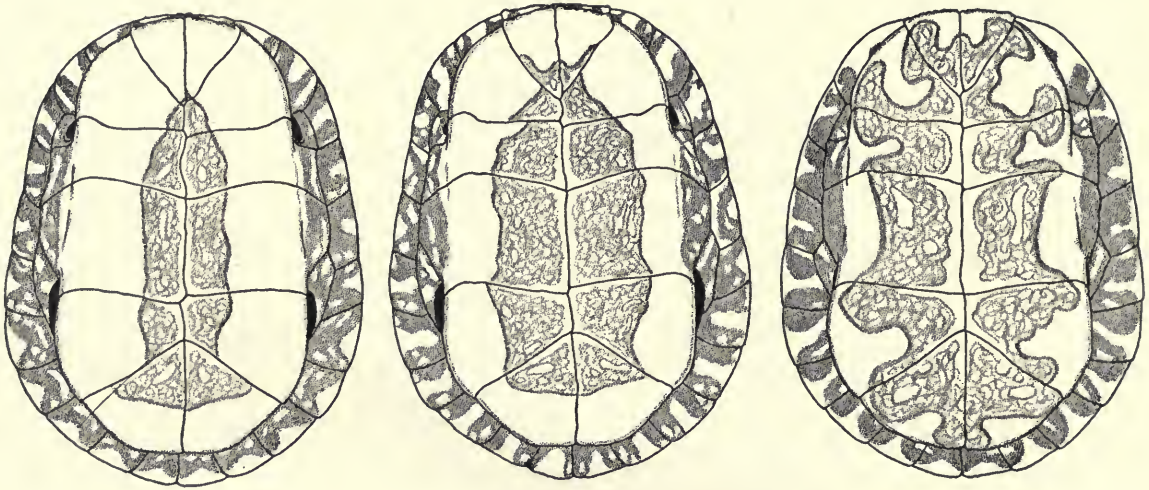


FIG. 4. Variation in the black pattern of the plastron of the painted turtle. *a*. Typical narrow pattern (true *marginata*) of a specimen from Porter County, Indiana. *b*. Intermediate pattern (intergrade between *bellii* and *marginata*) from Du Page County, Illinois. *c*. Typical pattern of true *bellii* from Clark County, Wisconsin.

The painted turtles of the subspecies *marginata* range from western New York to western Indiana, south to the Ohio, and into southern Illinois. West of the Mississippi this subspecies is replaced by the western form *bellii*, with a much more extensive black pattern on the plastron. The turtles of this group in northern Illinois are intergrades between these two subspecies, with a black ventral pattern of varying extent. The specimens from the Indiana dune region are typical *marginata*. A more detailed study of this species from the Illinois rivers is desirable.

This form is perhaps the most abundant turtle of the Chicago area, especially numerous in the ponds and lakes of the moraine district and in the borrow pits along the dunes highway in Indiana, but numerous also along streams. It is especially given to basking in the sun on exposed logs and banks. The eggs number from four to eight. They are dull white in color, with a soft, easily indented shell. Egg-laying takes place in June, and although hatching occurs in August, belated broods may spend the winter in the egg to hatch in May or June of the following year. The food of the painted turtle is miscellaneous animal matter.

MAP TURTLE (*Graptemys geographica*)

The map turtle is considerably larger than the spotted or painted turtles, reaching a shell length of more than ten inches. The carapace has a low but distinct keel on the mid-line, much more distinct in young specimens. The carapace is dark olive with a network of light yellow lines, while the plastron is uniform yellow, the shields sometimes with dark lines along their margins. The head is large and broad, with a characteristic coloration, illustrated in plate 2.

The map turtle inhabits the central United States, from New York to Virginia and from lower Michigan to Texas. It has a widespread southern relative, the

"pseudogeographic turtle," *Graptemys pseudogeographica*, which has a more sharply keeled carapace.

