

NON-VENOMOUS SNAKES.—II.

BY C. FEW SEISS.

In the genus *Pityophis*, containing the pine or bull snakes, are perhaps found the largest or greatest in length of the serpents of the United States. The diamond rattlesnakes of the South are, however, far greater in circumference or bulk. The prairie bull snake of the West frequently attains the length of 8 feet, and according to Dr. Holbrook, our Eastern species has been known to measure 9 feet. From 5 to 7 feet are the ordinary dimensions of pine snakes taken in New Jersey. Woodsmen declare that these snakes at certain times and seasons "bellow like a bull," and hence they are called "bull snakes." I have never had proofs of this, and look upon it with doubt, as their throats contain no vocal organs, and in captivity they are always silent.

12. Pine snake, bull snake, *Pityophis melanoleucus*. Color above, white or pale brown, with a vertebral series of oblong black spots, or brown spots bordered anteriorly and posteriorly with black. These generally widen into bands toward the tail. Below the dorsal row of spots, a second series, sometimes more, of blackish or brown irregular spots and streaks. Beneath pale cream color, with a row of dark spots on each side near where the plates join the scales. These spots occupy portions of two abdominal plates and are generally opposite each other, and at intervals of three to five plates, becoming irregular and finally lost on the tail. Sometimes a few intermediate spots on the abdomen. Head with small black spots, a frontal bar, and a band back of the eyes. Often the ground color of the body is brown, and the spots are not clearly marked, being more or less blended into the ground color. Body long and robust, neck not much contracted, tail one-seventh of total length, and ending in a horny point. Usually 29 rows of dorsal scales, carinated (keeled) above, and smooth on the sides. Found in the pine barrens of New Jersey, and parts of the Blue Mountains of Pennsylvania, south to Florida.

13. Swift garter snake, *Eutania saurita*. Form very slender, tail long and tapering, about one-third of the total length. Ground color brown to olive black, with three narrow, sharply defined, yellow lines, one vertebral and two lateral, the former margined on each side with a narrow black line. Between the scales blackish, but showing little white streaks when the skin is stretched. Sometimes a series of lateral spots. Beneath light olive green, throat and lips yellowish white. The brown of the head posteriorly and the white of the upper lips sharply divided by a narrow black line. A pair of small light colored occipital spots (rarely wanting), 19 rows of carinated scales. Average length about 32 inches. Found from Maine to Florida and Texas, Kansas, and Wisconsin.

14. Common garter snake, *Eutania sirtalis*. Form rather robust when full grown. Tail about one-fifth the total length. Color olive brown or gray to greenish black; a vertical and two lateral pale lines. Two rows of alternating black spots on the sides. Sometimes the lines are scarcely visible. For full description and history see SCIENTIFIC AMERICAN for August 16, 1890. In variety *obscura*, the dorsal stripe and spots are scarcely visible on the dark ground color, while the lateral stripe blends into the color of the abdomen. In variety *ordinata*, the three stripes are not well marked, especially the two lateral, but the six alternating rows of dark spots are conspicuous. In variety *dorsalis*, the dorsal stripe is yellowish white, broad, sharply defined, and margined with black; sometimes a row of spots above each lateral stripe.

15. Storer's brown snake, *Storeria occipitomaculata*. Color above, bright brown to grayish brown; sometimes slate color; generally a paler vertebral line from the back of the head to near the end of the tail, which is bordered on each side by a narrow brown line. A yellowish spot behind the occipital plates, and below this another spot on each side. At times the body is uniform in color. No black bar across the angle of the mouth nor under the eye, as in De Kay's snake. Beneath generally salmon red in life, grayish white in alcohol. Lower jaw and throat whitish, minutely flecked with dusky dots. Fifteen rows of carinated scales. Length from 9 to 12 inches. Found from Canada to Florida and Texas, west to Wisconsin.

