

terior *tarsi* of the males, having the basal joint as long as the terminal. Moreover, although the genus certainly belongs to the *Scutelleridæ*, I have not been able to discover more than two joints in the *tarsi*.

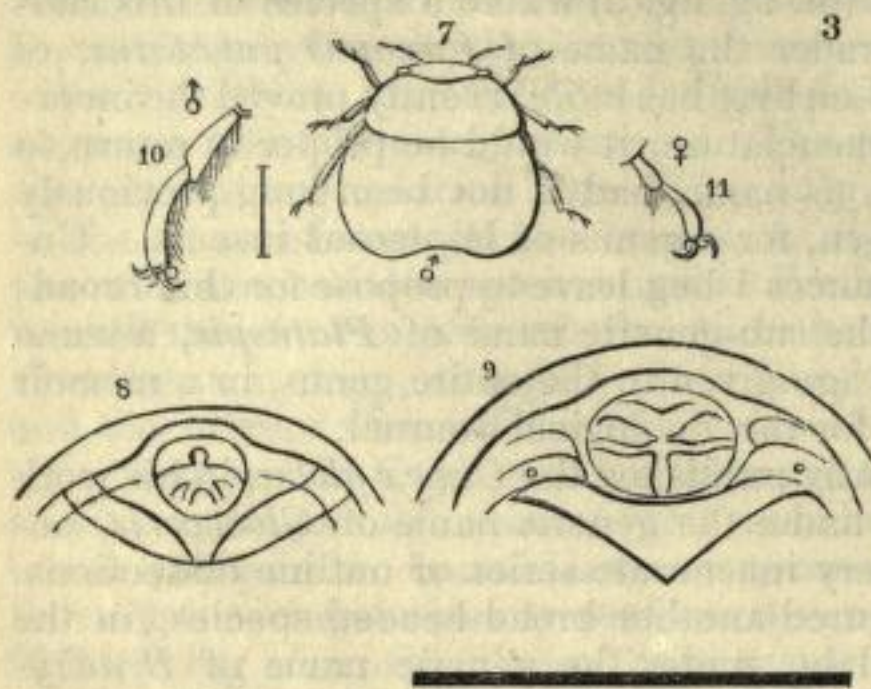


Fig. 3. No. 7. *Plataspis nigriventris*, magnified, (Java). 8. Extremity of the scutellum and abdomen of male. 9. Ditto of female. 10. Posterior tarsi of male. 11. Do. of female.

ART. VI. *Contributions to South African Zoology.* By ANDREW SMITH, M.D. Surgeon to the Forces.

No. I.

WHILST lately engaged in examining the saurian reptiles of South Africa, I found amongst them nine species referrible to the genus *Cordylus*, of Gronovius; and as only one of them appears to be distinctly described, I here propose to characterise the remaining eight species; not, however, without a suspicion, that some of them, at least, may have already been indicated by Schlegel, in his Monograph of the genus *Cordylus*, which I have not been able to consult. All the species belong decidedly to the same genus; at least, their general configuration and anatomical characters, place them together: yet there are modifications presented by some, which may render it desirable to arrange them for the present, in sections, or sub-genera. The characters common to all, may be indicated as those of the genus; and the peculiarities common to certain of the species, as those of the sections, or sub-genera.

Genus *CORDYLUS*, Gronov.

Head broader than the neck, somewhat triangular, square behind, the temples bulging, above it is covered with thin plates, five of which form a distinct square upon the *occiput*. *Teeth* small, cylindrical, closely set, and disposed in a groove, around the inner surface of both jaws; those about half way between the nose and angle of the mouth, generally the largest.—*Tongue* short, its apex emarginate. *Ears* partially concealed by the hinder

edges of the temples. Scales of the back and belly disposed in transverse rows; those of the tail, in spinous rings. Femoral pores distinct, and arranged in one or two rows.

