season are ostentatiously performed in the presence of his mate, around whom he plays in irregular zigzag courses. The nest is almost always in trees or bushes overhanging the water’s edge, and is a large structure of sticks, roots and moss, in which are laid four eggs with the white chalky shell that is so characteristic of most Steganopodous birds. Not infrequently several or even many nests are built close together, and the locality that suits the Snake­bird suits also many of the herons.@@1 The African snake-bird, *P. congensis* (or *levaillanti* of some authors), inhabits the greater part of that continent N. from Natal; but, though met with on the White Nile, it is not known to have occurred in Egypt, a fact the more remarkable seeing that Canon Tristram found it breeding in con­siderable numbers on the Lake of Antioch, to which it is a summer visitor, and it can hardly reach its home without passing over the intervening country. The male bird is easily distinguishable from the American species by its rufous coronal patch, its buff throat and its chestnut greater wing-coverts. A third species, P. *melano- gaster,* ranges from Madagascar to India, Ceylon, Borneo, Java and China. This so closely resembles the last-mentioned that the differences between them cannot be briefly expressed. The Australian region also has its snake-bird, which is by some regarded as forming a fourth species, *P. novae-hollandiae;* but others unite it to that last mentioned, which is perhaps somewhat variable, and it would seem (*P.Z.S*., 1877, p. 349) that examples from New Guinea differ somewhat from those inhabiting Australia itself.

The anatomy of the genus *Plotus* has been dealt with more fully than that of most forms. Beside the excellent description of the American bird's alimentary canal furnished to Audubon by Mac- gillivray, other important points in its structure have been well set forth by A. H. Garrod and W. A. Forbes in the Zoological *Proceedings* (1876, ρρ. 335-345, pls. xxvi.-xxviii. ; 1878, ρρ. 679-681; and 1882, pp. 208-212), showing among other things that there is an appreciable anatomical difference between the species of the New World and of the Old; while the osteology of P. *melanogaster* has been admirably described and illustrated by A. Milne-Edwards in A. Grandidier’s great *Oiseaux de Madagascar* (pp. 691-695, pls. 284, 285). In all the species the neck affords a feature which seems to be unique. The first seven of the cervical vertebrae form a continuous curve with its concavity forward, but the eighth articulates with the seventh nearly at a right angle, and, when the bird is at rest, lies horizontally. The ninth is directed downwards almost as abruptly, and those which succeed present a gentle forward convexity. The muscles moving this curious framework are as curiously specialized, and the result of the whole piece of mechanism is to enable the bird to spear with facility its fishy prey. (A. N.)

**SNAKE-FLY,** the name given to neuropterous insects of the genus *Raphidia,* closely allied to the alder-flies, remarkable for the elongation of the head and prothorax to form a neck and for the presence in the female of a long ovipositor. The larva, which is active and carnivorous, is terrestrial, and lives in rotten timber.

**SNAKE-ROOT.** In most countries where snakes abound some root or herb is used by the natives as an antidote for the bites of venomous species, and many herbs have consequently received the name of snake-root. Botanically speaking, the name properly belongs to *Ophiorrhiza Mungos,* the Mungoose plant, a plant of the natural order Rubiaceae, used in the (E. Indies for the purpose above indicated. In medicine, however, the roots of *Arislolochia Serpentaria, Polygala Senega* and *Cimicifuga racemosa* were understood by this name, being distinguished as the Virginian, seneca and black snake-roots. The root of *Aristolochia reticulata* is known in the United States as Red river or Texan snake-root.

The roots or rhizome of *Liatris spicata, Eryngium aquaticum* and *Eupatorium altissimum* have all been used in N. America for snake-bites, the first two being known as button snake-root and the last as white snake-root. The rhizome of *Asarum canadense* passes under the name of Canadian snake-root. All of these con­tain acrid or aromatic principles which, when a warm decoction of the drug is taken, exercise a powerfully diaphoretic or, in some cases, diuretic action, to which any benefit that may be derived from their use must be attributed.

