

THE REPTILES OF SIND;

A SYSTEMATIC ACCOUNT,

WITH DESCRIPTIONS OF ALL THE SPECIES
INHABITING THE PROVINCE, AND A TABLE OF THEIR
GEOGRAPHICAL DISTRIBUTION IN PERSIA,
BELOOCHISTAN, AFGHANISTAN, PUNJAB, NORTH-
WEST PROVINCES, AND THE PENINSULA OF
INDIA GENERALLY,

WITH

WOODCUTS, LITHOGRAPHS, AND COLOURED ILLUSTRATIONS.

BY

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TO THE GEOLOGY, BOTANY, AND ZOOLOGY OF SIND;" "THE PLANTS
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VERTEBRATE ZOOLOGY OF SIND," &c.

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TO

FRANK GLEADOW, Esq.,

IN REMEMBRANCE OF THE PLEASANT HOURS PASSED TOGETHER

DURING SEVERAL YEARS IN THE STUDY

OF THE HERPETOLOGY OF SIND,

THIS BOOK,

WHICH ENLARGES THE BOUNDS OF OUR PRESENT

KNOWLEDGE, RENDERS THE SUBJECT MORE INTERESTING TO THE

STUDENT, AND GENERALLY FACILITATES THE STUDY

OF THE SCIENCE, IS DEDICATED BY

THE AUTHOR.

P R E F A C E.

THIS reprint with Addenda originated in a desire on the part of the Author to make known to Scientists in this specially interesting branch of Natural History and to the public generally, the discoveries which have been made since the issue of his work entitled "The Vertebrate Zoology of Sind."

During this interval a great many Mammals (Micro-mammalia especially), birds and reptiles, which were not previously known, have been found to inhabit the province, several in each class being new to science. And as the greater number of these are comprised in the Reptilian fauna, this portion of the work has been re-issued. Among those to whom Science is indebted for bringing about this happy result may be mentioned, first, Mr. F. Gleadow, Deputy Conservator of Forests, whose never ceasing interest in Herpetology has been the means of adding much to the present knowledge of the reptiles inhabiting Sind; next, to Captain F. Babington Peile of the P. W. O. Grenadiers, also Lieutenant E. Y. Watson of the 47th Regiment, both of whom did much towards extending our knowledge of the species inhabiting South Afghanistan, while Captain Bishop of the I. G. S. "Patrick Stewart" contributed largely to our knowledge of the *Hydrophidæ*. The several new species described in this work are due to his efforts.

Diagrams as before are given, illustrating the different parts of reptiles with the corresponding terms used in their description, also those showing the dentition of venomous and non-venomous snakes, as well as all the colored illustrations, lithographs and woodcuts. It would, no doubt, have been more useful if a larger number of these could have been introduced, but costly embellishments are not possible beyond a certain limit.

A table of the Geographical distribution of the Sind reptiles is also appended. This has now been much extended by the hearty co-operation of those mentioned above, as well as by the Author's trip last year along the Western Coast.

The Author trusts that this small effort will find public favor. It is complete so far as present knowledge exists, but there is still a wide field for further labors.

THE REPTILES OF SIND.

Reptiles in Sind are neither numerous nor formidable as far as they have been collected and determined. Of Land Tortoises two species occur, and of the freshwater forms (*Emydidae*) only a few are known. Probably most of the Gangetic and Punjab forms will be found to occur on closer investigation.

Of the Trionycidæ or Freshwater Turtles, besides the Common Mud Turtle, (*T. Gangeticus*), three others occur; while *Chelonia virgata* and *Caouana olivacea* are the only marine forms known to affect the Coast.

The Saurians are represented by the common Crocodile (*O. palustris*) and the Gharial (*G. gangeticus*), while the species representing the Lacertiliadæ are numerous on the sandy ridges and plains. The Varanidæ or family of Water Lizards are nearly all represented.

Among the Lizards the most remarkable is the one known among Europeans as the *Biskobra*, the *Khun* of the Sindees. Numerous deaths are attributed to it, and strangely enough believed in by not a few. Collections of this lizard have been received from various part of Sind and preserved in the Kurrachee Museum, and these are all *Eublepharis macularius et hardwickii*. "Give a dog a bad name and hang him," is an old proverb, and it well applies in the case of the *Khun* or *Biskobra*, the repulsive appearance of these harmless creatures no doubt being the cause. There is, however, some risk attending the careless handling of these lizards, when killed or freshly preserved in spirit. The tubercles with which their bodies are studded contain a very irritant secretion, which, coming in contact with the naked skin of the back of the hand or other part of the body, occasions a numbness followed by a painful swelling of that part, and subsequently a species of *Herpes* which the natives in Sind cure by the application of a poultice made of chalk paste. The Geckoes too have this irritant secretion contained in the tubercles with which their bodies are studded, but in a lesser degree.

The Ophidians are familiar to and recognizable by all. They inhabit either arid or moist localities, trees, &c.; some are entirely aquatic, as the Hydrophidæ or Sea Snakes. All live entirely on animal food, and many, not unlike some of the other orders of the animal kingdom, prey on their kind, as *Bungarus caruleus* and *Ophiophagus elaps*; (this last does not inhabit Sind). They are oviparous, ovo-viviparous, or viviparous. Many are remarkable for the beauty of their colouring and handsome markings, and although this may be all the eye can desire, the want of knowledge of the innocent species and the potency of the venom of some inspire dread and a general aversion to the whole order.

The popular mode of discriminating poisonous from non-poisonous snakes is very erroneous, as the characters given by some writers for

the purpose are applicable to most of the innocuous species. The broad, flat and lanceolate form of head is not exemplified in the Cobra, nor in the genus *Bungarus*, while the *Callophis* genus is characterized by a short obtuse head and a broad snout. The *Crotalidæ* and *Viperidæ* approach the characters rather closely. Theobald says in the Appendix to his work on the Reptiles of British India; "practically as regards poisonous snakes which are dangerous to man, the question is narrowed to the consideration of a limited number of species, since many from their small size, and others from their rarity, may be disregarded, and hence perhaps the simplest way of learning what are poisonous snakes would be to pass an hour or so in some museum where acquaintance might be made with the commoner or more deadly species." He adds "the rule is absolute and without exception that every snake possessing a loreal shield (see Plate on p. 373) is harmless." There are, however, a few exceptions of snakes possessing a loreal shield being also innocuous, but these are otherwise readily known and do not occur in Sind.

The venomous snakes are—(1) The *Hydrophidæ*, which possess a flattened tail, the whole of which are deadly without exception. Their fangs are small, but their venom extremely potent; next are the vipers possessing tubular, erectile fangs of great length, and then follow the Cobra, the *Bungarus* and the giant *Hamadryas*. The Kuppur is the viper of Sind, and is noted for its deadly venom as well as for the great numbers in which it is found throughout the province, inhabiting store-rooms and houses.

Although it is said that the venom of a poisonous snake has no effect on another of the same kind, yet in the case of the bite of a Kuppur it has been proved to the contrary. Dr. Imlach, in his pamphlet on Snake bites in Sind, says of it—"Fierce and aggressive, it is very much dreaded, and numerous deaths are attributed to its bites; even the Cobra, whose poison is as deadly, falls a victim to it. In the society of the Kuppur (*Echis carinata*) the Cobra appears as if fascinated, and even when bitten makes no movement indicative that pain had been felt; still in a few minutes down goes its head and crest (hood), and ere half an hour the reptile that had been capable of dealing death and destruction has succumbed to the poison of one of the same family." Dr. Fayer says "that the poison of the Kuppur killed a fowl in four minutes, another in two minutes, and a dog in about four hours," and Dr. Imlach "that the poison introduced into the system of a fowl induces death in about three quarters of a minute." Death in a fowl occurs much in the same way as in the human subject; the mucous membrane is powerfully acted on, the head gradually droops, the legs give way, and the creature rolls on its side in the last agony of passing life.

Of the Cobra (*Naja tripudians*) there are three varieties in Sind, and the most common is that known as the black Cobra or *Karo Nag* of the Sindees. This attains a length of from 4 to 5 feet. Being commonly exhibited by snake charmers, its identity is perfect, and notwithstanding the virulence of its poison, very few fatal cases are recorded against it. In fact the popular belief of the Sindees is, that

unless the Cobra is harmed it is itself harmless. Other venomous snakes in Sind are *Daboia Russelli* (Russel's Viper) and *Bungarus cœruleus* (The Krait), whose bites are very justly dreaded.

The effects of the poison of the venomous species, both on man and animals, produce morbid symptoms, differing, however, in the degree or rapidity of action in man. From the numerous experiments on brute animals by able physiologists, and the effects of the remedies employed, which, while in the case of man have proved successful, have been of non-effect in the cases of dogs, &c., it may be safely assumed that the effects of serpent poison are not precisely the same in man and beast; but there can be little doubt that experiments judiciously conducted on brute animals would contribute in a great measure towards suggesting hints as to the best mode of treatment and the antidote to be employed.

The degree of danger as Drs. Gunther and Shortt rightly say, and which is confirmed by experiments, "depends but little on the species which has inflicted the wound, but rather on the bulk of the individual, the quantity of poison injected and the situation of the wound, and again upon the frequency with which it has been biting, upon which depends the intensity of the poison." A second consideration is the size and vigour of the person bitten. In regard to Cobra poison, the symptoms it is said are uniform in effect both in man and beast, and usually, if remedies are not applied in time, the case terminates fatally in from half an hour to twelve hours.

The symptoms of Cobra poisoning are said to be a burning sensation or stinging pain in the bitten part, which becomes swollen, red and painful on pressure, a feeling of intoxication, lethargy, partial paralysis, loss of speech and profuse salivation, and often nausea and vomiting. The blood in human beings remains fluid after death, and does not coagulate as in brute animals.

In cases of *Daboia* bite, the same burning and stinging sensation of pain is felt as in that of Cobra poisoning, but the symptoms begin with convulsions, and there is much dilatation of the pupil, and less salivation, while in Krait or *Bungarus* poisoning, there is a parallelism in the effect to that of the Cobra.

The virulence of the poison of the Cobra is well known, and to it, the *Daboia*, the *Bungarus* and the *Kupper*, are to be attributed the numerous deaths in Sind, the Punjab and N. W. Provinces. There is no hope of recovery from the bite of any of these, once the poison is thoroughly inoculated into the system, and has entered the circulation. Paralysis of the nerve centres set in and death ensues in a very few minutes. The first consideration then in all cases of snake bite is to prevent the absorption of the poison, by applying effectual ligatures above the wound of any material which would be at hand, such as narrowly twisted cloths, cords, or where it is possible to obtain it, a tourniquet, or an India-rubber band, which is best and less painful. This done, aid could be obtained within the next few hours and the part excised or amputated, as the case would deserve, and remedies applied. Suction of the wound is said to have been effectual in a few cases, but there is risk attending such

a procedure if the person has a sore lip or tongue, and is likely to imperil two lives instead of one. Dr. Shortt in the *Madras Monthly Journal of Medical Science*, March 1870, gives an instance of this in a case in which he himself sucked the wound of a man. He says—“The blood I sucked out of the wound had a very peculiar taste, I felt nothing strange till about a couple of hours after the accident had occurred, when I began to feel a tightness across the gums and roof of the mouth, in the place between the two incisors. This was followed by a sharp stinging pain of a peculiar burning character. I was somewhat restless and uneasy, and shortly after began to feel languid and faint, when, for the first time, it struck me that I might have imbibed some of the poison into my system. I became alarmed and anxious about myself, I had some brandy and water, and felt somewhat better after it; while the pain and uncomfortable feeling in the roof of my mouth continued, and my bowels were inclined to act. I did not give in to the feeling, but resisted it altogether. At 3 p. m. the uncomfortable feeling extended not only to the roof of the mouth, but to the same extent in front of the incisor teeth, to the gums under the upper lip. On retiring to bed as usual I slept soundly that night; but about 4 a. m. next morning I was awakened by an acute burning pain in the roof of the mouth, which continued for a couple of hours, and then left, leaving behind a soreness, not only at the roof of the mouth, but extending to the tongue to the extent of an inch from the tip. This feeling became more acute on attempting to take my usual cup of tea, nor could I taste any curry or other dish prepared with condiments, which did not give me instant pain.

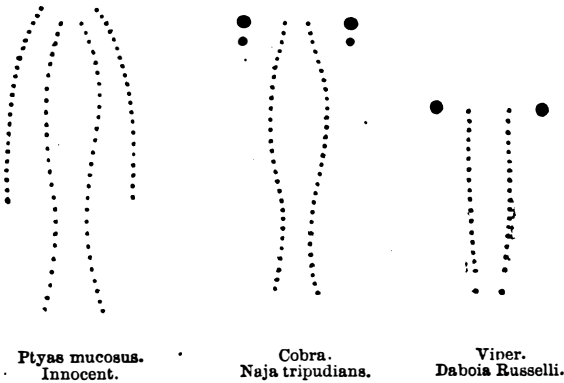
“I believe the sucking out of the poison from the wound was the main cause of saving the man’s life, yet, at least five minutes, if not more, must have elapsed between the time the man was bitten and the suction of the wound, and there must have been ample time for some of the poison to have entered the system. The Cobra was fresh and vigorous, and the effect produced in my mouth was the best evidence that ample poison was injected into the wound. I believe the subsequent potash treatment, both internally and externally, in which I solely depended in this case, had its action expedited by the stimulant effect of the brandy, and aided materially in perfecting the cure.”

The excision of the part likely to contain the poison is best. Numerous remedies have been suggested and experimented on, but in my opinion there is nothing better than the following recipe properly administered when ligatures have been applied in time.

Liquor Potass	m.	xxx.
Brandy	oz.	iii.
Water	oz.	ii.

One-third part to be taken every 10 or 15 minutes according to the urgency of the symptoms. The wound too, after incision or excision, should also be washed with a solution of potass or permanganate of potass. As recommended by Dr. Fayrer “the patient should be allowed to rest or lie down to sleep if he can.” The common

practice of walking the patient about when in a lethargic state enhances the risk of death by forced circulation should it happen that the ligature is not properly or effectively applied, and in any case does more harm than good. Dr. Fayerer even goes so far as to recommend the amputation of a limb to save life. "The milk" he says "of a women bitten by a poisonous snake is fatal to the child if allowed the breast." The blood of an animal bitten by a poisonous snake is also a powerful poison introduced into the system of another animal; but apparently not so the flesh, which does not seem affected, and is eaten. It would be well in all cases of snake bite to examine the wound inflicted, and ascertain whether it was from a venomous or non-venomous snake. A wound from a venomous snake would show either one or two large punctures on each side besides smaller ones if it be from a Daboia, Cobra, or Echis, while that of a non-venomous snake would present a series of minute punctures only. The diagrams below, taken from Fayerer's *Thanatophidia*, well illustrate the direction and nature of the punctures that would be made by wounds from venomous and non-venomous snakes.



Much, however, would depend on the seat of the wound, whether all the punctures as illustrated would be present; but the large fang marks of the venomous species are seldom absent.

In the case of the Hydrophidæ or Sea Snakes, another very venomous family, the fang marks would not be very apparent, owing to their fangs being small and differing but little from the other teeth. Their poison, however, is very potent, and on it they depend chiefly for their food, which consists of fish. These are swallowed head foremost and entire. Russell and Cantor have ascertained by direct observation that the Sea Snakes belong to the most poisonous of the whole order. Tortoises, other snakes, and fish have died from their bite in less than an hour, and a man succumbed after four hours. Dr. Fayerer makes mention of two such cases as the last; one in which a fisherman died in an hour and a quarter.

ORDER—CHELONIA.

TORTOISES.

Reptiles with the bones of the thorax united into a solid shield or carapace, which is an osseous structure covered with an epidermoid coat and formed by the more or less complete anchylosis of the vertebræ, ribs, and sternum. Cervical and caudal vertebræ free and moveable. Skull articulated to the atlas by a single condyle. Epidermoid coat soft or horny, divided into horny shields or plates. Head, neck, limbs and tail covered with smooth or tubercular skin. Reproductive organ of male single, lodged within the vesico-genital cloaca, and with a seminal groove only. Oviparous. Eggs coated with a flexible or calcareous shell hatched in the sun under mould or a layer of sand. The order is divided into four families:—Testudinidæ or Land Tortoises, Emydidæ or Freshwater Tortoises, Trionycidæ or Freshwater Turtles, Chelonidæ or Marine Turtles.

Family, TESTUDINIDÆ.

LAND TORTOISES; TERRESTRIAL CHELONIANS.

Herbivorous. Shell or carapace very convex, with horny shields. Thorax and sternum united into an immovable case. Oviparous. Eggs sub-cylindrical, hard-shelled.

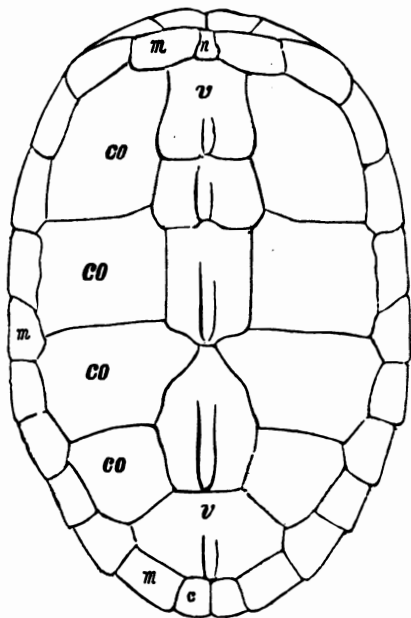
Testudo, *Oppel*.

Thorax and sternum solid, bony; sternum concave in males, flat in females; caudal plate single; gular plates not united. Toes short, not webbed; 5 before, 4 behind. Feet club-shaped.

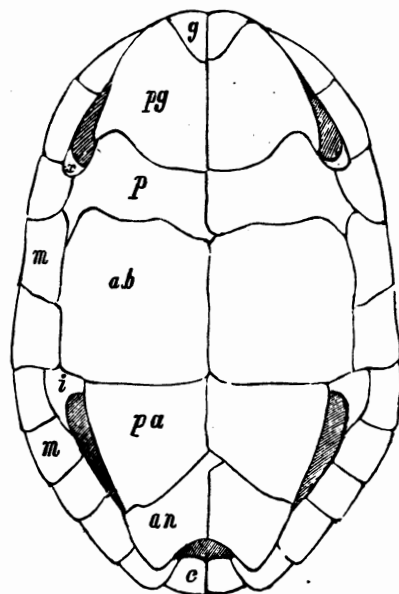
Testudo elegans, *Schoepff. Testudo*. t. xxv. p. 111; *Murray, Hdbk., Zool., &c., Sind*, p. 256. *Testudo actinodes*, *Bell, Zool. Jour.* 111-419; *Gunth. Rep. Br. Ind.*, iii., p. 419, p. 4; *Theob. Rep. Br. Ind.*, p. 2.—
THE STARRED TORTOISE.

Shell oblong-ovate, contracted towards both ends and elevated in the middle, with the lateral margins straight and slightly curved; it is higher than broad, and has a deep broad obtusangular notch anteriorly, and the sternum a similar one, but of less depth, posteriorly. Plates elevated into prominent humps from $\frac{1}{2}$ to 1 inch high. Areolæ of vertebral plates central, of the costals towards the upper margin, and of the marginal plates in the lower posterior corner. No nuchal plate. Areolar portion of the three hinder marginals projecting. Gular plates elongate, triangular, longer than broad. Post-gulars longer than broad. Abdominal as broad as long. Anal plates nearly regularly rhomboidal.

Head covered with small polygonal horny shields, those on the upper portion of the snout and on the crown being symmetrically arranged. An oblong shield above the tympanum. Jaws indistinctly denticulated.



n Nuchal.
v-v Vertebrals.
co Costals.
m-m Marginals.
c Caudal.



g Gular.
pg Postgular.
p Pectoral.
ab Abdominal.
pa Præanal.
an Anal.
e Axillary.
i Inguinal.

Front part of fore legs and the hinder part of the lower hind legs covered with large, flat triangular scales. A group of large conical tubercles on the hinder side of the thigh. Head and feet yellowish, more or less marbled with brown. Shell black with yellow areolæ, yellow streaks radiate from the areolæ. The streaks on the sternum are broader than those of the upper parts.

Length.—12 to 14 inches. Oviposits in October and November, laying 4 eggs, usually beneath shrubs or tufts of grass.

Hab.—In Sind this species has been found in the vicinity of the Hubb. It has also been found in Kutch and Central India. Dr. Gunther gives other authenticated localities, as Madras, Coromandel, the low jungles of the Carnatic, Pondicherry, Ceylon, and the hilly tracts of Meywar, where Captain Hutton says they are found in the high grassy jungles skirting the base of the hills. According to Blyth it does not occur in Lower Bengal. Gray gives the Himalaya on the authority of Captain Boys.

Testudo Leithi, *Gunth. Pro. Zoo. Soc.* 1869, p. 502, f. 1, 2, 3; *Theob. Rep. Brit. Ind.*, p. 3. *Peltastes Leithii*, *Gray, Sup. Cat. Sh. Rep. Br. Mus.*, p. 11; *Murr. Zool., &c., Sind*, p. 255.—THE SIND TORTOISE.

Shell broadly ovate, arched, the convexity of the upper shell stopping at the caudal plate, which is almost flat and forms a convex curve with the last vertebral. Posterior margin of the shell slightly serrated. Plates smooth, but with concentric striæ distinct. Abdominals as long as the gulars, post-gulars and pectorals together. Nuchal plate triangular, pointed in front. Colour yellow, each of the vertebral and costal plates with a black margin in front and on the sides, but not posteriorly. Marginal plates black-margined anteriorly. Sternum truncated in front, with a shallow obtuse-angular incision behind; it is entirely yellow with a broad cuneiform longitudinal black band in the middle of each abdominal plate with its apex behind.

Length.—4.75 to 5 inches.

Hab.—Sind.

Testudo horsfieldi, *Gray*.

The Afghan Tortoise, which is common throughout Beloochistan, in the Bolan, Afghanistan, and Persia, will probably be found to occur in Sind.

Family, EMYDIDÆ.

FRESH WATER TORTOISES.

Shell convex, more or less depressed, shields horny, caudal shields separate. Toes distinct, webbed. Feet for walking or swimming. Sternum flat in both sexes. Claws 5 before and 4 behind.

Pangshura, *Gray*.

Thorax and sternum solid, bony, united into an immovable carapace. Upper shell angularly elevated, compressed; the fourth vertebral shield

and generally the third also pointed at their junction. Pectorals sub-quadrangular. Caudal divided into two; claws 5 before, 4 behind; feet webbed.

Pangshura tentoria, *Gray, Pro. Zoo. Soc.* 1834, p. 54; *Gunth. Rep. Brit. Ind.*, p. 34; *Theob. Rep. Brit. Ind.*, p. 14; *Murr. Zool., &c. Sind.*, p. 255.—THE DURA.

Nuchal plate short, broadish, sub-quadrangular, broadest behind. Vertebrae raised along their median line in a ridge, which is most distinct on the middle of the back, terminating in a nodose prominence on the third and sometimes on the second vertebral. The first vertebral is sub-quadrangular; the second and third are rounded behind and narrowed, longer by half than broad; the fourth cuneiform, tapering anteriorly; the fifth more than twice as broad as the caudals. Caudals much longer than broad, separated by a groove and a very small notch. Hind margin of the upper shell distinctly serrated. Gulars longer than broad, the suture between them being shorter than that between the post-gulars. Pectorals shorter than post-gulars, abdominals or præ-anals. Head covered with undivided skin. Jaws finely denticulated. Upper jaw not emarginate anteriorly. Tail rather shorter than the head. Feet broadly webbed. Front part of the fore leg and base of the fifth toe with large imbricate scales. Colour above, brown with a black vertebral line. Sternal plates blackish brown, margined with yellow. Grows to $8\frac{1}{4}$ inches.

Hab.—The Deccan and the River Indus in Sind; also the Ganges, Kistna, and at Agra.

Pangshura smithii, *Gunth. Cat. Rep. Br. Ind.*, p. 36; *Murr. Zool., &c., Sind.*, p. 255. *Batagur smithii*, *Gray, M. S.; Sup. Cat. Sh. Rep.*, p. 61; *Gunth. Rep. Br. Ind.*, p. 36; *Theob. Rep. Br. Ind.*, p. 15.

Shell ovate, slightly depressed, with a distinct vertebral ridge from the nuchal to the caudal plate, rising into an elongate prominence on the back of the third plate. Sternum flat, its width between the inguinal incisions being rather more than that between the axillary, and rather less than one-half its length. Upper shell slightly serrated posteriorly; nuchal plate small, triangular. The first vertebral is bell-shaped, scarcely longer than broad, and broadest behind; the second sub-quadrangular; the third rectangular, oblong, two-thirds as broad as long; the fourth much elongate, pear-shaped, tapering anteriorly. Gulars considerably longer than broad. The posterior margins of the post-gulars are strongly convex, forming a deep curve. Abdominals nearly as large as post-gulars and pectorals together. Colour above pale yellowish olive; vertebral keel blackish, lower parts black, each plate with yellow margins. Fore legs covered in front with large imbricate scales rather obliquely arranged and with roundish smaller ones between. Hind legs on the outer side with smaller scales, but apparently more horny. Grows to 9 inches.

Hab.—Common in the Indus, extending to the Punjab, where it is found in the Sutlej and Chenab Rivers. Affects the Ganges also.

Batagur, Gray.

Thorax and sternum united into a solid case; shell depressed sternum flat in both sexes; pectorals sub-quadrangular; toes broadly webbed, 5 before, 4 behind. Habits, aquatic. Food, vegetable.

Batagur dhongoka, *B. Ham.*; *Gray, Ill. Ind. Zool.* 11 tab.; *id. Shield, Rept.* p. 36, tab. 18 and 36; *Gunther, Rept. Br. Ind.* p. 42; *Theob. Cat. Rep. Br. Ind.* p. 22.—THE DHONGOKA.

Nuchal plate triangular, broadest behind; vertebrals keeled, the keel terminating on the second and third in a prominent knob; first and second vertebrals longer than broad, also the caudal plates. Gulars as broad as long, the hind margins of the post-gulars form a straight line. Anal quadrangular. Colour dark grey; a yellow line from the nostril to the tympanum. A black vertebral line and two lateral ones.

Length.—18 to 20 inches.

Hub.—The Indus (Sind) the Ganges and Punjab rivers; also N. W. Provinces at Futtehgur and Deccan in Bengal. Theobald gives Central India, Assam and Nepal.

Batagur baska, *Gray, Sh. Rept.*, p. 35, tab. 16; *Gunth. Rept. Br. Ind.*, p. 37, pl. iii., fig. B.B.; *Murr. Zool., &c. Sind*, p. 255. *Tetraonyx baska*, *Buch. Ham. MSS. Gray, Ill. Ind. Zool.*; *Theob. Rept. Br. Ind.*, p. 25; *Dum. and Bib. Erpet. gen. ii.*, p. 341.—THE BATAGUR.

Toes four on all feet. Anterior half of shell elevated and convex, posterior much depressed and flattened; the greatest width behind its middle; sternum truncated in front. Carapace smooth and polished. Nuchal plate sub-quadrangular, four anterior vertebrals sub-quadrangular, nearly as broad as long; the fifth hexagonal. Caudal plates square, separated by a suture, without notch behind. Head covered with undivided skin; snout rather pointed; nose turned upwards. Upper jaw denticulated. Colour uniform brown. Grows from 20 to 24 inches.

Hab.—The river Indus; Ganges, Irawaddy, Hooghly, Pegu and Tenasserim. Considered wholesome food.

Batagur thurgi, *Gray, Sup. Cat. Sh. Rep. Br. Mus.*, p. 58; *Murr. Zool., &c., Sind*, p. 255. *Cachuga oldhami*, *Gray, Pro. Zoo. Soc.* 1869, p. 200. *Hardella indi*, *Sup. Cat. S. R.*, p. 58; *Theob. Rep. Br. Ind.*, p. 23.

Nuchal plate triangular, broadish posteriorly, shell depressed, with an interrupted median ridge. No costal ridge. Head covered with undivided skin. Upper jaw strongly denticulated with a pair of tooth-like prominences in front. Tail shorter than head. Feet broadly webbed. Fore arm with transverse series of broad short imbricate scales. Toes 5 before, 4 behind. Colour of shell more or less deep brown, or black, the plates of the lower side edged with yellow. A broad yellow band runs from the nostrils over the eyebrows along the side of the neck; a short yellow band anteriorly on each side of the upper jaw. Feet olive, spotted with yellow. Attains to 22 inches.

Hab.—The river Indus, the Ganges, and, according to Cantor, Penang also. Other authenticated localities are Calcutta, Dacca in Bengal and Futtehgur (N. W. Provinces).

Family, TRIONYCIDÆ.

FRESHWATER TURTLES.

Shell much depressed, covered with soft skin, feet strongly webbed, claws 3 on all feet. Carnivorous.

Emyda, Gray.

Shell oval, depressed, only partly ossified, covered with soft skin, a more or less broad margin remaining cartilaginous. Sternum united to thorax by cartilage. A broad flexible flap on each side of the posterior sternal lobe. Feet strongly webbed. Claws 3-3.

Emyda granosa, Schœpf. *Test.*, p. 127; *Gunth. Rep. Br. Ind.*, p. 45. *Trionyx granosa*, *Theob. Rept. Br. Ind.*, p. 32; *Murray, Zool. &c., Sind.*, p. 255; *Gray, Ill. Ind. Zool.*—THE BUNGOMA.

Upper surface of shell and sternal plates granular; the odd osseous plate on the sternum is very small; the plates of the posterior pair rather small, far apart in young specimens, not confluent and only in large individuals forming a suture together. Colour above, pale greenish olive, with yellow spots on the head, neck, and shell, which disappear with age. Hind margin of shell with 6-7, bony granular plates. Grows to 10 inches.

Hab.—The River Indus in Sind, extending into the Punjab and N. W. Provinces. Common in lakes and dhunds. Abundant on the Coromandel Coast, and in lower Bengal. Found also in Sikkim and at Bombay.

Trionyx, Geoff.

Shell as in *Emyda*. Sternum sometimes with two pairs of externally visible osseous plates, and with the hinder lobe not dilated into lateral valves. Muzzle produced into a nasal tube. Snout conically pointed.

Trionyx gangeticus, *Cuv. Rep. Anim; Murr. Zool., &c., Sind.*, p. 256; *Gunth. Rep. Br. Ind.*, p. 47; *Theob. Rep. Br. Ind.*, p. 28. *T. hurum*, *Gray, Ill. Ind. Zool.*—THE GANGES TURTLE.

Carapace rather longer than broad, with a slight swelling on the vertebral line. The anterior dorsal bone rather short, broad, rugose like the other costal plates, and confluent with the first pair of costals. The small tubercles of the epidermis are arranged in 12 or 13 irregularly interrupted rows. In large individuals the lunate bone of the sternum is granular. Colour variable, light to dark or olive green of various shades, with 2 or 3 pairs of brown ocelli, which disappear with age.

Hab.—The Rivers Indus, Ganges, and tributaries up to Nepaul, also the rivers of the Punjab and the N. W. Provinces.

Family, CHITRIDÆ.

Freshwater Chelonians with 3 claws on all feet, and extremely weak lower jaws. Feet webbed.

Chitra, Gray.

