

attached for a variable distance by a secondary mesentery to the duodenal loop. In more specialised intestines the ileic region forms a distinct loop which is narrower or wider, and which is equal to, longer, or shorter than the duodenal loop, to which it is attached for a greater or less length by the ileo-duodenal ligament already mentioned. Not infrequently the ileic region consists of two loops, of which one is often small and lies just above the cæca.

(7) The plan of the gut is constant (except for very slight variations) in all the members of certain groups. This is the case with the Psittaci, Galli, Raptores, Striges. In the case of other groups, there are considerable divergences of structure within the group: this is the case with the Picopasserres, Limicolæ, Grues, Struthiones (if, that is to say, the two latter groups can be regarded as natural groups, which is open to doubt on other grounds).

(8) A comparison of the intestine of Birds with that of Reptilia (especially Crocodilia) allows of the recognition of more and of less primitive types of intestine. The most primitive type is found in the Cassowaries, *Struthio*, *Apteryx*, and all the Gallinaceous birds; and is also seen among the Picopasserres (Woodpeckers) and Limicolæ (*Pluvianus*). Most Picopasserres and the Birds of Prey (nocturnal as well as diurnal) show a rather more specialised form of intestine. In the remaining groups of Birds the intestine is more specialised still and in several different directions.

(9) Certain classificatory results seem to follow from a comparison of the differences exhibited by the intestinal tract. Thus, the resemblance of both Cuculi and Musophagi to the Picopasserres, and the likeness between all the Accipitres (New World and Old World, nocturnal and diurnal) are remarkable. The close likeness between the Bustards and the Cariamidæ is to be commented upon. The Passerine character of the gut of *Turnix* and the possible likeness between *Crypturus* and *Rhea* seem also to be shown.

7. On the Specimens of Spotted Hyænas in the British Museum (Natural History). By Prof. ANGEL CABRERA, C.M.Z.S.

[Received November 5, 1910: Read November 29, 1910.]

Every zoologist working on the Spotted Hyænas with suitable material from different localities feels the convenience of recognising several local forms. As early as in 1812, two of them were admitted by Cuvier, and in modern times no less than nine other "species" have been described. It is not easy to say with which form Erxleben's *Hyæna crocuta*, afterwards the type of the genus, or subgenus, *Crocuta*, must be identified, as the species was

based on the "Spotted Hyæna" of Pennant*, and this author gave no definite locality, saying only that the animal is found in "Guinea, Æthiopia, and the Cape." That indication practically embraces all the African countries known in Pennant's time, excepting only Barbary and Egypt. As to the original description, made from a specimen shown in London some years before, it runs thus :—

"Short black mane: hair on the body short and smooth: ears short and a little pointed; their outside black, inside cinereous: face, and upper part of the head, black: body and limbs reddish brown, marked with distinct round black spots; the hind legs with transverse black bars; tail short, black, and full of hair."

Now, I have never seen, nor found described, a Spotted Hyæna with black mane. Young specimens commonly have dark hairs in it, producing a general blackish tinge, but it seems clear that Pennant's specimen was not young, as in the description it is afterwards stated that it was bigger than the striped species, and the author says about the latter in a previous page that it is larger than a big dog. It is therefore necessary to suppose either that Pennant spoke from memory and forgot some details of the coloration, or that the actual specimen represented a form quite unknown to modern naturalists. The latter view being a very unlikely one, I prefer to think that the description was written from memory only, under the impression of a reddish-brown animal spotted with black, and perhaps a not quite developed specimen with a little of the juvenile dark hair in the mane.

This determination being adopted, it seems to me very probable that the specimen alluded to came from Senegambia, although this locality is not mentioned among those given by Pennant as inhabited by Spotted Hyænas. Senegambia and the Cape were, during the eighteenth century, the two countries that chiefly and almost exclusively furnished the European menageries with African animals. But in the Cape Hyæna the ground-colour is a dirty yellowish which nobody would call reddish brown, whereas this rather indefinite designation may be correctly applied to the peculiar colour, intermediate between dark cinnamon and raw umber, of the Senegambian Hyæna. The fact that Pennant did not include Senegambia in the habitat of the species is of little, if any, importance, as he compiled the geographical distribution from the works of Bosman, Kolbe, &c., and was evidently unaware of the provenance of the specimen he saw in London. In his 'Game Animals of Africa,' Mr. Lydekker says that the typical *Hyæna crocuta* is the form found from Southern Egypt, across Central Africa, to Senegal in the west and the Transvaal in the south. I cannot agree entirely with such a conclusion. As will be seen below, Spotted Hyænas from the Nile Basin and East Central Africa are very different in colour from the animal described by Pennant and Erxleben, and therefore

* 'History of Quadrupeds,' i. (1781) p. 252.

these countries at least must be discarded. The supposed distribution being restricted in this manner to Central Africa and Senegambia, it becomes clear that, as Central Africa was totally unknown to Europeans in Pennant's time, the only conclusion at which we can arrive from Lydekker's statement is that which I have adopted. *Crocota crocuta* may therefore be selected as the name for the Senegambian Spotted Hyæna, at least until a stronger argument can prove that this view is not the right one.