The map turtle is essentially aquatic, and partial to standing waters and sluggish streams. Its jaws are provided with broad crushing surfaces which adapt this species to its diet of mollusks and crayfishes. The eggs

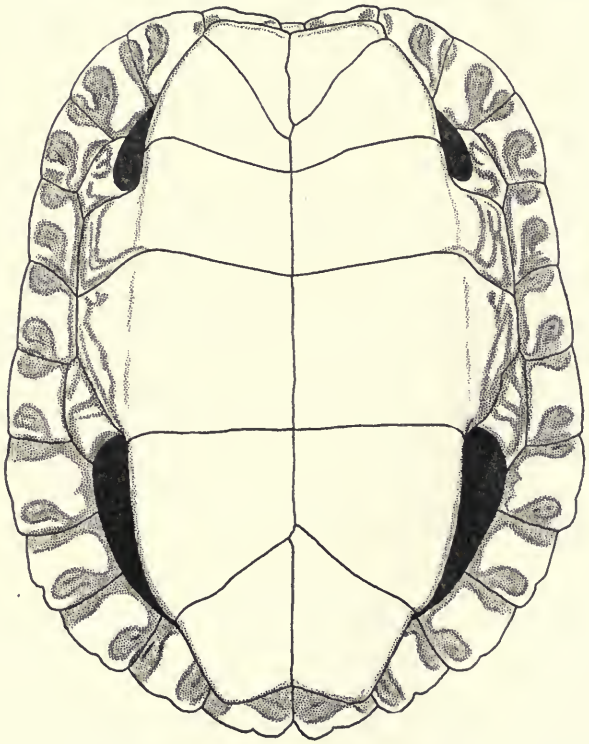


FIG. 5. The plastron of the map turtle is without black spots.

are leathery-shelled, ellipsoidal in shape, a little more than an inch in length. From eleven to sixteen eggs are laid in two layers in a flask-shaped excavation, with sometimes one or two eggs left over for the narrowed neck of the repository. The ground is carefully smoothed over by means of the plastron after the eggs are deposited and the

nest filled in. Egg-laying begins in early June and hatching takes place in September. If egg-laying is delayed, hatching may not take place until the following spring, the development of the eggs being arrested during winter, the embryos "hibernating" much as the young would have to do in normal autumn hatching.

CUMBERLAND TERRAPIN (*Pseudemys troostii*)

The terrapins of the genus *Pseudemys* are sometimes known as "sliders" or "cooters." There are many species of this genus in the southeastern United States, only one, the Cumberland terrapin, reaching the Chicago area. This turtle is a good-sized species, its shell about ten inches long, most easily recognized by its band of red or yellow on each side of the head and neck. The plastron is yellow with a black mark or circle on each shield. In the South, male specimens are frequently without the yellow color in the head and shell pattern, and have a very distinctive mottled black appearance, so that they were long regarded as belonging to a distinct species.

The Cumberland terrapin is extremely abundant in the rivers of the central Mississippi Valley, ranging northward to Wisconsin and eastward to Ohio. In the Chicago area it is known only from the Kankakee River, and it appears to be entirely absent from the dune region of northern Indiana.

This common species is doubtless predominantly carnivorous, like its relatives, but experiment with captive specimens shows that vegetable matter is also taken. Great numbers of newly hatched specimens of this species are sold annually to be kept as pets. While they make attractive pets for children, they do not usually survive the winter in our climate, apparently on account of lack of direct sunlight. Small specimens feed greedily on canned tuna fish.

Egg-laying takes place late in June. The female turtle, leaving the water in search of a nest site, chooses a

sandy bank, often at some distance from the water's edge, and excavates a hole to a depth of about six inches. About fifteen eggs are deposited by a full-grown turtle. The hole is carefully filled and the surface smoothed over with the hind legs and plastron. The time required for hatching is about eight weeks.

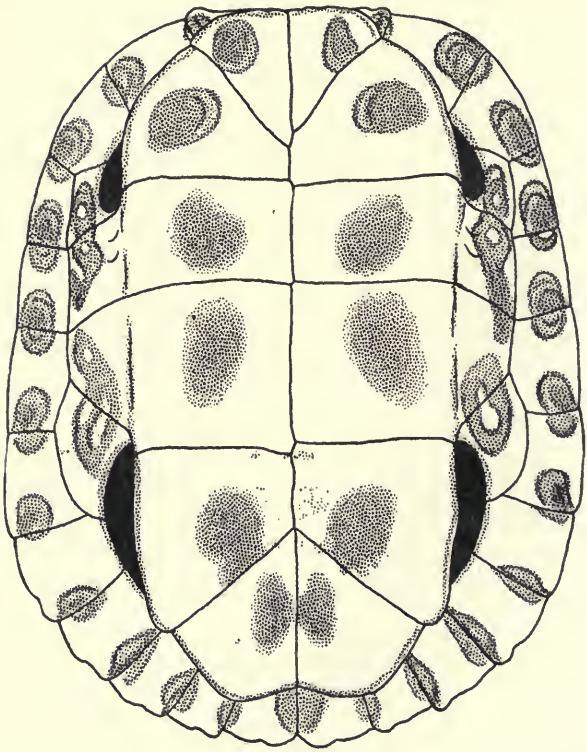


FIG. 6. The paired rounded black spots on the shields of the plastron are characteristic of the Cumberland terrapin.