Shell depressed with cartilaginous margins. Sternum united to thorax by cartilage. Sternal callosities four. Head elongate. Lower jaw weak. Eyes placed very forward.

Chitra Indica, Gray, Cat. Sh. Rep., p. 70; Theob. Rep. B. Ind., p. 26; Gunth. Rep. Br. Ind., p. 50; Murr. Zool., &c., Sind, p. 256.

General aspect of *Trionyx*, but shell more depressed, neck elongate; colour above dark olive brown, lineately marbled or spotted with brown or rust colour.

Hab.—Sind, Punjab, N. W. Provinces and Bengal.

Family, CHELONIDÆ.

MARINE TURTLES.—*Fins in place of feet.*

Caoua, Gray.

Fifteen vertebral and costal shields. Fin with one nail.

Caoua olivacea, Gray, Cat. Sh. Rep., p. 73; Gunth. Rep. Br. Ind., p. 52; Theob. Rep. B. Ind., p. 23; Murr. Zool., &c., Sind, p. 256.—THE INDIAN LOGGERHEAD.

Marginal shields 27. Vertebral and costal shields non-imbricate; never less than fifteen, but one or two may be subdivided so as to raise the number to twenty. Shields of the back strongly ridged in the young, which are blackish and paler than in the adult. In life the shell and fins of adolescents are edged with pale yellow, the sternum is pale yellow, tinged with greenish and washed with chestnut. The shell of the adult is blackish or dark greenish, the marginal scales of the fin yellow as in the younger stage. Sternum yellow, washed with chestnut. Oviposits in March and April; eggs 150 to 200, spherical, white.

Hab.—Sind, Malabar and Bombay Coasts, Bengal and South India. Theobald (*Rep. Br. Ind.*) mentions having extracted 206 unshelled eggs from a female which had then deposited 103 mature ones. The flesh is said to be unpalatable, but the Chinese, also the Hindus in Bengal, are said to relish it. This species with the next is common on the Sind Coast, and has been found on the Malabar and Penang Coasts also.

Chelonia, Fleming.

Thirteen vertebral and costal shields.

Chelonia virgata, Schw.—THE INDIAN TURTLE.

Distinguished from the last by having one pair less of costal shields.

Hab.—The Sind Coast and the Bay of Bengal. Deposits its eggs at Clifton and Ghizree at Kurrachee, great quantities being daily brought in for sale during the season. The flesh is eaten by the natives. According to Sir Emerson Tennent it is said to be occasionally poisonous.

ORDER—SAURIA.

LIZARDS.

Scaled reptiles usually possessing eyelids and four external limbs. Jaws toothed; the rami of lower jaw united in front by a bony suture. Limbs and eyelids never both absent. Oviparous or ovoviviparous.

Emydosauria.—WATER SAURIANS.

Body cuirassed with osseous plates. Vent longitudinal. Oviparous. Tongue, short, flat, immovable.

Family, CROCODILIDÆ.

CROCODILES.

Head with the snout produced, body depressed, covered above and below with square shields arranged in longitudinal and transverse series; tail compressed, elongate. Feet short, more or less webbed. Teeth unequal, strong, conical, acute, in a single series and embedded in sockets. Toes 5—4. Claws 3 on all feet. Hind feet with an external ridge of scales.

Crocodiles are found between the tropics wherever the country is watered by sufficiently large rivers or lakes.

According to Cantor, the Indian species also inhabit the sea coast, and in calm weather may be seen floating at a distance of two or three miles from shore. Those inhabiting inland waters which are dried up during a drought are compelled to wander about in search of water. They do this during the night. Some, however, bury themselves in the mud and remain in a state of torpor, till better times come. Dr. Gunther further adds, that a man seized by a crocodile has only one way of saving his life, if not his limb, namely, to force his fingers into the eyes of the beast, which immediately lets go its victim.

Crocodilus, Cuv.

The fourth tooth of the lower jaw fits into a notch in the upper jaw. Snout moderately long.

Crocodilus palustris, *Less. in Belang. Voy. Ind. Orient. Zool. Rept.*, p. 305; *Gunth. Cat. Rep. Br. Ind.*, p. 61; *Theob. Cat. Rep. Br. Ind.*, p. 36.—THE MARSH CROCODILE.

Upper surface of snout covered with numerous small irregular prominences; inter-orbital space deeply concave. Two pairs of keeled anterior nuchal plates; three pairs of large posterior ones, all strongly

keeled. Sixteen transverse rows of strongly keeled dorsal plates. Colour pale or greenish olive, conspicuously black spotted. Grows to 30 feet; individuals 15 feet in length are not uncommon.

Hab.—Found throughout India and Ceylon. This is the species so religiously cared for at Muggur Peer. Affects marshes, lakes, rivers, estuaries and the sea coast. Eggs white, cylindrical, hard-shelled; 3.25 inches \times 1.5 in diameter.

Gavialis, Geoff.

Snout very long and slender; teeth slender, sharp; food, fish and turtles.

Gavialis gangeticus, Gmel. Syst. Nat. i., p. 1057; Gunth. Rep. Br. Ind., p. 63; Theob. Rep. Br. Ind., p. 37; Murr. Zool., &c., Sind, p. 256.—THE GAVIAL.

Dorsal shields in six rows in the middle of the back. Adult males have a large hollow prominence at the end of the snout, in which the nostrils are placed. Grows to 20 feet.

Hab.—Found in the Indus, N. W. Provinces, Bengal and Ganges river.

Family, VARANIDÆ.

WATER LIZARDS OR MONITORS.

Head with the snout produced, pyramidal, covered with small scale-like, but not imbricate, shields. Teeth acute, compressed. Tongue elongate, slender, terminating in a long fork, retractile into a sheath at its base. Scales small, equal on the sides and on the back and arranged in cross bands. Toes five. Claws on all feet. Tail long, generally compressed.

Varanus, Merrem.

Nostrils in an oblique slit, situated in, or nearly in the middle between the eye and the extremity of the snout. Scales elliptic, small, those on the back and on the sides not imbricate, each being surrounded by a small circular, granular fold. Tail vertically compressed, with a crest of keeled scales. Throat with a transverse fold. All the species of the genus live on snakes, smaller lizards, toads, frogs, &c.

Varanus flavescens, Cantor. Mal. Rep., p. 28; Gunth. Rep. Brit. Ind., p. 65, pl. ix., fig. A.A. Theob. Rep. Brit. Ind., p. 38; Murr. Zool. &c., Sind, p. 256. Monitor flavescens. Gray, *Illust. Ind. Zool.* c tab.—THE SHORT-TOED WATER LIZARD OR THE INDIAN EMPAGUSIA.

Nostrils nearer the nose than eye. Superciliary scales of unequal size, the outer being smaller than the inner. Scales of the upper parts distant, strongly keeled, *those of the belly smooth, in 65-70 transverse series between the gular fold and the loins.* Colour greenish or brownish olive, with irregular dark markings confluent into cross bands on back and tail. Throat with irregular dark transverse bands. Toes comparatively smaller than any of its congeners.

Hab.—Southern and Central India, Concan, Deccan, Kutch, Sind, Beloochistan, Punjab, N. W. Provinces, Bengal, Burmah, Nepaul, Penang and Ceylon. Attains 3–4 feet, the tail being longer than the body.

Varanus dracæna, *Linn.*; *Gunth. Rep. Brit. Ind.*, p. 65, pl. ix. fig. B.B.B.; *Theob. Rep. Brit. Ind.*, p. 38; *Murr. Zool., &c., Sind*, p. 256. *Varanus Bengalensis*, *D. et B. Erpet. gen. iii.*, p. 480. *Varanus bibroni*, *Blyth, J. A. S. B. xi.*, p. 869. *Ghorepore* of the natives of the Deccan; *Gooare*, Hind.; *Goh*, Sind.—THE COMMON INDIAN WATER LIZARD.

Toes of moderate length, armed with strong claws. Nostrils in an oblique slit, midway between the nose and eye. Superciliary scales small without a series of larger ones. Scales of the neck and back without keels, only a little raised in the middle, *those of the belly smooth in 90 transverse series between the gular fold and the loin*. Colour brownish olive, black dotted, each dot occupies a scale. These dots are more numerous on the throat. Young specimens marked with numerous small white ocelli edged with darker. Lower parts with irregular dark transverse bands. Nape of the neck with regular cross bands.

Attains to 4 feet, of which the tail is three-fifths.

Hab.—Sind, Punjab, N. W. Provinces, Central and Southern India, Bengal, Concan, Deccan, Ceylon, Burmah and Nepaul; also Beloochistan, Afghanistan. The Iguana of the Europeans.

Dr. Kelaart (*Prod. Faun. Ceyl.*) says “that the natives are partial to its flesh”; and adds:—“We have once tasted some excellent soup made from a tender iguana, it tasted not unlike hare soup.” Natives of the Deccan and Sind are also partial to its flesh, and esteem it a specific for rheumatism. Its blood drunk fresh or applied to the loins is considered a cure for lumbago, and is also said to be a good aphrodisiac. Of the skin native tambourines are made.

Varanus lunatus, *Gray, Lizards*, p. 10; *Gunth. Rep. Brit. Ind.* p. 66, pl. ix. fig. 6; *Theob. Rept. Brit. Ind.* p. 38; *Murray, Zool., &c., Sind*, p. 256.—THE BANDED WATER LIZARD.

This species is very similar to *V. dracæna*, from which it is distinguished by the following characters:—A larger number of ventral shields, which are *arranged in 105 cross series from the gular fold to the loin*; neck, tail and trunk marked with cross bands, the first formed by a dark streak from either eye meeting on the neck, the angle being directed backwards on neck and forwards on the body; four on neck and eleven on the trunk; sides and legs yellow dotted.

Hab.—Sind, Punjab, N. W. Provinces (Futtehgur and Agra) Oudh, Bengal and Kutch.

Psammosaurus, *Fitz.*

Tail rounded and without a keel. Other characters as in *Varanus*.

Psammosaurus scincus, *Gray, Ann. Nat. Hist.* i. 392; *Murray, Zool., &c., Sind*, p. 257. *Varanus scincus*, *Merr. Tent.* 59. *Varanus*

ornatus, *Carleyle, J. A. S. B.* 1869, p. 192; *Theob. Rep. Brit. Ind.* p. 40.—THE OUARAN.

Nostrils ovate, oblique, nearer the eye than nose; superciliary scales small and granular; scales of the neck and back keeled; of the belly smooth, slightly raised in the centre. Tail unarmed, rounded, not keeled; sides convex; scales in 116 transverse rows; colour olive green or greenish ashy, passing on the neck into orange; crown of head black, with lines of the same colour below and behind the eyes and down the neck; a median black line along the nape, and some other less distinct lines and dashes on nose, neck and shoulders; below white; tail slightly more than half the total length. Grows to 30 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Beloochistan, Persia and Kutch.

Family, LACERTIDÆ.

LAND LIZARDS.

Head covered with symmetrically arranged shields; tongue slender, free, exsertile, tip forked; scales on back granular or rhombic, of the sides granular, of the belly quadrangular, or rounded; in transverse bands. No longitudinal fold, but generally one across the throat. Tail fragile, long, rounded, with the scales arranged in rings; eyes diurnal, eyelids present; tympanum distinct; limbs four.

Cabrita, Gray.

Nostrils on the ridge of the snout between an upper and a lower nasal plate, both being rather swollen; a small hinder nasal; upper eyelid short, lower large, with a transparent disc; collar none, but a small fold present before each shoulder; scales of the back rhomboidal, keeled, imbricate; ventral scales four-sided, smooth, longitudinally arranged; præ-anal shield single, surrounded by smaller ones; femoral pores distinct; toes 5—5, keeled beneath, not toothed on the sides.

Cabrita leschenaulti, M. Edw. Ann. Sc. Nat. xvi. pp. 80-86; *Gray, Cat. Liz. Brit. Mus.* p. 43; *Gunth. Rep. Brit. India*, p. 71; *Theob. Rep. Brit. Ind.* p. 41; *Murray, Zool., &c., Sind*, p. 258. *Calosaura leschenaulti, D. et B. Erpet. gen.* v. p. 262. *Cabrita brunnea, Gray, Ann. Nat. Hist.* i. p. 282.—THE CABRITE.

Shields of the head longitudinally rugose, with partially raised margins. Rostral triangular, broader than high, separated from the single præ-frontal by the supra-nasals, which are in contact with each other. Præ-frontal triangular behind, separated from the vertical by the post-frontals, which are in contact with each other. Vertical elongate, obtusely sub-triangular in front, three-sided posteriorly. Two pairs of occipitals; anterior occipital sub-pentagonal; inter-occipital triangular in front, obtusely rounded posteriorly, with a small shield following; upper labials 8, the fifth very large, and under the eye. Mental large; 5 pairs of chin shields behind it, three of which only are in contact; nostrils between the first upper labial, post-nasal, and two small shields;

temples with small hexagonal, keeled scales. Superciliaries 2, with a series of 7—8 small scales between them, and two long shields above the orbit. Ventral shields in six longitudinal and 25—26 transverse series. Femoral pores 7—8 on each thigh. Tail covered with keeled imbricate scales. Colour olive brown, with two broad white streaks on each side, the upper from the superciliary and running along the side of the back, the lower from below the eye and ear, along the middle of the side to the axil of the hind limb.

Length.—5 to 6 inches.

Hab.—Sind, Punjab, N. W. Provinces, Afghanistan, Rajputana, Kutch, Central India, South India, and Coromandel Coast. Common at Dorbajee on stony ground.

***Acanthodactylus*, Fitzinger.**

Nostrils between three shields, the lower of which is the first labial. Eyelids present. A scaly fold across the throat. Ventral scales four-sided. Femoral pores present; toes 5—5, keeled beneath, and toothed on the sides.

***Acanthodactylus cantoris*, Gunther, *Rep. Brit. Ind.* p. 73; *Theob. Rep. Brit. Ind.* p. 42; *Stol. J. A. S. B.* 1872, xli. pt. 2, p. 91; *Murray, Hdbk., Zool., &c., Sind.*—CANTOR'S SPINED-FOOT.**

Rostral shield bent backwards on the upper surface of the snout, with an obtuse angle behind. Supra-nasals contiguous; pre-frontal nearly square; posterior frontals longer than broad, obtusely keeled; superciliaries three (the anterior one small) separated from the orbital margin by small scales; two pairs of occipitals, the anterior pair small, triangular, the posterior twice as large and sub-quadrangular; a very small central occipital is also present; eight upper labials, infra-orbital shield resting on the fifth, sixth and seventh labials; mental shield nearly as long as broad. Chin shields five pairs, the first three only in contact; scales on the back strongly keeled, imbricate, and in 13 longitudinal rows, the keels forming continuous lines; scales on the sides of the trunk keeled, much smaller than those of the back; ventral scales smooth, square, variable in number (10 to 16 longitudinal rows) commonly twelve; scales of the tail keeled; femoral pores 20 on each thigh (varies from 16 or 17 to 21); the fore limb extend to the front edge of the orbit if laid forward; the hind limb to the collar. Hind toes serrated along their external margins; colour greenish olive above, with reticulated blackish lines, uniform white below.

Length.—7 to 9 inches, of which the tail is about two-thirds.

Hab.—Sind, in sandy places, especially on the ridges of blown sand, also Punjab, N. W. Provinces, Beloochistan, Southern Afghanistan and S. E. Persia.

***Acanthodactylus micropholis*, Blf. *Ann. and Mag. Nat. Hist.* July 1874, xiv. p. 33; *Eastern Persia*, p. 383, pl. xxi. fig. 2.**

Rostral moderate, obtusely triangular behind. Præ-frontal single, hexagonal, separated from the rostral by the supra-nasals; nostrils

between the supra-nasal; the first upper labial, and a shield in front of the loreals. Post-frontals, each about the size of the single præ-frontal, and broadly in contact with each other above its apex. Vertical nearly twice the length of its greatest width, grooved mesially in front, where it is rounded and forms a suture with the post-frontals. Post-occipital twice the size of the præ-occipital; inter-occipital very small, three-sided in front; three shields above each side of each post-occipital, the middle one trihedral and about six times the length of the small hind one; temporal region covered with granular scales, the upper and smaller series convex, the lower and larger series faintly keeled. An elongate scale placed obliquely in front of the ear above; ear opening with 2-4 projecting scales forming a serrated edge. Upper labials 7, the infra-orbital shield resting on the fourth and fifth, or falling inside the labial margin between them; lower labials six; five pairs of chin shields along the edges of the labials, the first three pairs only in contact mesially; scales of the back small, sub-imbricate, semi-oval, obtuse behind and distinctly carinate, those between the post-occipital and fore limb smaller, granular, and faintly keeled, as also are those between the axils of the fore and hind limbs on the lower part of the back, they gradually increase in size towards the tail, the keel forming continuous lines. Scales on the tail three or four times the length of those on the back, all strongly keeled and arranged in verticels. The number of scales round the middle of the body, not including the ventral plates, is 50-53. Ventral plates 10-12. Femoral pores 23-27 on each thigh; præ-anals larger than the adjoining scales; body and tail elongate; tail twice the length of the head and body; the fore leg laid forward reaches the end of the snout generally. The hind leg laid forward reaches to the eye, and often to just beyond the ear. Colour, a grey brown on the head, darker on the body, five white lines down the back and an indistinct one on the sides, between the axils of the fore and hind limbs. The three dorsal series coalesce below the hind limbs, and the two laterals on the tail, where they become indistinct. Legs with irregular blotches of white, the dark ground showing a reticulated pattern.

Length 7·8 inches to 8·12, tail from 4·0 to 4·85.

Hab.—Sind (Kurrachee) Beloochistan, Persia, Afghanistan. Found consorting usually with *A. cantoris*. Habits similar.

Mesalina, Gray.

Nostril on the ridge between three swollen shields, the lower and anterior moderate, hinder upper small, triangular. Collar indistinct, sub-angular, attached in the middle, free on the side. No fold under the ears. Toes five on all feet. Præ-anal single, with one or two series of small scales round it. Scales of the back rhombic or circular, not imbricate; of the belly smooth, contracted behind, arranged in oblique rows (longitudinal, *Blanford*).

Mesalina Watsonana, *Stol. P. A. S. B.* 1872, p. 86; *Theob. Cat. Rept. Brit. Ind.* p. 43. *M. brevirostris*, *Blf. Ann. and Mag. Nat. Hist.* July 1874, xiv. p. 32.—WATSON'S MESALINA.

Nostrils between three swollen shields, the lower as long as the first loreal. Præ-frontal single, hexagonal, separated from the vertical by the post-frontals, which are in contact with each other, their hind lateral points touching the front point of the superciliaries on each side. Vertical elongate, broader in front than behind and obtusely rounded. Superciliaries two, margined externally with granular scales, the first of these large and sub-triangular; hind superciliary separated from the post-occipital on each side by a group of granular scales. Occipitals five, the anterior pentagonal, the posterior triangular and separated by a small shield. Two loreals; the first very narrow, the last larger, and triangular; 9-10 upper labials, the fifth and sixth largest and beneath the orbit. Lower labials 7-9, the fifth and sixth largest and followed by much smaller shields. Five pair of chin shields, the fourth largest. Ear spacious, margined above, in front with a long narrow shield; scales on the body granular, in about 43-45 rows in the middle of the body; on the upper side of the limbs slightly keeled; on the tail enlarged, verticillate and sharply keeled. Shields of the belly enlarged, trapezoid in 8 rows. Femoral pores 12-15 on each thigh, separated in the præ-anal region; lower eyelid with a transparent disc, granular, with some enlarged flat shields in the centre. Shoulder fold well developed. Colour brownish olive, with four alternating rows of white spots with some blackish ones down the back, and one or two rows down the sides tending to form bands. A dark stripe behind the thigh and dark marks on the tail. Below greenish white.

Length.—6.50 (tail 2.10).

Hab.—Sind.

Mesalina pardalis, *Licht.*; *Gray, Cat. Liz. Brit. Mus.* p. 43; *Blf. Eastern Persia*, p. 377; *D. et B. Erp. gen. v.* p. 312; *Murray, Hdbk., Zool., &c., Sind*, p. 259.—THE DOTTED MESALINA.

Resembles *Watsonana*. Scales of the abdomen in 28-31 transverse rows. Femoral pores 11-15, commonly 12; 45-50 granular scales round the middle of the back, not including the ventrals, which are in ten longitudinal rows; the hind foot laid forward sometimes reaches the ear, in some specimens barely extends to the shoulder. The fore limb sometimes extends to the end of the muzzle, but usually falls short of it. Rostral broader than high, obtusely triangular behind. Nostrils between three swollen shields which separate the single præ-frontal from the rostral. Two transparent plates on the lower eyelid; inter-occipital plate usually well developed, and forms a suture with the central occipital, separating the post-occipitals from each other, but occasionally the inter-occipital is very minute and not sufficiently produced in front to meet the central occipital, or there may be another small plate interposed between the two. Colour dark slaty grey above, with small black spots, often edged on one or both sides by white. Lower parts white with a yellowish tinge.—*Blanford*.

Hab.—Sind, Beloochistan, Persia and S. Afghanistan. The more desert tracts in the vicinity of the Hubb, in Sind. Mr. Blanford says—

“It appears to occur throughout Persia to far east in Beloochistan, and was common near Gwadur and S. W. Persia.” It occurs also commonly throughout the Bolan and S. Afghanistan, whence I collected specimens.

Family, SCINCIDÆ.

SKINKS.

Head covered with symmetrical shields. Tongue free, exsertile, bilobed at the tip. Scales of the back rounded, quincuncial, imbricate; of the belly and sides similar. No gular or lateral fold. No femoral or inguinal pores. Tail rounded, fragile.

Euprepes, Wagler.

Each scale with several keels. Tail rounded and without spines. Nostrils in a single small shield. Limbs four, each with 5 toes. Palatal notch placed far behind.

Euprepes carinatus, *Schn. E. rufescens, Cantor Cat. Mal. Rep.; Gunth. Rep. Brit. Ind. p. 79; Theob. Cat. Rep. Brit. Ind. p. 49; Murray, Hdbk., Zool., &c., Sind, p. 257.*—THE COMMON INDIAN SKINK.

A pair of supra-nasal shields; scales three, sometimes five, keeled in 28 to 30 longitudinal and about 30 transverse series; the præ-frontal is generally separated from the rostral and vertical by the supra-nasals and post-frontals, but sometimes touches one of them. Fifth upper labial below the orbit much longer than high. Colour variable, rich olive brown or bronze, darker on the sides, and with a pale lateral stripe from over the eye down each side of the back. This lateral stripe is often white spotted, or of a very pronounced yellow, and seasonally the sides are suffused with red. Back often streaked or dotted blackish.

Length.—13 to 20 inches.

Hab.—Sind, Punjab, N. W. Provinces, Bengal, Central and Southern India, the Deccan, Ceylon, Arracan, Berars, Nepaul, Penang, &c., and Afghanistan. Very widely spread. Gunther says—“It occurs in almost every part of the Continent as well as of the Archipelago, from Afghanistan to China and to the Phillipine Islands.” It is even said to inhabit the Sandwich Islands. Cantor says—“It is exceedingly numerous in the hills and valleys of the Malayan countries. They may be seen basking in the sun, in bamboo hedges or on trees. The female deposits 6 to 12 yellowish white, oval, cylindrical eggs, half an inch in length.”

Euprepes macularius, *Blyth, J. A. S. B. 1853, p. 652; Gunther, Reptiles Br. Ind. p. 81; Theob. Cat. Rept. Br. Ind. p. 49. E. rufescens, Shaw apud Cantor.*—THE SPOTTED EUPREPES.

Rostral longer than high; a pair of supra-nasals not contiguous; præ-frontal quadrangular, its anterior and posterior points touching the rostral and vertical; post-frontals separated from each other by the hind angles of the præ-frontal and triangular front of the vertical; they are each about half the size of the præ-frontal, and form sutures with the post-nasal, first superciliary shield and loreal. Vertical elongate,

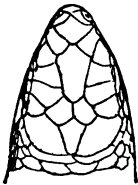
truncated behind, its point extending as far as a line drawn across the sutures of the 2nd and 3rd superciliary shields, and in contact with the anterior occipitals, which form a sub-triangular hollow to receive it. A similar hollow behind the anterior occipitals receives the sub-triangular front of the inter-occipital. Post-occipitals form sutures with the hind lateral angles of the anterior occipitals, first superciliary shield, and the sides of the inter-occipital, but does not meet at its apex. Mental longer than broad, with a large chin shield stretching across behind it, followed by two others on each side along the edges of the lower labials; a groove between the lower labials and chin shields, extending to the gape. Superciliaries four, bordered laterally by a similar number of elongate plates. Upper and lower eyelids fringed with scaly plates. Lower eyelid semi-transparent. Upper labials seven, the fifth the length of the first three, and under the eye. Lower labials seven. Ear opening moderate, about the size of the sixth upper labial with some small lobules in front. Scales in 30 longitudinal rows, and 28 between the axils; those on the back and tail 5-7 carinate; hind margin of the post-occipitals also carinate. Præ-anal and sub-caudal plates not enlarged. The fore limb laid forward reaches the middle of the ear. Colour olive brown with a greenish tinge, the back with eight irregularly broken up longitudinal dark brown lines, formed by elongate dark spots 2-3 carinations wide in the middle of each scale behind. A black lateral streak from behind the eye, widening between the axils and narrowing on the tail, each scale with a white spot, forming four interrupted longitudinal white lines. Entire under parts white; sides of the neck and half way between the axils suffused with vermilion. Limbs olive brown, with minute white and black spots.

Length.—Head and body 2.5 to 2.75 inches, tail 3.25 to 3.5 inches.

Hab.—Sind (Kurrachee) Rungpore (*Blyth*) Punjab, N. W. Provinces, Oudh, Bengal, Central India, Assam, Kachar, Burmah and the Malayan Peninsula; affects hedges and gardens.

***Euprepes septemstaniatus*, Reuss. ; *De. F. Pl.* xxvii. fig. 3 ; *Bfld. Eastern Pers.* p. 388. *E. affinis*, *D. F. Viag. in Pers.*—THE SEVEN-STREAKED EUPREPES.**

General form much as in *E. carinatus*, except that the tail is much shorter. A pair of supra-nasal shields, which meet in a suture behind the rostral. Post-frontals separate, each about half the size of the single præ-frontal. An elongate central occipital completely separating the post-occipitals from each other. Fifth upper labial largest and under the orbit, two other labials behind it. Lower eyelid with a large transparent disc. Ear opening rather small, circular, with two or three sub-equal lobules in front. Scales of the back with three very faint keels. Scales of the anterior portion of the back, sides and limbs smooth. 34-38 series of scales round the body; 35-38 between the axils. Præ-anal and sub-caudal shields not enlarged. Limbs moderate.



Euprepes septemstaniatus.

The fore limb laid forward extends to the front of the eye. Colour olive brown, with more or less numerous black spots on the head, back and sides; these tend to form longitudinal bands on the anterior portion of the back, and a broad band produced in front of the eye down each side. Below this is a narrow pale line from the upper labials to above the shoulder, with a more or less dark band beneath it. According to Mr. Blanford this species is viviparous. A large female he captured at Kush-kizard, on being placed in spirit, gave birth to three perfectly formed young, each about 3 inches in length and with an umbilical cord attached to a placenta-like mass. Two others, he says, remained inside the body.

Length.—Of specimen 7·8 inches, of which the tail measured 3·9 inches.

Hab.—Sind and Persia.

Scincus arenaria, Sp. Nov. Plate

Rostral broader than high, depressed, spatulate, rounded in front and sharp edged. It is slightly concave posteriorly to receive the convex front of the large single præ-frontal. Supra-nasals widely separated. Nostrils lateral, in the front edge of the nasal and below the sub-quad-rangular supra-nasals. The post-frontals are pentagonal, longer than broad, rounded anteriorly and sub-triangular behind. They are broadly joined together and separate the vertical from the præ-frontal, with both of which they are in contact, and their upper outer margins form sutures with the outer margin of the first and about one-third of the second superciliary shield. The vertical is elongate, in length is twice its greatest width, and extends behind to a line drawn across the hind outer edges of the fourth superciliary shields on each side. Its apex is nearly triangular, and behind it are two anterior occipitals, both broadly in contact with each other, behind these the nearly triangular front of the inter-occipital is received. Upper labials 8, one-half of the fifth, and the sixth, and seventh under the eye. Infra-labials 7-8. Superciliary shields 6, the hindmost smallest. Below these there is also a row of shields, 4 in number, the anterior of which is the longest and the length of the three others together. There is a small shield in the corner of the eye anteriorly, immediately below the first superciliary; another 3-4 times its size behind the eye, and a row of 4 shields below the eye, just above, and in suture with the upper labials. Loreals two. Mental small with two shields stretching across the chin behind it, and three pairs of other enlarged shields along the edge of the lower labials, the anterior of which only is in contact with each other. Enlarged scales on the back in 10-12 rows, and 28-30 round the middle of the body. Of all the seven specimens I possess, each scale on the back is mesially streaked with dusky brown and edged yellowish white; those on the middle of the back have darker brown tips. There are 7-10 deep reddish-brown blotches or spots along the sides; from the middle of the neck to above the fore limb they are rather rounded, and between the axils of fore and hind limbs, vertically elongated. Tail conical, pointed, about a third the length of

the head and body. Body angular; præ-anals and sub-caudals enlarged. Toes 5-5, flattish, their edges toothed. The fore leg laid forward reaches to beyond the eye, the hind leg laid forward touches the toes of the fore leg laid back.

Length of my largest specimen $6\frac{1}{4}$, of which the tail is $2\frac{1}{4}$; another 6 inches, with a tail of 2 inches.

Hab.—Sind. Obtained on the Hubb plains.

I have no extended description of any of the four recognized Skinks, except what is contained in Mr. Blanford's paper on Persian Reptiles (*P. Z. S.* 1881, pp. 677-678.) From his remarks under *S. conirostris*, I am inclined to the belief that this species is distinct from any known, except *S. Hemiprichii*, which it may possibly be.

Blepharosteres, Stolickza.

Scales smooth. Head shielded much as in *mocoo*. Nostril in a single shield. Eyelid none. Sub-caudals entire.

Blepharosteres grayanus, *Stol. Proc. A. S. Beng.* 1872, p. 74; *Theob. Cat. Rep. Brit. Ind.* p. 61; *Murray, Hdk., Zool., &c., Sind*, p. 257.

External ear none. Body slender. Snout obtuse. Rostral broader than high; præ-frontal single, hexagonal, in contact with the rostral, post-frontals and vertical; its suture with the vertical separating the post-frontals, which are about half the size of the præ-frontal; vertical sub-quadrangular, its anterior sub-triangular front forming sutures with the post-frontals, and its posterior elongate sides with the first, and part of the second superciliaries, the point touching the præ-occipital; præ-occipital single, concave behind to receive the convex front of the occipital, behind which, the lateral angles of the præ-occipital and last superciliaries, the post-occipitals form sutures. Two rows of small shields round the anterior upper, and posterior edge of the eye. One small post-ocular, followed by a temporal shield. Scales in 18-20 longitudinal rows, and 36-38 transverse rows between fore and hind legs. Seven upper labials, the fifth under the eye. Colour above olive green with a distinct metallic lustre, darker on the sides, where speckled with black, and passing on the belly to greenish white. A silvery black edged band from the superciliary edge to the tail, which is paler with a pink blush. Limbs brown olive, with rows of white spots.