A. Scales forming the transverse rows contiguous or over-lapping, of a squarish form, and smooth or carinated; sides of the neck armed with projecting spinous scales; most of the scales of the tail carinated, and many of them, particularly those on the sides, terminated by strong sharp spines; femoral pores in one row, and in the male only. CORDYLUS.

C. griseus, Seba. Back with about 26 transverse rows of quadrangular scales, the latter smooth towards the dorsal line, but, on the sides, carinated. Anterior edge of ear concealed by two or three slightly projecting semicircular horny scales. Above, colour brown, or brownish black, below, light brown. The back, in many individuals, is variegated with irregular black or light reddish brown spots, and in some there is a reddish brown line, following the course of the spine. Femoral pores generally 7 on each side. Length from 6 to 8 inches.

C. polyzonus. Back crossed by about 40 bands of quadrangular scales, the latter smooth, except on the sides, where they are slightly carinated.—Anterior margin of ear covered by several thick, projecting, pointed scales, the lowermost of which is largest. Temporal scales slightly carinated, and each with a faint aculeus. Above, brown or black, sometimes brown variegated with spots of a darker or lighter tint; below, livid brown; on each side of the neck, immediately behind the ear, an oblong black blotch. Femoral pores 12 on each side. Length, from 8 to 10 inches.

C. nebulosus. Back with about 16 transverse rows of quadrangular scales, the latter smooth on the middle of the back, but strongly carinated and spinous on the sides. Ears defended by four large projecting scales. Sides of neck armed with strong spinous scales, directed outwards. Temples very prominent, thereby giving a great breadth to the hinder part of the head. Scales of the tail terminating in very strong spines. Colour above, brown, below, yellowish brown, clouded with black spots and stripes. Length, from 6 to 8 inches.

The diagnostic characters of the foregoing species are numerous. They may all be readily distinguished, simply by reckoning the rows of scales, which are nearly uniform in the individuals of each species; but should this not be considered sufficient, other discrepancies will easily be discovered. On comparing specimens of *Cordylus griseus* and *C. polyzonus*, it will be found that the rows of scales are much narrower in the latter than in the former, and that the scales of the tail in *polyzonus* are never so strongly armed as in *griseus*; besides, the latter never attains to the same size as the former, nor does it ever exhibit the oblong black blotch, which occurs on the side of the neck of *polyzonus*. *C. nebulosus* is again easily to be distinguished from both the last, by the breadth of its hind head, the great size of its scales, their superior strength, and the very strong and lengthened spines, with which the greater portion of the tail is armed. The black variegations upon the chin, throat, and belly, are also peculiar to it.

B. Back covered by transverse rows of contiguous or over-lapping scales; sides by small tubercular or granular scales; sides of the neck with a fold of loose skin, which, as well as the parts surrounding it, is covered with granular scales. HEMICORDYLUS.

H. *Capensis*. Scales of the back quadrangular and carinated; the number of transverse rows considerable, but from their being indistinct on the back of the neck, where the granular scales abound, it is not possible to reckon them with any certainty. About the middle of each side, a longitudinal row of large scales amongst the granular ones. Scales of tail with moderate spines. Belly with 8 longitudinal rows of square plates. Femoral pores, 18. Colour above, dirty black, beneath, livid blue black. Length $7\frac{1}{2}$ inches.

This is the only species I have yet seen, which well belongs to this section; and the only specimen of the species which I have had an opportunity of examining, is contained in the Museum of the Army Medical Department, whither it was sent, from the Cape of Good Hope, by Assistant Surgeon Forde, of the 72nd Regiment. By its peculiar scales, it is at once to be distinguished from the species of the foregoing section. The mixed character of the scales on the sides, points out its close connection with the species of the next section.

C. Scales of the back and sides disposed in transverse rows, somewhat circular in form, and those of each row more or less separated by the intervention of small granular scales. Neck with two folds of loose skin, and by the mode in which they are disposed generally give rise to triangular depressions behind the ears. Femoral pores in two rows, most distinct in the male.—PSEUDOCORDYLUS.

