

NON-VENOMOUS SNAKES.

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The following is a plain descriptive list of the non-venomous serpents found in the States from Maine to Delaware and Maryland inclusive, and from the Atlantic coast to Ohio. It embraces 23 species and from 4 to 5 well marked varieties. In this section there are found but three venomous species, viz., two rattlesnakes, one of which is rare, if not exterminated, and the copperhead. Of the non-venomous snakes many are insectivorous and beneficial, while others reduce the number of destructive rodents. But the common water snakes are pests and robbers, and destroy the game fishes of our rivers and lakes by the thousands.

1. Ground snake, *Carphophis amœna*. Body glossy and opalescent; color uniform brown above; beneath salmon color in life, dull yellow in alcoholic specimens. 13 rows of smooth rhomboidal scales across the back. Length of adult from 8½ to 12 inches. Found from Massachusetts to the Gulf States, and westward to Illinois. The Western species is the *C. vermis*. It is generally found hidden in the ground, and is consequently called "worm snake" in some sections.

2. Valeria's snake, *Virginia Valeria*. Color yellowish brown above; pale yellow beneath. There are generally minute black dots scattered along the dorsal region, sometimes forming two or more longitudinal rows. The center of each scale is marked with a pale line, which gives the body a somewhat striated appearance. 15 rows of dorsal scales, smooth or very faintly keeled (carinated) on the posterior portion of the body. Length from 8 to 11 inches. Rare north of Delaware and Maryland.

3. Chain snake, king snake, *Ophibolus getulus*. Color deep lustrous black, with 27 to 30 nearly equidistant transverse white or pale yellow bands or rings. These bands are narrow and do not encircle the body, but bifurcate on the sides, so that one portion joins the white band in front and the other unites with the band behind, thus often producing a nearly continuous undulating line on the sides. Sometimes these lines cut the ground color into the form of large somewhat hexagonal black blotches. Beneath, either uniform glossy black or dull yellow, more or less spotted with black. The coloration is not uniform, the ground color being brown in some individuals. The head is black and spotted with pale yellow or white. 21 to 23 rows of smooth dorsal scales. Length from 3 to 5 feet. Found from Long Island, N. Y., and New Jersey southward to Florida and Texas. Has been frequently known to crush and swallow other snakes. The commonly expressed stories that it wages particular warfare against the rattlesnake, so far as I can learn, have not been confirmed. I have heard of instances in the South where it has attacked and killed the moccasin, so there can be no reason why a hungry king snake should be so fastidious as to pass by a fat rattler. My note book says: On the 27th of June, 1879, a female of this species laid 5 eggs. They were white and chalky, of a blunt oblong oval shape, and measured about 1½ inches in length.

4. Scarlet snake, *Ophibolus doliiatus*. Scarlet to red brown, in life, with 21 or more pairs of black rings with a yellow band between them. In some varieties these pairs of black rings are parallel and regular, while in others they separate or diverge on the sides and unite with the adjacent black ring of the next pair; thus forming a black border to a large red spot. Beneath, yellowish white, irregularly marked and spotted with black. 19 to 22 rows of smooth dorsal scales. Length 18 to 27 inches. Found in certain localities from Delaware to Kansas and southward to the Gulf of Mexico.

House snake, milk snake, checkered adder, *Ophibolus doliiatus*, var. *triangulus*. All the common names are inappropriate, as it neither lives in houses nor drinks milk, and an adder is, strictly speaking, a venomous snake. Ground color, dull white or pale gray to pinkish; a dorsal row of dark brown or red brown spots, bordered with black, and one or two alternating rows of smaller spots on each side. Beneath yellowish white, marked with small subquadrate black spots, giving the abdomen a pretty tessellated appearance. A V or Y shaped spot on the head. 21 rows of smooth dorsal scales. Length 27 to 42 inches, rarely 4 feet. Canada southward to Mississippi and west to Kansas. The young are often bright red in color like the scarlet snake. Very useful on farms as a field mouse destroyer. It will also kill and devour other snakes.

5. Ring-necked snake, *Diadophis punctatus*. Generally dark slate color above, with a small darker spot at the base of each scale; sometimes ash color or brown. The head posteriorly has a yellowish white

ring generally bordered with black; sometimes this ring is wanting. The lips are white. Body beneath orange, in life, with two series of small black subtriangular spots; each abdominal plate having two spots, one on each side uniting with the dorsal color. Often there is a third or middle row; and rarely the spots are entirely absent. 15 rows of smooth scales. Length 12 to 15 inches. Canada to Florida and west to Michigan. A pretty and timid little snake; found generally under rotten logs and bark. It feeds upon salamanders, slugs and earthworms.