Hab.—Sind. Specimens collected in the verandah of the Frere Hall. Lives in chinks of the stone flags. Found also in N. E. Kutch.

Ablepharus, Cocteau, Weigman.

Head sub-quadrangular; nostrils lateral; fronto-parietal plates 2. Eyelids rudimentary, circular. Ears distinct. Legs 4. Toes 5-5, unequal. Præ-anal plates.

Ablepharus brandti, *Strauch, Bull. Acad. St. Pet.* xii. p. 367; *Blf. East. Pers.* p. 391, pl. xxvii. fig. 1, 10. *A. pusillus*, *Blf. Ann. and*

Mag. Nat. History, July 1874, xiv. p. 33. *Blepharosteres agilis*, *Stol. P. A. S. B.* 72, p. 126; *Theob. Rep. Br. Ind.* p. 62; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

Rostral twice as broad as high. Nasals lateral, separated by the single hexagonal præ-frontal. Post-frontals small, separated from each other by the front triangular point of the vertical, the lateral angles of which form sutures with the post-frontals, and the hind elongated angle with the first superciliary on each side, the point extending a little beyond the division of the first and second superciliaries, and meeting the front median angle of the occipital. Occipital heart-shaped, its lateral borders in contact with the second and third superciliary shields; the hollow in its broad posterior margin filled



Ablepharus
Brandti.

by a nearly bell-shaped inter-occipital, which, in all my specimens (8 in number) has a sub-central dusky spot. Post-occipitals rounded behind, meeting above the apex of the inter-occipital; their inner margins form sutures with the outer lateral angles of the occipital and inter-occipital. Loreals two, orbital ring scaly; 3-4 narrow whitish shields between the superciliaries and the orbit; temporals large, the largest in contact with the post-occipital. Upper labials seven; the fifth largest and under the eye; lower labials six. Mental nearly as broad as the rostral; a large shield behind it, also 3-4 pairs of chin shields. Back rather flat, 20 rows of scales round the middle of the body, and 35-36 between the axils of fore and hind limbs. Toes scutate, all clawed, palmar surface of feet granular. A row of enlarged præ-anals. Ear opening small, circular, with 2-3 minute lobules in front. Colour brownish olive above, a narrow whitish line from above the eye on each side, to about the length of the hind limb on the tail; above this in many specimens there is a very narrow dark brown line formed by the upper edge of the scales being tipped that colour; below the white line is another dark brown band extending from the nostrils on each side to nearly the very tip of the tail. Under parts white, with a few small dusky spots on the labials and on the sides of the body. Limbs dusky brown with longitudinal whitish lines extending to the tips of the toes.

Length.—2.75 to 3.12 of the largest specimens I have. Tail 1.87 to 2 inches.

This beautiful little lizard is evidently diurnal in its habits. All the specimens I possess were found during the day in the verandah of the Kurrachee Museum running about after red ants, on which they evidently live, and in no instance were any found, except, as it were, basking in the sun. Mr. Blanford records it from the banks of the Shatel Arab, opposite the town of Bussora, and Dr. Stolickza found it in Kutch.

Eumeces, *Weigman.*

Scales thin, polished, not keeled. Tail rounded, more or less long, with keels or spines. Nostrils in a single shield. Lower eyelid scaly.

Eumeces tæniolatus, *Blyth, J. A. S. B.* 1854, p. 739. *Plestiodon scutatus*, *Theob. Cat. Rep. As. Soc. Mus. Mabouia tæniolata*, *Blyth; And. P. As. B.* September 1871.

Rostral large, subtriangular, as high as broad, behind which the supra-nasals form a suture. Nasal between the first upper labial, rostral and supra-nasal. Præ-frontal single. Post-frontals form sutures with the præ-frontal and vertical, and laterally with the præ-ocular and loreal. Vertical three times as long as its broadest part, followed by a pair of large shields, within the hollow of the sutures of both of which is a bell-shaped inter-occipital, with, as in *Ablepharus*, a small sub-central dusky spot. Post-occipitals form sutures with the sides of the inter-occipital and meet above it, and also with a large temporal plate and the hindmost superciliary. Upper labials 9-10, the 6th and 7th below the eye. Lower labials 9; mental as broad as the rostral with two shields behind stretching across the chin; three pairs of chin shields, the first only in contact with each other. There is a small scale between the second pair. The third pair distant. Superciliary shield 6-7, the third the largest; one post-ocular, one pre-ocular. Two rows of small scales between the upper labials and the disc of the lower eyelid, which is scaly, and a row of small shields between the superciliaries and the upper eyelid. Scales round the middle of the body in 20-21 rows, the dorsal series about three times the width of those on the sides. Anal shields two, sub-caudals 110-120. Toes scutate, all clawed. Ear opening fringed with 3-4 scales. Colour brownish yellow above and below with three broad dark brown lines down the back, all three lines begin from the rostral, and are spotted yellowish; the spots on the lateral line are formed by every alternate scale being tipped yellow. In spirit the yellow changes to a whitish. Tail of the same colour as the body with dark brown specklings in 48-50 irregular bands.

1. Length 10 inches, of which the tail is 6 inches.
2. „ 10.5 „ „ „ 6.25 „

Hab.—Sind and the Punjab, also Cashmere, commonly seen among hedges in and around gardens during the hottest part of the day.

Family, SEPSIDÆ.

Nostrils in the front edge of a small shield contiguous to the rostral.

Sphenocephalus, *Blyth*.

Limbs four, rudimentary, each with three toes, except in *S. pentadactylus*, which has five. Anterior limbs very small, fitting into a groove. Ears invisible. Lower eyelids semi-transparent.

Sphenocephalus tridactylus, *Blyth, J. A. S. B.* xxii. p. 654; *Gunth. Rept. Br. Ind.* p. 98; *Theo. Rept. Br. Ind.* p. 70; *Blf. East. Persia*, p. 395; *Murray, Hdbk., Zool., &c., Sind*, p. 258.—THE CICIGNA.

Rostral triangular, as broad as high, and protruding beyond the mental. Nostrils between two shields contiguous to the rostral in its

lower third. Supra-nasals form sutures with the sides of the triangular rostral and meet at its apex. Præ-frontal single, hexagonal, broader than long, with a concave hinder margin, into which fits the obtuse front of the vertical. Post-frontals widely separated, pentagonal, and a little elongated posteriorly, its lowest part forming a suture with the fourth labial. Vertical very large, broadest behind, and emarginated laterally. Occipital inequilaterally pentangular. Post-occipitals obliquely elongated, in contact with the outer margin of the occipital, but not meeting at its apex. Upper labials six, the fifth the largest, and under the eye. One præ-ocular, one loreal or post-nasal, separated by the post-frontals. A small plate between the lower eyelid and the large upper labial. Superciliaries four on each side, the second the largest, and with the first form a suture with the lateral emarginated border of the vertical. Mental small, with a small shield behind, followed by a large inequilateral pentangular one, which is concave anteriorly and receives the first small shield. These are followed by three other enlarged shields on each side, the first of which only forms a suture with the large chin shield.

Form slender, elongate. Body cylindrical, laterally angulated, flat beneath. Tail not quite cylindrical. Body covered with small smooth lustrous scales. Sub-caudals broader than the adjoining scales. Head conical. Ears invisible. Lower eyelid well developed, semi-transparent. Legs rudimentary; feet covered with imbricate scales. Toes all clawed. Scales on the back obscurely marked with 3-4 pale ridged lines. Colour a very pale whitish brown. In two of five specimens there is a distinct dusky streak from each nostril through the eye to the hind margin of the temporal plate. The other three, which are much darker in colour, have only traces of these.

Hab.—Sind, Beloochistan, Persia, Afghanistan and Punjab, commonly known as *Rigmahi* or Sandfish, from its inhabiting large tracts of blown sand, and sandy soil in general. Used in Sind and the Punjab as a specific for rheumatics and pains in the lumbar region.

Gongylus. *Wagler.*

Head conical. Muzzle rounded. Rostral square. Frontal large. No fronto-nasal and fronto-parietal. Supra-nasals contiguous. Toes 5-5, unequal. Tail round, tapering.

Gongylus ocellatus, *Wagler, Syst.* 162; *D. et B. Erp. gen. v.* 616; *Gunther, Liz.* 123. *Tiliqua ocellata*, *Gray, Ann. Mag. Nat. Hist.* ii. 292. *Scincus tiligugu*, *Gmel. S. N.* 1073; *Murray, Zool., &c., Sind*, p. 258.—THE TILIGUGU.

Rostral large, square, with the nostril in its upper hinder edge. Supra-nasals two, contiguous. Frontal large, septangular, widest in its upper third, the first superciliary shield in contact with its upper lateral margin, and a large square inter-nasal on each side in contact with the lower lateral margin. Superciliaries five. Vertical large, widest in its upper third across the hinder edge of the third superciliary shield on each side, its apex deeply hollowed to receive the small

granular, without tubercles; two tubercles on each side of the sacral region. Tail slightly depressed at the base, verticillate, finely granular above, with an enlarged tubercle on each side of each segment. Sub-caudals very wide, 6-7 times the width of the adjoining scales. Thumb well developed, claw on it small. Upper labials 12-14, with a row of enlarged scales along its superior edge; lower labials 11-12. One pair of chin shields in contact with each other behind the triangular mental and first lower labial; there is also an enlarged scale behind it, followed by other smaller in size along the edges of the labials. Scales of the belly in 36 longitudinal rows. Femoral pores 6 to 8 on each thigh, widely separated in the pubic region. Tail often bulged at the base in old females.

Length.—6-9 inches. Colour greenish grey or olive, with 5 transverse undulating dark bands from neck to loins (not always distinct). Tail similarly banded.

Hab.—Sind, Beloochistan, at Quetta, Punjab, N. W. Provinces, Oudh, Bengal, Sikkim, Khasi Hills, Burma, Kutch, Concan, Deccan, Penang and Patna, usually frequents houses and especially old tombs and mosques in Sind.

Hemidactylus Gleadowi, Sp. Nov. Plate

10-12 upper and 8-10 lower labials; rostral grooved, broader than high; nostrils between the rostral, first labial and three small scales, the latter scarcely differing in size from those covering the muzzle between the rostral and the middle of the orbits; back of the head and between the eye and ear opening covered with round tubercles; upper eyelids distinct, covered with granular scales. Scales on the muzzle closely packed. Ear opening large. Pupil vertical; one pair of chin shields forming a suture with the mental and first lower labial followed by an enlarged one, and others along the edges of the lower labials; the first four situated immediately between each pair of labials, the rest smaller and irregular, forming at the angle of the mouth five distinct rows of enlarged scales. Chin and throat covered with small scales, each with one or two minute black dots. There are 38-39 scales across the middle of the abdomen. Back covered with granular scales interspersed with keeled or sub-triangular tubercles, all smaller than the ear opening in size; the dorsal series are distinctly keeled, those on the sides rounded, the last row very small. There are 15-16 irregular rows of tubercles across the middle of the back. The tail is longer than the head and body, verticillate, and dorsally grooved at the base to the 4th verticel; each of the first three or four verticels with 5-4 tubercles on each side; on the posterior half they are two or three in number, and become indistinct towards the tip; the spaces between the tubercles on the tail are covered with 5-6 rows of granular scales. Sub-caudals enlarged, about 54-58 in number. Femoral pores 13 on each thigh, interrupted by a single scale. The fore leg laid forward reaches the anterior edge of the orbit, 7 pairs of plates beneath the toes, the last undivided.

Colour pinkish grey, a greyish white line from the nostril to the eye, bordered by a dark line above and below; three dark lines



1.



2.



3.



radiating from behind the eye, the uppermost curving behind and nearly meeting on the occiput, the next or central one extends from above the ear opening to the shoulder, and the third or lowest to below the ear opening. Back with 5 imperfect transverse bands. Tail with from 12 to 15 bands.

Length.—Head and body 1.75, tail from the anus 2.5.

Hab.—Rantah forests in Sind, (Jerruck division) lives under the bark of Babool (*Acacia*) trees. Collected by Mr. F. Gleadow, Deputy Conservator of Forests, after whom I have much pleasure in naming it.

Hemidactylus karachiensis*, *Sp. Nov.

Plate

Rostral grooved, slightly broader than high. Upper labials 9-10. Lower labials 8-10. Nostrils between the rostral, first labial and three small shields behind. One pair of chin shields in contact with the mental and first labial, and in some specimens just touching the front edge of the second labial. An enlarged shield behind the chin shield in contact with the second labial, and a row of smaller ones along the edges of the others. A row of enlarged scales about the size of those covering the muzzle along the superior edge of the upper labials. Eyelids covered with granular scales. Pupil vertical. The muzzle, or between the nostril and eye, covered with closely-packed granular scales, larger than those on the head. Ear opening moderate. Occipital portion of the head, back, limbs and tail covered with granular scales and studded with tubercles, those on the head small and round, on the back about one-third the size of the ear opening, sub-trihedral and in 16 rows across the middle of the back. Tail verticillate. The tubercles on it are 3-4 on each side of the verticels, and also slightly trihedral; on the first four rings about as large as those on the back. Tubercles on the hind limbs large and rounded. Sub-caudals 38-40 in specimens with unreproduced tails. Of 30 specimens the tails of all except two are wholly or partially reproduced. Præ-anal pores six, arranged triangularly, and interrupted by a single scale. Scales on the chin granular; on the abdomen nearly rounded, with one or two dark spots terminally, and arranged in 38-40 longitudinal series across its middle. In most specimens there is a longitudinal fold of skin along the middle of the back between the fore and hind limbs; the base of the tail is dorsally grooved; the fore limbs laid forward reaches the hind edge of the eye, and the hind limb to about one-third the distance from the axil of the fore limb. Plates beneath the toes 12-14.

Colour in life pinkish grey, a dark line from the nostril through the eye, extending above the ear opening, and to the shoulder in some well-marked specimens; in others slightly beyond the ear opening only, or to above its posterior edge. A small dark patch on the muzzle; the rest of the facial portion greyish white; back and tail with imperfect transverse bands.

Length.—3.5 to 4 inches, of which the tail is from 1.75 to 2 inches.

Hab.—Sind. Numerous at Kurrachee; found during the day, with *Gymnodactylus petrensis*, under stones which have lain on the ground

for some time, and associated with a species of beetle which lives in the same situation in small holes. Both this species and *Gymnodactylus petrensis* frequent houses after dusk.

***Gymnodactylus petrensis*, Sp. Nov.**

Plate

Rostral grooved, broader than high, 10-12 upper, and 8-10 lower labials. Nostril between the rostral, first labial and three shields slightly larger than the adjoining ones. One pair of chin shield in contact with the mental and the first and second labials. An enlarged shield behind it in contact with and between the second and third labials; a row of smaller ones along the edges of the others. Upper eyelid well developed, covered with granular scales. Pupil vertical; muzzle, or the space between the rostral and posterior edge of the orbits, covered with coarse, rather convex scales, about half the size of the small ear opening. Occipital portion of the head with granular scales, interspersed with large convex tubercles. Back covered with small granular scales, and sharply keeled trihedral tubercles equal to the ear opening in size, and arranged in 12 longitudinal series in the middle, besides a longitudinal series of much smaller keeled trihedral tubercles along the vertebral area between the fore and hind limbs. The number of tubercles between the hind limbs is six. The tail is verticillate, and each ring bears on each side three sharply-pointed keeled trihedral tubercles, larger than those on the back on 10-12 verticels. The tubercles diminish in size after the 10th or 12th verticel to within half an inch of the tip, where the verticels are lost and replaced by keeled imbricate scales. No distinct sub-caudals, but there are a few large bifid scales irregularly arranged. A pair of tubercles on each side of the sacral region. The fore and hind limbs are covered on the outer side with imbricate, keeled scales, and studded with trihedral tubercles; their inner side with flat scales, regularly arranged in longitudinal rows, and the palmar surface bears a few large round tubercles. The fore leg laid forward reaches a little beyond the end of the snout, and the hind leg to beyond the shoulder and nearly to the ear opening. Scales on the chin small and granular; on the abdomen three times the size of those on the chin, and arranged across the middle in 34-35 longitudinal series, irrespective of the 5-6 rows of granular scales between the lowest trihedral tubercle and the distinctly larger scales of the beginning of those on the sides of the abdomen. Præ-anal pores 4 in a straight line. In two out of seventeen specimens there is an ill-defined fifth one.

Colour in life brown, with a pinkish tinge, which is lost in spirit. Five imperfect dusky transverse bands on the back and 11-12 on the tail. Looked at with the naked eye each band on the back appears to be divided into three dusky spots in an angular series, the spot in the centre being behind the two on the sides.

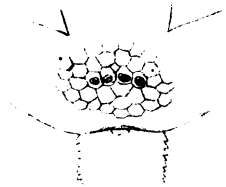
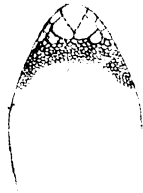
Length.—3 to 3.5 inches, of which the tail is from 1.75 to 2 inches.

Hab.—Sind.

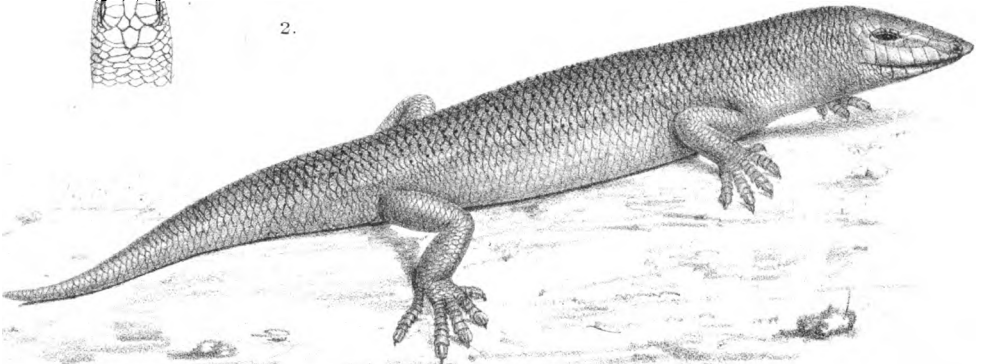
***Stenodactylus*, Cuvier, D. et B.**

"Toes all clawed, cylindrical, pointed at the end, toothed, the side with

1.



2.



denticular cross plates. No femoral nor præ-anal pores. Scales granular, equal. Lower eyelid very short; pupil linear. Tail round, swollen at the base, very slender at the end."—(Gray, *Cat. Liz. B. M.* p. 177.)

Stenodactylus orientalis, *W. Blanford, Journ. As. Soc. Bengal*, vol. xlv. pt. ii. 1876, p. 21; *Murray, Hdbk., Zool., &c., Sind.*, p. 259.

General form stout, somewhat depressed; head flat, short and blunt; tail slightly swollen at the base, thence diminishing regularly, much stouter than in *S. guttatus*, about the same length as the body without the head. Limbs stout; the fore limb laid forward does not quite reach the end of the snout; the hind limb extends to the axil. The largest specimen obtained measures 3·3 inches, of which the head is 0·5 and the tail from anus 1·4. The nostril is situated at the upper outer angle of the rostral, between that shield and three slightly enlarged scales, one of which separates the nasal orifice from the first upper labial. Rostral rectangular, rather higher than the adjoining labials, and about twice as broad; it has a deep vertical groove in the middle, which disappears on its lower portion. Upper labials about 12, lower labials 10-13, both series becoming much smaller behind and passing into the head scales. Mental as broad as the rostral, rounded below. No enlarged chin shields, but the granular scales near the lower labials are a little larger than those of the throat. Upper eyelid well developed, covered with granular scales; lower eyelid wanting. Pupil vertical. Ear opening a vertical slit, not quite equal to the diameter of the eye in length. Upper surface of the head, body and limbs finely granular; over the back there are scattered small convex dark-coloured tubercles; none on the limbs. Lower parts covered with small granular scales, rather flatter than those of the back, but scarcely larger on the abdomen and smaller on the throat. Toes short and thick, all of them finely fringed with short-pointed denticulations, the lower surface with cross plates, each divided into several ribs or tubercles. All the toes furnished with nearly straight claws. Tail finely granular throughout, the granules being disposed in rings.

Colour pale sandy, the tail (and in one specimen the body) with dark transverse bands; a darker line from the eye down each side. The enlarged tubercles on the back are dark brown. In one specimen the sides of the snout and labials are mottled with dusky markings. (*Blanford, J. A. S. B.* vol. xlv. pt. ii. 1876, p. 21.)

Hab.—Sind (South of Rohri, and Hills west of the Shikarpoor district) obtained by Mr. Blanford.

Stenodactylus Dunstervillei, *Sp. Nov.*

Upper labials 15. Lower labials 13-14, with an increasing series of scales, larger than those on the chin and throat, running along their lower edge, there being one between the 1st and 2nd labials, and 7 rows immediately below the middle of the eye. Scales on the chin and throat smaller than those on the belly. Rostral grooved, as high as wide. Nostril between the rostral, first labial and two post-nasals; a scaly fringe

nearly oblong inter-parietal. Post-nasal one. A small shield above the front edge of the eye. A row of six scales between the upper eyelid and superciliary shields, and three shields on each side of and above the fifth upper labial, forming, as it were, a nearly complete scaly ring round the eye. Lower eyelid with a transparent disc, its edge as well as that of the upper eyelid margined with 7-8 scales. Ears distinct. Upper labials 9. Lower labials 6-7; mental wider than the rostral with one large shield behind it, and three others along the edges of the labials on each side, the first of which only is in contact, the others widely separated. The fore foot laid forward reaches the gape. Body sub-cylindrical; 28-30 longitudinal series of scales round its middle. Tail round, tapering; sub-caudals slightly larger than the adjoining scales. Toes scutate, all clawed, the palmar surface of feet covered with sub-imbricate flat scales. Colour, a rich bronze above, with an irregular and broken longitudinal series of white lines down the back to nearly the tip of the tail caused by every alternate or third scale in each series, having a small central white streak, bordered with dark brown. There are about 10 series of these on the back of the head, 15-16 across the middle of the back, and 6-7 on the tail. Entire under parts white or yellowish white.

Length.—8-9 inches, of which the tail is about one-third.

Hab.—Kurrachee and the Persian Gulf.

Family, GECKOTIDÆ.

GECKOES.

Head broad, triangular, depressed. Back and sides generally covered with tubercles or granular scales. Belly covered with rhombic imbricate scales. Tongue thick and short, its basal portion attached to the gullet. Eyelids generally rudimentary, not connivent. Pupil generally erect. Toes generally with apparatus for pneumatic adhesions. Femoral or præ-anal pores in the males only rarely absent. Eggs calcareous, globular.

Ptyodactylus, *Cuv. Wagl.*

Toes slender, dilated at the end, with two diverging series of plates beneath. Body simple. Tail round.—(*Gray, Liz. B. M.* p. 143.)

Ptyodactylus homolepis, *Blanford, Journ. As. Soc. Bengal*, vol. xlv. part ii. 1876, p. 19.

“The general build and appearance of this Gecko are very similar to those of the only other species of the genus, as restricted, *P. hasselquisti*.* General form rather elongate, body round, head broad and high behind, wedge-shaped in front, the region in front of the eyes slightly concave. Limbs elongate; the fore limb nearly reaches the thigh when laid back; laid forward it extends beyond the end of the

* *Stellio hasselquisti*, *Schneider*; *Ptyodactylus hasselquisti*, *Dum. et Bibr.* iii. p. 378; *P. gecko*, *Gray, Cat. Liz. B. M.* p. 151.

snout; the hind limb brought forward comes in front of the shoulder. The only perfect specimen measures rather over $7\frac{1}{2}$ inches, head 1 inch; tail from anus $3\cdot4$ or rather less than the head and body. The nostrils are entirely surrounded by swollen scales, usually 3, but sometimes 4 in number, considerably smaller than the anterior labials. Some of these scales separate the nostrils from the rostral and labials. Rostral rectangular, its height rather more than half its breadth, which is more than double that of the adjoining labials. Upper labials on each side about 15-16, mental pentagonal, narrower than the adjoining lower labials, and very much narrower than the rostral; a row of enlarged chin shields along the lower edges of the anterior lower labials. No enlarged or pointed scales on the upper eyelid. The whole upper surface of the head, body, limbs and tail is finely and almost uniformly granular. Scales of the abdomen flat, not imbricate, very little larger than those of the back; those of the chin and throat smaller, except near the lower labials. Scales beneath the tail irregularly polygonal, considerably larger than those of the abdomen, not arranged in longitudinal rows. Tail not verticillate. Lower surface of limbs and soles of feet covered with smooth scales; toes with simple cross plates, except at the extremity, where they are expanded into a double disc, marked beneath with radiating striæ; claws retractile, minute, but present on all toes. No femoral or præ-anal pores.

“Colour (noted on living specimens) light brownish grey with broad transverse wavy bands of lighter and darker shades, alternating on the back, tail and limbs. There are about five darker bands on the back, the cross bands are closer together on the tail; lower parts white.” (*Blanford, J. A. S. B.* xlv. pt. ii. 1876, p. 19).

Mr. Blandford adds,—“A few specimens of this new Gecko were brought to me near the Maki Nai in the lower portion of the Kirthur Range, which bounds the province of Sind on the west. The locality whence the types were obtained was in the Mehur division of the Shikar-poor district; this is the second species of the genus as restricted, and the first which has been found in Asia; the other species *P. hasselquisti*, which is found in Egypt, is distinguished from this by having enlarged tubercles on the back, and the nostrils in contact with the first upper labial and rostral.”

Hab.—Sind.

Hemidactylus, *Cuvier*.

Fingers and toes dilated, ovate, with a double row of transverse, pneumatically adhesive plates beneath. Sides of the trunk without cutaneous appendage. Toes and claws 5 on each foot. Tail with the lateral edge not serrated.

Hemidactylus cocteau, *D. et B.* iii. (1836), p. 365; *Cantor Mal. Rept.* p. 23; *Gunth. Rep. Brit. Ind.* p. 109; *Theob. Rep. Brit. Ind.* p. 77; *Murray, Hdbk., Zool., &c., Sind*, p. 259.

Rostral grooved above. Nostrils in its upper hinder edge, surrounded by three scales larger than those on the muzzle. Back uniformly

of skin extending from the centre of the rostral above the nostrils on each side to the fourth labial and forming a deep groove. Head and back covered with small sub-equal scales above and below; mental about the size of the rostral and rounded behind; a distinct fold under the throat. Ear opening a transverse slit. Upper eyelids distinct and well-developed, covered with granular scales. Toes long, clawed, 5-5, fringed at the sides and with transverse rows of plates below. No femoral or præ-anal pores. Tail not complete, being reproduced. The scales of the back and sides run so imperceptibly on to the abdomen that it is not possible to count them with accuracy as to their number. I count 115. Pupil vertical. Colour pinkish. A dark brown band from behind the eye extending along each side and meeting at the base of the tail, another across the eyes; a spot in the centre of the head of the same colour; there is also a narrow band across the back of the neck, a nearly perfect triangular or V mark following, and two oblique bars; also a narrow line issuing from the last from the middle, on to the base of the tail. Limbs reticulated with greyish brown, forming roundish white spots.

Locality.—Halla (Sind) found on blown sand, at the roots of *Calotropis* bushes.

Bunopus, *W. Blanford*.

Toes slender, not fringed at the sides, covered below by cross plates which are furnished with projecting tubercles. (*Eastern Persia*, pl. xxii. fig. 4a.) General form as in *Gymnodactylus*. Differs from *Stenodactylus* in the absence of fringes to the toes.

Bunopus tuberculatus, *Blanf. Eastern Persia*, p. 348; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

General form moderately depressed; the head higher and broader in proportion to its length in adult specimens than in young ones. Back granular, with numerous enlarged tubercles in about 14 longitudinal rows (not very regular) larger, and as a rule trihedral on the centre of the back and base of the tail, where they are often nearly as large as the ear opening, smaller and convex on the back of the neck and on the sides. The larger trihedral tubercles are nearly as broad as long. Pupil vertical. Nostril between the rostral, first labial and three small shields behind, the latter scarcely larger than the granular scales covering the muzzle. Rostral about as broad as high, grooved above. Mental rather broad. Upper labials 10-12; lower labials 8-10. No enlarged chin shields behind the mental; but a row of scales along the edges of the labials larger than those on the throat. Ear opening small. Chin and throat covered with small granular scales. Abdomen covered with flat, hexagonal sub-imbricate scales in about 25-30 rows across the middle. A row of præ-anal pores between the thighs in a straight line, usually seven in number, sometimes 6 or 8. Tail when perfect longer than head and body, verticillate, each ring being terminated by a row of large closely-set carinate scales, wanting below and in the centre above. No enlarged

sub-caudals. Limbs moderate, granular above, with scattered enlarged tubercles, the granular scales larger and flatter below, on the thighs especially. Toes and fingers rounded, rather short, and covered with small imbricate scales above. Colour sandy with dark spots, taking more or less the form of cross-bands on the back and tail. Dark marks from the nostrils on each side through the eye, sometimes meeting each other on the occiput. A dark interrupted line on each side from behind the eye, along the side of the back.

Hab.—Mr. Blanford says—"It abounds in parts of Beloochistan, being found in houses and under stones on the hill sides." Specimens were also collected in Sind by Mr. Blanford.

Pristurus rupestris, *W. Blanford, Eastern Pers.* pl. xxiii. fig. 1, 1a, p. 350; *Ann. and Mag. Nat. Hist.* June 1874, xiii. p. 454; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

Plate

Scales of the back, sides and upper part of head and limbs equal, not imbricate, round, convex. *Back not crested.* Tail compressed laterally, indistinctly verticillate, with a low crest of flat spines, their points directed a little backward along the top; none below. Scales of the sides of the tail equal, granular; those below rather larger and flatter. Scales of abdomen round, flat, a little larger than those on the back, and passing so gradually into the convex scales of the sides, that it is difficult to estimate the number. No femoral or præ-anal pores. Pupil round. Upper eyelid slightly developed; no lower eyelid. Nostril directed laterally upwards between the rostral and about three scales, two of which on each side of the nostril are enlarged, the outer of these separating the nostril from the first labial; the other enlarged scale does not meet the corresponding one on the opposite side of the rostral. Rostral large, cleft above. Mental larger and broader than the rostral. Upper labials 6. Lower labials 3. No enlarged chin shields behind the labials.

Limbs rather elongate, the fore limb laid forward reaches the end of the nose, and laid back extends to the thigh; the hind limb laid forward comes nearly or quite to the ear. Toes 5-5, slender, rounded, with minute claws. Scales above the limbs similar to those on the back, those on the inner anterior side of thigh and below the tarsus larger and flat, those above the toes imbricate. Beneath the toes there are cross plates as in *Gymnodactylus*, scarcely so broad as the toes, the plates beneath the joints of the toes being longer but not broader than the others.

Colour olive grey, a pale band down the centre of the back, the back and sides with rufous spots, forming broken longitudinal lines, those on the back larger than those on the sides, and with a white hinder margin. These spots disappear in spirit. A narrow dark line from nostril to the eye, continued a short distance behind the latter. Chin covered with dark spots.

Length.—2 to 2.5 inches, of which the tail is 1.25 to 1.5.

Hab.—Kurrachee, Jask, Muscat, Arabia, and north west of Bushire.

Eublepharis, Gray.