✓ *P. montanus*. Scales forming the transverse rows small, somewhat ovate and faintly carinated; those on the sides largest; scales of tail with moderate sized spines. Colour above, brown or blackish brown, and transversely divided at nearly equal distances by 7 or 8 interrupted yellowish bands; below, yellow or orange, with tints of red; legs variegated by transverse yellow bands; tail irregularly marked, black and yellow. Femoral pores 8 in the last, and 4 or 5 in the first row. Length, from 10 to 13 inches.

✓ *P. fasciatus*. Scales forming the transverse rows rather closely set, somewhat circular, and with elevated discs. Anterior margin of ear concealed by three projecting horny scales, the lowest being largest. Colour above, brown-black, variegated by 7 or 8 transverse rows of dirty white spots, 2 of which rows cross the back of the neck; beneath, light livid brown. Seven femoral pores in the last row, and 4 or 5 in the first. Length, from 8 to 10 inches.

✓ *P. melanotus*. Scales circular and small along the middle of the back, on the sides larger and somewhat ovate, each with a faint carina, ending in a rudimentary spine. Colour above, black, sides and belly orange yellow, tinted with vermilion red. On each side of the neck two large black spots. Ten femoral pores in the last row, and 8 in the first. Length, from 12 to 14 inches. The female has the back freely variegated with short yellowish stripes.

✓ *P. Algoensis*. Scales forming the transverse rows, sub-ovate, each with an elevated disc, and a faint carina; those towards the dorsal line smallest. Colour above, reddish brown, crossed by some imperfect yellow bands in the male, and by 6 or 7 rows of yellow spots in the female; sides and belly orange yellow, tinted with vermilion red; two large black spots on each side

of the neck. From 7 to 9 femoral pores in the last row, and 4 in the first. Length, from 14 to 16 inches.

P. sub-viridis. Scales of transverse rows smallest towards the dorsal line, where they are of a somewhat circular form; on the sides they are larger, and inclined to a triangular shape, with elevated discs, and each faintly carinated. Colour above, blue green, the back freely variegated with faint longitudinal short whitish streaks, beneath greenish brown. Length 10 inches.

There is a considerable resemblance between the two first species of this section, but they will easily be distinguished by a regard to the character of the scales. In *montanus* they are carinated; whilst in *fasciatus* they have elevated discs, without any appearance of carinæ.

ART. VII. *On the generic characters of Cartilaginous Fishes, with Descriptions of new genera.* By PROFESSOR J. MULLER and DR. HENLE.

THE confusion which still exists in the natural history of cartilaginous fishes, may be attributed to the generally imperfect descriptions which have been given of the species, and also to the circumstance of the most important generic characters having been, in many instances, either overlooked or not sufficiently appreciated. In searching for characters by which the genera and species might be distinguished with more accuracy than had been previously done, we found ourselves compelled to enlarge the number of genera and subgenera hitherto established; but, at the same time, we most carefully avoided making these additions, unless very essential differences rendered their establishment necessary. Such are, in the order of *Sharks*, the system of dentition, the form of the nose, of the mouth, and lips, and of the caudal fin; the existence or want of the eyelid, (*membrana nictitans*) spiracles, and of the small depression or dimple on the root of the tail; the situation of the branchial openings, and of the dorsal fins; and in the order of *Skates*, the form of the nasal valve, and of the membranaceous curtain behind the teeth, (*velum maxillare*) the number and si-

* We regard this communication as an extremely valuable one, from the very extensive materials to which the authors have had access, in drawing up the arrangement of so highly interesting an order of vertebrate animals as the Cartilaginous Fishes. Prof. Müller and Dr. Henle have just returned to Berlin, after spending some months in this country; during which they visited the different Museums of Natural History, besides having the use of Dr. Andrew Smith's extensive collection of Sharks from the Cape; the result of their investigations, up to the present time, is embodied in this paper. The Article is in Dr. Henle's own English, with a few revisions. ED.