As I have said above, Cuvier, in his 'Ossements Fossiles,' distinguished two different forms of Spotted Hyænas, a grey one and a reddish one. In the second edition of the same work, he states that his reddish Hyæna is frequently found about the Cape, but the source of this knowledge is not given. The first exact description of the Cape Hyæna is by Desmarest*, who named it *Hyæna capensis*. As to *H. rufa*, of the same author, based on Cuvier's reddish Hyæna, its exact locality being unknown, it is best to consider it as a synonym of true *crocuta*. Boitard† gives the three names to one and the same animal, and describes a yellowish Hyæna from the Cape as *H. cuvieri*, this name becoming thus a synonym of Desmarest's *capensis*.

Since the publication of all these old names, no other splitting of the group has been attempted till 1900, when Matschie‡ described five so-called new species: *Crocota wissmanni*, from German West Africa; *C. gariepensis*, from the Orange River; *C. germinans*, from German East Africa; and *C. thierryi* and *C. togoensis*, from Togo. In a subsequent paper§, the same zoologist named the form from Kamerun *C. noltei*. Satunin|| has given the name *leontiewi* to the Abyssinian Spotted Hyæna, and Lönnberg¶ has described two other forms from East Africa, *C. kibonotensis*, from Kibonoto plains, and *C. panganensis*, from the Pangani River.

It is impossible to decide now, without the comparative study of large series of specimens, and especially of skulls, whether all these forms are true different species, or whether they are local races of one or of several species. From the material in the British Museum, which I have been able to examine through the kindness of Mr. Oldfield Thomas, F.R.S., it appears that two different types of skulls may be distinguished:—a broad one, in which the width of the palate across the upper carnassials is practically equal to or a little greater than the length of the lower tooth-series exclusive of incisors; and a narrow one, in which the width of the palate is equal to or a little less than the length of the upper tooth-series. This latter always being 4–15 mm. shorter than the lower tooth-row, it is clear that the difference between the two types can be

* 'Mammalogie,' i. (1820) p. 216.

† Le Jardin des Plantes, 1845, p. 232.

‡ SB. Gesellsch. Nat. Fr. Berl. 1900, pp. 18–58.

§ L. c. 1900, p. 211.

|| 'Zoologischer Anzeiger,' xxix. (1905) p. 556.

¶ Sjöstedt, Kilimanj. Meru Exped. 1908, pp. 16–18, pls. 5 & 7.

detected at first glance. Moreover, the ratio between the zygomatic breadth and the condylo-basal length is 65 to 72.5:100 in narrow skulls, and 70 to 75:100 in broad skulls. Of course, I refer solely to adult specimens; in young skulls the proportions are very changeable, according to the age.

Three only among the eleven forms described up till now seem to be represented in the British Museum collection, as follow :—

CROCUTA CAPENSIS Desm.

Two adult specimens, one from the Cape (B.M. no. 46.8.3.3, *Turner*), and another from the Pongola River, Zululand (B.M. no. 2.2.8.1, *D. Bruce*), and a young one from the Cape (B.M. no. 37.9.26.90, *Turner*). Ground-colour dirty cream-buff; spots small, round, numerous, and of a pale hair-brown; mane dirty ochre-yellow; snout and feet dark-coloured, between sepia and hair-brown. Skull of the broad type.

Skull-measurements of no. 46.8.3.3.—Condylo-basal length, 236 mm.; zygomatic breadth, 176; interorbital breadth, 57; postorbital constriction, 42; rostral breadth on canines, 64; width of palate across the carnassials, 114; mandible, from condyle, 180; upper tooth-series*, 100; lower tooth-series, 111; upper carnassial, 35 × 22; lower carnassial, 30 × 12.

A specimen from the Cape in the Madrid Museum of Natural Science is entirely like the British Museum specimens. The figure given by F. Cuvier in his 'Histoire Naturelle des Mammifères,' after a living animal obtained in the same locality by Capt. Baudin, is not good, the difference in height between the fore and the hind quarters being too exaggerated.

