

## 3. Notes on the Goral found in Burma.

By Major G. H. EVANS \*.

[Received September 2, 1905.]

The Himalayan range in Assam gives off a succession of spurs southward to form a tract of mountainous and, in many parts, almost impassable country extending into Arakan and Burma, and inhabited by numerous wild tribes. That portion of this tract lying between Assam and Manipur to the north, Chittagong and Tipperah on the west, Arakan on the south, and Burma on the east, is now known as the Chin-Lushai Hills. These so-called hills vary in their altitude from 1000 to 10,000 feet.

I was employed in what was known as the Southern Chin Hills from November till June 1889-90, and during my stay visited several Chin villages. Like many others who have visited these people, I came to the conclusion that Chins generally, and their chiefs in particular, have one hobby at least, viz., collecting skulls. Outside and inside the villages, skulls were to be seen stuck on posts or kept in the houses. The finest collection I met with was in the house of a Boungshé chief, whose tribe is thus called by the Burmans, from the method in which they dress their long hair. The whole hair is done up in a large knot placed well forward on the top of the head, almost on the forehead, and round this ball of hair is wound, round and round, usually a white turban with a blue stripe through the centre. In the chief's house was a collection of skulls, excellent as regards the number and variety. The heads ranged from those of elephants to palm-civets, and I doubt if there are many museums which could excel the collection of monkey skulls, at least numerically. The chief enjoyed the reputation of having been a mighty Nimrod in his youth, and I was informed that he had shot practically every head in the collection. I noticed one splendid gaur skull, three or four fine mythun or gayal, several sambar and serow, also some small heads which I concluded must be goral. Game throughout the hills was scarce, a matter not to be wondered at, inasmuch as every Chin had a gun of some sort, and in addition was always trapping and snaring. I was assured that the Goral heads had been obtained in the hills, but that now the animals were very scarce. I had no opportunity of verifying at this time the presence of Goral in these hills, and any attempt to do so would have been a matter of considerable risk owing to the most unfriendly attitude of the people. Many months later I happened to be in a Burmese village some hundred miles distant, but on the confines of the South Chin Hills, and there discovered in a house the skull of a Goral identical with those above mentioned. On enquiry from the Burmans I learned that it had been obtained from some Chinbôks, another tribe of Chins near Lounghshé in the Yaw country. As

\* Communicated by R. LYDEKKER, F.Z.S.



the Burmans dare not venture into Chin-land, they could afford no definite information beyond that the Chins had told them that there were several of these animals on a certain high mountain now known as Mount Victoria. Since then several Goral have been shot there by policemen on outpost and others.

During the season of 1896-97 I visited the Arakan Hill-tracts, which are merely a southern continuation of the Chin Hills into the Akyab district of Arakan. Here again I came on a skull and a skin (the latter in a very bad state of preservation) of this Goral. This animal, from the horns evidently a female, was shot in the hills at a place not very far distant, and local informants said that there were a fair number. Being unable to visit the place at that time, I told a friend of the ground, and asked him to find out if what I had heard was correct. He did so, and came across some six animals, of which he shot a couple. One of these, owing to the ground, it was impossible to recover. I sent a skull for identification, and was informed that it was a Himalayan Goral. I was unacquainted with the Indian Goral, but from the descriptions in books I was not quite satisfied that it was the same animal. Later on, while after Serow in the Shan range of hills to the east of the Irrawaddy, I was much surprised again to run across these animals. I was still more convinced that the beast was not the same as the Indian Goral, so much so, that I asked a friend to shoot an Indian Goral and send me a head and skin, which he very kindly did. On comparison my suspicions were confirmed. I was then most desirous to procure a specimen for the British Museum, but luck was against me, as it was a long time before I ran across them again.

The following are the chief characteristics of these Goral :—

*General form.*—Goat-like with sturdy limbs. Horns are present in both sexes : those of the female are shorter, thinner, and not so rough as those of the male. They are generally almost parallel, *i. e.* only slightly divergent, and have a slightly backward curve. The coat is moderately long, close, and the hair rather coarse ; there is generally a well-marked underfur. The mammæ are four in number.