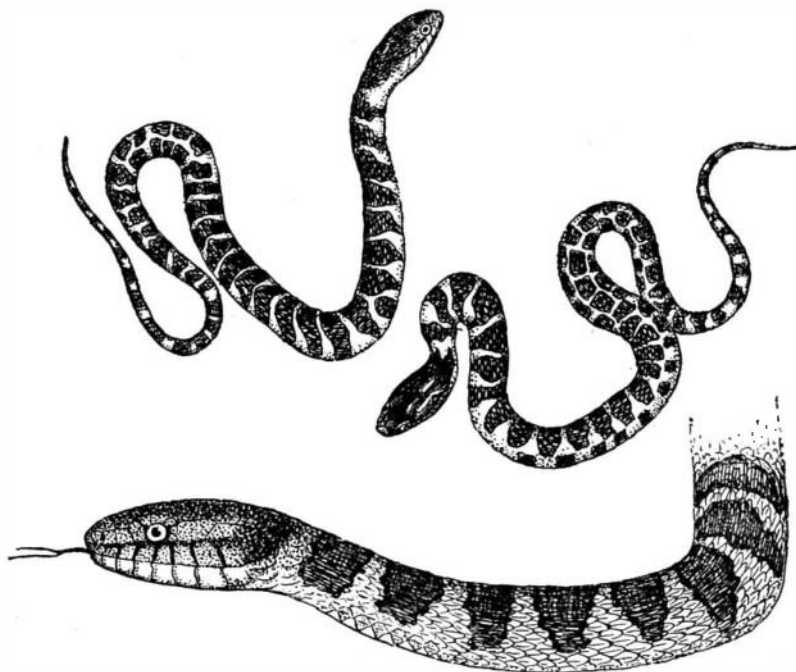
16. De Kay's brown snake, *Storeria De Kayi*. Color above yellowish brown, with a light-colored dorsal stripe, bordered on each side by a row of small dark spots, the first spot forming a curved blotch on each side of the neck. Sometimes these spots are scarcely visible. A black bar from the occipitals across the angle of the mouth; a small black spot or line below the eye. Beneath yellowish white, with one or two dark dots on each plate, toward the outer edge. These dots are at times wanting. Occasionally a specimen is seen in which the two rows of dorsal spots are united, thus forming short bands across the back, scarcely

visible posteriorly. Seventeen rows of carinated scales. Length of adult from 9½ to 12¼ inches. Found from Canada to Florida and Texas, and west to Michigan and Wisconsin.

17. Striped water snake, *Regina leberis*. Color above olive brown to chestnut brown, with three narrow dark longitudinal lines, one dorsal and two lateral. A wider light line or stripe on each side one half scale above the abdominal plates. These lines are well marked in the young, but sometimes nearly disappearing in old individuals. Beneath pale yellow, with four dark longitudinal lines, formed by four spots on each plate. The two external are the larger, and include the dark lower half of the first row of scales. Nineteen rows of carinated scales, the outer row nearly smooth. Average length 22 inches. Young at birth 7 inches. Found from New York to Georgia and Texas, west to Wisconsin. Feeds largely on tadpoles and small frogs; it is not a noted fish destroyer. Found under partly submerged stones along creeks and rivers.

18. Rough water snake, *Regina rigida*. Color olive brown above, with two dark brown longitudinal bands along the back. The edges of the outer row of scales and abdominal plates margined with brown. Beneath dull yellow, with two central rows of dark brown spots, nearer together anteriorly. Nineteen rows of strongly carinated scales, the outer row smooth. Length from 15 to 22 inches. Found from Pennsylvania to Georgia. Some consider this a variety of the preceding, but to me it appears to be a well marked species. Apparently a rare snake in Pennsylvania.

19. Kirkland's snake, *Regina Kirklandi*. Color above reddish brown, with four or three rows of alter-



WATER SNAKES—T. SIPEDON—ADULT AND YOUNG AT BIRTH.

nating subcircular black spots. Beneath uniform reddish yellow, with a row of small black spots on each side. Head rather convex, glossy deep brown to the edge of upper labials. Tail short, about one-fifth the total length. Nineteen rows of carinated scales. A moderately stout snake, about 16 inches in length. New Jersey and Pennsylvania, west to Michigan. This also appears to be rare in this State; only a few specimens are reported from Delaware County.

20. Common water snake, *Tropidonotus sipedon*. Color brown above, with large transverse darker brown blotches margined with black anteriorly, generally breaking up into three series of spots posteriorly. These spots are separated on the dorsal region by narrow whitish bands or spaces, which widen on the sides and merge into brownish red patches. Beneath pale yellowish-brown, with two or more rows of irregular, semicircular, or angular brown spots, edged with darker brown or black; generally darker posteriorly and more or less confluent beneath the tail. Sometimes sprinkled with dusky dots. Often in old snakes the body above becomes uniform dull brown in color, and the spots nearly disappear. In some localities they are nearly uniform blackish-brown above, spotted on the flanks and abdomen; stoutly and firmly built; twenty-three rows of strongly keeled dorsal scales. Length of adult, from 3 to nearly 5 feet. Found from Canada to Florida and west to Nebraska and Arkansas. Common in nearly all of our rivers, creeks and lakes. They frequently make their homes in partly submerged piles of rocks or embankments full of crevices. They will catch and swallow any species of fish they are able to master. I saw a large catfish, armed with its usual sharp spines, taken from the stomach of one, and was informed that a large pike was removed from another. Have known of a well stocked goldfish pond that was completely cleaned out in a few weeks by one or more of these snakes. Eels and frogs also furnish a part of their bill of fare, while the young snakes take kindly to tadpoles. The old snakes do much of their fishing