Eyelids well developed. Toes not dilated, all clawed. Pupil sub-elliptical; tympanum thin, deeply sunk.

Eublepharis hardwickii, *Gray, Zool. Journ.* iii. p. 223; *Gunther, Rep. Brit. Ind.* p. 119, pl. xi. fig. B; *Theob. Cat. Rep. Brit. Ind.* p. 94; *Murray, Hdbk., Zool., &c., Sind*, p. 258. *Gymnodactylus lunatus*, *Blyth, J. A. S. B.* 1874, p. 633.

Plate

Rostral with a slit mesially in its upper half and broader than high. Nostrils directed laterally and upwards, and placed between the rostral and first labial. One pair of chin shields and 4-6 enlarged shields behind it in transverse line. 9-10 upper and lower labials. Back granular, covered with large ovate convex tubercles. Tail cylindrical, verticillate, each verticel with 3-4 conical tubercles on each side. Scales of the abdomen sub-imbricate, six-sided, in 30 longitudinal series; 17 pores in an angular series in the præ-anal region.

Colour—top of head (in the young) black from rostral to behind the occiput, with a central white V mark and a transverse line below it. A white horse-shoe-shaped band on the nape, extending to the gape. Upper and lower labials and chin white; back banded dark brown and white, there being one white band across the fore limbs, one in the middle of the back, the third in front of the hind limb. There are five bands on the tail, the tip being black. In the adult the colouring is different; the crown is marked with dark blotches on a white ground, the dark bands across the body and tail are also broken up, but the banded appearance is present.

Hab.—Sind, Punjab, N. W. Provinces, Bengal and Southern India. In Sind it is found with the next species in the more desert tracts, under large stones, stone heaps and old timber; rather numerous from July to September. Both species are considered venomous by the natives, among whom they are known as the "*Khun*," the Biskobra of Europeans, &c. It is a question whether this and *E. macularius* are distinct species, both are found associated, and I am inclined to the belief that *macularius* is the very adult form of *E. hardwickii*.

Eublepharis macularius, *Blyth, J. A. S. B.* 1854, p. 738; *Murray, Hdbk., Zool., &c., Sind*, p. 258; *Theob. Rep. Brit. Ind.* p. 94. *G. fasciolatus*, *Gunth. A. and Mag. Nat. Hist.* vol. xiv. p. 429.

Sides and back covered with oval tubercles, widely separated by closely-packed granular scales. Nostril in a single shield above the first labial. Eleven upper and lower labials. A pair of large chin shields behind the mental with four smaller ones in transverse series behind it. Fingers more slender and longer than in *Hardwickii*. Tail verticillate, with eight large tubercles transversely arranged along the hinder margin of each verticel.

Colour translucent, pink or fleshy grey in young specimens, with a broad band across the nape, two more across the back, another in the sacral region, and three more, besides its black tip across the tail. A few black tubercles on the body, otherwise spotless. In adults these bands change to ocelli. Grows to 1 foot in length.

Hab.—Sind, Punjab, North-West Provinces. In Sind associated with *E. hardwickii*.

Family, AGAMIDÆ.

AGAMES.

Head covered with numerous small flattish or convex shields. Tongue thick, attached to the gullet along its whole base, not, or but slightly, notched in front. Scales of the back, sides and belly imbricate, generally rhombic. Tail long, tapering, not fragile. Eyelids well developed. Pupil round. Nostril in a separate plate. Teeth implanted on the edge of the bones of the jaw, with generally a pair of canines in front of either jaw. Limbs well developed.

Calotes, Cuvier.

Tympanum naked. Back and sides covered with scales, equal in size and regularly arranged, the tips of those on the sides being directed backwards and upwards. Dorsal crest present, formed by non-united spines. Gular sac slightly developed. Sub-caudals as broad as long. Femoral pores none.

Calotes versicolor, *Daud. Rep.* iii. p. 395; *D. et B.* iv. p. 405; *Gunth. Rep. Brit. Ind.* p. 140; *Theob. Rep. Brit. Ind.* p. 109; *Murray, Hdbk., Zool., &c., Sind*, p. 258. (*Surrud*, Hind., Deccan).—THE BLOOD SUCKER.

Two small groups of spines perfectly separated above each tympanum. No fold before the shoulder. Dorsal crest moderately elevated on the neck and anterior part of the trunk, extending on to the root of the tail in large individuals, and gradually disappearing on the middle of the trunk in younger ones. Scales behind the lower jaw much smaller than the others. Gular sac not developed. From 39 to 43 series of scales round the middle of the trunk. Colour variable, sometimes uniform brownish or greenish olive, or yellowish. Generally broad brown bands across the back and a pale lateral band. Two black specks on the occiput, and some streaks radiate from the eye. Young and half-grown specimens have a dark black-edged band across the inter-occipital region.

Seasonally the males assume a brilliant garb. Body bright red, extending to the loins; tail and limbs black; head and neck yellowish.

Hab.—Sind, Beloochistan, Afghanistan, and throughout India, Ceylon, Burmah and Tenasserim.

Calotes viridis, *Gray, Ann. Mag. Nat. Hist.* 1846, vol. xviii. p. 429; *Theob. Rep. Brit. India*, p. 110; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

Nape with two isolated spines above the ears. Neck without any pit in front of the shoulder, but with dark spots at the hinder part of the lower jaw. Eyebrows not horned.

Colour green. Scales large; at base of tail larger; of limbs and under side of the body smaller; of crown smallest; nape and shoulders with a compressed crest. Hinder part of back and tail with an obscure keel.

Hab.—Upper Sind, Beloochistan, Punjab, S. India and the Deccan.

Phrynocephalus, Kaup.

Head short, depressed, obtusely rounded in front, covered with small shields; those on the snout and occiput largest and convex. Nostrils in front of the snout directed upwards and forwards. Tympanum hidden. Body and tail depressed, covered with very small scales. Throat with a transverse fold. No dorsal crest whatever. No præ-anal and femoral pores. Viviparous. No canthus rostralis. A distinct groove runs round the upper jaw above the labial shields. Eyes rather small. Eyelid well developed.

Phrynocephalus olivieri, *Dum. et Bib. Erp. Gen.* p. 517; *Blanf. Eastn. Persia*, p. 237; *Gunth. Rep. Brit. India*, p. 160. **Phrynocephalus tickelli**, *Gray, Cat. Liz. Brit. Mus.* p. 260; *Gunth. Rep. Brit. India* p. 160.—OLIVIER'S OR THE AFGHAN PHRYNOCEPHALE.

Tail depressed at the base, slender, not prehensile, with a series of small spinous tubercles along each side of its basal portion. Scales of the upper parts of equal size, except in the sacral region, where some larger ones are intermixed with the others. Upper labials 31, most of which are triangular and slightly pointed. The hind leg extends to the eye if laid forward. Tail with broad, alternate, whitish and blackish rings. Colour variable. Mr. Blanford notes the colours of living specimens as olive grey, drab or dusky. Along the middle of the back a well-defined oval patch from shoulder to loin, one-third of which is pink or pale purplish. A dark band across the back behind the shoulders, another in front of the thighs, often united by longitudinal bands, one along each side.

Length.—From 3·5 to 4·5 inches.

Hab.—Sind, Beloochistan, Afghanistan, Southern Persia and the Punjab. Inhabiting holes in gravelly situations or barren wastes.

Stellio, Daudin.

Body depressed. Scales of back and sides unequal in size and shape. Tail round. Scales irregularly verticillate. Throat with a cross fold. No gular sac; no femoral or præ-anal pores, but thickened spongy scales in the præ-anal region. Tympanum naked.

Stellio melanura, *Blyth; Theobald, Rep. Brit. India*, p. 117; *Murray, Hdbk., Zool., &c., Sind*, p. 259. *Laudakia melanura*, *Blyth, J. A. S. B.* 1854, p. 737.

Eight rows of enlarged keeled scales on the middle of the back, the keel forming longitudinal lines. No enlarged scales on the back of

the neck, except those forming the nuchal crest. Scales of the sides in transverse rows granular, with a minute apical spine and without enlarged scales among them. 17 upper and 15 lower labials.

Colour olive grey, speckled with darker, some scales paler. Throat and below the shoulders beautifully marked with greyish black:

Length.—11—14 inches, of which the tail is 7·7.

Hab.—Sind, Western Himalayas, Simla and Cashmere. A specimen I have from the north of Jacobabad has 10 enlarged scales in the middle of the back, and, except on the vertebral line and on the tail, the keel on the scales is indistinct; *length* head and body 5 inches, tail 12 inches=17 inches; the rostral is three times as wide as high.

Stellio nuptus, *De. Fil. Gior. dell. I. R. 1st Limb. vi. 1843*; *Blanf. East. Persia*, pl. xix. fig. 1. p. 317.

General form rather stout. Head and body depressed. Tail long, $1\frac{1}{2}$ or twice the length of the head and body. Head rather flat, triangular, broader in males than in females. The breadth of the ear orifices in the former being equal to the length. The fore leg laid back extends to the thigh; in some specimens falls somewhat short of it; hind limb nearly reaches the ear when laid forward. Scales on upper surface of the head mostly smooth, especially those of the supra-orbital and occipital regions. On the snout the scales are bluntly keeled. Nostril of moderate size, directed a little backwards, and situated on the *canthus rostralis*, which is sharp just in front of the superciliary ridge, and then appears interrupted by the nostril. Two or three scales between the nasal shield and the rostral, and the same number between the former and the upper labials. Rostral nearly twice as broad as it is high, and twice the breadth of the supra-labials. Mental (lower rostral) same breadth as the rostral, but longer and pointed behind. Labials very little larger than the adjoining scales, about 15 or more on each side. Scales of the side of the head keeled, those near the upper labials longitudinally elongate; margins of the tympanum, sides, and back of neck ornamented with groups of flattened spines, two on each side of the neck, the posterior pair more widely separated than the anterior ones. Round the tympanum are five almost equi-distant groups, the largest bearing the longest spines, being just behind the ear opening, and there are three or four much smaller groups in an horizontal line under the ear, the hindmost of them being at the extremity of the anterior throat-fold. Some of the scales on the throat in old specimens have distinct spines. Scales of the occiput keeled; of the back imbricate, equal in size, all keeled and terminated by small points. Fifteen or sixteen (13-19) enlarged scales across the centre of the back, arranged in slightly oblique lines converging behind, separated at the sides from the small rhomboidal scales of the flanks. Ventral scales also rhomboidal, larger than those of the sides, though smaller than those of the back, and arranged in transverse and oblique series. No enlarged or tubercular scales on the sides. Scales above the limbs and tail sharply keeled, terminating in points. Scales above the shoulder are almost spines in some specimens. Scales

on the lower part of the tail not keeled near the base, and are in more or less distinct rings. A double fold beneath the chin, a distinct one across the back of the neck, single in the middle, more or less double at the sides; from the side of the neck another fold begins, which runs upwards and backwards above the shoulders, and then descends gradually along the sides to the anterior lower portion of the thigh. There are in the males only 3 or 4 rows of thickened scales in front of the arms, and a small oval patch 5-7 scales long and 5 or 6 broad, of similar thickened scales in the centre of the abdomen.

Colour pale yellowish brown, sometimes more or less dusky. Chin cobalt blue, mottled and veined with yellow.

Length.—16-17 inches, of which the tail is 10-11.

Hab.—Upper Sind near old mosques, &c.; also Beloochistan, Afghanistan, Southern and S. E. Persia.

Trapelus, Cuv.

Head convex, covered with unequal scales. Paratoids unarmed. Eyelids with a fringe of small scales. Back not crested, covered with imbricate scales. Pores on the front edge of the vent. Ears with small scales in front.

Trapelus megalonyx, *Gunther, Rep. Brit. Ind. p. 159; Theobald, Rep. B. Ind. p. 118.*

Head short, triangular, covered with small convex shields. Canthus rostralis absent. Supercilium formed of rather long narrow shields. Nostrils in front on the snout. Rostral the size of the upper labials, which are square and 38-39 in number all round. Upper margin of the tympanum denticulated. Throat with a transverse fold across, and covered with small smooth scales. No crest on the neck. Body covered with small keeled scales, irregularly arranged; ventral scales small, also irregularly arranged, indistinctly keeled, and in about 22 oblique series between the fore legs. No anal pores in the female. Tail covered with imbricate keeled scales. The fore leg laid back reaches beyond the hip joint. Hind leg laid forward extends to the eye. Fingers with long claws, and with three series of spines below. Colour greyish, marbled with brown, with six ocellated spots along the vertebral line.

Length.—8-10 inches, of which the tail is about one-half.

Hab.—Sind and Afghanistan. Stolickza also obtained a specimen in Sind, which is now, or was, in the Indian Museum at Calcutta in 1872.

Trapelus ruderatus, *Olivier, Voy. Emp. Oth. Eg. et Pers. ii. p. 429; Gray, Cat. Liz. Brit. Mus. p. 258; Anderson, P. Z. S. 1872, p. 384.*—THE VARIABLE TRAPELUS.

Head short, triangular. Canthus rostralis very small. Rostral little larger than the labial; 7-8 long shields behind the nostril along the superciliary edge to the hind edge of the eye-brow, and 4-5 between the two nostrils, which are lateral and directed upwards. Throat with a cross fold; upper lip fringed with 18-20 scales on each side. Scales

of the head and sides of the head tubercular; of the back imbricate, keeled, and gradually increasing in size towards the tail, on which it is twice the size of the largest on the back. Limbs and toes covered with keeled imbricate scales. Ventral scales indistinctly keeled and in 24-26 series between the fore legs. Length 8 to 8½ inches, of which the tail is 5 to 6½. Colour sandy, or greyish, or pale brown, with a longitudinal paler, or pale white stripe on the neck, and a series of 6 oval patches on the vertebral line, laterally edged with black in females and red in males, with two rows of sub-quadrate spots on the sides. Tail with 12-14 dark brown bands, not extending on its under surface, which, like the entire lower parts, is white, or yellowish white. Limbs with dark patches, each with a mesial yellowish vertical streak, which is indistinct in some specimens; there are also 2-3 dusky bands across the forehead. Claws dark brown in most specimens.

Hab.—Sind (Kurrachee) Bushire, and Shiraz in Persia.

Trapelus rubrigularis, *Rupp.*; *Murray, Hdbk., Zool., &c., Sind*, p. 259.—THE RED-THROATED TRAPELUS.

Head short, bluff, covered with unequal sized, rather convex and faintly keeled scales. Superciliary edge covered with smooth imbricate plates in 3 series. Nostril in a single shield placed anteriorly and directed upwards. Rostral nearly three times the size of the upper labials, its upper edge separated from the nostril by two small shields. A median series of enlarged scales on the head, the last of the series with a sub-central depression and three or four larger shields behind. Eyelids scaly, the edges fringed. Ear sunk, with two or three scales on its hinder edge. Upper lip surrounded by 30—32 scales. Back covered with indistinctly keeled imbricate scales, with some distinctly keeled larger ones interspersed. Ventral scales smooth in 22-24 series across the fore legs. Legs slender, covered inside and out with imbricate keeled scales, also the palmar surface of the feet. The fore leg laid back reaches a little beyond the axil of the hind leg, and the hind leg laid forward reaches the hind edge of the eye.

Colour greyish with a longitudinal interrupted dark brown band on each side of the back from the nape, and another from the side of the neck on each side to the shoulder. In well-marked specimens two dark lines behind the eye, and five rather oval white spots on the vertebral line. Tail with 10-12 transverse dark bands. Throat with a patch of red, rest of under parts China white.

Length.—3 to 3½ inches, of which the tail is 1¼ to 1½.

Hab.—Shikarpoor, Temple Deyra (Upper Sind), Nari base, Muscat, Beloochistan and Persia.

Agama agilis, *Oliv. Voy. Ottom.* ii. p. 428, pl. xxix. fig. i.; *D. et B. E. G.* iv. 497; *Anderson, P. Z. S.* 1872, p. 384; *Murray, Hdbk., Zool., &c., Sind*, 259.—THE AGILE AGAME.

Muzzle short, blunt. Nostrils small, situated behind the 3rd scale from the margin of the upper jaw. A fold before each shoulder. Scales on the forehead convex, larger on the back of the head. Dorsal scales

imbricate, distinctly keeled, and ending in a point. Scales of the belly sub-imbricate, smooth. Ears with some small spines above it. A small group of spines on the nape. Back not crested. Tail long, conical. Colour dark sandy above, the scales tinged bluish on the back. Chin, throat, and sometimes the entire under parts, chiefly the sides of the body, cobalt blue. Tail banded.

Hab.—Sind, Punjab, Beloochistan, Afghanistan, Persia and Arabia.

Uromastix, *Merrem*.

Tympanum naked. Scales minute, granular, of equal size. Tail depressed, surrounded by rings of spinous tubercles, not extending on its lower side. Throat with a transverse fold. No dorsal crest. Ventral scales smooth. Femoral and præ-anal pores present.

Uromastix hardwickii, *Gray*, *Zool. Journ.* iii. p. 219; *Gunth. Rep. Brit. Ind.* p. 155; *Theob. Cat. Rep. Brit. Ind.* p. 119; *Murray, Hdbk., Zool., &c., Sind.* *Uromastix reticulatus*, *Cuv. Regne. Anim.*

Head short, obtuse; body and tail depressed; eyes rather small; eyelids scaly; snout covered with small shields; nostrils lateral; rostral shield the width of nearly 4 labials; upper labials 12 on each side, the hind ones lobate. Tympanum deeply sunk, fringed with small tubercles in front. A series of large scales from behind the mental towards the temporal region, separated from the lower labials by a granular interspace. Skin of the throat lax, and with several folds. Back covered with unequal-sized granular scales. Tail very broad anteriorly, tapering behind, ringed with transverse series of spinous shields, with granular interspaces. Lower part of tail smooth, covered with small scales, but larger than those on the belly; outer side of thigh of hind leg covered with spinous tubercles. A series of 16-18 pores on each thigh, interrupted in the pubic region. Toes of the anterior pair of feet covered above with sub-imbricate scales, below there are large cross-plates with 3-4 denticulations in front, and an indistinct keel mesially, those on the hind feet the same, but with less broad cross-plates.

Colour yellowish grey, clouded or waved with blackish or reddish brown transverse lines; in some specimens two to three dark lines radiate from in front of the eye. Occasionally a black spot inside of each femur; attains to a length of 15 inches.

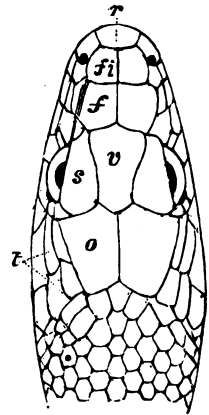
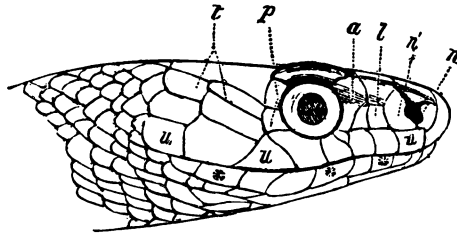
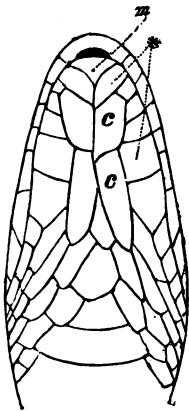
Hab.—Sind, N. W. Provinces, Punjab, Beloochistan, beyond Sibi (not met with at Quetta) and India generally.

ORDER—OPHIDIA.

SNAKES.

Body exceedingly elongate, without limbs or rudiments of limbs; rudimentary pelvic styles scarcely visible externally. Belly covered with broad plates. Head covered with shields. The ribs perform the functions of locomotion, and are articulated with the vertebral column. Sternum none. Tail conical, tapering. Rami of mandible united in front by an

elastic extensible ligament; generally both jaws and palate provided with teeth. Eyelids none. Integuments with numerous scale-like folds, rarely tubercular.



r Rostral.
 fi Anterior frontal.
 f Posterior frontal.
 v Vertical.
 s Superciliary.
 o Occipital.

n, n' Nasals.
 l Loreal.
 a Anterior ocular or orbital; anteorbital or præorbital.
 p Posterior ocular or orbital; post-ocular or post-orbital.

u, u Upper labials.
 t, t Temporals.
 m Mental.
 ** Lower labials.
 c, c Chin-shields.

Ophidians are divided into three Sub-Orders:—

1. Harmless colubrine snakes, without grooved or perforated fangs in front.
2. Venomous colubrine snakes, with a grooved fang.
3. Viperine snakes, with a permanently erect perforated fang.

SUB-ORDER I.—HARMLESS COLUBRINE SNAKES.

Snakes without grooved or perforated fang-like teeth in front. Poison glands none.

Family, TYPHLOPIDÆ.

BLIND SNAKES.

Body cylindrical. Head short, not distinct from neck. Tail short. Body and tail covered with rounded polished imbricate scales, equal in size and form above and below. Fore part of the head covered with large shields. Upper labials four. Eyelids rudimentary. Cleft of the mouth inferior, short and narrow; a few teeth in the upper jaw only, none in the lower or on the palate. Maxillaries short. Mandibles feeble. Rudiments of hinder limbs hidden beneath the skin.

Typhlops, Dum.

Snout covered with large shields; rostral larger, rounded in front; præ-ocular present; nostril laterally in front of the snout.

Typhlops braminus, *Cuv. Cat. Regn. Anim; D. et B. vi. p. 309; Cantor. Mal. Rep. p. 52; Gunth. and Theob. Rep. Brit. India. Eryx braminus, Daud. Rep. vii. p. 379; Ind. Serp. i. p. 48, pl. 43.*

Rostral not much broader above than below. Nasal entirely separate from the fronto-nasal, but in contact with the præ-ocular, below the fronto-nasal. Nostril lateral. Upper part of the fronto-nasal almost as broad as the rostral; it extends rather more backwards than the rostral, but it does not touch its fellow from the other side. Præ-ocular as large as the ocular. Eye distinct. Labials four, the first in contact with the rostral and nasal; second with nasal and præ-ocular, but not with the fronto-nasal; third slightly ascending between præ-ocular and ocular; fourth below the ocular and extending further backward than the latter shield. Frontal, supra-oculars and parietals equal in size. Body rather thicker behind than in front, the circumference in the middle is about 1-13th of its total length. Tail slightly curved, short, terminating in a minute spine. Scales of body in 20 longitudinal and 316 transverse series.

Colour uniform brown, paler beneath. Upper shields of the head with a faint crenellated whitish marginal line.

Length.—8 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Kutch, Guzerat, Concan and Deccan, generally distributed throughout the Indian Continent and Archipelago. Common also in Ceylon, China and Nepal.

Typhlops porrectus, *Stol. J. A. S. B. 1871, p. 426.*

Rostral narrowed behind, broader above than in front. The nasal touches the fronto-nasal in front towards the rostral, but is disunited below. The fronto-nasals extend behind the rostral, but without meeting. The nasal is in contact with the first and second labials. The fronto-nasal touches the second labial only. The præ-ocular is in contact with the second and third, and the ocular with the third and fourth labials. The eye is very indistinct, situated below the anterior part of the suture, between the supra-ocular and the ocular. The first upper labial is very small, and in young specimens hardly traceable; the second distinct; the fourth considerably higher and longer than the third. All the head shields finely punctate. Scales of the body in 18 longitudinal and 440 transverse rows in adults.

Colour above pale chocolate or leaden brown, shading into paler below. Grows to 11 inches. Circumference of body $\frac{1}{2}$ of entire length.—(*Theob.*)

Hab.—Sind (Kurrachee) Punjab, N. W. Provinces, Oudh and Bengal.

Family, OLIGODONTIDÆ.

OLIGODONTES.

Body cylindrical or slightly compressed, rather rigid. Head short, blunt, sub-conical, not distinct from neck, ornamented with symmetrical arrow-shaped markings. Body and tail with rounded smooth scales, in 15, 17, 19, or 21 rows. Sub-caudals in two rows. Nostril lateral. Eye of moderate size, with round pupils. Rostral more or less enlarged, flat in front, more or less produced backwards. Maxillary teeth few, the last longest, not grooved.

Oligodon, *Boie*.

Rostral more or less extended backwards. Loreal occasionally absent, two pairs of frontals, one præ-ocular, one or two post-oculars. Scales smooth in fifteen or seventeen rows. Palatine teeth usually absent.

Oligodon subgriseus, *D. et B.* vii. p. 59; *Gunth. Rep. Brit. Ind.* p. 207; *Theob. Cat. Rep. Brit. Ind.* p. 146.

Scales in 15 rows; loreal distinct, exceptionally united with the posterior frontal. One præ-ocular, two post-oculars. Upper labials seven, the 3rd and 4th entering the orbit. Temporals 1 + 2. Ventral shields 180 (187-189)202. Sub-caudals 48-54. Head with symmetrical brown black-edged markings. Back with numerous narrow, rather irregular, reticulated cross streaks, formed by the black edges of some of the scales, and interrupted by three or more less distinct narrow whitish lines, one of which runs along the vertebral line. Belly white, occasionally a minute black dot on the lateral edge of every second or third abdominal shields. Grows to 17 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Anumally Mountains, and southern parts of the Indian Peninsula.

Cyclophis, *Gunther*.

Form slender; head rather distinct from neck; shields of head regular. Loreal present or confluent with nasal. One nasal shield pierced by the nostril. 1-2 præ-oculars, 2 post-oculars. Scales smooth, in fifteen rows. Eye of moderate size; pupil round.

Cyclophis frænatus, *Gunther, Cat. Colub. Snakes, B. M.* p. 120; *Rep. Brit. Ind.* p. 230; *Theob. Cat. Rep.* p. 157; *Murray, Hdbk., Zool., &c., Sind*, p. 261. *C. monticola*, *Blyth (not Gunther)*; *Blanfd. Eastern Persia*, p. 408.

Head broad, scarcely distinct from neck. Rostral small, as high as broad. Anterior frontals much broader than long, sub-quadrangular, not quite half as large as post-frontal; vertical broad in front, with the lateral margins converging behind; superciliaries broad behind. Occipitals longish, rounded behind. One præ-ocular, not extending to the upper surface of the head, two post-oculars, one loreal, which is square. Seven upper labials, 3rd and 4th forming the lower part of the orbit. Temporals large, 1 × 2. Two pairs of elongate chin shields, the anterior in contact with four labials. Scales smooth, in fifteen rows. Ventral 165, without keel, slightly bent up the sides. Anal bifid. Sub-caudals 95.

Crown of the head, back and posterior part of body uniform olive. A broad black band begins behind the eye, becomes gradually narrower and disappears in the second fifth of the total length; a second streak or zigzag line from the throat, along the outer edges of the ventrals, a third intermediate between the band and zigzag line, disappearing with the first.

A single specimen from Upper Sind in a very bad state of preservation, and badly injured.

Hab.—Sind, Afghanistan and Fao (Mesopotamia); also the Khasia hills? (*Theob.*). Probably occurs in Persia.

Cynophis, Gray.

Form somewhat slender and compressed. Head narrow. Tail one-fifth of total length. Eye of moderate size. Pupil round. Nostril lateral, between two plates. One præ-ocular. Scales slightly keeled or with a pair of apical grooves, in 25-27 rows. Anal entire. Teeth numerous in the jaws and palate.

Cynophis helena, *Daud. Rep. vi. p. 277*; *Gunth. Rep. Brit. Ind. p. 247*; *id. Colub. Snakes, p. 95*; *Theob. Rep. Br. Ind. p. 167*. *Cynophis bistrigatus, Gray, Ann. and Mag. Nat. Hist. 1849, iv. p. 246*.

Head narrow, flat, rather distinct from neck. Snout long, obtusely rounded. Rostral rather broader than high. Anterior frontals small, $\frac{1}{3}$ or $\frac{1}{4}$ the size of the posterior frontals. Post-frontals large, rather longer than broad. Vertical nearly twice as long as broad, triangular behind, with the lateral margins convergent. Occipitals elongate, obliquely truncated behind. Loreal longer than high. One præ-ocular, generally in contact with the vertical. Two post-oculars. Nine upper labials, the fifth and sixth and sometimes the hinder margin of the fourth entering the orbit; the fourth sometimes divided. Anterior chin shield in contact with 5 or 6 lower labials. Scales on the back slightly keeled, in 27 rows. Ventrals 220-238. Anal entire. Sub-caudals 85-94. Each maxillary armed with twelve teeth, the middle rather longer than the others.

Colour reddish olive, with numerous more or less distinct, reticulated, black, transverse bands across the anterior part of the back, each of which encloses two white ocelli on either side of the body, one above the other; posteriorly these are replaced by a broad lateral brown band running to the tip of the tail. Neck with a pair of parallel longitudinal black bands above, and with an oblique black band on the side. A black line along the occipital suture; another oblique one from the eye, along the edge of the seventh labial; lower parts white. Grows to 42 inches. Tail about a fifth.

Hab.—Sind (Kurrachee) Rajputana, Kutch, Southern and Central India, and the Deccan (Poona).

Gen. Ptyas, Fitz.

Body elongate, rather compressed. Tail one-third or more the total length. Head distinct from neck. Eye large. Nostril between two

shields. Præ-oculars 2. Loreals 2-3. Scales smooth, feebly keeled, and in 15-17 rows. Ventrals not keeled. Anal bifid.

Ptyas mucosus, L.; *Gunther, Rep. Brit. Ind.* p. 249; *Theob. Rep. Br. Ind.* p. 168. *Coryphodon blumenbachi*, *Merr. Tent.* p. 119; *Gunther, Colubrine Snakes, Br. Mus.* p. 111.—THE INDIAN RAT-SNAKE.

Head broad, distinct from neck. Rostral deeply indented beneath, as broad as high. Nostrils between two shields, their upper edges in contact with the præ-frontal and rostral. Præ-frontal not quite half the size of the post-frontal. Post-frontal bent down on the side touching the loreals and hinder nasal shield. Vertical longer than broad, three-sided posteriorly, nearly straight behind the post-frontal, with its lateral margins concave; it is longer than its greatest breadth. Occipitals truncated behind, with two elongated temporals on each side of their outer margin, the anterior in contact with the post-oculars. Upper labials 8, the fourth and fifth entering the orbit. Loreals 3, præ-oculars 2, the upper large, and extending on to the upper surface of the head between the superciliary and post-frontal, but not touching the vertical. One large projecting superciliary. Scales in 17 rows (19 on the neck), the vertebral series keeled, larger than those on the sides, and with two apical grooves. Ventrals large, 196-208. Anal bifid. Sub-caudals 118-130.

Colour olive, the scales with darker margins, those on the hinder part of the body and of tail with broad dark edges giving a reticulated appearance. Grows to 7 feet.

A specimen from Jerruck, 56 inches long, has the scales on the hinder portion of the body and tail, a reddish brown colour, and the hinder margins of the labials, ventrals and sub-caudals similarly coloured, darker on the tail, above.

Hab.—Sind, Indian Peninsula, Ceylon and the Malay Archipelago.

Zamenis, *Wagler*.

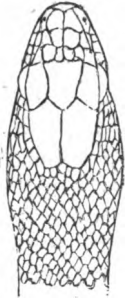
Body and tail elongate, rounded, sometimes very slender. Head distinct from neck; crown flat; muzzle rounded. Eye of moderate size, with round pupil. Nostril lateral, between two plates. The shields of the head have a tendency to split in two or more pieces. Loreal entire or divided: generally 2 anterior and 2 posterior oculars. Eye sometimes surrounded by separate pieces of the upper labials. Scales smooth or slightly keeled (posterior maxillary tooth longest, not grooved). Ventrals rounded or with a very indistinct lateral keel. Anal bifid. Sub-caudals two-rowed.