*General colour.*—A dark, more or less rat-grey, with an admixture of longish, dark, rufous-tipped hairs running through the coat, but mostly on back and upper surface of body. In an old buck the back, haunches, and upper portions of sides were dark pepper-and-salt or grizzled grey. In a young specimen the colour was generally lighter. There is no distinct dorsal stripe : in a young animal a very faint but distinct brownish line was traceable, extending from the nape to the dock, and in the skin of a female also, when held in a good light, a darker brownish median line could be discerned. The colour fades gradually on the side to a dirty reddish white under the abdomen. The colour about the back of the neck is a lighter grey than that of the body, and the hair is longer. A distinct crest of longer hair of a blackish-brown colour extends from between horns to behind the



ears. The hair surrounding base of horns is also long and of a rufous tint.

The face is ruddy brown, passing into grey on the cheeks, and to a fainter and almost whitish colour around the eyes and lips. The throat is a yellowish white. The hair on the outer surface of the ears is rufous; whitish on the inner surface. The muffle is black in colour and naked. The tail is black or brownish black, and has a tuft of long hair of varying length. The colour of the iris is reddish brown.

*The Limbs: Fore legs.*—Outer aspect a dark brown or yellowish red to just above the knees, and this colour is continued on the posterior aspect of lower limb to hoofs. The anterior aspect from below the knees, or in some cases just above the knees, is a yellowish white.

*Hind legs.*—Outer aspect of thigh brownish, the posterior aspect of the hocks dark brown, continuing down posterior aspect of lower limb. The anterior aspect below the hocks is a dirty white.

*Horns.*—Short, black in colour, conical, irregularly ringed, especially at the base in males. The annular markings extend for about three quarters of the total length on the posterior aspect of the horn; they appear to be rubbed off in front. The horns are set close, and in some cases are almost parallel. For the first inch or so from the base they are straight, then curved slightly backwards, and are slightly divergent towards the tips.

#### *Measurements of Horns.*

	1.	2.	3.	4.	5.
	inches.	inches.	inches.	inches.	inches.
Right horn .....	5	4	$3\frac{1}{4}$	$3\frac{1}{2}$	$4\frac{1}{2}$
Left horn .....	$4\frac{7}{8}$	4	$3\frac{1}{8}$	$3\frac{5}{8}$	3 (broken)
Girth.....	$2\frac{3}{4}$	$2\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$
Between horn-cores ...	$\frac{5}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{3}{4}$	...
Between points .....	$2\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{1}{4}$	2	...

#### *Dimensions.*

	♂. inches.	♀. inches.
Height at shoulder .....	25 to 27	25 to 27
Girth behind shoulder .....	$29\frac{1}{2}$	27
Length from nose to tail .....	$50\frac{1}{2}$	50
Tail: average of five specimens.....	$4\frac{1}{2}$	
Tuft: average of five specimens .....	$2\frac{3}{4}$	
Length of ears.....	$3\frac{5}{8}$ to $4\frac{1}{2}$	
Length of head .....	$10\frac{5}{8}$	10
Breadth across orbits .....	4	$3\frac{1}{4}$ to $3\frac{3}{4}$
Length of horns .....	5	$4\frac{1}{2}$
Girth of horns.....	$2\frac{1}{2}$ to $2\frac{3}{4}$	2
	22*	



*Distribution.*—So far as is at present known to me, in the localities noted, and at elevations above 3500 feet. These Goral appear to be rather localised, and I should say are uncommon. It is reasonable to expect, however, that when a more intimate knowledge of the higher ranges is gained, the distribution of these animals may be found to be more extensive.

These Goral, I believe, extend into Siam and are to be found in suitable places on the Siamese side of the Thaungyin River, and also occur, but are more scarce, about the hills at the headwaters of the Me-Ping.