CROCUTA WISSMANNI Matsch.

An old specimen from Linyanti (B.M. no. 0.10.3.1, *P. C. Reid*). Ground-colour ochraceous; under surface, from the throat, pale cream-colour. The spots are very dark brown and show a tendency to form longitudinal rows on the flanks. On the limbs they are darker, almost black, and reach a lower level than usual in the group. Mane ochraceous. Snout dark brown. Feet buff-yellow. Skull of the narrow type.

Skull-measurements.—Condylo-basal length, 256 mm.; zygomatic breadth, 185; interorbital breadth, 64; postorbital constriction, 53; rostral breadth on canines, 66; width of palate across carnassials, 112; mandible, from condyle, 190; upper tooth-series, 113; lower tooth-series, 117; upper carnassial, 35 × 20; lower carnassial, 32 × 11.

It is not without hesitation that I call this specimen *wissmanni*, as it lacks the black feet which Matschie says are characteristic of the German West Africa *Hyæna*, and which are to be seen in

* In describing Carnivora, I always measure the tooth-rows from the front of the canine to the back part of the hindmost cheek-tooth.

Schreber's plate xevi. (Säugth.), with which *wissmanni* is identified. But the ochraceous ground-colour, the paleness of the under parts, and, moreover, the relative proximity of Linyanti to Epukiro, the type-locality of *wissmanni*, prevent me from giving it a new name, at least until some other specimens are available. By the way, the material on which *Crocota wissmanni* was based is far from good. The type is a skin without skull, and Prof. Matschie is not sure that the skull from Windhoek, described in his paper, really belongs to the same form.

CROCUTA LEONTIEWI Satunin.

A skull, without skin, from Abyssinia (B.M. no. 69.2.2.13, *Jesse*). Its dimensions answer rather well to those given by Satunin for his specimen 5784. It belongs to the narrow type and is broken behind, it being, therefore, impossible to measure its condylo-basal length.

Skull-measurements.—Zygomatic breadth, 153 mm.; interorbital breadth, 55.5; postorbital constriction, 41; rostral breadth on canines, 58; width of palate across the carnassials, 99; mandible, from condyle, 172; upper tooth-series, 98; lower tooth-series, 103; upper carnassial, 36×19 ; lower carnassial, 26×10 .

Another skull, without skin, from the White Nile (B.M. no. 2.8.5.4, *Maj. Dunn*), seems to belong to the same species; whereas another from Bar-el-Zaraf (B.M. no. 0.8.6.2, *Stanley Flower*) evidently represents a different form, perhaps the Sudanese Hyæna, which I do not dare to name without knowing the colours. It is of the broad type, and undoubtedly came from a very big animal.

There are in the British Museum, besides the specimens just mentioned, some others representing three different and apparently new forms. In describing them, it is only provisionally that I use binomial names.

CROCUTA RUFOPICTA, sp. n.

Diagnosis.—A very pale reddish form with red spots, quite different from the grey Hyænas of Abyssinia and Uganda.

Colour.—Ground-colour pale ochraceous buff, verging to tawny ochraceous on the back and the mane, and fading to pale buff on the under parts. Spots small, very scattered, and ochraceous rufous in colour. Feet ochraceous. Tip of the tail blackish, as usual in Spotted Hyænas.

Skull.—Palate narrow, its greatest breadth being rather less than the length of the upper tooth-series. Bullæ elongate; paroccipital processes considerably drawn backwards, their hind outlines appearing, when the skull is resting on its basis, as oblique lines.

Skull-measurements (of type).—Condylo-basal length, 240 mm.; zygomatic breadth, 159; interorbital breadth, 53.5; postorbital constriction, 40; rostral breadth, 59; width of palate across the carnassials, 97; mandible, from condyle, 178; upper tooth-series,

103; lower tooth-series, 106.5; upper carnassial, 36×20 ; lower carnassial, 28×11 .

Hab. Oduaina, Boran Country.

Type. Old female. B.M. no. 9.6.1.14. Collected by Mr. Drake-Brockman.

Remarks.—The type-skin lacks the head and fore part of the neck, but it is so different from all the other Spotted Hyænas that, although the only specimen and an incomplete one, it deserves to be considered a new form. *C. kibonotensis*, pale reddish in colour like *rufopicta*, has the spots dark brown, not red, and its skull, an excellent photograph of which has been published by Lönnberg, is also different from that of the present species or race.