BLANDING'S TURTLE (*Emys blandingii*)

The turtle known as Blanding's turtle in books does not appear to have any current popular name. It is a very distinct kind of turtle, its nearest relative being *Emys orbicularis* of Europe. This turtle has a very

characteristic coloration, especially of the head and neck, as shown on plate 1. The uniform yellow of the chin and throat meets the dark brown color of the upper surfaces in a sharply defined line. The carapace is black with yellow or brown spots and vermiculations. The plastron

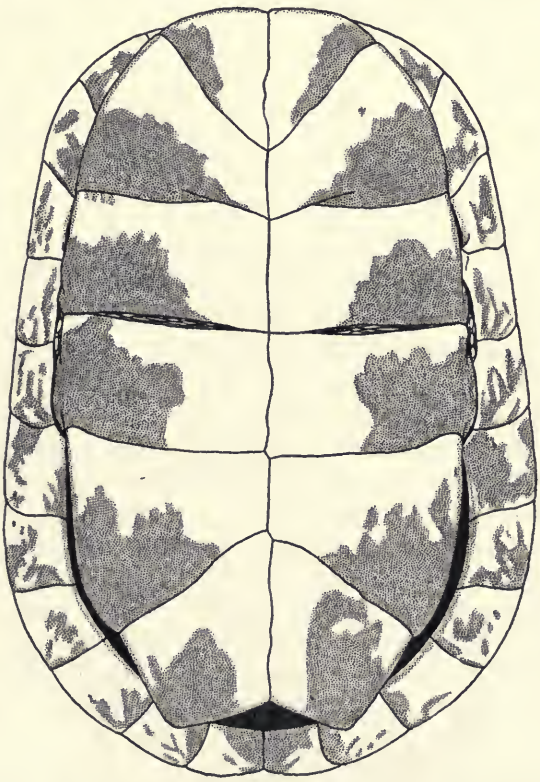


FIG. 7. The plastron of Blanding's turtle is imperfectly hinged. The large black blotches on the outer corners of the shields are distinctive.

is yellow with a large black blotch on the outer part of each shield. The plastron almost completely fills the opening of the carapace, and is somewhat imperfectly hinged, so that its two ends close against the upper shell. The usual length of an adult shell is about eight inches.

Blanding's turtle ranges across the northeastern United States from Iowa to New England and Long Island. It does not range far to the south. It is at least partly terrestrial, and appears to have been abundant on the Illinois prairies before they were completely settled. It is still moderately abundant in the Chicago area, especially in the dune region of Indiana and in the sandy region north of Waukegan.

Little is known of the habits of this species, though it is one of our most distinct and interesting forms.

EASTERN BOX TURTLE (*Terrapene carolina carolina*)

The box turtles are small turtles with a high, domed shell, very different in this respect from other turtles of the Chicago area. The name refers to the power of closing the front and rear lobes of the plastron completely, with the head and limbs withdrawn.

The pattern of the carapace in the eastern box turtle often consists of radiating dark lines on each shield. The coloration of this species is extremely variable. It may be uniform olive, without markings, and either dark or light markings may predominate. The plastron, however, though varyingly blotched with dark markings, never has the regular pattern of the ornate box turtle. The males are distinguished by having bright red eyes. Large specimens attain a shell length of six inches. The upper shell has a low but distinct keel on the mid-line.

The typical eastern box turtle ranges over the eastern United States from the Mississippi to Maine and Georgia. It is replaced by the three-toed subspecies *Terrapene carolina triunguis* in the Gulf coast region and westward, while on the Great Plains there is only the ornate box turtle.

These turtles are strictly terrestrial but they may occasionally enter water. Our subspecies frequents hardwood forests. The box turtle is to a large extent herbivor-

ous, feeding on leaves, berries and mushrooms, but worms, caterpillars and other animal food are also taken. Captive specimens have been known to attack and eat horned lizards. The eggs are four to six in number, with a thin flexible shell. They are laid late in June and hatch in August or early September. The newly hatched young