*Habits.*—As has been recorded in the case of the Indian form, these Goral live in parties of four, six, or even a dozen. They inhabit very steep ground and the more precipitous it is the better they seem to like it. They are never to be found at any distance from rugged, rocky ground, even though there may be forest near by. The only time they may be found away from dangerous ground is during the early hours of the morning and late in the evening, when they graze on the grassy patches close by. No doubt when the sky is overcast, as is the case during the rains, or in the cold weather when there is a heavy mist, they feed much later. Apparently they are inclined to remain always about any favourite locality. Their sight seems to be extraordinarily good, and they appear to rely more on this sense than on smell or hearing. The day is usually passed lying on inaccessible ledges of rock about precipices.

If a Goral is startled it jumps up and makes a short sharp hissing or sneezing noise, very often repeated at short intervals. It may be a note of alarm or a call to its mates, for as sure as one calls, if there are any others about (and this is generally the case), it is immediately answered. In Burma, at least, these Goats are not easily followed, unless by expert cragsmen; and in this category I do not include myself.

Goral, when standing about these crags, afford fairly easy shots with high-velocity rifles, but the recovery of a carcase is, as a rule, by no means an easy matter. The shikaris and followers are generally anything but keen on a trip down one of these precipices, and I for one do not blame them. Though they may be adepts in woodcraft, they cannot be anything like the cragsmen (hill-shikaris) met with in the Himalayas. Goral-flesh is not at all bad. From December till May is the best season to hunt these animals, and morning and evening is the best time to find them, as they are then grazing or lying down in places more accessible.

I sent specimens of the skin &c. of this Goral to Mr. Lydekker, by whom the animal has been named after myself, *Urotragus evansi*.

I have to thank Captains Blakeway and Wood, R.E., and Mr. W. B. Tydd, of the Burma Civil Service, for their kindness in helping me in this matter.

Rangoon, 1st June, 1905.



## 4. On the Mammals of Crete. By DOROTHEA M. A. BATE\*.

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The following list of the wild mammals known to inhabit Crete is based on a small collection made in the island during a stay of four and a half months in the earlier part of last year (1904). This includes only sixteen species, but it is quite possible that a species of *Crocidura* may have to be added to the number, for remains of a Shrew were found in more than one Pleistocene cave-deposit in the western part of the island, and it is not unlikely that it may yet survive. It is probable that a Roedeer still existed in the island during the earliest historical times. Four species seem to be here recorded for the first time from this locality; these are *Rhinolophus ferrum-equinum*, *R. hipposideros*, *Micromys sylvaticus hayi*, and *Acomys dimidiatus minois*.

In his work on Crete † published in 1869, M. V. Raulin gives a list of thirteen species, amongst which is included the Polecat as well as the Beech-Marten and Weasel; however, no specimens appear to have been obtained, so that their occurrence may have been admitted on insufficient evidence or as the result of some confusion with regard to the other members of the group. Admiral Spratt ‡, in describing the country between Eremopoli and Palaikastro, mentions that Foxes occur there; but this was doubtless a slip, for elsewhere (vol. ii. p. 157), in reference to the safety of the flocks of sheep, he says that "Crete has no wild animals but badger and weasels or martens." Dr. Lorenz-Liburnau has written at some length on the Wild Goat of Crete; and in 1903 Major Barrett-Hamilton described the Hare, and noticed the Badger and Beech-Marten, at the same time remarking on the paleness of the specimens from this locality. The same may be said of the Cretan Hedgehog and Rabbit, but is not the case with the Weasel and Spiny Mouse, which are both richly coloured forms.

Crete has, in all probability, been isolated as an island for a considerable period, therefore it is not surprising to find that there are a number of localised forms amongst the Mammalia. Admiral Spratt, whose valuable researches were carried on in so many parts of the Mediterranean, was of opinion § that Crete was connected in earlier times with Europe (including Asia Minor), and not with the north coast of Africa as tradition would have us suppose ||. Suess ¶ would also seem to link this island rather with the northern than the southern boundaries of the Mediterranean. The mammalian fauna, as well as the recent land-

\* Communicated by OLDFIELD THOMAS, F.Z.S.