CROCUTA THOMASI, sp. n.

Diagnosis.—A pale grey, black-spotted Hyæna, with the skull of the narrow type.

Colour.—General colour pale grey, strongly suffused with buff on the fore quarters, and marked with large black spots, very irregular in form, some of them being elongate and even somewhat linear. Mane dirty ochre-yellow, fading to cream-buff on the sides of the neck, where there are two irregular rows of faint burnt-umber spots. Feet and legs to near the elbow and the knee dark clove-brown, almost black. Tail pale grey, blotched with small blackish spots, and with the distal half black.

Skull.—Palate narrow, but not so much as in *C. rufopicta*, its largest breadth being practically equal to the length of the upper tooth-row, and even considerably exceeding it in young specimens, in which the carnassial is not yet quite developed. Hinder outline of paroccipital processes forming a vertical line.

Skull-measurements (of type).—Condyle-basal length, 245 mm.; zygomatic breadth, 165; interorbital breadth, 54; postorbital constriction, 41; rostral breadth on canines, 58; width of palate across the carnassials, 101; mandible, from condyle, 175; upper tooth-series, 100; lower tooth-series, 107; upper carnassial, 35×18 ; lower carnassial, 26×10.5 .

Hab. Ankole, Uganda.

Type. Adult male, B.M. no. 1.8.9.27. Collected by Sir Harry Johnston.

Remarks.—I have seen two other specimens, from Ankole also, one obtained by Sir Harry Johnston (B.M. no. 1.8.9.28) and the other, a young female, collected by Mr. Delmé Radcliffe (B.M. no. 5.4.3.4). All three are readily distinguishable from the other grey Hyænas of East Africa. The Abyssinian *C. leontiewi* is not pale grey in colour, but "bräunlichgrau, auf der Mitte des Rückens rostbräunlich," and has a smaller skull (zygomatic breadth about 155 mm., against about 165 in *C. thomasi*). In *C. panganensis*, from the Coast Region, the colour is darker, brownish ash, verging to rusty brown in the mane, and the skull is considerably broader behind the postorbital processes. The

West-African *C. togoensis* appears to be the only species similar in colour to the Uganda Hyæna, but according to plate 104 of Dr. Heck's 'Lebende Bilder aus dem Reiche der Tiere,' in which the type of the species is figured, in the Togo Hyæna the large spots are more regular in form, and there are among them some very small spots which are not present in *thomasi*. The skull of *togoensis* is, moreover, of the broad, not of the narrow, type. The original specimen is a young one, and therefore useless for comparison, but an old topotypical specimen in the Berlin Museum, Prof. Matschie kindly informs me, presents the following dimensions: width of palate across the carnassials, 107.1 mm.; upper tooth-series, 99.8; lower tooth-series, 109.3. Of course, it was not to be expected that a so plastic group would be represented by the same form in two countries so widely separated.

I have much pleasure in naming the Uganda Hyæna in honour of Mr. Thomas, as a remembrance of the kindness shown me while examining the invaluable collections under his charge.

CROCUTA NYASÆ, sp. n.

Diagnosis.—A pale yellowish Hyæna, with large dark spots and pale brown feet.

Colour.—General colour dirty buff; mane pale ochraceous; belly dark brown. The spots are dark Vandyke-brown, large and very scattered on the body, smaller and more close-set on the limbs. On the sides of the neck there are some faint traces of brownish-red spots. The muzzle is of a pale, dirty wood-brown, and the feet are of this same colour, somewhat lighter.

Skull.—Palate long and narrow, its greatest breadth practically equal to the length of the upper tooth-row. Zygomatic arches comparatively close to the skull.

Skull-measurements (of adult female, paratype).—Condyllo-basal length, 260 mm.; zygomatic breadth, 179; interorbital breadth, 61; postorbital constriction, 48; rostral breadth on canines, 69; width of palate across the carnassials, 110; mandible, from condyle, 190; upper tooth-series, 111; lower tooth-series, 119; upper carnassial, 38×20 ; lower carnassial, 32×12 .

Hab. Mount Milanji, South Nyasaland.

Type. Immature skin and skull. B.M. no. 92.8.1.5. Collected by Alexander Whyte and presented by Sir Harry Johnston.

Remarks.—There are in the British Museum, besides the type, an old female skull (92.8.1.4), measured above, and a stuffed specimen exhibited in the public galleries, both received from Sir Harry Johnston. The species, which very probably is the same as found in Portuguese East Africa, is readily distinguishable from *C. germinans*, its geographically nearest ally, this latter being a much darker animal, wood-brown with the mane clay-colour.