6. Common green snake, *Cyclophis vernalis*. Color of head, body and tail above, bright grass green (blue in alcohol); lips yellowish white, tinged with green. Beneath pale yellow or pale yellowish green. 15 rows of smooth dorsal scales. Length 15 to 20 inches. Found from Nova Scotia to Wyoming and New Mexico. Frequently met with on the ground in grassy valleys, but has been observed also searching among the branches of low plants, for insects.

7. Green bush snake, *Phyllophilophis œstivus*. Entire upper surface brilliant green. Beneath creamy white, or with a tint of pale green. Form slender; tail long and delicate. Scales in 17 rows, *carinate*, or keeled, except the two rows next to the abdominal plates. Length 24 to 34 inches. Found from New Jersey to Kansas (in certain localities), and southward to Florida and Mexico. Most commonly seen gliding about bushes in mountains and hills.

8. Fox snake, *Coluber vulpinus*. Ground color above, yellowish brown; a series of subquadrate chocolate brown dorsal blotches; another lateral row of smaller spots on each side, one spot opposite to each space between the dorsal blotches. Sometimes another

young, is often pale brown, with a dorsal row of about forty large dark-edged brown spots, separated by narrow light spaces of the ground color, and with rows of alternating spots on the sides (*S. confinis*). Scales generally in twenty-seven rows, carinated above, with about seven rows of smooth scales on the sides. Tail less than one-fifth the total length. Length, when full grown, 5 to over 7 feet. Can easily be distinguished from the common black snake by the keels in the upper dorsal scales. Found from Massachusetts to Texas and Missouri.

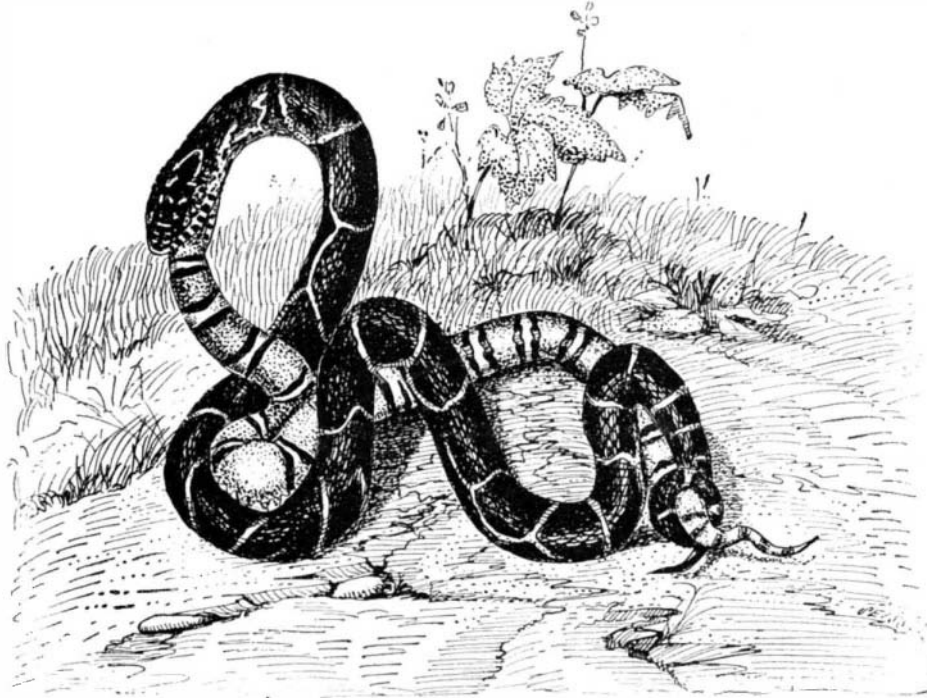
11. Black snake or racer, *Bascanium constrictor*. Color above uniform glossy black, beneath bluish slate, chin and throat white, sometimes with few black spots. Westward the color varies from bright blue and leaden blue to olive, while the under parts are more or less yellow (var. *flaviventris*), the blue racer. The young when about a foot and a half in length are dark olive colored, with a row of irregular brown spots, with darker margins along the back, the sides of the body and the abdomen also spotted, the spots becoming indistinct posteriorly, head yellowish, spotted with brown. Scales large, smooth, hexagonal, in 17 rows. Tail about ¼ the total length. Length 4½ to 6 feet. Canada and the United States. The typical black variety is found from Canada south to Texas. This well known snake is of a restless and wandering nature. In the breeding season the old males are often irritable and aggressive. But although they sometimes put on a bold front and slowly approach the intruder, they keep at a safe distance, and retreat when a sudden advance is made. If the intruder should turn and run, the snake will at times give chase, but the moment the runner halts and turns, the snake halts and turns also, and beats a hasty retreat the moment you become the chaser or aggressor. I have no authentic facts of its ever seizing hold of a man, unless an attempt was made to catch or hold it under foot, when I have known it to give the trousers a good shaking. Linné was informed that it entwined itself about the legs of men, and thus threw them to the ground. For this reason he named it constrictor. The black snake is a great and active climber, and will ascend the tallest trees to rob bird's nests, even mounting dead and almost branchless trunks to drag young woodpeckers and squirrels from their holes.