† Description Physique de l'Île de Crète, 2 vols., Paris, 1869.

‡ Travels and Researches in Crete, 2 vols., London, 1865 (vol. i. p. 205).

§ *Op. cit.* vol. ii. pp. 408-10.|| *Ibid.* pp. 278-9.

¶ La Face de la Terre, vol. ii. p. 713.



shells, of the island shows a decided preponderance of European types; the only suggestion of a North-African relationship being found in the Wild Cat and perhaps the Spiny Mouse.

I should like to take this opportunity to express my thanks to Mr. Oldfield Thomas, who has again most courteously given me every facility for working out my collection in his department of the British Museum (Natural History).

### *List of Species.*

#### 1. RHINOLOPHUS FERRUM-EQUINUM Schreb.

In the latter part of March three large Horseshoe Bats were secured in a cave close to the sea, on the north-west coast of the island.

#### 2. RHINOLOPHUS HIPPOSIDEROS Bechst.

Only one specimen of this Bat was obtained, from a cave in the hills south of Khania. Neither this nor the above mentioned species appears to have been previously recorded from Crete.

#### 3. MYOTIS MYOTIS (Bechst.).

When visiting the extraordinary underground quarry known as the Labyrinth, near Haghia Dekka in the south of the island, one of the galleries was found to be tenanted by hundreds of Bats belonging to this species. They were hanging from the roof in large clusters and became very noisy when approached. Four specimens were preserved, and these appear to be somewhat smaller than examples from the Continent. These underground galleries have evidently been inhabited by this species of Bat for many hundreds of years; their occurrence in the "Labyrinth" was noticed by Tournefort as early as about 1700\*.

#### 4. MINIOPTERUS SCHREIBERSI (Natt.).

Two examples of this species were also procured, and several others observed, in the so-called Labyrinth. These, however, occurred singly, and in galleries other than those occupied by *Myotis myotis*.

#### 5. ERINACEUS EUROPÆUS NESIOTES, subsp. n.

On comparing the three specimens obtained of the Cretan Hedgehog, these were found to differ from all the forms of *E. europæus* represented in the British Museum collection; therefore this island race may be given subspecific rank.

In external characters it seems to most closely resemble *E. e. italicus* Barr.-Ham.†, from which it may be distinguished by its slightly smaller size, dingy appearance, and the lighter

\* See Raulin, *op. cit.* vol. ii. p. 1033.

† *Anu. Mag. Nat. Hist.* ser. 7, vol. v. April 1900, p. 364.



colour of the fur. In one specimen (No. 17) this is almost pure white except on the face, hands, and feet. The spines are shorter and more slender, whilst both the short and long hair of the under-parts is much scantier.

The following measurements (in millims.) were taken in the flesh :—

	Head and body.	Tail.	Hind foot.	Ear.	Basal length of skull.
No. 9 (♂) (type) .....	208	29	40	29	51·5
No. 17 (♀) .....	...	34	37	28·5	48
No. 8 (♀) .....	204	...	38	26·5	50·5

The skull differs from that of *E. e. italicus*, and resembles that of *E. e. roumanicus* Barr.-Ham.\* in having the frontal processes of the premaxillæ squared posteriorly, and further these only extend backward for less than half the length of the nasals.

In Crete, Hedgehogs are common in the low country, but were not met with in the hills. In captivity they will eat oats freely as well as a more natural diet of eggs &c.