Zamenis diadema, *Schleg. Phys. Serp.* ii. p. 148; *Russell*, ii. p. 34, pl. 30; *Gunth. Rep. Brit. Ind.* p. 252, pl. xxi. fig. G; *Theob. Cat. Rep. Brit. Ind.* Periops parallelus, *Jan. et Sor.*; *Murray, Zool., &c., Sind*, p. 260.



Zamenis diadema.

Allied to *Z. cliffordi*. Head rather elongate, broader behind. Rostral as high as broad. Præ-frontals rather larger than post-frontals, which are separated from the vertical by a transverse series of four small shields;

*Zamenis diadema.*

vertical large, five-sided; occipitals obliquely truncated behind. Loreals 3 or 4. One large præ-ocular extending to, or nearly to, the vertical. A ring of small shields surrounds the lower and hinder parts of the orbit. Upper labials small, about 14. Temporals numerous, scale-like. Scales ovate or oblong-ovate, keeled, in 27-29 series. Ventrals 237. Anal entire. Sub-caudals two-rowed; a distinct ridge on each side of the abdomen.

Colour yellowish olive, with a dorsal series of round brown spots, and two series of short brown longitudinal streaks along each side. Each shield on the snout with a brown spot; a brown band crosses the inter-occipital space, and is continued to the angle of the mouth. A horse shoe-like band on the occipitals.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana and Kutch, also in Beloochistan (Quetta) Afghanistan and Mahim (Bombay).

Zamenis ventrimaculatus, *Gray, Ind. Zool.*, fig. C.; *Lizards*, p. 106. *Gonyosoma dorsale*, *And. P. Z. S.* 1872, p. 395; *Gunth. Rep. Brit. Ind.* 253; *Theob. Cat. Rep. Brit. Ind.* p. 169; *Murray, Hdbk. Zool., &c., Sind*, p. 260.

Head of moderate length. Habit slender. Rostral as high as broad. Præ-frontals nearly as large as post-frontals. Vertical five-sided, with the lateral margins very concave. Occipitals truncated behind, each with a small semi-circular shield following. Loreal quadrangular. Two præ-oculars, the lower smaller, upper concave and extending to the vertical shield. Two post-oculars. Nine upper labials, the 5th and 6th entering the orbit. Scales oblong, ovate, smooth, without apical groove, in 19 rows. Ventrals 205-220. Anal bifid. Sub-caudals 90-102.

Colour yellowish olive, with numerous very distinct narrow cross bars on the back, each being half as wide as an interspace of the ground colour. A series of small black spots along each side. Belly yellowish, with an irregular row of black dots on each side. A black cross band between the eyes; an oblique black streak below them, another on the temple. A black spot in the loreal region, and a dark line on the median line of the neck.

Hab.—Sind, the Deccan (Poona) Concan (Bombay) Bengal, Beloochistan and Persia, and the whole of South Western Asia to Egypt.

Zamenis gracilis, *Gunth. Ann. and Mag. Nat. Hist.* 1862, p. 125; *Rep. Brit. Ind.* p. 254, pl. xxi. fig. H.; *Theob. Cat. Rep. Brit. Ind.* p. 170; *Murray, Hdbk. Zool., &c., Sind*, p. 260.

Head narrow, distinct from neck. Body and tail slender. Rostral as high as broad. Præ-frontals half as large as post-frontals. Vertical five-sided. Occipitals rounded behind. Loreal square. Two præ-oculars, the upper in contact with the vertical; the lower small. Nine upper labials, the 5th and 6th entering the orbit. Temporals 2+2+3+3, the anterior in contact with the post-oculars. Scales elongate, narrow,

smooth, in twenty-one rows, some with a pair of very indistinct apical grooves. Ventrals 219. Anal bifid. Sub-caudals 120. Abdomen with a slight ridge on each side.

Colour yellowish olive, with a single series of round brown spots, edged with black along the anterior half of the trunk; the spots become indistinct posteriorly, and only the black edges remain, forming cross bars on the back, but merely spots on the tail. A blackish streak across the snout. Crown of the head with two brown black-edged cross bands, the anterior between and below the eyes, the posterior across the occipitals, forming an acute angle on the vertical. The first brown nuchal spot is produced forward within the limb of the occipital cross band. An irregular series of black spots on each side of the belly, which is yellow. Grows to 4 feet or more.

Hab.—Sind, Concan (Bombay) and the Deccan (Poona).

Tropidonotus, *Kuhl.*

Body cylindrical. Head distinct from neck, flat. Cleft of the mouth wide. Eye of moderate size, or rather large, with round pupil. Nostril lateral, between two plates. Shields of head regular. Loreal always present. Two small anterior frontals, acute-angled in front, and forming together an isosceles. Scales keeled. Ventrals rounded, considerably less than 200 in number. Anal bifid. Teeth numerous in the jaws, equal, except the posterior in the upper jaw, which is *longest*.

Distribution world-wide.

Tropidonotus quincunciatus, *Schleg. Ess.* pl. 12, f. 4,5; *D. et B.* vii. p. 592. *Trop. umbratus*, *Cantor, Mal. Rep.* p. 89; *Gunth. Rep. Br. Ind.* p. 260; *Theob. Cat. Rep. Brit. Ind.* p. 174; *Murray, Hdbk., Zool., &c., Sind,* p. 260.

Head and tail of moderate length. Body rather stout. Eye small. Scales keeled in 19 rows. Ventrals 129-146. Sub-caudals 64-80. Anterior frontals pointed in front. One præ-ocular just reaching the upper surface of the crown; three (exceptionally four) post-oculars. Loreal large, square. Nine upper labials, the fourth and fifth entering the orbit, the seventh and eighth largest. Temporals 2+2. Colouration varies exceedingly. Generally two oblique black streaks behind the eye; the upper crosses the temporal plates and the eighth labial; the lower, the inferior post-orbital, running along the suture of the sixth and seventh labials. Upper parts greyish, brownish or greenish olive, with from 3 to 7 rows of black spots down the body in quincuncial order. Sides sometimes with a series of scarlet spots, separated by black cross bars.

Hab.—Sind, and throughout India, Ceylon, Assam, Pegu, Mesopotamia to S. China. Inhabits rivers and pools, feeding on frogs and fishes. Attains 40 inches.

Tropidonotus stolatus, *Linn. Mus. Ad. Fried.* t. 22, fig. 1, and *Syst. Nat.* 1. p. 379; *Boie. Isis*, 1827, 535. *Amphiesma stolatum*, *D. et B.* vii. p. 727.

Head rather narrow; body and tail of moderate length. Scales in 19 rows. Ventrals 125-161. Sub-caudals 50-79. Anterior frontals pointed in front. Occipitals rounded behind, not much larger than vertical. One præ-ocular extending to the upper surface of the crown; three, rarely four, post-oculars. Loreal square. Eight upper labials, the third, fourth and fifth entering the orbit; the third and fourth are sometimes united into one shield. Temporals large, 1+1. Colour greenish or brownish olive, with numerous reticulated cross bars, intersected by two yellow or white longitudinal dorsal bands. Lower parts white. Head brown above, the shields more or less distinctly edged with black. Præ-ocular and post-ocular white, the former with a black anterior margin. The suture between the 5th, 6th, 7th and 8th upper labials black. Seasonally the head, neck, and sides are yellow, diffused with vermilion.

Hab.—Sind and throughout India. Like the last inhabits pools, &c., and feeds on fishes. Attains to a length of 26 inches.

Tropidonotus plumbicolor, *Cantor, Proc. Zool. Soc.* 1839, p. 54. *Xenodon viridis*, *D. et B.* vii. p. 763; *Gunth. Rep. Br. Ind.* p. 272; *Theob. Cat. Rep. Brit. Ind.* p. 179.

Form stout. Scales in 25 rows, sometimes in 23 or 27. Ventrals 160-161. Sub-caudals 42. Præ-frontals more than half the size of post-frontals. Two præ and three post-oculars; seven upper labials, the third and the fourth entering the orbit. Temporals 2+3. Vertical five-sided. Occipital not twice as large as vertical. The præ-orbital scarcely reaches the upper surface of the head.

Colour dirty greenish. In the young a broad white or yellow collar, pointed in front and forked behind, with a similar black band in front. An oblique black streak behind the eye. Trunk with ten or eleven narrow cross bars. Sides of the throat black dotted. Belly more or less blackish.

Hab.—Sind, Northern, Southern, Western and Central India; throughout Bengal and Ceylon. Attains to a length of 25 inches. Tail 3 inches.

Family, HOMALOPSIDÆ.

FRESHWATER SNAKES.

Body of moderate length, cylindrical or slightly compressed. Head rather thick and broad, not very distinct from neck. Tail strong, tapering, more or less prehensile and compressed. Scales sub-equal, not much imbricate. Anal bifid. Sub-caudals two-rowed. Eyes small. Nostrils situated anteriorly on the upper surface of the head, valvular. Anterior frontals small. A grooved fang at the hinder extremity of the maxillary bone.

Habits thoroughly aquatic. Several species enter the sea and have a distinctly prehensile tail. All are viviparous. Of the five genera composed in this family one genus only is found in Sind.

Cerberus, *Cuvier*.

Head of moderate length and width. Body cylindrical, its hinder part and the tail rather compressed. Cleft of mouth wide, turned upwards behind. Eye small. Pupil vertical. Snout covered with shields. Occiput with scales. Nostrils between two nasals, the anterior of which is larger, forming a suture with the corresponding nasal of the other side; two small triangular anterior frontals. Eye surrounded by a ring of small orbitals. Posterior upper labials divided transversely into two. Scales keeled in from 21 to 25 rows. Ventrals 132-148. Anal bifid. Sub-caudals two-rowed, 54 to 57. Maxillary teeth in a continuous series, slightly increasing in length posteriorly, the last being grooved. Mandibular teeth longest in front. Viviparous.

Cerberus rhynchops, *Russell, Ind. Serp.* ii. p. 43. pl. 40; *id.* i. pl. 17; *Gunth. Rep. Br. Ind.* p. 279; *Theob. Cat. Rep. Br. Ind.* p. 185. *Hydrus rhynchops*, *Schn. Hist. Amp.* i. p. 246. *Cerberus boæformis*, *D. et B.* vii. p. 978.

The two anterior frontals together are as large as one of the posterior. Vertical elongate, generally broken up into smaller shields, sometimes perfect. Loreal as large as, or larger than, the post-ocular extending on to the upper surface of the snout. One præ-ocular sometimes divided; two post-oculars, one infra-ocular; nine or ten upper labials, the fifth below the infra-ocular; some (2 to 4) of the hinder ones split transversely into two. Temporals scale-like. Three pairs of chin shields, of which the anterior are the largest, broadest in front and tapering behind; the second and third pairs wedged in between the front pair and the lower labials. Upper parts blackish ash, with irregular black cross bars; the two or three outer series of scales yellowish. Lower parts whitish, with more or less confluent dark blotches. Labials black-spotted.

Hab.—The Sind and Mekran Coasts and the Coasts of India and Burmah, also the Malayan Peninsula, the Andamans and Nicobars. Attains to a length of 48 inches.

Family, PSAMMOPHIDÆ.

DESERT SNAKES.

Body and tail generally elongate. Head distinct from neck. Loreal region very concave. Scales smooth, in 15-19 rows. Sub-caudals two-rowed. Cleft of mouth wide. Nostril lateral. Eye moderate. Pupil round or vertical. Head shields normal. Posterior frontals rounded or angular behind. Vertical narrow. Superciliaries prominent. Loreal present. One præ and two post-oculars. One of the maxillary teeth longer than the others; the last grooved.

Psammophis, *Boie*.

Head rather long and pointed. Vertical long and narrow. Loreal elongate. Scales lanceolate, smooth, in 15-19 rows. Anal bifid. Pupil round. Front teeth of lower jaw long.

Psammophis condanarus, *Merr. Tent.* p. 108; *Blyth, Journ. As. Soc. Beng.* 1855, xxiii. p. 293; *Gunth. Rep. Br. Ind.* p. 291; *Theob. Rep. Br. Ind.* p. 187; *Murray, Hdbk., Zool., &c., Sind*, p. 261. *Psammophis indicus*, *Beddome, Mad. Quart. Journ. Med. Sci.* vol. v.

Body and tail slender, rather compressed. Pupil round. Rostral as high as broad. Anterior frontals small, sub-triangular, with the front obliquely truncated, and as long as broad. Posterior frontals rather longer than broad, rounded behind. Vertical narrow, as long as the occipitals. Nostrils in the middle, between two shields. Loreal quadrangular, twice as long as high. One præ-ocular *not reaching to the vertical*. Two post-oculars. Eight upper labials, the fourth and fifth entering the orbit. Temporals 1+3+3. Scales lanceolate, in seventeen rows. Anal bifid.

Back brown, or isabelline brown, with a dark or brownish stripe along each side from head to tail, and a broader stripe, much darker on either side of the belly, which is yellowish. Head uniform dark brown above. A yellow black-edged streak from the rostral along the canthus rostralis, above the orbit to the neck; a second along the upper half of the labial shields.

Hab.—Sind (Jacobabad) the Punjab, N. W. Provinces, Pegu, and Nullay Mullay Hills in the Kurnool district. Grows to 40 inches; tail 8·5 inches.

Psammophis Leithii, *Gunther, P. Z. S.* 1869, p. 505, pl. 39; *Stol. J. A. S. B.* 1871, part ii. p. 439; *Theob. Rep. Br. Ind.* p. 188; *Murray, Hdbk., Zool., &c., Sind*, p. 260.

General characters of *Condanarus*. Præ-frontals small; post-frontals longer than broad. Eight upper labials, the fourth and fifth entering the orbit. *One præ-ocular reaching the vertical*. Scales in 17 rows. *Anal entire*. Colour light reddish olive, with four brown black-edged longitudinal bands, the dorsal ones running to the end of the snout; a narrow brown median one along the vertical shield and occipital suture. Belly and lower half of the last row of scales white.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab and North West Provinces. Attains to 48 inches.

Family, DIPSADIDÆ.

DIPSADES.

Body much compressed, elongate. Head short, generally broad behind, sub-triangular. Eye large; pupil vertical. Nostril lateral. Lower jaw with a mental groove. Scales generally smooth. Maxillary bone and teeth well developed. A grooved fang behind.

Dipsas, *Auct.*

Body and tail generally compressed, elongate. Head much depressed, triangular, broad behind, very distinct from neck. Loreal present. One præ and two post-oculars. Nostril between two shields. Head shields

regular. Scales smooth, more or less narrow on the sides. The vertebral series dilated. Anal entire. Sub-caudals two-rowed. Posterior maxillary tooth longest, grooved.

Dipsas trigonata, *Boie, Isis*, 1827, p. 559; *Schleg. Phys. Serp.* ii. p. 267. pl. ii. figs. 6 and 7; *Gunth. Rep. Br. Ind.* p. 312. *Dispadomorphus trigonatus*, *Fitz. Syst. Rep.* p. 27; *Gunth. Colub. Snakes*, p. 175; *Theob. Cat. Rep.* p. 196; *Murray, Hdbk., Zool., &c., Sind*, p. 210.

Rostral grooved on the under side, obtusely triangular, reaching slightly above the suture of the nasal and præ-frontals. Præ-frontals sub-triangular; post-frontals sub-quadrangular; vertical three-sided behind, pentagonal. Occipitals a little longer than its greatest width, with usually two temporals alongside of their outer margins. Scales smooth, in 21 rows (exceptionally in 19), the vertebral series larger. Ventrals 235-269; sub-caudals 79-87; anal entire. Nostril rather small, rounded. Loreal one, as high as long. One præ-ocular. Two post-oculars. Eight upper labials, the third, fourth and fifth entering the orbit, sometimes the fourth and fifth only. Maxillary with 10 small teeth, and a pair of grooved posterior teeth; two pair of chin shields behind the first and second lower labials, the anterior longest, and 4 labials in contact with it.

Colour yellowish olive with a rather irregular white or yellow zigzag band along the back, edged with black. Crown of the head with two dark bands, edged with black, convergent behind, and a nearly quadrangular dark spot behind, edged with white. Belly white, with an irregular series of brown dots along each side.

Hab.—Sind (Kurrachee, Kotree and Sehwan), Rajputana, Central India, Kutch, Guzerat and Southern India, extending to Bengal and to the foot of the Himalayas. Attains 34-36 inches.

Family, LYCODONTIDÆ.

LYCODONTES.

Body generally of moderate length, rather slender, rounded or slightly compressed. Head depressed; snout flat, obtuse. Eye rather small. Pupil generally vertical. Head shields regular. Nostril between two shields. Posterior frontals enlarged. Maxillary with a fang in front, but without a posterior grooved tooth. Of five genera in this family, one only (*Lycodon*) is represented in Sind.

Lycodon, *Boie*.

Head depressed, distinct from neck; snout flat, obtuse; nostrils between two shields. Loreal present. One præ and two post-oculars. Scales smooth, in 17 rows. Sub-caudals two-rowed. Anal entire or bifid. Pupil elliptical. Maxillary with one of the anterior teeth enlarged; posterior maxillary tooth enlarged, not grooved; palatine teeth not enlarged.

Lycodon aulicus, *Linn. Syst. Nat.* i. p. 381; *Boie. Isis*, 1826, p. 981; *Gunth. Rep. Brit. Ind.* p. 316; *D. et B.* p. 369; *Gunth. Colub. Snakes*, 200; *Murray, Hdbk., Zool., &c., Sind*, p. 261.

Rostral just reaching the upper surface of the head. One loreal, one anterior ocular in contact with the vertical and third labial; two post-oculars. Snout broad, much depressed, long, spatulate. Upper lip swollen, without canthus rostralis. Anterior frontals small, posterior longer than broad. A lateral notch between the anterior and posterior frontals in which the inner anterior angle of the loreal is received. Nostril small, directed upwards, and situated between two nasals. Nine upper labials, the third, fourth, and fifth entering the orbit. Temporals many, and scale-like. Scales 3, smooth, in 17 rows, with a minute apical groove. Abdomen and tail with an angular ridge on each side. Ventrals 183-209. Anal bifid or entire; sub-caudals 57-77. Each maxillary with two fangs in front, in a transverse line.

Colour variable, uniform brown or greyish above, with or without a white collar, and reticulated white cross bands.

Hab.—Sind, and the whole of India and Ceylon. Specimens in the Kurrachee Museum are from Kurrachee, Sehwan, Poona, Bombay and Madras. Attains to a length of 26 inches.

Lycodon striatus, *Russell, Ind. Serp. i. pl. 16; Gunth. Rep. Brit. India, p. 318; Theob. Rep. Brit. Ind. p. 199. Coluber striatus, Shaw, Zool. iii. p. 527.*

Snout much depressed, rather broad, and of moderate length. *Upper lip not swollen*, and without canthus rostralis. Rostral low, not twice as broad as high, slightly bent on the upper surface of the snout. Anterior frontals small, half as large as posterior; posterior as broad as long. Vertical not elongate. Occipitals small, scarcely longer than the vertical. Nostril small, lateral, between two nasals. Loreal one, twice as long as high. Præ-ocular one, in contact with the third labial, but not with the vertical. Two post-oculars. *Eight upper labials*, the third, fourth and fifth entering the orbit. Dentition same as *L. aulicus*. Scales smooth, with a minute apical groove in seventeen rows. *Abdomen and tail without lateral ridge*. Ventrals 167-174; anal bifid; sub-caudals 46-48. Colour brown or black, with or without a whitish collar; body and tail with white cross bands, or a vertebral series of white spots.

Hab.—Sind (Kurrachee) Punjab, N. W. Provinces, Oudh, Deccan (Poona) Madras and Bombay.

Family, PYTHONIDÆ.

ROCK SNAKES.

Body and tail of moderate length. Size large. Tail prehensile. Head depressed. Snout truncated or rounded in front. Eye moderate; pupil vertical. Scales smooth, in numerous series. Sub-caudals two-rowed. Some of the labials pitted. Teeth in the intermaxillary, maxillary, palatine, pterygoid and mandibular bones of unequal size; none grooved. A spur-like prominence on each side of vent, indicative of a rudimentary limb.

Python, Daudin.

Only the anterior half of the head covered with shields; the hinder with scales.

Python molurus, *Linn. Syst. Nat.* i. p. 225; *Gray, Zool. Miscellany*, p. 44; *D. et B.* vi. p. 417; *Gunth. Rep. Brit. Ind. The Ajgur* of the Hindoos.

Scales in 65 rows round the middle of body. A pair of anterior and posterior frontals. Several other small shields between the vertical and the posterior frontals. Two anterior upper, and four lower labials, which are pitted. Eleven upper labials, the sixth below the orbit. A brown lanceolate or sub-cordate spot on the crown and nape, its point rests on the frontals, but frequently it is truncated anteriorly, its extremity being on, or behind, the vertical; a light median streak divides its triangular portion. A dark brown streak from the nostril to gape, gradually becoming broader and confluent with another band running along the lower jaw. A vertebral series of large quadrangular spots, sometimes serrated or straight, and an oblong spot on each side of each of the quadrangular spots. Lower parts yellowish, brownish, or blackish on the sides.

Hab.—Sind (Joongshai, Jerruck) Punjab, N. W. Provinces, Oudh, Rajputana, Kutch, Guzerat and the whole of Peninsular India, also Ceylon, the Malayan Peninsula, and Southern China. Commonly kept by snake charmers for exhibition. It is perfectly harmless as to poison, and shows no propensity to bite, but it is said that a bite, though containing no venom, produces a gradual wasting of the fingers and toes.

Family, ERYCIDÆ.

SAND SNAKES.

Body of moderate length, cylindrical, covered with small scales. Tail very short, with a single series of sub-caudals. Eye small. Pupil vertical. Head of moderate length. Snout broad. None of the labials pitted. Cleft of the mouth wide. Teeth in the maxillary, on the palate and in the mandible. None in the intermaxillary; anterior teeth longest. A short conical prominence in a groove on each side of the vent, indicative of a rudimentary hind limb.

Inhabits dry, sandy and stony plains.

Eryx, Daudin.

Head not distinct from neck. Snout shielded, obtusely conical, and with a sharp anterior edge. Nostril narrow, lateral. Scales slightly keeled. *Chin with a median groove.*

Eryx johnii, *Russell, Ind. Serp.* ii. pl. 16. p. 18; *Dum. et Bib.* vi. p. 458; *Gunth. Rep. Br. Ind.* p. 334. *Clothonia johnii*, *Gray, Zool. Misc.* p. 45; *Gunth. Proc. Zool. Soc.* 1860, p. 164. **Eryx maculatus**, *Hallowell.* (*Loondee*, Sind)—THE DOUBLE-HEADED SNAKE OF EUROPEANS.

Rostral large, wedge-shaped, triangular. Two pairs of small frontals on the upper surface of the snout, one behind the other. Ten to thirteen upper labials, none of which enter the orbit, which is surrounded

entirely by small scales. Scales in the centre of the body in from fifty-four to sixty-five longitudinal rows, all slightly keeled. Ventrals 194-209. Sub-caudals 26-36. Upper parts reddish olive, with or without irregular small black spots and dots. Lower parts grey, marbled with blackish. Young specimens with three or four blackish broad bands on the hinder part of the body.

Hab.—Sind, the Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Central India, Kutch, Guzerat, Concan, Deccan and Southern India.

Attains to a length of 48 inches.

Cursoria elegans, *Gray*.

A species found in Afghanistan, probably occurs in Sind. The type specimen in the British Museum remains unique.

Gongylophis, *Wagl.*

Head flat, oblong. Snout long, obtusely rounded, without canthus rostralis. Nostril directed upwards. Head covered with scales, only the fore part of the snout and lip shielded. Scales keeled. *Mental groove none*. Chin covered with small scales.

Gongylophis conicus, *Wagl. Syst. Amph.* p. 192; *Gunth. Proc. Zool. Soc.* 1860, p. 163; *Rep. Brit. Ind.* p. 333; *Theob. Cat. Rep. B. Ind.* p. 207. *Boa conica*, *Schn. Hist. Amph.* ii. p. 268.

Rostral nearly twice as broad as high, with two pairs of small shields, behind the outer of which are the anterior nasals. Twelve upper labials, sub-equal in size, none of which enter the orbit, which is entirely surrounded by scales. The margins of the lower jaw surrounded by a narrow belt of numerous labials. Scales in the centre of the body in from 41-47 series, keeled. Colour brownish grey, with a dorsal series of large quadrangular brown blotches, edged with dark brown and whitish, often confluent and forming a zigzag band, with small irregular spots below. Lower parts white. An oblique streak on the temple behind the eye.

Hab.—Sind and throughout India as the last.

SUB-ORDER II.—OPHIDI VENENOSI.

Venomous snakes with grooved fangs in front of the maxillary.

Family, ELAPIDÆ.

Tail conical, tapering. Head normally shielded. Loreal invariably absent. Nostril lateral. Eye moderate or small. Pupil round. Venom fang grooved in front; the canal in its interior terminates in a slit at the extremity.

Naja, *Laurenti*.

Neck dilatable into a hood. Head rather high and short, not very distinct from neck. Nostrils lateral, between two shields. Eye moderate. Pupil round. One præ, three, sometimes two or four post-oculars. Scales smooth, much imbricate, in numerous series round the hood, and in fifteen rows round the body. Anal entire;

sub-caudals two-rowed. One or two small ordinary teeth at a short distance behind the fangs.

Naja tripudians, Merr. *Tent.* p. 147; Gray, *Ind. Zool.*; Gunth. *Colub. Snakes*, p. 223; Rep. *British Ind.* p. 338; *Theob. Cat. Rep. Br. Ind.* p. 208. *N. atra*, Cant. *Ann. and Mag. Nat. Hist.* 1842. *N. lutescens*, Laur. *Syn.* p. 91.

Six upper labials, the third and the fourth entering the orbit; the sixth small and forms a suture with a large temporal shield. Two temporals in contact with the post-oculars. Scales on the fore neck in 23-25 series.

Colour variable, from brownish olive to blackish brown, with or without spectacles on the neck, which also vary much in development. The Sind varieties are—1. Uniform brownish olive, spectacles conspicuous, black-edged; belly yellowish, more or less marbled. Found also in Poona, Bombay, Madras. 2. Uniform blackish, or brown-black. No spectacles. Found also in Bombay and Poona. 3. Uniform black above and below, with a brownish ocellus on necks (Kurrachee and Jempeer). Attains to 60 inches.

Hab.—All India and Belocchistan; not yet recorded from Persia and Afghanistan, but it is not unlikely it occurs in both.

Bungarus, Daud.

Body elongate. Tail comparatively short. Head scarcely distinct from neck. Neck not dilatable. Nostril between two nasals. Loreal none. One præ and two post-oculars. Scales smooth, in oblique rows, forming 13-15 longitudinal series round the body, those of the vertebral row broad and hexagonal. Maxillary with a fang in front. A second, small, simple tooth behind it.

Bungarus cæruleus, Daud. *Hist. Rep.* v. p. 270; Gunth. *Rep. Br. Ind.* p. 343; *Theob. Rep. Br. Ind.* p. 215. (Krait, Hind; *Kalgundait*, Punjab).—THE KRAIT.

One præ-ocular, two post-oculars. Nostrils between two nasals. First temporal shield considerably longer than high. Ventrals 201-221; sub-caudals 38-56. Scales smooth, in fifteen rows. Lower parts uniform white, upper parts bluish or brownish black, more or less lustrous, or with numerous narrow white cross streaks, radiating from a vertebral spot.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Central Provinces, Bengal, Rajputana, Central India, Kutch, Guzerat, Concan, Deccan and Southern India. Attains to 60 inches.

Next to the Cobra, this species is most destructive to human life; its bite is fatal usually in from 20 minutes to an hour; and in cases where immediate medical aid has been obtained, perhaps for a quarter of an hour longer. Very few recoveries are reported. The effect of the poison generally produces a greater degree of stupor than that of the Cobra, and there is apparently less convulsive twitchings; bleeding from the mouth, bloody urine and sputa, and difficult and stertorous breathing are the fatal symptoms.

SUB-ORDER III.—VIPERINE SNAKES.

Maxillary bone short, furnished with long tubular, erectile, perforated fangs.

Family, VIPERIDÆ.

Head broad or thick, scaly or incompletely shielded. Body stout. Tail short. No pit in the loreal region. Pupil vertical. Scales keeled. Viviparous.

Daboia, Gray.

Head covered with scales. Nostril lateral, oblique, extremely large, in and between three shields. A narrow superciliary shield. Sides of the head covered with keeled scales, several series of which are between the orbit and the low upper labials. Scales imbricate, strongly keeled, in 29-31 rows. *Sub-caudals bifid*.

Daboia russelli, Gray, *Viper, Snakes*, p. 24; *Gunth. Rep. Br. Ind.* p. 396; *Theob. Rep. Br. Ind.* p. 217. *Vipera elegans*, Daud. *Rep. vi.* p. 124. *Daboia elegans*, Gray, *Zool. Misc.* p. 69.—THE TIC POLONGA OF CEYLON or RUSSEL'S VIPER.

Greyish brown, with three series of large, black, white-edged rings, those of the middle series ovate, those of the outer circular; there are sometimes very small, black, white-edged ocelli between the rings. A broad arrow mark on the head formed by two pale or yellowish lines from the snout, over the eyes. Head elegantly marbled. A brown spot below the eye. Belly uniform yellowish or marbled with brownish, with generally numerous semi-circular brown spots on the hinder margins of the ventrals.

Hab.—Upper Sind (Jacobabad) the Punjab, N. W. Provinces, Oudh, Rajputana, Kutch, Central and Southern India, Concan, Bengal, Ceylon, Arrakan and Pegu. Happily not very common in upper Sind.

Echis, Merrem.

Head covered with keeled scales. A pair of very small frontals behind the rostral. Nostril small, round, directed upwards, situated in a large nasal shield, divided below. Two series of keeled scales between the eye and the low upper labials. Scales imbricate, strongly carinate, in from 25 to 29 series round the body, the tips of the lateral series directed obliquely downwards. *Sub-caudals entire*

Echis carinata, Merr. *Tent.* p. 149; *Gunth. Rep. Br. Ind.* p. 397; *Theob. Cat. Rep. Br. Ind.* p. 218; Murray, *Hdbk., Zool., &c., Sind*, p. 260. Horatta pam, *Russell, Ind. Serp. i.* pl. 2. (The Kuppur, Sind; *Foorsa*, Deccan and Concan; *Afai*, N. W. Provinces.) Plate

Brown or brownish grey, with a series of sub-quadrangular or ovate whitish spots, edged with blackish. An undulating whitish line on each side of the dorsal spots, each loop enclosing a round dark brown

lateral spot. Crown of the head with a whitish or yellowish white lozenge, or arrow-like mark, convergent anteriorly; a brown spot below the eye, and an oblique streak behind, extending to the gape. Belly whitish, with more or less numerous brown specks.

Length.—12 to 20 inches.

Hab.—Extremely common and in great numbers in Sind, the Punjab, N. W. Provinces, Central and Southern India, the Concan, Deccan, and all along the Western Coast to Ceylon, also Beloochistan and Persia.