at twilight, or on cloudy days, and moonlight nights. I have heard that large bass have been seen to fearlessly attack and devour young water snakes when a foot and less in length. "Copper-belly," variety *Erythrogaster*. Color uniform bluish-black to rusty black above, lighter on the sides, often with a dull blue lateral band. Beneath dull coppery yellow. At times the front edge of each abdominal plate is bluish. No distinct spots on the abdomen. Faint dorsal spots in young specimens. Found in the great lakes and their rivers. Have not met with it in Pennsylvania or New Jersey. Frequent South. Variety *fasciatus*, banded water snake. Above uniform dark brown in adult; lighter in younger individuals, with black patches on the back; a row of about thirty red spots on each side; obsolete in old animals. Upper jaw white, tinged with red. A dark band from the eye to the corner of the mouth. Beneath reddish-white. Perhaps not found north of Virginia; common South.

21. Holbrook's water snake, *Tropidonotus taxispilotus*. Color reddish-brown, with three rows of sub-quadrangular dark spots; the ground color between the spots about the same width as the spots. Beneath yellowish, clouded with dark brown. Head rather small, with the snout somewhat pointed. Twenty-nine to thirty-one rows of carinated scales. Specimens in United States Natural Museum labeled from New York and Georgetown, D. C. (?) A Southern species. Serpents belonging to the following genus, *Heterodon*, can be easily identified by their up-curved, shovel-like snouts, and the manner in which they flatten themselves and blow when approached.

22. Spreading snake, hog nosed snake, *Heterodon platyrhinus*. Color yellowish gray, or brown, to reddish brown, with about 25 dark brown or black spots along the back, from the head to above the vent, and about 10 half rings on the tail. The spaces between the dorsal spots are generally lighter, and the spots themselves edged with whitish. A series of dark lateral spots; one spot opposite to each light dorsal space. Beneath these several series of smaller spots, indistinct or absent. Throat yellowish; abdomen more or less pale olive or yellowish, clouded posteriorly with darker olive brown or slate color. A dark bar runs from eye to eye, anteriorly across the head; another posteriorly, often broken into spots. Two dark bands run from the occipital region down the neck, often with a spot between them, and another from the eye backward. In maritime specimens the head is often uniform brown, and they are duller and grayer in coloration than the inland specimens. The little linear plate which runs up the central part of the snout, behind the rostral plate, called the azygos, is not surrounded by a border of small scales, as in the smaller hog snake of the South, *H. simus*, but is in contact with the frontal plates. Generally 25 rows of carinated scales, the first row smooth. Length when full grown about 2 feet.

Found from Massachusetts to Florida and Texas, and west to Minnesota. Along the coast it feeds almost entirely upon toads. Black hog nosed snake, "black viper," variety *niger*. Black or dark olive brown above; beneath slate color, fading into white on the chin and edge of the upper labials. Length from two to three feet. Found from Pennsylvania to Florida and Texas and Illinois. A truly formidable-looking snake. It flattens its neck and head, blows violently, and throws itself into rigid contortions when confronted, and will strike wickedly at an object placed within its reach. It has large, somewhat fang-like teeth, and is often considered venomous, but it is, however, perfectly harmless, as it does not possess poison glands with which to secrete venom.

Maximum Locomotive Speed.

Most experienced railroad men feel that the possibilities of steam practice are nearly reached, and that much greater speed is not practicable. A maximum of ninety miles an hour, with a running speed of sixty to seventy, is all that can be hoped for under the very best conditions. The limitations are numerous, and are well known to all engineers. The maximum speed of which a locomotive is capable has not been materially increased in a number of years. The schedule time has been shortened, principally by reducing gradients, straightening curves, filling up ravines and replacing wooden structures by permanent ones of iron or stone; by the use of heavy rails, safer switches, improved methods of signaling, the interlocking switch and signal system, the abolition of level crossings; in fact, by improvements in detail and management which permit a higher speed on a more extended section of road because of greater safety and the greater degree of confidence inspired in the engine driver.

To obtain a dark finish on oak and ash, inclose in a box or closet with some saucers or plates of strong ammonia. The fumes will darken the wood.