**SNAKES,** an order (*Ophidia)* in the class of Reptiles. They may be characterized as very elongated reptiles without limbs (unless with tiny vestiges of posterior limbs), without eyelids and external ear openings, with the teeth anchylosed to the supporting bones, a bifid slender tongue which is telescoped into its basal half, and with a transverse vent. These characters apply to all snakes, although none are peculiar to them. The

vast majority of snakes are further characterized by having the right and left halves of the under-jaws connected by an elastic band; a median, longitudinal furrow in the skin below and behind the chin; the whole palatal apparatus is but loosely connected with the skull, nowhere articulating with it. The quadrate is indirectly articulated with the skull, first by the horizontal, movable squamosal, secondly by the columella auris. The quadrato-mandibular joint is placed in a level far behind the occiput.

More detail concerning skull, scales and teeth will be found in the diagnostic descriptions of the various families *{vide infra)* ; for further anatomical information the reader is referred to the article Reptiles *{Anatomy),*

The snakes are the most highly specialized branch of the *Sauria* or *Squamata, i.e,* of scaly reptiles with movable quadrate bones; with a transverse vent, near the posterior lateral corners of which open the eversible, paired copulatory organs. In the article Lizard attention is drawn\* to the many characters which make it difficult, if not impossible, to give diagnoses applicable to all lizards and all snakes. Both these groups seem to have reached their climax but recently, while the tortoises, crocodiles and sphenodon are on the descending scale, mere remnants of formerly much more numerous and cosmopolitan development.

The number of recent species of snakes is about 1600. The order is practically cosmopolitan, with the exception of New Zealand and certain absolutely isolated oceanic islands, like the Hawaiian islands and the Azores. The N. limit approaches that of the permanently frozen subsoil, going into the arctic circle in Scandinavia, elsewhere sinking to about 54° N.; in the S. hemisphere the 45th parallel may indicate their limit. The number of species and individuals steadily decreases in the cooler temperate zones, whilst it reaches its maximum in the tropics. Every kind of terrain is tenanted, from dense, moist and hot forests at the level of the sea to arid deserts, high plateaus and mountains. In accordance with this general distribution snakes show a great amount of differentiation with regard to their mode of life and general organization; and from the appearance alone of a snake a safe conclusion can be drawn as to its habits.

Dr A. Günther characterizes the chief categories as follows:— (1) Burrowing snakes, which live under ground and but rarely appear on the surface. They have a cylindrical rigid body, covered with generally smooth and polished scales; a short strong tail; a short rounded or pointed head with narrow mouth; teeth few in number; small or rudimentary eyes; no abdominal scutes or only narrow ones. They feed chiefly on invertebrate animals, and none are poisonous. (2) Ground snakes rarely ascending bushes or entering water. Their body is cylindrical, flexible in every part, covered with smooth or keeled scales, and provided with broad ventral and subcaudal scutes. The non-poisonous kinds of ground snakes are the typical and least specialized snakes, and more numerous than any of the other kinds. They feed chiefly on terrestrial verte­brates. The majority are non-poisonous; but the majority of poisonous snakes must be referred to this category. (3) Tree snakes, which are able to climb bushes or trees with facility or pass even the greater part of their existence on trees. Their body is generally compressed and slender; their broad ventral scutes are often carinate on the sides. Those kinds which have a less elongate and cylindrical body possess a distinctly prehensile tail. The eye is generally large. Their coloration consists often of bright hues, and sometimes resembles that of their surroundings. They feed on animals which likewise lead an arboreal life, rarely on eggs. Poisonous as well as innocuous snakes are represented in this category. (4) Freshwater snakes, living in or frequenting fresh waters; they are excellent swimmers and divers. The nostrils are placed on the top of the snout and can be closed whilst the animal is under water. Their body is covered with small scales and the ventral scutes are mostly narrow; the tail tapering; head flat, rather short; and the eyes of small size. They feed on fish, frogs and other aquatic animals, and are innocuous and viviparous. (5) Sea snakes are

@@@1 The curious but apparently well-attested fact of the occurrence in England, near Poole, in June 1851, of a male bird of this species (*Zoologist,* pp. 3601, 3654) has been overlooked by several writers who profess to mention all cases of a similar character.