This little viper is very venomous. Although the action of its poison is not quite so quick as that of the Cobra, it is equally as potent, and numerous deaths annually occur from its bite. The bite of the young may not be as dangerous, but it occasions great pain and suffering; bloody sputa, and bleeding from every pore, as well as from the eyes and nostrils, are the chief symptoms. Dr Fayrer records several experiments with it, and in every instance (except one, that of his own snake man, who was only slightly punctured accidentally by one fang, and promptly attended to) the bite proved fatal. The latent virulence of the poison is said to be difficult to eliminate from the system. Instances have occurred in which the symptoms have recurred, such as partial paralysis, vertigo and distressing pain in the heart. Prurient sore and eruptions too are known to occur after cures have been effected.

The most popular remedy among the Sindees for the treatment of the bite of this viper and snake bites generally is brandy, or any strong spirituous liquor *ad libitum*, keeping the patient in a state of semi-intoxication; scarification or burning of the wound is also resorted to, poultice of the fresh or dried leaves of *Aristolochia bracteata* applied, and the juice of the leaves administered internally with one part of liquor and a quarter part (nowsagur) carbonate of ammonia, when procurable.

To the efficacy of brandy I can vouch. A small dog of mine was bitten in the leg in one of the Lawn Tennis Courts adjoining my house at about 7 P. M. Immediately it was bitten it howled with pain, and was quite paralysed within two minutes of the bite. The servants running out to ascertain the cause of the dog having so piteously howled, saw and killed the snake, which was an adolescent Kupper. The dog was immediately brought in. Two distinct punctures were visible under two small serous exudations; ligatures were applied, and the first one ounce dose of brandy was administered through a tin funnel. The dog was quite paralysed, could not stand, the limbs and the whole body was in a convulsive tremor, and a frothy foam came from its mouth, slightly tinged with blood. Six, one ounce doses of brandy were given at intervals of 20 minutes. At the end of five hours the convulsions and frothing subsided, and the dog lay in a sort of stupor. It was placed in a room by itself, having been given up as hopeless, but to my surprise was perfectly well the following day, but extremely dull. Two more doses of brandy were administered, $\frac{1}{2}$ oz. each, and the dog now lives, still in my possession.

Family, HYDROPHIDÆ.

SEA SNAKES.

Body sub-cylindrical anteriorly, more or less compressed posteriorly. Tail strongly compressed, elevated, paddle-shaped. Head shields generally abnormal. Loreal none. Nostrils situated on the upper side of the head (except in *Platurus*). Eye small. Pupil round. Venom fang small, grooved in front, with a canal terminating in a short slit.

Very widely distributed.

All are venomous, and attain from 2 to 8 feet in length.

Hab.—Tropical parts of the Indian and Pacific Oceans.

Hydrophis, Daud.

Posterior part of the body strongly compressed. Head short, or of moderate length, shielded above. Only one pair of frontals. Nostril superior, in a single nasal shield, both nasals being contiguous to each other. Scales imbricate or not imbricate, generally with a tubercle or a keel. Ventrals narrow, rudimentary, or absent. Lower jaw without notch in front.

Hydrophis Stewartii, Anderson ; Fayrer, *Thanatophidia*, p. 28.

Neck moderately long and slender. Head rather short, not much broader than the neck. Body much compressed. Rostral considerably broader than high. The nasals are as broad posteriorly as they are long; third and fourth labials under the orbit, the former not in contact with the nasal. Temporals three; the anterior the largest. Two post-oculars. Vertical pointed behind. Occipitals long and narrow. Two pairs of chin shields, almost quadrangular, in contact with each other. Thirty-three rows of scales round the neck. Scales hexagonal, not imbricate, with a feeble central tubercle. Ventrals 387, smooth, the first forty about four times as large as the adjoining scales, becoming narrow posteriorly, to within six inches of the tail, where they are hardly discernible. Two pairs of small scale-like anals. Tail broad, markedly dilating from its root. Lips yellowish. Upper surface of head, neck and trunk greenish olive; under surface of head, sides of the neck and trunk salmon coloured. Fifty-seven very obscure darker olive almost black bars on the dorsal area of the neck and compressed portion, but not extending on to the light coloured sides. Tail greenish olive, mottled and tipped with black. Attains to 40 inches.

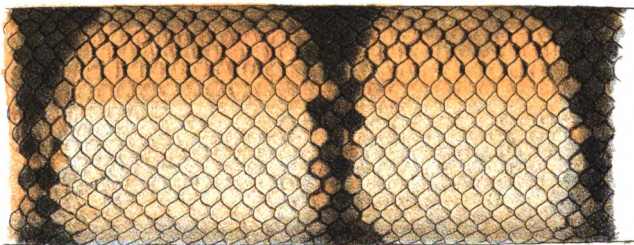
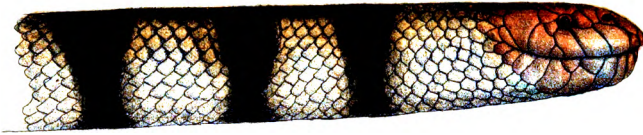
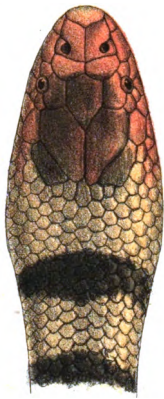
Occurs on the Sind Coast, and at Bombay (Bassein). Dr. Anderson's description is from a specimen obtained at Pooree on the Cuttack Coast.

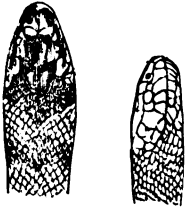
Hydrophis spiralis, Shaw, *Zool.* iii. p. 564; tab. 125; Gray, *Vip. Snakes*, p. 54; *Gunth. Rep. Br. Ind.* p. 366, pl. xxv. Fayrer, *Thanatophidia*, p. 29. *Hydrophis melanurus, Wagler, &c. Amph.* tab. 3.



Hydrophis spiralis.

Head of moderate size and width. Neck and body somewhat elongate. One post-ocular; the third and fourth labials enter the orbit. Three temporals on the side of each occipital, the anterior largest. Two pairs





Hydrophis spiralis.

of chin shields, in contact with one another, 29-33 rows of scales round the neck. Scales imbricate, each with a central tubercle, those on the posterior half of the trunk as high as long and rounded behind. Ventrals 320, twice or thrice as large as the scales of the adjoining series, nearly all undivided. Præ-anals of moderate size. Trunk surrounded by from 42-48 black rings, scarcely broader on the back than on the sides and below, about half as broad as the interspaces of the ground colour. A series of round black spots alternating with the black rings along the vertebral line, commencing either before, on, or behind the middle of its length. Head above black, with a horse shoe-shaped yellow mark, the convexity of which rests on the frontal shields. Lower half of upper lip, chin and throat yellowish; belly black for nearly its anterior half; posterior part of the tail black.

Hab.—Sind and Kutch Coasts, also Madras. Dr. Gunther says the "Indian Ocean," and does not specify localities of the specimens in the British Museum. Attains to 6 feet in length.

Hydrophis Bishopii, *Sp. Nov.*

Plate

Head scarcely distinct from neck. 31-33 scales round the neck; 35-36 round the middle of the body. Scales on the posterior half of the body with a feeble sub-central keel. Rostral triangular, broader than long, forming a suture with the præ-frontal, which is divided furcately to receive it. Præ-frontal longer than broad. Frontals nearly five-sided. Vertical triangular in front, truncated behind. Occipitals twice as long as its greatest breadth. Three temporals along the side of each occipital, the anterior the largest, entering the labial margin, and forming the 6th upper labial. Upper labials seven, 3rd and 4th entering the orbit. One præ and two post-oculars. Two pair of chin shields in contact with each other. Ventrals 372, smooth, twice the breadth of the adjoining scales. Anal shields small, six in number. Last scale of tail four times the size of the adjoining ones. The length of tail nearly four times its breadth. A large patch of greenish olive on the middle of the head, rest of facial portion salmon colour, also the lower labials. Trunk greenish yellow dorsally, and whitish below, encircled with 41 black rings round the body, which are broader above and below,—two rings on the tail. Each scale in the interspaces edged with black at the base.

Hab.—Kurrachee. I am indebted to Captain Bishop, of the I. G. S. "Patrick Stewart," for the specimen described, after whom I have much pleasure in naming it.

Hydrophis cyanocincta, *Daud. Rep. vii. p. 383; Gunth. Rep. Brit. Ind. p. 367; Fayr. Thanat. p. 29. Hydrophis striatus, Schleg. Faun. Jap. Rep. p. 89. pl. 7. H. sublævis, Gray, Zool. Misc. p. 62; Tenn. Ceylon. p. 301.*—THE CHITTUL.

Head of moderate size and width. Body rather elongate, generally two labials below the orbit. Two post-oculars (exceptionally confluent). Two or more temporals along each side of each occipital. Two

pairs of chin shields in contact with each other. Scales in 29-33 rows round the neck, slightly imbricate, rhombic, and faintly keeled, those on the highest part of the body rather longer than high. Ventrals 320, 360, 406, 426, twice or thrice as large as the scales of the adjoining series; almost all are entire, not longitudinally divided or bi-tubercular. Anals shields four, the outer large. Terminal scale of the tail small, or of moderate size.

Back greenish olive, yellowish on the sides and belly. Trunk with from 50 to 75 black cross bands, which are broadest on the back and broader than the interspaces of the ground colour; on the sides they are narrower, sometimes disappearing on the sides and belly of adult or aged specimens, or visible only as spots on the ventral shields. In young or half-grown specimens the bands surround the body entirely, and are sometimes joined by a black band running along the whole line of the ventral shields. Head greenish olive above, yellowish on the sides; in the young black, variegated with yellow, the yellow colour sometimes forming a frontal and temporal band.

Hab.—Sind, Kutch and Bombay Coasts, also the Coasts of Ceylon, Madras, Bay of Bengal, East Indian Archipelago and the Seas of China and Japan. Attains to a length of 7 feet.

Hydrophis chloris, *Daud. Hist. Rep.* vii. p. 377; *Gunth. Rep. Brit. Ind.* p. 370; *Fayr. Thanat.* p. 29. *Hydrophis obscura*, *Gray, Vip. Snakes*, p. 49; *Russell, Ind. Serp.* ii. pl. 7.

Head very small, of moderate width. Neck slender, the length of the thin part of the body being more than one-third of the total. Rostral very small, broader than high. One post-ocular; third upper labial not in contact with the nasal. Two pairs of chin shields, in contact with each other. Scales on the neck in 31-33 series, those on the back with faint keel, and with a small tubercle near the apex. Ventrals distinct, not much larger than the adjoining series, 473-500 in number. Præ-anal shields four, the outer are very large. Trunk greenish olive above, yellowish on the side and below, with 59-67, black, rhombic, blackish bands across the back, narrower and fainter on the sides, and extending on the belly; their angles on the vertebral line are sometimes confluent on the anterior part of the body. Head and anterior part of the belly entirely black.

Hab.—Sind, Kutch and Bombay Coasts, also the Coasts of Madras, Bay of Bengal and Penang. Attains to nearly 4 feet in length.

Hydrophis Lindsayi, *Gray, Vip. Snakes*, p. 50; *Gunth. Rep. Br. Ind.* p. 371. *Aturia lindsayi*, *Gray, Zool. Misc.* p. 61.

Very similar to *H. chloris*, but has a shorter neck. Rostral shield as long as broad. Ventral shields twice as large as the adjoining series, 345-449 in number, a very few longitudinally divided. 48 to 58 blackish brown bands across the back, those on the neck form complete rings, the middle and posterior extending only to the middle of the side, and twice as broad as the interspaces of the ground colour. Head and anterior part of the belly black.

Hab.—The Sind Coast. Specimens in the British Museum are from the Coasts of China, Siam and Malabar, the largest being 39 inches. Kurrachee specimen 41 inches.

Hydrophis tuberculata, *Anderson, M. and S. B.; Murray, Hdbk., Zool., &c., Sind*, p. 262; *Fayrer, Thanatophidia*, p. 28.

Head slightly broader than the neck, and of moderate length. Neck not very slender. Rostral broader than high. Fourth and fifth labials below the eye. One præ-ocular and two post-oculars. 3—4 temporals along the side of each occipital, the anterior the largest and almost entering the labial margin. The nasals are large and quadrangular, and much larger than the frontals, which are rounded behind. The vertical is emarginate and much smaller than the elongated occipitals. All the shields of the head, including the lower labials and scales in the immediate vicinity of the head, are thickly studded over with minute granules. 38 rows of slightly imbricate scales round the neck, each scale with two prominent tubercles, one before the other. Ventrals 321, small, about twice the size of the adjoining scales, irregular, sometimes dividing; those on the fore part of the body largest, and each with several minute tubercles on either side. Four anal shields, the external the largest. Terminal scale of the tail moderately large, tuberculated at its base. Trunk encircled by 59 bands (58-60 in Kurrachee specimens). Eight black bars on the tail. The bands are broadest and blackish on the back, contracting on the sides into narrow indistinct lines, continued on to the ventral surface. Ground colour olive yellow above, bright gamboge yellow below. A dark olive patch on the crown of the head, with a pale yellowish band from orbit to orbit, and passing backwards through the temporals to the neck; an obscure dark line through the upper labials, which are yellowish. (*Anderson.*) Length of Dr. Anderson's described species 49 inches. Kurrachee and Bushire 52 inches.

Hab.—Calcutta, Kurrachee and Bushire (Persian Gulf).

Hydrophis Dayanus, *Stoliczka, Proceedings of the Asiatic Society of Bengal*, 1872, p. 89; *Murray, Hdbk., Zool., &c., Sind*, p. 262.

Head short and stumpy in the young, a little more elongate in advanced age, distinct from neck, which gradually increases in thickness towards the middle of the body. Rostral one-third broader than high; each nasal somewhat larger than a frontal, which equals in size a supra-orbital; vertical hexagonal, obtusely angular in front and much elongated and pointed behind, smaller than either of the two occipitals; one ante, two post-oculars; seven upper labials, the third and fourth enter the orbit; the fourth is sometimes split in two, the penultimate is small, and the last one minute; temporals 2+3+ pl., the lower of the two anterior is only a detached portion of the labial; lower rostral very small, triangular; six lower labials; first three large, posterior three much smaller; two pairs of sub-equal chin shields, either both are in contact, or the posterior one is separated by a small shield; all the head shields above and at the sides are very minutely granulated. There are 33 series of somewhat elongate, sub-imbricate scales

round the neck, but further on the scales become regularly hexagonal, a little higher than long, and are in 40-44 series round the middle of the body. There are 400-415 scales in a line between the angle of the mouth and the vent, and 52-56 in a longitudinal row along the tail, the terminal scale is moderately enlarged, but not forked. Each scale on the body has a minute central keel, and on the side of the tail the keels of the succeeding scales become continuous, forming thin ridges.

Ventral scales each with two short keels; they are 328-334 in number, anteriorly twice as large as the adjoining scales, but posteriorly their size considerably decreases, and many of them become split in two shields. Two pairs of præ-anal scales, the outer twice as large as the inner.

Head olive blackish, tinged with red, brightest on the lower side, an \mathcal{N} shaped vermilion mark on the top of head, composed of more or less isolated spots, the upper convexity rests on the frontals, the lateral branches run along the supraciliary edge, and the ends curve outward towards each angle of the mouth; this vermilion mark becomes rather obsolete with age.

Of two specimens the smaller one is 23 inches, of which the tail is a little above two; the body is moderately compressed, of almost equal height throughout, encircled with 58 black rings, separated above, but united by a black line along the ventrals; the rings are only slightly contracted at the middle of the sides, being separated by narrower yellow bands; the tail has besides eight black rings, the terminal three or four confluent on the lower side, and the tip is entirely black.

Another more adult specimen is 27 inches, of which the tail is nearly 2.5; the body is in the middle twice as high as at the back; there are 46 transverse blackish rings on the body, and six round the tail; each ring is blackest along the back, contracted to nearly half its breadth at the middle of the sides, and from there to the broader base strongly tinged with yellow, which is the general colour of the snake.

Hab.—Kurrachee; in tidal waters.

This species is evidently closely allied to the New Guinean *H. belcheri*, differing from it by the smaller number of scales on neck, the hexagonal ones on the body, keeled ventrals, and by its colouration. Another, as regards colouration, almost identical species is *H. tuberculata*, (*Anderson, Journ. A. S. B.*, xl. p. 18), but it has 38 rows of scales round the neck, two keels in a line on each scale, and several keels on each ventral. The scales on the side of the body are also slightly more elongate, and there exists a noticeable difference in the arrangement of the labials, and the form of the head shields.

Hydrophis robusta, *Gunth. Rep. Br. Ind.* p. 364. *H. nigrocincta*, *Schleg. Phys. Serp.* ii. p. 505. pl. 18. (not synon.) *Fischer. Abhandl. Natur. Hamb.* iii. p. 46. tab. 1.

Head of moderate size and width. Neck and body not elongate. Two or three upper labials below the orbit. One post-ocular. Anterior temporal shield large. Two pairs of chin shields in contact with each

other. Scales slightly imbricate, each with a sub-central tubercle, those round the neck in 31 rows, those on the highest part of the body rounded or sub-truncated behind, as high as long. Ventrals smooth, 310 in number, twice or thrice as broad as the adjoining series. Terminal scale of the tail rather large. Trunk with 35 narrow, distinct, black rings extending round the belly, sometimes interrupted on the sides and dilated on the back. Head without markings in the adult. Throat and belly whitish.

Hab.—The Sind, Kutch and Bombay Coasts.

Hydrophis curta, *Gunth. Rept. Br. Ind.* p. 379. *Hydrus curtus*, *Shaw, Zool.* iii. p. 562. *Hydrophis propinquus*, *Jan. Iconogr. discr. in Rev. et Mag. Zool.* 1859.

Head short, thick, obtuse. Anterior part of body stout, not elongate. Occipitals always divided into two or more pieces, or broken up into small shields. Two pairs of chin shields, separated in the middle by small gular scales. One post-ocular. Scales round the neck in 30-34 rows. 209-252 scales in a lateral series between the angle of the mouth and vent. Ventrals 156-160, nearly twice as broad as the scales of the adjoining series. Præ-anal shields four, small. Back with 50-53 black bands, broadest in the middle, nearly touching each other, and tapering on the sides generally, not extending to the belly. A more or less distinct yellowish streak on the temple. Tail black, with only two yellow transverse spots at its root.

Hab.—Sind Coast, and also that of Beloochistan, Persian Gulf, Bengal and Southern India.

Hydrophis gracilis, *Shaw, Zool.* iii. p. 560; *Gunth. Rep. Br. Ind.* p. 373.

Head very small, and narrow. Neck very slender. Rostral shield cutting in front; one post-ocular; the third upper labial not in contact with the nasal. Two large temporal shields along the side of the occipital. Two pairs of chin shields, in contact with each other. 19 to 21 series of scales round the neck, scales provided with central tubercles. The ventral shields are twice as large as the scales of the adjoining series on the slender anterior part of the body; those of the compressed part are split into two, both halves being first opposite to each other, and alternate posteriorly. They are 228 (247-254) 264 in number. Six small anal shields. Anterior part of the body surrounded by blackish rings, which become very indistinct posteriorly. The hinder half of the body is greenish olive above and whitish below; sometimes traces of darker cross bands extending downwards to the belly are visible. Throat, anterior ventral shields, and crown of head blackish, sides of the head and snout lighter.

A young specimen has 41 rhombic black cross bands, continued on to the belly, but sub-interrupted on the sides; head, ventral shields and posterior part of the tail black.

Hab.—Sind, Beloochistan Coast, Persian Gulf, Bay of Bengal, Kutch, Bombay and Southern India.

Hydrophis Guntherii, Sp. Nov.

Plate

Upper jaw projecting much beyond the lower. Ventrals 225. Scales round neck in 19 rows, 33-34 round the body.

Head black, very small and narrow. Neck very slender. Upper jaw projecting much beyond the lower. Rostral as broad as high. Nasals twice as long as broad. Vertical pyriform. Occipitals narrow and truncated, with a small shield behind, between their furcation. Two large temporals alongside the occipitals, the anterior the largest, and nearly entering the labial margin. Upper labials five, the first very small, and with the second, in contact with the nasal; 3rd and 4th enter the orbit. Præ-ocular one. Post-ocular one. First pair of lower labials long and in contact with the first pair of chin shields, which are in contact with each other. Scales smooth on the slender anterior part of the body, bi-tuberculate on the posterior. The ventral shields are twice as large as the adjoining scales on the slender anterior part, split into two on the posterior, and almost uniformly opposite each other. General colour yellowish. The trunk ventrally black on the anterior slender portion, the sides with large roundish yellow spots. There are 46 dark bands on the body, which become nearly obsolete towards the tail, which is tipped broadly with black.

Allied to *H. gracilis*, from which it differs in having a protruding upper jaw, one præ-ocular, the anterior temporal nearly entering the labial margin. Scales of the body not tuberculate, except on the posterior portion, where they are bi-tuberculate.

I have pleasure in associating with this species the name of our veteran herpetologist.

Length.—32 inches. Tail $2\frac{3}{4}$.

Enhydrina, Gray.

Differs from *Hydrophis* in having a deep longitudinal cleft or notch in front of the lower jaw.

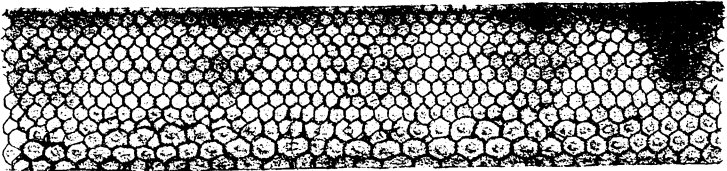
Enhydrina bengalensis, Gray, Vip. Snakes, p. 48; Gunth. Rep. Br. Ind. p. 381. *Hydrus schistosus, Cant. Mal. Rep. p. 132.* *H. valakydyn, Boie. Isis, 1827.* *Valakadyn, Russel, Ind. Serp. 1. tab. ii.*

Head rather short, of moderate width. Neck and body moderately elongate. Rostral small, lobuliform, its projecting point fitting into a corresponding cavity of the lower jaw. The fourth upper labial below the eye. Mental shield narrow and long, situated in a groove. Throat covered with scales. One post-ocular, sometimes divided into two. Forty-eight series of scales round the neck. Scales scarcely imbricate, hexagonal, each with a short keel. Ventrals 284-314 in number. Terminal scale of the tail rather large. Attains 4 feet in length. The young has black rhombic bands across the back, which disappear with age.

Hab.—Sind, Kutch and Bombay Coast, the Madras Coast, and in the Bay of Bengal, also Beloochistan and the Persian Gulf.

Pelamis, Daud.

Head flat, very long. Snout spatulate. Neck stout. Nasal shields



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HYDROPHIS GUNTHERI.

contiguous, longer than broad. One pair of frontals. Scales not imbricate, tubercular or concave. Ventrals none, or very narrow. Lower jaw without notch in front.

Pelamis bicolor, *Daud. Rept.* vii. p. 366; *Gray, Vip. Snakes*, p. 41; *Gunth. Rep. Br. Ind.* p. 382. *H. variegata*, *Schleg. Faun. Japon.* tab. 8. *Pelamis ornata*, *Gray, Vip. Snakes*, p. 43.

Two or three post-orbitals. 45-51 rows of scales round the neck. 378-440 scales in a lateral longitudinal series from the angle of the mouth to vent, with or without tubercles. Colour variable. Upper parts of head and back uniform black, under parts and sides brownish olive or yellowish.

Hab.—Sind, Kutch and Bombay Coasts, also on the Beloochistan Coasts, the Persian Gulf, and throughout the tropical and sub-tropical parts of the Indian and Pacific Oceans.

Second Sub-Class, BATRACHIANS.

Only one ventricle of the heart. Atrium incompletely divided into two. Passing a metamorphosis. Breathing by gills in an early stage of their development, the gills being permanent in some species. Two occipital condyles.

ORDER, BATRACHIA SALIENTIA.

TAILLESS BATRACHIANS.

Body broad, short, with four legs, and without tail in the perfectly developed state.

Section opisthoglossa. Tongue adherent in front, and more or less free behind.

Family, RANIDÆ.

Ranina with webbed toes, cylindrical processes of sacral vertebræ, and without paratoids.

Rana, Auctorum.

Habit generally moderate; fingers quite free, none of them opposed to the others. Toes more or less webbed, generally with broad web. Head covered with skin. Skin smooth, or with cutaneous or glandular folds. Never a large paratoid gland. Vomerine teeth in two series or groups. Tongue large, free, oblong and deeply notched behind. Metatarsus with one or two blunt tubercles. Males with two lateral vocal sacs, exceptionally wanting.

Rana kuhlii, *Schleg. Mus. Legd. Batav.; D. et B. Erpet.* gen. p. 384; *Gunth. Batrach Salientia*, p. 8; *Rep. Br. Ind.* p. 404, pl. 26. *Rana corrugata*, *Peters. Monatsber, Berl. Acad.* 1863, p. 412.

Snout short, rounded, without canthus rostralis. Eyes very prominent, directed obliquely upwards and forwards. Lower jaw generally with a pair of very prominent fang-like apophysis in front. Vomerine teeth small, in two oblique series, convergent behind. Skin on the back with short longitudinal or transverse plaits, which become indistinct with age, and with small tubercles. Hind limbs thick and short,

the distance between vent and metatarsal tubercle being equal to, or somewhat more than, the length of the body. Tips of toes slightly swollen; fingers tapering; toes completely webbed, a narrow fringe along the inner metatarsal edge, including a single elongate tubercle. Brown above, marbled with darker. A yellowish cross band between the eyes. Lower parts whitish. Throat and inner side of the hind limbs marbled with brown. Attains from 2 to 4 inches in length.

Hab.—Sind, Beloochistan, Kutch, Bombay, Bengal, Ceylon and Java.

Rana cyanophlyctis, *Schn. Hist. Amph.* i. p. 137; *Peters, Sitz. Berl. Acad.* 1863; *Gunther, Rep. Br. Ind.* p. 406; *Blanford, East. Pers.* ii. p. 433. *Rana bengalensis*, *Gray, Ind. Zool.*; *Kelaart, Prod. Faun. Zeyl.* i. p. 192. *Rana leschenaulti*, *Cantor. Mal. Rep.* p. 138; *Gunth. B. et Sal.* p. 11. (*Daydur*, Sind.)

Snout moderate, without canthus rostralis; tympanum distinct, as large as the eye; lower jaw with two distinct apophysis in front; vomerine teeth present, small, in two oblique series converging behind. Tongue deeply notched. Vocal sacs large, externally separated, situated in a long slit at the lower margin of the mandibles, but communicating with each other interiorly. No fold of skin across the occiput. Back tubercular, warty or nearly smooth. Hind limbs moderate, the distance between vent and knee being one half the length of the body; fingers pointed; tips of the toes very slightly swollen; webs entire, reaching to the tips of the toes; a cutaneous fringe along the outer margins of the first and fifth toes, and an indistinct fold along the metatarsus. Fourth toe slightly longer than the third and fifth; metatarsus with a single pointed tubercle.

Colour in life—*Adults.*—Upper parts greenish yellow, dirty yellowish in some, with irregular spots of dark brown. Usually a large sub-triangular dark spot between the eyes on the occiput; fore and hind limbs externally barred and marbled with dark brown; a yellow band along the under side of the thighs from one ham to the other. Under side white, thickly spotted with dark brown. Webs of hind feet yellowish, faintly marbled with brown. In adolescent specimens from 1 to 1½ inches long, the markings are similar; the vomerine teeth are wanting, and in every respect agree with the description of *Gunther's Dicroglossus Adolphi* (*Rep. Br. Ind.* p. 402.) Young, and undeveloped specimens with a small tail have their under surface unspotted white. There is no trace of vomerine teeth, and the metatarsal tubercle, (the limb laid forward) reaches a little beyond the eye, while in adults and adolescent specimens this tubercle reaches the end of the snout or beyond.

Hab.—Sind, Beloochistan, Punjab, N. W. Provinces, Oudh, Lower Bengal, Kutch, Rajputana, and the Western Presidency generally, also Ceylon, Southern India and Nepaul.

Rana tigrina, *Daud. Rain.* p. 64, pl. 20; *D. et B. Erpét. gen.* viii. p. 375; *Kelaart, Prod. Faun. Zeyl.* i. p. 192; *Gunth. Batr. Sal.* p. 9; *Peters. Sitz. Berl. Acad.* 1863, p. 77. *Rana cancrivora*, (*Boie*) *Gravenh. Delic.* p. 41; *Murray, Hdbk., Zool., &c., Sind*, p. 262.—THE BULL FROG.

Snout moderate, without canthus rostralis. Tympanum moderate, as

large as the eye. Two distinct but scarcely prominent apophysis in front of the lower jaw; vomerine teeth distinct, in two oblique series, converging behind. Skin of the back with numerous short longitudinal folds. Tips of fingers and toes slightly swollen; fourth toe one-third longer than the fifth; all broadly webbed, the web not extending quite to the tip of the fourth toe. Fifth toe with a cutaneous fringe along the outer margin. Metatarsus with a slight fold of skin along its inner edge and with a sub-crescentic tubercle.

Colour in Life.—Upper parts greenish brown with ovate, sub-quad-rangular and rounded black spots. Usually a yellowish white vertebral line from the tip of snout to the vent. Limbs barred with dark brown. Under surface white.

Length.—Head and body 4 to 6.5 inches. Hind limb from vent, 7 to 8 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Western Presi-dency generally, Southern India and Ceylon.

Pyxicephalus, Tschudi.

Head large and thick; muzzle rather short; vomerine teeth in two oblique series. Tongue large, free and deeply notched behind. Meta-tarsus with a flat, sharp-edged spur. Toes incompletely webbed.

Pyxicephalus breviceps, Schneid. *Hist. Amph.* i. p. 142. *Pyxice-phalus fodiens, Jerd. J. A. S. B.* 1854, p. 534. *Sphærotheca strigata, Gunth. Batr., Salienta,* p. 20. pl. ii. fig. A.

Body short. Head covered with moveable skin. Occiput swollen. Tongue cordiform, free and deeply notched behind; a cleft on each side of the tongue of males for the vocal sac; vocal sac externally formed by two lateral bladders communicating in the middle; tympanum round, distinct, nearly as large as the eye. Vomerine teeth in two oblique series, convergent behind, but with an interspace between. Limbs short; fingers free, each with one or two tubercles on the palmar surface. Metatarsus with a larger, oval, outer tubercle and with a smaller inner one. Skin smooth, with some small indistinct tubercles. Nostril near the muzzle, and very near the canthus rostralis.

Colour above yellowish brown, generally with a yellow dorsal band from the snout to the anus, and with dark brown, sometimes confluent spots. Crown with two oblique brown streaks, beginning on the upper eyelids, convergent behind and separated by the yellow vertebral streak. A brown streak from the eye along the canthus rostralis; beneath nearly uniform white.

Length.—1.75 to 2.5 inches.

Hab.—Sind, Punjab (Simla), N. W. Provinces, Oudh, Bengal, Southern India (Madras), Ceylon and Southern Africa.

Tomopterna, Bibr.

Characters same as those of *Pyxicephalus*. Males with an internal sub-gular sac. Toes half-webbed.

Tomopterna Strachani, Sp. Nov.