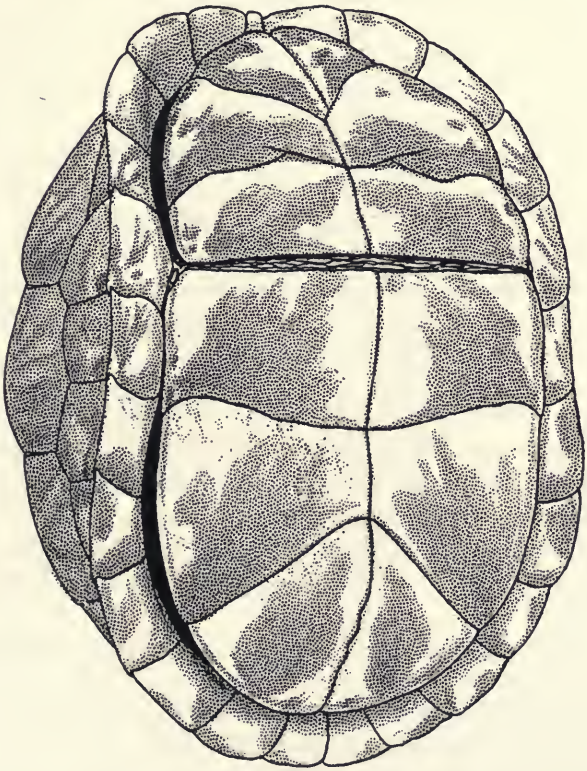


FIG. 8. The plastron of the box turtle works on a hinge to close the shell at front and rear.

are entirely without a plastral hinge, and look very unlike the adults.

Some years ago Mr. and Mrs. C. M. Breder devised an ingenious means of studying the daily life of the box

turtle. This consists in attaching a spool of thread to the turtle's shell by means of a wire frame, so that the spool will unroll as the turtle progresses, leaving a thread trail wherever it goes. Some of the preliminary results of studies by Mr. and Mrs. Breder, made in New Jersey, showed that *Terrapene carolina* has a well-defined sense of direction; that each individual has apparently an area of rather circumscribed dimensions which it traverses and which it will attempt to reach if removed a short distance therefrom; that it wanders about rather at random when on its home territory; and that it burrows into leaf mold for the night, and is most active just after sunrise and before sunset, while, in emerging from a burrow, it proceeds to "plow" through the soft soil, not backing out in any case.

Similar observations and confirmation and extension of these conclusions might offer an interesting study in local natural history to some Chicagoan spending week-ends or vacations in the dune region.

ORNATE BOX TURTLE (*Terrapene ornata*)

The ornate box turtle may be recognized by the bold pattern of the plastron, and it is distinguished in a number of other ways from the eastern box turtle. It is a somewhat smaller species; there is no keel on the middle of the upper shell, and this is less domed and somewhat flattened on top.

The distribution of this species is especially interesting, since it is a form common on the Great Plains, reaching its maximum abundance in Oklahoma and Kansas. In Illinois and Indiana it occurs only in isolated sandy areas. It is believed that this affords evidence for an important eastward spread of the plains vegetation and animal life in postglacial times. This was followed by the change to the modern climatic conditions, which are unfavorable to some of the western forms, with the result that they are restricted to special areas, especially to sandy areas, to which these plains animals are better adjusted.

Except for its evident preference for sandy areas, the ornate box turtle has habits greatly like those of its eastern relative. It is most curious that the western species, which is found in sandy areas in Lee and Kankakee counties in northern Illinois, should be absent in the Indiana dune region, and replaced there by the eastern species.

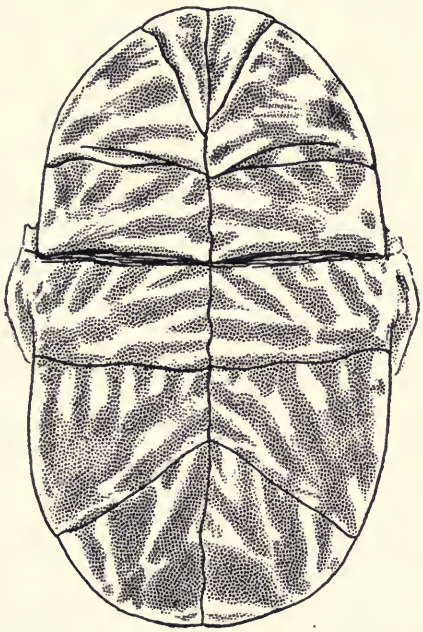


FIG. 9. The ornate box turtle is most easily distinguished by the handsome and symmetrical pattern on the lower shell.