Packing the Stern Gland at Sea.

The New Zealand Shipping Company's steamship Otarama, on her last voyage homeward from the Colonies, lost two of her propeller blades; the two remaining blades being at right angles to each other placed an awkward strain upon the tail shaft, the consequence of which was a tendency to eccentricity and the setting up of great vibration. After a time the packing in the "stern gland" was destroyed, and gradually worked out in small pieces; then the water commenced to make rapid ingress. At this period the ship was off the South American coast. However, something must be done. So after a consultation between the engineers, a most original plan was adopted. Procuring a length of new 2½ manila rope, a loop was passed over one of the remaining propeller blades; then a turn was taken round a deck bollard, and the engines turned round with the steam twining gear; the rope was pulled in toward the "stern tube," and gradually became wound tightly round the shaft at the recess between the propeller boss and the stern frame. The result was that a perfectly tight joint was secured, and the stern gland could be repacked in safety. The plan was found to answer so well that the leakage was almost nil.

A New Compressed Air System.

A system of pipes for the transmission of power by compressed air has been recently established at Offenbach. The laying down of the pipes was commenced in November last, and has been carried out in spite of many difficulties. The total length of pipes laid amounted to 7,760 yards, of which 1,702 yards consisted of pipe 1 foot in diameter, 1,710 yards 8 inches in diameter, and 4,347 yards 4 inches in diameter. The pipes were laid about 1½ feet below the footpath. The connections of the pipes were made by means of India rubber, as in the similar installation in Paris. Valves are provided for shutting off the air from separate lengths of pipe. A trial of the system was made by the engineering authorities of the town and by the Boiler Inspection Association, which showed that there was a loss of 0.11 of an atmosphere in 7½ hours—that is, 0.39 of a cubic meter per hour kilometer. This loss amounts to 13 per cent on the daily output, the power transmitted being, on an average, 500 h. p. This result is regarded as very favorable.



CHAIN SNAKE SWALLOWING A SCARLET SNAKE.

row of small spots, resting on the edges of the abdominal plates, either opposite to the dorsal spots or uniting with the second row, and thus forming vertical bands. Beneath, white with a tint of yellow, with alternating subquadrate black spots; generally two spots on each plate. Body robust in form, more so than any of the genus; tail thick, rather short, and subconical. Head rather large, and eyes small. Dorsal scales in twenty-five to twenty-seven rows; fourteen to seventeen rows are carinated, the lower rows smooth. Length, 4 to 5 feet. Found in Ontario, Canada, Massachusetts (Allen), New York, and in several localities west to Nebraska.

9. Corn snake, spotted racer, *Coluber guttatus*. Color above, light reddish brown; somewhat lighter on the sides; along the back is a row of about forty large, dark brick-red spots, bordered with dark brown or black. On the sides are about three irregular rows of small spots, sometimes indistinct. Beneath, white or yellowish, with black squarish spots, irregularly dispersed and of unequal size; two or three close together occur on one side and then on the other. Twenty-seven rows of dorsal scales, about thirteen of the upper rows indistinctly carinated; body, rather slender; tail, small and tapering, about one-sixth the total length. [The tail of a snake is that portion posterior to the anus or vent.] Length, from 3 to 5 feet. Specimens have been taken in Massachusetts and New York (United States National Museum). Found from Virginia to Illinois, and south to the Gulf of Mexico.

10. Pilot black snake, *Coluber obsoletus*. General color above, glossy, coal black; often small white streaks or dashes are seen at intervals between the scales, indicating the boundaries of large spots; sometimes dull red blotches appear along the sides. Beneath, bluish slate color posteriorly; yellowish clouded with slate anteriorly; chin and throat, white or pale yellow. The Southern variety, especially when