Muzzle very little longer than broad. Snout obtuse. Tympanum

distinct, circular, as large as the eye. Crown flattish. Lower jaw with weak bony prominences. Skin of the back with short longitudinal folds; a fold on each side of the abdomen, and another across the under surface of the body, immediately behind the fore limbs. A plait behind the tympanum coming down to the shoulder. Fingers quite free, swollen at the tips, and with a tubercle on each articulation on the palmar surface; there are also three well developed *palmar pads*. Laid beside each other, the first, second and fourth fingers are of equal length; the third about one-third longer than the three others. Hind limb longer than the head and body; laid beside the body, the metatarsal tubercle reaches the end of the snout. Metatarsus with a sharp-edged spur on the inner side and a tubercle on the outer. Toes half-webbed, the tips slightly swollen, and each of the joints on the under surface with a tubercle. Third toe slightly longer than the fifth; fourth the longest.

Colour greyish, with a rufescent tinge. A dark brown sub-triangular spot on the occiput, extending from across and behind the eyelids, immediately following which is a filiform white vertebral streak, extending to the vent; back with six irregular shaped dark brown spots. Plait behind the tympanum reddish brown. Fore and hind limbs externally with transverse bars of the same colour. Upper and lower jaws with vertical bars of reddish brown as in *T. delalandi* (*Bat Sal. B. M.* pl. ii. fig. A). Chin, throat and rest of under surface white.

The species of this genus belong to the South African fauna. Gunther gives *T. natalensis* and *adspersa* from the Cape and Natal. I was at first inclined to put this down as *Pyicephalus breviceps*, but on closer examination I found it to differ very materially in the form of the toes and disposition of the tubercles on their hinder surface, the short longitudinal plaits on the back and the fold across the body behind the fore legs; on the under surface are also two very prominent and distinguishing characters.

Hab.—Sind (Mulleer). I am indebted to Mr. J. Strachan, of the Kurrachee Municipality, for this single specimen, which was received with about three dozens of *Rana cyanophlyctis*. I have pleasure in associating his name with it.

Family, BUFONIDÆ.

Toes webbed, processes of sacral vertebra dilated. Paratoids present.

Bufo, Auct.

Snout round or truncated. Crown flatter or with ridges. No cutaneous fold on the sides. *Tongue entire, ovate, and free behind.* Paratoids distinct, swollen. Skin more or less warty. Toes entirely or partially webbed. Males generally with a single vocal sac, not visible externally.

Bufo melanostictus, *Schneid. Hist. Amph.* p. 216; *Cant. Malay Rep.* p. 142; *Gunth. Batr. Salienta*, p. 61; *id. Rep. Br. Ind.* p. 422.—
THE COMMON INDIAN TOAD.

Crown deeply concave, with a bony enlargement round the orbit above and bent down between orbit and paratoid. Paratoids moderate, elongate, prominent, as long as, or longer than the head. Tympanum distinct, nearly as large as the eye. Skin of the back and external or upper surface of the limbs covered with conical tubercles, generally a double series runs down along the vertebral line. Tubercles covered with a sooty or blackish horny substance. Legs short, the length of the hind limb being not more than the length of the body; metatarsus with two prominences; tarsus without longitudinal fold. Toes half webbed.

Colour uniform brown, greyish olive or earthy brown above, marbled with dark brown or pale brown. Under surface buffish white. Young the same, the lower surface pale brown.

Length.—2 to 3 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, South, Central and N. W. India, Assam, Nepal and the Andamans.

***Bufo Andersonii*, Sp. Nov.**

Snout rounded in front. Crown of the head flat, without any elevated bony ridges, the inter-orbital space as wide as, or a very little wider than the upper eyelid. A narrow groove in front of the eye, and another behind it, between the tympanum and paratoid. Tympanum distinct, and as large as the diameter of the eye, smaller in some, and with a distinct semi-circular ridge edging it in front. Paratoid rather oblong, elliptic, and slightly larger than the head. A paratoid-like gland behind the maxilla, from which it is separated by a vertical groove. Back covered with rather flattish tubercles, which are more prominent in the sacral region. Limbs the same, but with faint indication of dark brown spots in the centre of a few tubercles. Tarsus with a longitudinal fold of skin. Toes a little more than half webbed, the tips brownish, tuberculous below. Metatarsus with two well-developed pads of equal size, the outer, and in some the inner more prominent. The first finger laid beside the second is slightly the longer, and as long as the fourth. The hind limb is much longer than the head and body; laid forward the metatarsal tubercles reach to the front edge of the eye.

Colour brownish or greyish olive, marbled with dark brown. Lower surface pure white, including the labial edge of upper jaw.

Hab.—Sind, (Tatta (ponds) and Joongshai.)

This may turn out to be an aberrant form of *B. melanostictos*, with which it is associated in the lakes and ponds at Tatta and Joongshai. It differs however from it in having a longitudinal tarsal fold, also by the absence of prominent conical, spine-bearing tubercles, as well as by its much longer hind limbs.

ADDENDA.

ORDER, CHELONIA.

Family, EMYDIDÆ.

Gen. *Melanochelys*.

Melanochelys pictus, Murray, *Annals and Magazine of Natural History*, August 1884, p. 107.

Head two-thirds as broad as long, its greatest length 3 inches. It is covered with skin, divided into plates; a long central one above a single broad frontal; a superciliary on each side, and a small subtriangular plate behind, in suture with the sides of the central plate. Temples covered with numerous irregular-shaped plates. Upper jaw with a small festoon on each side, the groove in the middle of the jaw rather deep. A plate in front of the eye in suture with the sides of the frontal; another nearly as large under the orbit, and a third about twice the size of the latter behind the eye. Anterior half of neck covered with small subimbricate plates in transverse series. Shell oblong-ovate, elevated, much arched, nearly half as high as long, nodosely tricarinate, the costal carina being much nearer the vertebral carina than the marginal plates. Length of shell over curves 14 inches; breadth over vertebrals 11.75 inches. The sternum is bent upwards from the suture of the pectorals with the postgulars; greatest length of sternum to point of furcate projection of anal plates 12 inches. Anals deeply notched posteriorly, the distance between the projecting ends being 1.5 inch and the depth of notch 1.37 inch. Width of sternum at axillary incision 6 inches, at inguinal 4.75. Gulars together broader than long, their hind margin received into the subtriangular concavity in front of the postgulars, which are as broad as long. Pectorals very narrow, each 3×1.5 inches, the suture between them about equal in length to that of the postgulars and slightly more than half of that of the abdominals. Abdominals nearly rectangular, winged beyond the inguinal incisions, and forming a suture on each side with the inguinal plate and sixth marginal. Postabdominals longer than broad, the length of their suture together slightly less than that of the abdominals; transverse sutures of postgulars with abdominals and abdominals with postabdominals straight; suture of postabdominals with anals concave; the suture together of the anal plates is shorter than the suture of a single one with the postabdominal. Nuchal plate oblong (0.75×0.5 inch). Vertebrals hexagonal; first somewhat bell-shaped, convex in front, straight behind (except a concavity mesially to receive an apophysis of the second vertebral), sinuately concave on each side

in its anterior half and convex lower down. Second and third vertebrals hexagonal, as broad as long; fourth similar, but concave behind in suture with the convex front of the fifth, which is about twice the size of the other vertebrals, broader than long (2.37×3.37 inches), with the sides sloping outward to the last marginal; its suture with the caudals is straight. Caudal notched, the suture of both plates a little more than half the length of the fifth vertebral. Tail short, 1.5 inch in length. Costals large, four in number, nodosely carinate on their upper margin, but not extending, or scarcely seen on the fifth vertebral. The first costal is subtriangular and largest, convex in front, in suture with one-half of the first and the whole of the upper margin of the second, third, and fourth marginals; second costal in suture with the fifth and sixth marginals, its greatest breadth about two-thirds its greatest length (4×2.75 inches); third costal in suture with the seventh, eighth, and anterior third of the ninth; it is nearly the size of the second in length and breadth; fourth costal smallest and forming sutures with the posterior two-thirds of the ninth marginal, entire tenth, mesially the apex of the eleventh, and the sides of the fifth vertebral. Marginals variable in size, not serrated posteriorly, but slightly dilated at the eighth, ninth, and tenth. Feet anteriorly covered with imbricate scutes, posteriorly, or higher up, subimbricate, the scutes much smaller. Toes short, strong, and webbed to the claws; they are covered with annular scute-like plates. Claws strong and hooked. Sides of the legs fringed with large scales.

Colours: all the scales on the tarsi and feet with a yellow spot. Head black, with large spots, blotches, and streaks of yellow; a patch on each side of the snout, also on each side of the nostrils; one under each eye, another at the maxilla on the labial margin, and two behind each eye. There are also some large blotches on the tympanic and temporal regions, and three on each side of the lower jaw. Shell olive or greenish brown, the marginals, lower part of costals, and vertebrals with pale yellowish blotches and streaks of irregular shape. Sternum pale yellow, with linear transverse lines, very close together on the abdominal plates, and forming a large patch. The gulars and post-gulars are not marked.

Mr. Gleadow obtained this species in the Sind "*Doro*," in the Kushmore Talooka, Upper Sind.

It differs from all the described forms of *Melanochelys*, first by its greater size, next by the size and shape of the vertebrals and costals, and lastly by the markings of the shell and the spotted character of the head and feet.

Melanochelys trijuga, Schweig, *Prod.* p. 310; *Dum. et Bibr. Erpet. Gen.* ii. p. 310; Gray, *Shield Rept.* p. 20, tab. 4 and tab. 37, fig. 2; *Gunther, Rept. Br. India*, p. 29, pl. 2, fig. cc.; *Theob. Rep. Br. Ind.* p. 12.—THE COMMON POND TORTOISE.

Head covered with undivided skin, jaws not denticulated. Tail shorter than the head.

Shell depressed, ovate, not emarginate or serrated, with three longitudinal ridges, which are not interrupted by nodose prominences. The notch in the caudal shield is very small and shallow. Sternum rounded on the sides in adult females, and angularly bent in young males; its breadth between the front and hind incisions is nearly equal, and one-half of its length; it is subtruncated anteriorly, its posterior notch being rectangular.

The areolæ are finely granular, situated on the posterior margins of the plates; those of the vertebrals as well as of the costals are divided into two by the longitudinal ridges. The costal ridges are narrow, but very distinct near the vertebral ridge, and remote from the lateral edge of the shell. Nuchal plate longer than broad. Vertebrals as broad as long in adult specimens, rather broader in young ones; the last vertebral a little broader than the caudal, which is divided into two by a groove. Marginal plates of moderate width, with the outer edge slightly reverted in adult specimens. Gulars longer than broad, the suture between them being twice as long as that between the post-gulars. Postgular and pectoral of equal length, the latter square. The abdominal plate is the longest on the sternum, its sternal portion being considerably longer than broad. Suture between the anals longer than their posterior margin.

Fingers and toes completely webbed; claws pointed, five anteriorly and four posteriorly. The front side of the fore-arm and the dorsal side of the toes are covered with large, not prominent scales, the remainder of the limbs being granular. Wrist with a transverse series of four large scales on its inner side.

Colours: shell nearly uniform brown, the ridges somewhat lighter, sternum brownish black, in young specimens with broad white margins; head and feet unspotted brown.

Hab.—The Indus at Jerruck and Kotree, Punjab and, according to Theobald, Continental India.

This species is so accurately described by Dr. Gunther in his *Reptiles of British India* that I have given his description in full. The specimen got in Upper Sind differs only in the colouration of the head, which is unspotted brown. The length is, however, 7·37 inches. It is a question whether this species at any certain age, or by being immersed in spirit, loses the spotted character of the head. Theobald makes *M. Sebæ* gray, a second species, simply on account of the red markings on the head.

Family, LACERTIDÆ.

Gen. *Ophiops*, *Menetries*.

Lower eyelids wanting; nostrils between 2-3 nasals in the young and adolescent, and in a single partly divided plate in the adult; postnasals 2-3; no collar but a small fold in front of the shoulder. Scales of back keeled. Femoral pores present. Tympanum distinct.

Ophiops Jerdoni, *Blyth, J. A. S. B.* xxii., p. 653.; *Blanford, J. A. S. B.* vol. xlv. part ii. 1876, p. 26.

Nostril on the muzzle ridge between 2-3 nasals or in a single partially divided plate. Head shields plicate; one anterior and two posterior frontals; loreals 2, the second largest and separated from the eye by small scales; six pairs of chin shields, the first three forming a suture; superciliaries two on each side; upper labials 8; lower labials 7. Dorsal scales in 24-28 rows, the outer sharply keeled. Ventrals smooth, enlarged, and in six rows. Tail verticillate, covered with keeled scales. Femoral pores 8-10 on each thigh. One large præanal shield with another about one-half its size behind it.

Colour: bronze, with four rows of dark spots on the back and a lateral pale line between the outer rows on each side.

Length: 3.5 to 4.75 inches, of which the tail is usually from 2.25 to 2.5 inches.

Hab.—Sind, Kutch, (Mhow), Central India and South India.

Family, SCINCIDÆ.

Euprepes Guntheri, *Blanford, J. A. S. B.*, vol. xlviii. part 2, 1879. *Euprepes monticola*, *Gunther, Rep. Br. Ind.* p. 80, pl. x. fig. c; *Stolickza, J. A. S. B.* 1872, part. 2, p. 120; *Theobald, Rep. Br. Ind.* p. 52.

Lower eyelid with a transparent disk. A pair of supranasal shields in contact with each other; postfrontals forming a broad suture together; vertical elongate, tapering behind. Ear-opening rather small with lobules in front; the fifth upper labial is much longer than high, and below the orbit. Scales in 35-36 rows round the body and 35-40 between the axils. Dorsal scales with 2 keels and sometimes with a faint third keel between the two stronger ones. Lateral scales 3 keeled, præanal scales not enlarged; subcaudals rather longer than the others, the third hind toe is one-fifth shorter than the fourth.

Colours: upper and lateral parts greenish olive with a light band along each side of the back which is marked with small black spots, some scales on the side with a white black-edged ocellus. A white longitudinal streak edged with black below the eye, continued to the ear; lower parts greenish white.

Length: 8 to 8.75 inches, of which the tail is from 5 to 5.25.

Hab.—Upper Sind, Ajmere, Jubbulpore, Punjab and Central Provinces.

Riopa Hardwickii, *Gray, Lizards*, p. 96; *Jerdon, J. A. S. B.* xxii. p. 478; *Theobald, Rep. Br. Ind.* p. 63; *Gunther, Rept. Br. Ind.* p. 92. *Mabouya elegans*, *Gray, Lizards*, p. 95. *Eumeces punctatus*, *Lin. Syst. Nat.* p. 360; *Gunth. Rept. Br. Ind.* p. 93.—THE DOTTED SKINK.

Supranasals in contact with each other; limbs and toes feeble; the third hind toe nearly equal in length to the fourth. Lower eyelid

with a transparent disk. The single præfrontal is in contact with the vertical. Four superciliary shields; a pair of anterior occipitals. Ear-opening not denticulated, the front margin tubercular. 24-26 series of scales round the body, those between the axils variable, according to size. In specimens $4\frac{1}{2}$ to 5 inches long, 50 to 60; above this from 74 to 80 in number. Hind limb about one-fourth the length of the body. The foreleg does not extend to the eye.

Length: 4 to 7.5 inches, of which the tail is usually slightly more than one-half.

Colours: three longitudinal dark bands, one on the vertebral region and two laterally, made up, the vertebral one of four series of minute dark spots in the middle of each scale, and the lateral ones of six series of dark spots; between these three dark bands are two yellowish bands running from the nostril to the root of the tail. In some specimens these yellowish bands have also a dark spot on each scale. Tail with a dark spot on each scale all round. Under-surface white, except on the chin and throat. In large specimens the abdominal scutes are also spotted.

Hab.—Sind, South and Central India, Malabar, Coromandel, the Deccan, Concaa, (at Matheran,) the Punjab, (at Allahabad,) the Carnatic, Northern India and Bengal, also Belaspoor, in the Central Provinces.

Family, GECKOTIDÆ.

Hemidactylus kushmorensis, *Murray, Annals and Magazine Natural History*, xiv. August 1884, p. 109; *Boulenger, Cat. Lizards, Br. Museum*, p. 135.

Head rather depressed. Rostral grooved above, slightly wider than high. Upper labials 10; lower labials 8. Two pairs of chin-shields, the first only in contact. Muzzle covered with granular scales. Nostrils between the rostral, first labial and three small shields behind about equal in size to those covering the muzzle. Crown of the head interspersed with numerous rounded tubercles. Back with rounded tubercles arranged in twenty-two longitudinal series across the middle of the body; a few tubercles between the hind limbs are subtriangular. Tail verticillate, each verticel armed laterally with three rows of rather elongate subtriangular tubercles, except on its posterior third, where they are replaced by imbricate scales. Fore and hind limbs on their upper surface studded with round tubercles. Toes covered with imbricate scales. Claw on thumb well developed. Scales on the throat about one-third the size of those on the abdomen, across the middle of which they are arranged in 32-36 longitudinal series; the anterior half irregularly and minutely 1-3 crenulate, less conspicuous on the posterior half.

Femoral pores 10-12 on each thigh. Under surface of tarsi covered with large imbricate scales. Subcaudals single, 44-46. Middle toe with six pairs of plates and an odd one at each end.

Colours: neutral grey or brown, with three rows of squarish dark blotches, forming either longitudinal or obliquely transverse interrupted bands; a few smaller spots on the sides. A dark streak through the eye with a pale line above it. Scales on the under surface of the body freckled with 1-3 dark spots; many, especially on forward part of body, without them. Tail with 14-15 dark bands. Pupil vertical.

Hab.—Upper Sind, Kushmore and Thool Talookas.

Two only of six specimens with unreproduced tails. Length 4 to 4.25 inches. Type from Bhaner, Upper Sind frontier.

Differs from all the other species of the genus in having a greater number of dorsal tubercles, also femoral pores, except *H. Gleadowi*, and fewer abdominal scutes, except *H. triedrus*, and in having rounded tubercles.

The following table will sufficiently show the differences between it and the other allied species of the genus:—

Species.	Dorsal tubercles.	Abdominal scutes.	Pores.		Labials.		Length in inches.
			Femoral on each thigh.	Praeanal.	Upper.	Lower.	
<i>Hemidactylus Gleadowi</i> , Murray (V. Z. Sind)	15-16	38-39	13	.....	10-12	8-10	4.25
<i>H. karachiensis</i> , Murray (V. Z. Sind)	16	38-40	.....	6	9-10	8-10	3.5 to 4
<i>H.</i> , sp., <i>Blanford</i> (E. Persia) .	14	40	.....	none	10	8-9	3.65
<i>H. persicus</i> , <i>Blf.</i>	16	42-44	.....	8	11-12	9	5
<i>H. kushmorensis</i> , sp. nov.	20-22	32-36	10-12	.....	9-10	8	4.25
<i>H. subtriedrus</i> , <i>Jerd.</i> *	18-20	?	8	.....	7	.....	7
<i>H. triedrus</i> , <i>Daud.</i> *	Numerous.	30	7-8	.....	9-10	8	7
<i>H. maculatus</i> , <i>D. et. B.</i> *	do	37-41	10-14	.....	11	8	5
<i>H. Pieresi</i> , <i>Kelaart</i> *	do	40-42	32-36†	.....	11-12	10	9
<i>H. gracilis</i> , <i>Blanford</i> *	do	?	.....	6	?	?	?

Hemidactylus persicus, *Anderson*, *Proc. Zool. Soc.* 1872, p. 378, fig. 2; *Blanford*, *Zool. E. Persia*, p. 342; *id.* *J. A. S. B.* xiv. 1876, p. 18; *Boulenger*, *Cat. Lizards, Br. Mus.*, p. 131.

Head depressed; snout acuminate, as long as the distance between the eye and the upper border of the ear-opening. It is covered with large convex granular scales. Rostral grooved above, about four times wider than high. Ear-opening large, obliquely crescentic. Nostril between the rostral and three shields behind, the latter larger than those covering the muzzle. Upper labials 11-12; lower labials 9. Mental large, triangular behind. Two pairs of chin shields and some small ones following, the first pair largest and in contact behind the

* From Gunther and Theobald's work on Reptiles of British India.

† In a nearly continuous line.

mental, the second pair about half the size of the first. Inter-orbital space very narrow, about half the width of the upper eyelid. Eyelid fringed behind with spinescent scales. Crown of the head and temporal region interspersed with round, rather conical tubercles. Back with trihedral, strongly keeled tubercles arranged in 14-16 longitudinal series across the middle of the back; on the loins the tubercles are rather elongate, and on the sides conoidal. Tail verticillate, each verticel armed laterally with 6 (three on each side) elongate, trihedral tubercles, except on the posterior fourth, where these are replaced by imbricate scales. Subcaudals single, 66-70. Abdominal scutes small and smooth, and arranged across the middle of the belly in 42-44 longitudinal series. Scales on the throat smaller than those on the abdomen. Præanal pores 8, in an angular series. Limbs moderate. Upper surface of forearm and hind limb studded with tubercles. The hind foot laid forward does not extend to the shoulder, the forefoot reaches the eye.

Length: 5 to 5.5 inches, of which the tail is usually about two-thirds or less.

Colour: greyish or pale brown, with six brown bands across the back, a brown streak from the nostril through the eye to above the ear-opening; tail with dark transverse bars.

Hab.—Sind (Hydrabad and Sukkur) and Persia.

Teratolepis, *Gunther, Proc. Zool. Socy.* 1869, p. 504.

“Head as in *Hemidactylus*, but covered with small hexagonal scales. Body covered with faintly keeled imbricate scales. Toes 5 on all feet, clawed and with a divided row of transverse pneumatic plates beneath. Eye close to the gape; eyelids with a series of largish scales, and above the eyebrow a double row of most minute scales. Ear an oblique slit.” (*P. Z. S.* 1869, p. 504.)

Teratolepis (Homonota) fasciata, *Blyth, J. A. S. Beng.* xxii. 1853, p. 468; *Theobald, Cat. Rept. Br. Ind.* p. 97; *Boulenger, Cat. Lizards, Br. Mus.* p. 145.

Head covered with hexagonal flat scales. Body above covered with large imbricate, keeled and pointed scales, especially on the dorsal surface; laterally and below, with similar but much smaller hexagonal scales in oblique series; limbs long and slender, also studded with hexagonal scales, rather larger on the thighs and granular on inner side of arm; mental large, triangular; two pairs of chin shields in contact behind the mental followed by a series of smaller oval plates. Upper labials 7-8. Tail depressed, covered with irregular imbricate scales and tapering at the end.

Length: head and body 1.5 to 1.7. Tail 0.37 to 0.5.

Colours: greyish or plumbeous brown, with 7-8 irregular, rather broad pale brown or whitish cross-bands, formed of 3 or 4 spots together. Beneath ashy. A horse-shoe mark on the forehead.

Hab.—Sind.

Agamura, *Blanford, Ann. and Mag. Nat. Hist.* (4) xiii. 1874, p. 455.

"Digits slender, clawed, cylindrical at the base; the distal phalanges compressed, forming an angle with the basal portion of the digits; the claw between two enlarged scales; digits inferiorly with a row of plates. Body covered with small granules intermixed with enlarged tubercles. Tail very slender, not fragile. Pupil vertical. Males with or without præanal pores." (*Boulenger, Cat. Liz.*)

Agamura cruralis, *W. Blanf. Ann. and Mag. Nat. Hist.* (4) xiii. 1874, p. 455; *Eastern Persia*, p. 356, pl. xxiii. figs. 3, 3a; *Boulenger, Cat. Lizard, Br. Mus.* p. 50.

"Head covered with rounded scales, those on the occiput smaller than those on the snout. Eye large, pupil vertical. Upper eyelid well developed with a row of larger scales along the margin; lower eyelid wanting. Nostrils directed upward, situated between the rostral, first upper labial and three scales larger than those on the snout. Rostral grooved above, broader than high. Upper labials 12-14, lower labials 9-11 on each side. Mental elongate, trapezoid, longer than broad, no enlarged chin shields. Ear-opening vertically sub-elliptical. Back covered with small, flat granules, with numerous and larger scattered convex tubercles, irregularly arranged, but nearly equidistant from each other. Ventral scales small, roundish, hexagonal, subimbricate and smooth, passing gradually at the sides into the smaller scales. Limbs long and slender, covered above and below with nearly equal subimbricate scales about the size of those on the back, the thigh occasionally with a few enlarged tubercles. Soles of the feet covered with convex tubercles of unequal size. Toes cylindrical, covered with small imbricate scales above and with cross-plates below, all furnished with a minute claw. The hind limb laid forward reaches the eye, and the forelimb extends beyond the thigh, often reaching the vent. Two inguinal pores in enlarged scales in front of the vent in the males. Females with enlarged scales only. Tail thick at the base, but becoming suddenly thin, and continuing of the same thickness to the end. It is covered above and at the sides with smooth subimbricate scales arranged in rings, below is a single row of larger plates, each corresponding to two rings of scales." (*Blf. East. Pers.*)

Length: 5.75 to 6 inches, of which the tail is nearly one-half.

Colours: grey or greyish brown, with 4-5 broad transverse dusky bands on the back; tail and limbs also with transverse dusky bands.

Hab.—The Hubb, and foot of the Pubb range of hills (Sind), Cape Monze, Beloochistan.

Gymnodactylus scaber, *Rupp.; Murray, Ann. and Mag. Nat. Hist., Additions to the Vert. Zool. of Persia*, Aug. 1884, vol. xiv. pp. 102, 103; *id. Ann. and Mag. Nat. Hist.* Aug. 1884, p. 110., *Additions to the Reptilian Fauna of Sind.*

In form the counterpart of *Gymnodactylus petrensis*, Murray (Vert. Zool. Sind, p. 362).

Rostral broader than high and cleft above. Upper labials 10-12; lower labials 8-10. Pupil vertical; nostrils between the first labial and three small shields behind rather smaller than those covering the muzzle; interorbital space and occiput with large conical tubercles interspersed, a few also on the muzzle and a line of 3-4 in front of each eye. Two pairs of chin shields, the first largest and in contact. Back covered with granular scales and sharply-keeled trihedral tubercles, the latter as large as or slightly larger than the vertical ear-opening, and arranged across the middle of the trunk in 14 longitudinal rows; between the hind limbs the number is six. The tubercles on the sides of the body are rather smaller and subcarinate. Scales across the middle of the abdomen in 18-20 rows. Præanal pores 5-6. Outer surface of limbs with large trihedral tubercles. A pair of tubercles on each side of the sacral region. The forelimb laid forward reaches the end of the snout; laid back it reaches the axil of the hind limb. The hind limb laid forward extends beyond the axil of the forelimb. Tail verticillate, with three rows of sharply-keeled trihedral tubercles on each side to within an inch of the tip, beyond which it is covered with irregularly-arranged imbricate scales. Subcaudals distinct, single, about 44-54; a few of the anterior ones bifid.

Length: 4.5 to 5 inches, of which the tail is 2.5 to 2.75.

Colour: greyish brown, with three longitudinal rows of dusky subquadrate spots on the back; in some specimens one more row of rather indistinct spots on each side. Tail with 10-12 dark bands above.

Hab.—(Sukkur and Laki) Sind, Bushire and Tanjistan in Persia; Fao, in Southern Mesopotamia at the head of the Persian Gulf on the banks of the Shat-el-Arab; Charbar in Beloochistan, and Quetta and Kandahar in S. Afghanistan.

The synoptical table below will show the differences between this species and the other allied forms of *Gymnodactylus*:—

	Dorsal tubercles.	Abdominal scutes.	Pores.		Labials.	
			Femoral on each thigh.	Præanal.	Upper.	Lower.
<i>Gymnodactylus caspicus</i> , <i>Eichwald</i>	18-20	?	*32	-34	11	8-9
— <i>brevipes</i> , <i>W. Blf.</i>	10	22	.....	4	9	7
— <i>heterocercus</i> , <i>W. Blf.</i>	12	25-30	.....	no ne	8-10	7-8
— <i>petrensis</i> , <i>Murray</i>	12	34-35	.....	4	10-12	8-10
— <i>scaber</i> , <i>Rüpp.</i>	14	18-20	.....	5-6	10-12	8-10
— <i>kachensis</i> , <i>Stol.</i>	12-14	28-30	.....	*4.8	11-12	8-9
— <i>frænatus</i> , <i>Günther</i>	6-8	34	.....	4	11	9
— <i>Oldhami</i> , <i>Theob.</i>	30	?	.....	*4.0	11	10

* In a continuous line on both thighs.

Gymnodactylus brevipes, *Blf. East. Pers.* p. 344; *Murray, Ann. and Mag. Nat. Hist.* Aug. 1884, p. 102.

Head and body moderately depressed; limbs rather short. Scales of the back granular, with numerous sharply-keeled trihedral tubercles, each nearly equal to the small ear-opening in size, and arranged in regular longitudinal lines, of which ten may be counted in the middle of the back, diminishing to six between the thighs. All these tubercles are rather longer than broad. Tail longer than the body, distinctly ringed, each ring with three sharply-keeled, rather elongate trihedral tubercles (larger than those on the back) on each side, the space between the two uppermost in the centre of the tail being very little broader than the interspaces on the sides; lower portion of the tail, except at the base, covered with larger plates, many of them divided into two; when undivided they are about equally long and broad, and there are two to each ring.

Hinder part of head covered with unequal-sized granular scales; scales of the anterior portion larger, equal in size, convex, not carinate. Pupil vertical; upper eyelid very short, lower wanting. Nostrils between the hinder edge of rostral and first labial without any enlarged plates behind. Rostral rather broader than high, deeply cleft above. Upper labials nine, lower seven on each side. Two pairs of large chin shields, the first only in contact, the second pair smaller and widely separated; a few larger scales along the edge of the lower labials. Scales below head round, flat, those beneath the neck rather smaller, those on the belly considerably larger in the centre than towards the sides, in about twenty-two rows in the middle of the abdomen, but the passage into the granular scales of the sides is so gradual that it is difficult to say where either ends. I count about eight granules on each side between the flatter ventral scales and the lowest trihedral tubercles. Femoral pores four, in a curved row between the thighs.

The hind limb laid forward just reaches the shoulder; the forelimb laid back extends about two-thirds of the distance between the shoulder and thigh; laid forward the toe reaches to between the eye and snout. The longest toe of the hind foot is about equal to the distance between the eye and nostril. Limbs covered with imbricate scales above, some larger tubercles on the anterior portion of the hind limb only. The last two joints of each toe much smaller than the basal portion.

Length: 2.95 inches, of which the tail from the anus measures 1.7, forelimb 0.4, hind limb 0.57, middle toe of hind foot 0.13.

Colours: grey, with three rather imperfect longitudinal dusky bands on the back formed of arrow-head shaped marks. A dusky line not very strongly marked from the eye to the shoulder.

Hab.—The Hubb, Pubb range of hills, and Cape Monze, (Sind), Beloochistan, Bushire and Tanjistan in S. Persia.

Family, AGAMIDÆ.

Sitana, Cuv.

Body slightly compressed; limbs long, 4 toes only on the hind feet, no dorsal crest; scales keeled, regularly arranged; males with slight nuchal fold and a large gular appendage folding back on to the belly. Femoral pores none.