SOFT-SHELLED TURTLE (*Trionyx spinifera*)

The most peculiar of all the turtles of the Chicago area is the soft-shelled turtle, a representative of a large group whose headquarters are in southern Asia. These turtles have no horny plates, the bony shell being reduced and covered with skin. The snout is produced into a slender tube. There is a series of soft spines on the border of the carapace in front. The olive gray carapace is

margined with yellow and spotted with darker spots which may be ring-shaped or surrounded by rings, but which usually disappear in old specimens. The length of the shell reaches twelve inches.

Our soft-shelled turtle ranges from the Rocky Mountains throughout the Mississippi and St. Lawrence basins to the Alleghenies in the east.

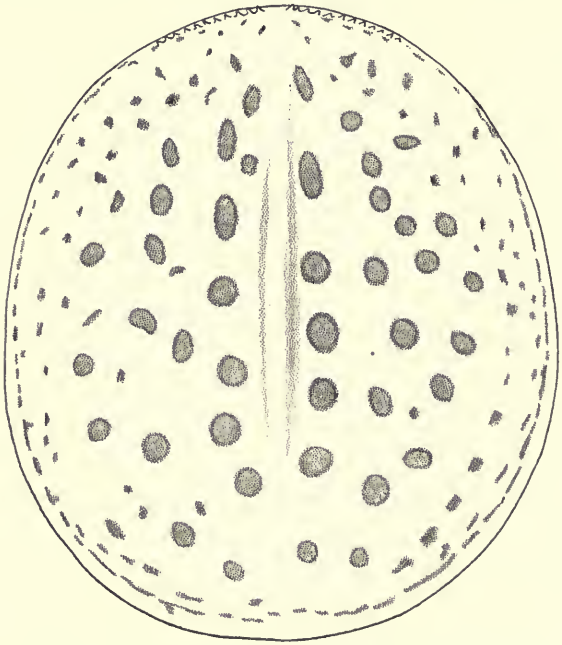


FIG. 10. Spotted carapace of soft-shelled turtle.

This species, like all its relatives, is completely aquatic, coming ashore only to sun itself and for egg-laying. Its powerfully webbed feet make it an excellent swimmer. It is somewhat surprising to find that it is quick in its movements on land. Young specimens, especially, run with great rapidity, high on their legs, belying the proverbial slowness of the tortoise. These turtles feed on animal matter, such as dragon-fly larvae, crayfishes, and

presumably occasional fishes. They are frequently caught by fishermen with hook and line.

A curious deformity is occasionally found in the soft-shelled turtle, in which the back is raised into a hump. Such hump-backed turtles have been reported from the Chinese soft-shelled turtles as well as from our species.

The eggs are nearly spherical, hard-shelled, and number up to twenty-five, eighteen being the average clutch. They are laid in a flask-shaped excavation in banks near the water. Laying takes place during late June and the early part of July. The time required for hatching is not exactly known, but young specimens have been found in late August and early September.

This species is the most highly esteemed for food of all the middle western turtles, though its market value does not equal that of the diamond-backed terrapin of the Atlantic coast.

KARL P. SCHMIDT

BOOKS AND ARTICLES ABOUT TURTLES

AGASSIZ, LOUIS.....Contributions to the Natural History of the United States (Cambridge, 1857).

BREDER, RUTH B.....Turtle Trailing: a New Technique for Studying the Life Habits of Certain Testudinata (Zoologica, Vol. 9, No. 4, New York Zool. Soc., 1927).

CAHN, ALVIN R.....The Turtles of Illinois (Ill. Biol. Monogr., Vol. 16, pp. 1–218, 46 figs., 20 maps, 1937).

DITMARS, R. L.....The Reptiles of North America (Garden City, N. Y., 1936).

GADOW, HANS.....Amphibia and Reptiles (London, 1901).

HILDEBRAND, S. F.....Review of Experiments on Artificial Culture of Diamond-back Terrapin (Bull. Bur. Fisheries, Vol. 45, pp. 23–70, 14 figs., 1929).

NEWMAN, H. H.....The Habits of Certain Tortoises (Journ. Comp. Neurol. and Psychol., Vol. 16, pp. 126–152, 1906).

RUTHVEN, A. G., THOMPSON, CRYSTAL, and GAIGE, H. T...The Herpetology of Michigan (Univ. Mich. Handbook Series, No. 3, 1928).

SCHMIDT, KARL P. and NECKER, WALTER L.....Amphibians and Reptiles of the Chicago Region (Bull. Chicago Acad. Sci., Vol. 5, pp. 57–77, 1935).

SHARP, D. L.....Turtle Eggs for Agassiz (in "The Face of the Fields," Boston, 1911).

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