EXHIBITIONS AND NOTICES.

December 13, 1910.

G. A. BOULENGER, Esq., F.R.S., Vice-President,
in the Chair.

THE SECRETARY read the following report on the additions made to the Society's Menagerie during the month of November, 1910:—

The number of registered additions to the Society's Menagerie during the month of November last was 181. Of these 72 were acquired by presentation, 31 by purchase, 33 were received on deposit, 35 in exchange, and 10 were born in the Gardens.

The number of departures during the same period, by deaths and removals, was 209.

Amongst the additions special attention may be directed to:—

1 American Bison (*Bison americanus*), born in the Menagerie on Nov. 1st.

5 Canadian Wapiti (*Cervus canadensis*), 1 ♂, 4 ♀, from Canada, purchased on Nov. 8th.

1 Tasmanian Wolf (*Thylacinus cynocephalus*), ♂, and 2 Tasmanian Devils (*Sarcophilus satanicus*), from Tasmania, purchased on Nov. 21st.

Dr. H. HAMMOND SMITH, M.R.C.S., F.Z.S., exhibited a mounted specimen of the Red Grouse (*Lagopus scoticus*) which displayed a curious variety of the ordinary plumage, and made the following remarks:—

“This Grouse was sent to me by Mr. Wynyard Dixon, of Sheffield, from the Gilkerscleugh Moors, Abington, Lanarkshire, on October 4th this year. The bird is a cock. The colouring is not common, and the specimen is not quite like the so-called pepper-and-salt variety, of which I saw a good example at Mr. Boyals, where this bird was set up. In the bird now exhibited, while the wings show grey colour, the feathers under the chin are more like the colour of the feathers of a young cock pheasant, and there is just an appearance of a light ring round one side of the neck; there are also a few bronze-coloured feathers on the flanks. Of this moor Mr. Dixon says in one of his letters: ‘I was much surprised the first time I came to this district to find pheasants on the moors considerable distances from coverts or farms—in fact, the pheasants do not appear to come into the spinneys till November’; he further states that he has seen them two miles from any covert. But all who have shot on moors adjoining pheasant preserves are aware that pheasants will stray for very long distances over the moors from the coverts, especially if there are bilberries to be found. It has been suggested that this bird may be a hybrid between the pheasant and the grouse; I can find no previous record of such

a hybrid. Grouse vary considerably in their colouring from very dark to cream-colour. I do not personally contend that this bird is a hybrid; in my opinion it is a Grouse, and I show it this evening as a curious variety of the colouring of the ordinary Red Grouse."

Other zoologists present confirmed Dr. Hammond Smith's opinion that the bird was not a hybrid.

Mr. D. SETH-SMITH, F.Z.S., Curator of Birds, exhibited some skins of the Australian Yellow-rumped Finch (*Munia flavi-prymna*). These birds had been kept alive in an outdoor aviary in England, and had developed certain markings tending towards those of another closely allied species, *Munia castaneithorax*. The exhibitor attributed this to the fact that the former species was a desert form of the latter, and when placed in a humid environment tended to revert to the plumage of the latter. He referred to a paper he had published on this subject in the 'Avicultural Magazine,' 1907, p. 195.

Dr. W. E. HOYLE, M.A., F.Z.S., English Member of the International Commission on Zoological Nomenclature, explained the Report presented to the Graz Meeting of the International Zoological Congress, and referred in particular to the proposals made for the protection of well known zoological names.

A discussion followed on the portion relating to the formation of an Official List of most frequently used Zoological Names. The feeling of the Meeting was very strongly in favour of the International Congress giving its authority to the forming of a List of Zoological Names, the significance of which should not be altered by application of the rules of the International Code. It was unanimously agreed to accept the action of the Congress if it would adopt this course.

PAPERS.

8. On the Segmentation of the Occipital Region of the Head in the Batrachia Urodela. By EDWIN S. GOODRICH, M.A., F.R.S., F.Z.S., Fellow of Merton College, Oxford.

[Received November 29, 1910 : Read December 13, 1910.]

(Text-figures 29-51.)

Introduction.

It is now well known that in the Craniata Gnathostomata the region of the head lying behind the auditory capsule is a compound structure, formed of a number of segments originally



Cabrera, Angel. 1911. "7. On the Specimens of Spotted Hyaenas in the British Museum (Natural History)." *Proceedings of the Zoological Society of London* 1911, 93–101. <https://doi.org/10.1111/j.1469-7998.1911.tb06993.x>.

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