Sitana ponticeriana, Cuv. *Regne. Anim.*; *Jerdon, J. A. S. B.* xxii. 1853; *Gunther, Rept. Br. Ind.* p. 135; *Blanf. J. A. S. B.* xxxix. 1870, p. 365. *Sitana minor, Gunth. Rept. Br. Ind.* p. 135; *Theob. Cat. Rept. Ind.* p. 102; *Boulenger, Cat. Rept. Br. India.*

Head tetrahedral, covered with small keeled scales; a transverse row of 5-6 scales above the rostral. Canthus rostralis and superciliary edge sharp. Tympanum distinct; nostril small, below the canthus rostralis, and directed outwards; eyelids covered with scales; upper labials 12-14. Dorsal scales large, larger than the lateral scales and ventrals, all sharply keeled and forming longitudinal lines, lateral scales smallest. Gular appendage large, tricoloured, (blue, black and red) folding on to the belly in males; absent in females. Limbs covered with regularly arranged carinate scales; the hind limb laid forward does not, in some, reach the end of the snout, in others it reaches it or extends beyond. Tail round, covered with keeled imbricate scales usually once and a half to twice the length of the head and body. Total length from 6 to 8½ inches.

Colour: brown or olive brown with a series of rhomboidal dark spots along the middle of the back, on a lighter ground than the sides of the body. Tail also with a few spots as well as the upper portion of the thigh.

Hab.—Sind (Thurr and Parkur districts on the borders of Kutch), Punjab, Kutch, Nassick and Jubbulpore in the Bombay Presidency; Ellore, Chanda and Central India generally, also Northern and Southern India, Western Bengal, Malabar and Ceylon.

Calotes grandisquamis, Gunth. Proc. Zool. Soc. 1875, p. 226, pl. xxx.; *Boulenger, Cat. Lizards, Br. Mus.* p. 325.

Head tetrahedral, covered with imbricate, smooth and some feebly keeled scales; scales on the supraorbital region enlarged; canthus rostralis sharp, the scales along it elongate; nostril pierced laterally in the first large shield. Rostral small, rounded above with a series of 4-5 scales above it. Eyelids covered with granular scales. Tympanum large, distinct, with 3-4 small spines above it about half the diameter of the orbit. Gular pouch with smooth scales, those on the sides of it larger than the ventrals. Ventrals strongly keeled, also the scales of the upper surface of the limbs. An oblique fold in front of the shoulder. Dorso-nuchal crest of non-united lanceolate spines, the longest of which is equal to the diameter of the orbit, or more in adult males. In females there is only a feebly serrated ridge. Scales round the middle of the body in from

29 to 35 longitudinal rows. Dorsal scales smooth, nearly four times as large as the ventrals, and pointing upwards and backwards. The hind limb laid forward reaches the tympanum or slightly beyond; the forelimb does not reach the vent. Tail compressed. Total length 14 to 16 inches, of which the tail is usually twice and a half the length of head and body.

Colours: greenish, with broad dark brown transverse dorsal bands, or uniform green with a slightly yellowish or ochrey tinge about the loins.

Hab.—Sind (Kurrachee and Jerruck), and Malabar.

Charasia, *Gray, Cat. Liz.* p. 246; *Gunther, Rept. Br. Ind.* p. 156. *Brachysaura*, *Blyth, J. A. S. B.* xxv. 1856, p. 448. *Charasia*, *Boulenger, Cat. Liz. Br. Mus.* p. 333.

Tympanum distinct. Body covered with keeled scales. Dorsal crest feeble. A pit on each side of the throat and a small transverse fold. No præanal or femoral pores. No gular sac.

Charasia ornata, *Boulenger, Cat. Liz. Br. Mus.* p. 334. *Brachysaura ornata*, *Blyth, J. A. S. B.* 1856, p. 448; *Stol. Proc. As. Soc. Beng.* 1872, p. 77, *Gunther, Rept. Br. Ind.* p. 161; *Theob. Cat. Rept. Br. Ind.* p. 110.

Head short and convex, covered with smooth tubercular and feebly keeled scales. Canthus rostralis sharp, the scales along it elongate. Nostril pierced in a shield below the canthus rostralis, in the angle between the latter and the upper labials. Eyelid covered with granular scales. Tympanum distinct, with two groups of small spines above it. Gular and ventral scales keeled, the gulars larger than the ventrals. Dorsal scales larger than the ventrals, imbricate, strongly carinate, and sharp-pointed behind, the carina pointing obliquely upwards. The number of scales round the body varies from 55 to 60. Nuchal crest small, composed of 15–20 non-united spines, the longest of which is about equal to half the diameter of the eye—it is not continuous with the dorsal crest, but separated from it by 8–10 scales. Limbs short, covered with carinate scales. The hind limb laid forward reaches the neck.

Tail round, shorter than head and body, and covered with carinate scales.

Length: head and body 3·37 inches; tail 2·5.

Colours: in the young and adolescent the prevailing colours are, a pale yellowish brown above with a reddish brown band across the forehead, a pale yellow oblique streak edged with brown from below the eye to the gape, and 3 longitudinal rows of five rhomboidal reddish brown spots edged with yellowish white on the back. There is also one very distinct on the root of the tail above the anus, and 9–10 less distinct forming transverse bands on the tail. The upper surface of the limbs is also marked with reddish brown transverse and oblique bands. Under surface yellowish white, with a few faint dusky spots.

on the chin. The adult is similarly marked, but the spots are larger, and on the tail are 5 distinct white-edged dark spots, besides 5 dusky transverse bands, while on the thigh is a large ovate white edged reddish brown spot.

Hab.—Sind (Thurr and Parkur districts); Kutch; Guzerat at Ahmedabad; Mhow and Saugor in Central India and Northern India.

Agama isolepis, Boulenger, *Cat. Lizards, Br. Mus.* p. 342. *Agama agilis* (non Oliv) *And. desc. Egypte, Rept. Suppl.* p. 169, pl. i. fig. 5; *Anderson, Proc. Zool. Soc.* 1872, p. 384; *Blanford, East. Pers.* p. 314, *J. A. S. B.* xiv. 1876, p. 22, and xxlviii. 1879, p. 129; *Murray, Vert. Zool. Sind*, p. 371.

Head moderate, convex, sub-cordiform. Nostril not tubular, superior, pierced just above the canthus rostralis in the posterior part of a flat nasal. Upper head scales convex, smooth, or feebly keeled; occipital not enlarged, generally a few short spines on the post-temporal region and a few on the upper edge of the ear, which is exposed and not larger than the eye-opening; males with a small gular pouch. Body roundish, moderately depressed, covered above with equal, rhomboidal, imbricate, keeled, more or less distinctly mucronate scales; lateral and ventral scales much smaller, feebly keeled, exceptionally smooth. Limbs moderate; tibia a little longer than the skull (to occiput), third finger shorter than fourth, fifth not extending as far as second, third toe much shorter than fourth, fifth not extending quite as far as first. Tail twice and one-fourth to twice and two-thirds as long as the distance from gular fold to vent, rounded, covered with keeled scales. Male with a single or double row of anal pores.

Colours: sandy grey or brown above with or without dark transverse bands and light rhomboidal vertebral spots; the collar-pit blackish; lower surfaces white, often with dark longitudinal lines more or less distinctly marked, males with sides of the body and the throat deep blue during the breeding season.

Total length 8 to 10 inches, of which the tail is usually about once and a half the length of head and body.

Hab.—Sind, Punjab, Beloochistan, S. and S. E. Persia.

ORDER, OPHIDIA.

SUB-ORDER, COLUBRIDÆ.

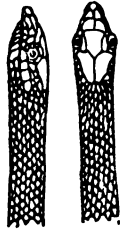
Family, ACONTIOPHIDÆ, *Gunther*.

Acontiophis, *Gunther*.

Snout acutely pointed, terminating in a rostral shield, which has the shape of a four-sided pyramid, is deeply grooved below and provided on each side with a longitudinal slit, the nostril as in *Acontias*. The posterior maxillary tooth is longest and not grooved. Sub-caudals two-rowed. Scales smooth in 19 rows.

Acontiophis paradoxa, *Gunther, P. Z. S.* 1875, p. 232; *Murray, Annals and Magazine of Natural History*, vol. xiv. 1884, p. 110.

Shields of the head normal. Vertical very broad, five-sided, with concave lateral margins and an obtuse posterior angle; two pairs of frontals, the præfrontal quadrangular, receiving in front about one-third of the upper ovate portion of the peculiar rostral; post-frontals longer than broad, bent down laterally and in contact with the loreal. Rostral deeply grooved; mental with an apophysis. The shield, which is the homologue of the nasal in other snakes, is elongate, smooth, not perforated and distinct from the loreal; 3 præ and 2 postoculars; 8 upper labials, the fifth entering the orbit. Ventrals



180-187. Subcaudals 44-52 pairs. Pupil vertical.

Colour: greyish brown; a dark line from behind the eye to the nape, a subovate dark patch on the occiput and a border along the margins of the occipitals from the anterior half of the superciliaries. A dorsal series of quadrangular dark spots with white interspaces nearly of the same width to within an inch of the end of the tail where they become smaller and more faint and gradually disappear.

Length: 12 to 14.25 inches, of which the tail is from 1.5 to 2.10 inches.

Hab.—Upper Sind, frontier districts, Thool Talooka at Zungipoor. Hitherto this peculiar snake was known from a single specimen only, the locality of which has only now been ascertained. Dr. Gunther, when describing it in *P. Z. S.*, 1875, thought that the late Dr. Jerdon obtained it probably within the Himalayan region or in Khasya, the bottle containing the single specimen bearing no record as regards locality. Science is indebted to Mr. F. Gleadow for unearthing two more specimens of this species from depressions a quarter of a mile apart, in a considerable area of blown sand forming hillocks from 20 to 30 feet high.

Family, ACROCHORDIDÆ.

Chersydrus, *Cuv.*

Hind part of body and tail slightly compressed. Tail vertically expanded. A fold of skin along the median line of the abdomen. Scales tubercular. No ventral or subcaudal shields.

Chersydrus granulatus, *Schneid, Amph.* p. 243; *Gunther, Rept. Br. Ind.* p. 336.

Head, neck, chin and entire upper and lower surfaces of the body covered with tubercular scales. Nostrils round, valvular, separated from each other by a single row of two scales; eyes directed forwards.

Length: 3½ to 4 feet.

Colour: dark brown or black, with transverse bands of white or yellowish white, broader on the abdominal region, and either meeting

or not on the dorsal surface. Head yellow spotted, a short yellow streak behind the eye.

Hab.—Sea coasts of Sind, Mekran, Kutch and Bombay, also of Madras and the Malayan Peninsula.

Family, HYDROPHIDÆ.

Hydrophis asperrimus, *Sp. Nov.*

Head slightly broader than the neck. Rostral broader than high; pentagonal triangular at apex; nasals higher than broad; frontals broader than high, subtriangular, and in suture with the præocular, superciliary, vertical, the second labial and nasal; superciliary single, large, six-sided. *All the head shields imbricate, and thickly studded with minute granules.* Vertical triangular behind, about half the size of an occipital. Upper labials 5, and 4 smaller ones behind; *the upper hind corner of the 3rd, and the 4th and 5th enter the orbit.* Two postoculars; temporals 5 on the side of each occipital, the anterior largest and nearly entering the labial margin, the next about half the size of the first and the others decreasing in size. *Three pairs of chin shields, the hindmost about half the size of the second; 33 rows of scales round the neck.* Scales on the anterior portion



of the body subimbricate and pointed behind; on the posterior portion non-imbricate and six-sided, all the scales of the body with a mesial bituberculate keel. Ventrals 368, entire, irregularly 5-7 tuberculate, and twice the size of the adjoining scales, posteriorly they are a very little smaller. Four anal shields. Terminal scale of the tail large.

Length: 60 inches, of which the tail is 5.5 inches. Circumference round neck 2 inches.

Colours: head pale reddish brown, a pale yellow streak on each side from the nasal over the eye to above the gape and a pale reddish streak through the eye. Labials whitish. Body yellowish white, completely encircled by 58 bands, reddish brown on the first half, and black on the posterior half, all broadest on the vertebral region, where the interspaces are only 2-3 scales wide; on the sides the bands are narrowed and again slightly dilated on the belly. Tail encircled by 10 bands and tipped black.

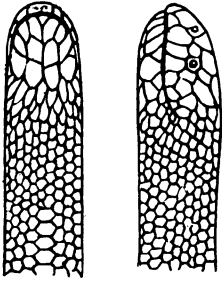
Hab.—Kurrachee Sea and Persian Gulf.

This species is allied to *Hydrophis tuberculata* and *dayanus*, but is easily distinguishable from both by having a 3rd pair of chin shields, a smaller number of scales round the neck (33 instead of 38), the 3rd, 4th and 5th labials entering the orbit, a greater number of ventrals (368 instead of 321), and also by having a greater number of bands on the

body which completely encircle it, the anterior half being a reddish brown.

Hydrophis tessellatus, Sp. Nov.

Head scarcely distinct from neck, its length about once and a half its greatest width. Anterior portion of body slender, its circumference



at the 5th dorsal band 1.25 inches, hind portion much compressed, forming a vertebral ridge. Rostral pentagonal, as broad as high, triangular at apex and in suture with the furcately divided nasals in front. Nasals twice as large as one of the anterior frontals, which is subtriangular and in contact with the vertical and the single superciliary shield; vertical six-sided, elongate posteriorly, $1\frac{1}{4}$ its length, is equal to the length of an occipital. Three temporals on each side of the occipitals, the

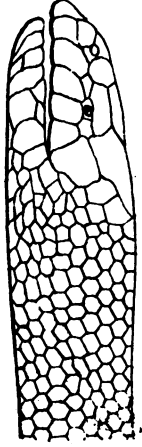
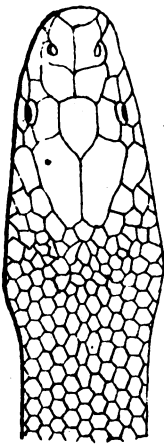
anterior nearly twice as long as broad. One præ and two post-oculars, 8 upper labials, the second largest and in contact with the nasal, frontal and præocular, the third and fourth enter the orbit. Lower labials 4 and 7-8 small ones following, a very small detached triangular piece on the labial margin on each side between the 3rd and 4th labials. Two pairs of chin shields in contact with each other. Scales of the anterior slender portion of the body elongate, 6 sided; on the broad compressed portion and on the tail hexagonal, and throughout arranged in non-imbricate, longitudinal lines, showing a tessellated pattern; 31 series of scales round the neck, 48 round the highest part of the body, and 28 round the tail, all with a scarcely perceptible subcentral keel; smooth in the young; ventrals also imperceptibly bitubercular, twice the size of the adjoining scales, many divided: 312 to 315 in the young and 332 in the adult, all subimbricate. Four slightly enlarged, callose, anal shields.

Length: adult, 28 inches, of which the tail is 2.25 inches; circumference of highest part of trunk 4.25 inches. The young specimens (all three) measure 12 inches, of which the tail is 1.25 inches.

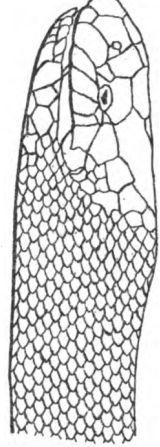
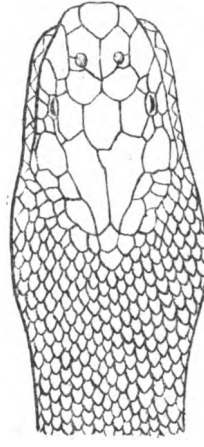
Colours: yellowish white, with 40 dark bands on the body, broader than the interspaces on the vertebral region, and narrowing on the sides and abdomen to a width of 4 scales. Tail with 4 dark bands and a black tip. Head black, with a yellowish salmon-coloured streak on each side from the middle of the large nasal plate, over the eye, to behind the gape, meeting the first white band on the neck; chin and throat pale brown. In the young the chin, throat and for a distance of 10 annulations, the lower portion of the neck is entirely black, also the lower surface of the tail and two annulations near the anus, thus making the neck appear to have 10 yellowish white annulations not meeting below, and the tail and anal region with 6.

Hab.—Kurrachee Sea and Persian Gulf.

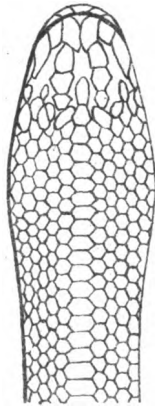
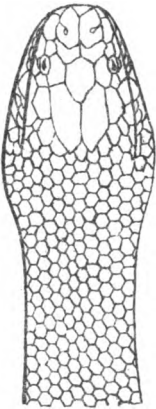
REPTILES OF SIND.



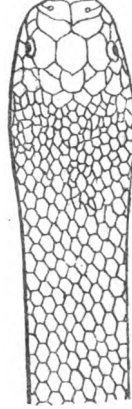
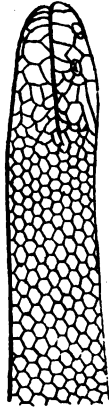
a



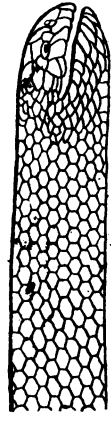
b



c



d



a *Hydrophis robusta.*

b *Hydrophis cyanocincta.*

c *Hydrophis stuartii.*



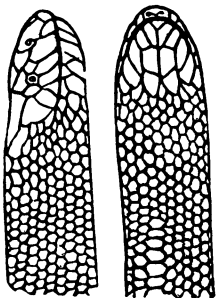
e

d *Hydrophis curta.*

e *Hydrophis chloris.*

Hydrophis aurifasciata, *Sp. Nov.*

Head scarcely distinct from neck; rostral pentagonal, sub-triangular at apex, lobuliform below, broader than high. Nasal longer than broad; frontal sub-triangular, and in contact with the vertical, super-



ciliary, præocular and second upper labial shields. Vertical triangular in front tapering behind, its length $1\frac{1}{4}$ its breadth. Occipitals twice the greatest breadth of the vertical, truncated behind, and both together forming a nearly triangular concavity behind, in which a shield is embedded. Two large temporals on the side of each occipital, not entering the labial margin. The vertical length of the first is equal to the longitudinal length of the second. One præ and one postocular; 7 upper labials, the third and fourth entering

the orbit; the second is in contact with the nasal, frontal and anterior ocular; the 4th, 5th and 6th and anterior temporal in contact with the postocular. Three large lower labials and 6-7 small shields behind, the anterior large ones in contact with the first and part of the second pair of chin shields. Neck about one-third the length of the body which is compressed posteriorly, the vertical height about, equal to the circumference of the neck, which is 1.5 inches. Circumference of body 2.62 inches. Scales round the neck in 31 rows counting from the 1st ventral, and round the highest part of body in 36 rows; anteriorly they are rather elongate, and irregularly six-sided, and posteriorly almost regularly hexagonal, all with a very feeble mesial tubercle, *not carina*, except on the vertebral region, where there are sometimes 2-3 carina like tubercles on some scales. Ventrals 367 in number, twice the size of the adjoining scales, bi-tuberculate, and the greater number chiefly posteriorly with a mesial longitudinal groove.

Length: 41 inches of which the tail is $2\frac{1}{4}$ inches.

Colours: Lower half of upper labials, all the lower labials and the chin and throat, shining golden yellow. A dark brown streak from behind and under each eye, across the upper half of upper labials extending to and meeting on the nasals, followed by a yellow band extending to the temporals. A subtriangular patch of dark brown covering the vertical, occipitals and hind temporals, from behind the latter is a dark streak continuous with it extending to the gape. A yellow spot on the vertical and in the middle of each occipital. Dorsal surface of body shining golden yellow tinged with greenish; each scale edged at its base with dark brown; lateral and ventral surface very little paler yellow, 54 rings of shining black scales on the body entirely encircling it, two and a black tip on the tail.

Hab.—Kurrachee Sea.

Hydrophis lapemoides, *Gray, Viper. Snakes*, p. 46; *Gunther, Rept. Br. Ind.* p. 374.

Head narrow, elongate, once and three-quarters the width is equal to the length. Body slender anteriorly, moderately elongate posteriorly. Two pairs of chin shields, the first in contact with each other. Two postoculars; thirty to thirty-two series of scales round the neck. Ventrals 350 in number. Four small præanal shields. Scales of the young smooth, of the adult with a short central keel. Thirty-seven to forty-three black rings round the body, broadest on the back, narrowest on the side, and again somewhat dilated on the belly; they occupy nearly as much space as the ground colour; ventral shields blackish.

Colours: head black above, with a yellow band on each side, the two bands convergent on the nasal plates. Lower parts of the head greyish. Tail black with a white ring round its base, and sometimes with some other half rings across its back.

Length: 24 to 26·5 inches, of which the tail is 2·5.

Hab.—Kurrachee Sea, Beloochistan, Bombay, Madras and Ceylon coasts.

ORDER, BATRACHIA SALIENTIA.

Family, RANIDÆ

Rana sternosignata, *Murray, Ann. and Mag. Nat. Hist.* 1885, p. 120.

Head broad, without an occipital fold. Gape 1·5 inch across. Snout rounded, without *canthus rostralis*, nostrils nearer the eye than the end of the snout. Tympanum rather indistinct, about one-third the size of the eye. Interorbital space slightly concave and as wide as the upper eyelid. A plait behind the eye above the tympanum, not very distinct in some specimens. Vomerine teeth in two small groups between the inner nostrils. Lower jaw with two not very prominent apophyses. Back and upper surface of hind limbs finely tubercular. Sides rugose, with spiniferous warts. *On the under surface there are two nearly circular patches of minute dark spinescent tubercles, on the sternum and the abdomen is covered with large horny-tipped tubercles, while under the throat and, in some specimens, on the chin also there are patches of minute spinous granulations.* Forelimb short and stout; fingers of moderate length, the tips dilated into small disks; subarticular tubercles well developed. Palmar surface of both fore and hind feet with minute, scattered, conical, dark spinous tubercles. Laid side by side the second and fourth fingers are equal, the first smallest and the third longest. *First finger with a nodose prominence covered with minute tubercles on the dorsal surface; second finger the same, with the nodose prominence less developed, while below, on the side of the first finger, is also a thumb-like prominence covered with tubercles.* Hind limbs

moderate. The distance between vent and knee equals half the length of the head and body. Laid forward, the knee reaches the axil of the forelimb and the metatarsal tubercles the tip of the snout. The toes are webbed to the base of the disks or swollen tips, and bear subarticular tubercles; metatarsus with a single elongate spur-like tubercle. A cutaneous fringe along the margin of the first and fifth toes.

Colours: from olive-brown to dark brown on the dorsal surface; yellowish brown on the ventral surface, with or without, or with a very few dark brown specklings. Chin and throat yellowish white, more or less marbled with brown. Inner side of thighs brownish, with flocculent yellowish marbling.

In general characters this species is not unlike *R. cyanophlyctis*, but is readily recognized by its broad head, sternal tubercular patches, and tubercular thumb-like nodosity below the first finger, as also by the tubercular dorsal surface of the first and second fingers.

Hab.—Sind, (Mulleer near Kurrachee) and Zandra and Quetta, in South Afghanistan.

TABLE SHOWING THE GEOGRAPHICAL DISTRIBUTION
OF SIND REPTILES.

SPECIES.	Belochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	South India.	Page
CHELONIA.															
<i>Testudo elegans, Schæpff</i>								+	×	×				×	6
<i>Testudo Leithi, Gunth</i>															7
<i>Pangshura tentoria, Gray</i>				×	×	×	×								8
<i>Pangshura smithi, Gunth</i>				×	×	×	×								8
<i>Batagur baska, Gray</i>							×								9
<i>Batagur thurgi, Gray</i>				×	×	×	×								9
<i>Emyda granosa, Schæpff</i>				×	×	×	×					×		×	10
<i>Trionyx gangeticus, Cuv.</i>				×	×	×	×		+						10
<i>Chitra Indica, Gray</i>				×	×	×	×								11
<i>Caouna olivacea, Gray</i>							×					×		×	11
<i>Chelonia virgata, Schw.</i>							×								11
SAURIA.															
<i>Crocodylus palustris, Less.</i>	×		+	×	×	×	×	+						×	12
<i>Gavialis gangeticus, Gmel.</i>				×	×	×	×								13
<i>Varanus flavescens, Cant.</i>	×			×	×	×	×		×	×		×	×	×	13
<i>Varanus dracæna, Lin.</i>	×		×	×	×	×	×	+	×			×	×	×	14
<i>Varanus lunatus, Gray</i>				×	×	×	×	+		×					14
<i>Psammosaurus scincus, Gray</i>	×	×	+	×	×	×				×					14
<i>Cabrita leschenaulti, M. Edw.</i>			×	×	×			×	×	×				×	15
<i>Acanthodactylus cantoris, Gunth.</i> ..	×	×	×	×	×										16
<i>Acanthodactylus micropholis, Blf.</i> ..	×	×	×	×	×										16
<i>Mesalina Watsonana, Stol.</i>															17
<i>Mesalina pardalis, Licht.</i>	×	×	×												18
<i>Euprepes carinatus, Schn</i>			×	×	×		×		×		+	+	×	×	19
<i>Euprepes macularius, Blyth</i>				×	×	×	×		×						19
<i>Euprepes septemtæniatus, Reuss</i>		×	+	+	+										20
<i>Scincus arenaria, Sp. Nov.</i>															21
<i>Blepharosteres grayanus, Stol</i>										×					22
<i>Ablepharus Brandti, Strauch</i>		×								×					22
<i>Eumeces tæniolatus, Blyth.</i>			+	×											24
<i>Sphenocephalus tridactylus, Blyth</i> ..	×	×	×	×											24
<i>Gongylus ocellatus, Wagler</i>		×													25
<i>Ptyodactylus homolepis, Blf.</i>															26
<i>Hemidactylus cocteauui, D. et B.</i>	×	+	+	×	×	×	×	×	+	×	+	×	×		27
<i>Hemidactylus Gleadowi, Murray</i>															28
<i>Hemidactylus Karachiensis, Murray</i> ..															29
<i>Gymnodactylus petrensis, Murray</i> ..															30
<i>Stenodactylus orientalis, Blf.</i>															31
<i>Stenodactylus Dunstervillei, Sp. Nov.</i>															31
<i>Bunopus tuberculatus, Blf.</i>	×	×	+												32
<i>Pristurus rupestris, Blf.</i>	×	×													33

Marks + show the additional knowledge of the distribution of species since the last publication.

SPECIES.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	South India.	Page
SAURIA—(continued).															
<i>Eublepharis hardwickii, Gray</i>				X	X		X							X	34
<i>Eublepharis macularius, Blyth</i>				X	X		X								34
<i>Calotes versicolor, Daud</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	35
<i>Phrynocephalus olivieri, D. et B.</i>	X	X	X	X											36
<i>Stellio melanura, Blyth</i>			+		X										36
<i>Stellio nuptus, De F.</i>	X	X	X												37
<i>Trapelus megalonyx, Gunth</i>															38
<i>Trapelus ruderatus, Oliv.</i>	X	X	+												38
<i>Trapelus rubrigularis, Rupp.</i>	X	X	+												39
<i>Agama agilis, Oliv.</i>	X	X	X	X											39
<i>Uromastix hardwickii, Gray</i>	X		X	X	X	X	X	X	X	X	X	X	X		40
OPHIDIA.															
<i>Typhlops braminus, Cuv.</i>				X	X	X	X	+			X	X	X		42
<i>Typhlops porrectus, Stol.</i>				X	X	X	X								42
<i>Oligodon subgriseus, D. et B.</i>			+	X	X	X	X	+						X	43
<i>Cyclophis frænatus, Gunth.</i>			X												43
<i>Cynophis helena, Daud</i>								+	X	X	+	X	X	X	44
<i>Ptyas mucosus, Lin.</i>	+		+	X	X	X	X	X		X	X	X	X	X	45
<i>Zamenis diadema, Schleg.</i>	X	X	X	X	X	X	X	X	X			X	X		45
<i>Zamenis ventrimaculatus, Gray.</i>	X	X	+				X					X	X		46
<i>Zamenis gracilis, Gunth</i>												X	X		46
<i>Tropidonotus quincunciatus, Schleg</i> ..		X		X	X	X	X	X	X	X	X	X	X	X	47
<i>Tropidonotus stolatus, Lin.</i>	+		+	X	X	X	X	X	X	X	X	X	X	X	47
<i>Tropidonotus plumbicolor, Cant.</i>				X	X	X	X	X	X	X	X	X	X	X	48
<i>Cerberus rhynchops, Russell</i>							X			X		X		X	49
<i>Psammophis condanarus, Merr.</i>				X	X			+						X	50
<i>Psammophis Leithii, Gunth.</i>	X	X	X	X	X										50
<i>Dipsas trigonata, Boie.</i>							X	X	X	X	X			X	51
<i>Lycodon aulicus, Lin.</i>				X	X	X	X	X	X	X	X	X	X	X	51
<i>Lycodon striatus, Russell.</i>				X	X	X		+	+	+	X	X	X	X	52
<i>Python molurus, Lin.</i>				X	X	X	?	X	X	X	X			X	53
<i>Eryx Johni, Russell.</i>			+	X	X	X	X	X	X	X	X	X	X	X	53
<i>Gongylophis conicus, Wagl</i>				X	X	X	X	X	X	X	X	X	X	X	54
<i>Naja tripudians, Merr.</i>	X		+	X	X	X	X	X	X	X	X	X	X	X	55
<i>Bungarus cæruleus, Daud</i>				X	X	X	X	X	X	X	X	X	X	X	55
<i>Daboia russelli, Gray</i>				X	X	X	X	X	X	X	X	+			56
<i>Echis carinata, Merr.</i>	X	X	+	X	X	X	X	X	X	X	X			X	56
<i>Hydrophis Stewartii, Andr.</i>							X				X				58
<i>Hydrophis spiralis, Shaw.</i>		†					X			X		X		X	58
<i>Hydrophis Bishopii, Murray</i>							X								59
<i>Hydrophis cyanocincta, Daud.</i>							X			X		X		X	59
<i>Hydrophis chloris, Daud.</i>							X			X		X		X	60
<i>Hydrophis Lindsayi, Gray</i>														X	60
<i>Hydrophis tuberculata, Anders.</i>		†					X								61
<i>Hydrophis dayanus, Stol.</i>															61

† Persian Gulf.

SPECIES.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	South India.	Page
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<i>Hydrophis robusta, Gunth.</i>							X			X		X			62
<i>Hydrophis curta, Gunth.</i>	*	†					X							X	63
<i>Hydrophis gracilis, Shaw</i>	*	†					X			X		X		X	63
<i>Hydrophis Guntherii, Sp. Nov.</i>		†								X					64
<i>Enhydrina bengalensis, Gray.</i>	*	†					X			X		X		X	64
<i>Pelamis bicolor, Daud.</i>	*	†					X						X	X	65
BATRACHIA.															
<i>Rana kuhlii, Schleg.</i>	X						X			X	+	X			65
<i>Rana cyanophlyctis, Schn.</i>	X	X		X	X	X	X	X	X	X	X	X	X	X	66
<i>Rana tigrina, Daud.</i>		X		X	X	X	X			X	X	X	X	X	66
<i>Pyxicephalus breviceps, Schn.</i>				X	X	X	X	X		X	X	X	X	X	67
<i>Bufo melanostictus, Schn.</i>				X	X	X	X	X		X	X	X	X	X	68
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* Coast. † Persian Gulf.

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* * * * *

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