#### 6. *FELIS OCREATA*† *AGRIUS*‡, subsp. n.

This species is the chief exception to the general European appearance of the mammalian fauna of the island, being unmistakably African in type and belonging to the *Felis ocreata* group. The two specimens obtained were bought, at different times, in the bazaar at Khania, and therefore are unaccompanied by any measurements taken in the flesh, though they appear to have been large and robust. In one of these, No. 35, the type, which is in summer coat, the average length of fur on the back is about 32 mm., while in the other, No. 36, evidently a winter specimen, the fur is much thicker and longer, averaging 45 mm. in length on the back, and there is at the same time a corresponding difference in the intensity of the markings of the dorsal region.

The Cretan race may be distinguished from specimens from Abyssinia, the type locality, and Egypt, by their much more distinctly marked stripes, both longitudinal and transverse, and by the greater number of rings, or half-rings, on the tail, which is short. As Mr. de Winton has mentioned§, these markings of the dorsal region are more distinct in short-coated specimens; and on comparing them it is found that even the *long*-haired Cretan skin is more strongly marked than *short*-haired ones from Abyssinia and Egypt in the British Museum collection. The same holds good in the case of a short-haired specimen from Machakos (B.M. 92.12.3.2.), which otherwise somewhat closely resembles the skin in winter pelage from Crete. It may also be mentioned that some specimens from Abyssinia show a

\* *Op. cit.* p. 365.

† For use of this specific name see Mr. H. Schwann, "On *Felis ocreata* and its Subspecies," *Ann. Mag. Nat. Hist.* ser. 7, vol. xiii. June 1904, pp. 421-2.

‡ From *ἀγρεὺς*, a hunter.

§ *Zoology of Egypt* (Anderson), London, 1902, p. 173.



tendency towards a sandy colouring; this is especially noticeable in a skin from Zoulla (B.M. 69.10.24.9.), in which the transverse dorsal bars are much broken up, causing a somewhat "spotty" appearance.

In the specimens from Crete the proximal portion of the fur is decidedly dark over almost the entire body; this feature is hardly noticeable in those from Abyssinia, and is not so strongly marked in the examples examined from Egypt. The increased richness in colour of the Cretan race is no doubt chiefly due to climatic influences: a still further divergence in this particular direction is exemplified by the wild cat, *F. o. sarda* Lataste, from the more westerly island of Sardinia.

Hybrids between *F. o. agrius* and the domestic cat of the island appear to be not uncommon, and this can easily be accounted for by the fact that formerly small villages were often totally deserted for a considerable time, or possibly entirely, during the insurrections which occur so frequently in Crete, when the cats, as well as the villagers, are forced to take to a life in the hills. Skins of these hybrids, which are generally of large size like the true wild race, may often be seen hanging up in the bazaars at Khandia and Candia.

*F. o. agrius* was recorded by Raulin\* as *F. catus*.

#### 7. MELES MELES MEDITERRANEUS Barr.-Ham. †

Only two immature specimens of this Badger were obtained; these came from an earth in a rocky mound, on the crown of which is perched one of the several monasteries of the Lasseth Plain.

The local name for the Badger is "Arkalos" (ἄρκalos); it is plentiful in the island, and is killed in some numbers by the natives, the richer of whom use the skins for saddle-cloths and for making into purses &c.

#### 8. MUSTELA FOINA BUNITES‡, subsp. n.

Five skins of the Cretan Beech-Marten were obtained, and have been carefully compared with those of *M. f. leucolachnea* Blanf., from Turkestan, with which two specimens from Crete, already in the British Museum collection, were formerly identified§. However, the examples from these two localities are found to differ considerably and to be easily distinguishable; therefore it is proposed that the island form be known by the above-given subspecific name.

In length and woolliness of coat *M. f. bunites* is intermediate between the typical *M. foina* and *M. f. leucolachnea*, though in general appearance it most closely resembles the latter. From this it differs in its much duller and more uniform colouring,

\* *Op. cit.* vol. ii. p. 1033.

† *Ann. Mag. Nat. Hist.* ser. 7, vol. iv. pp. 383-4.

‡ From βουνίτης, a dweller on hills.

§ *Ann. Mag. Nat. Hist.* ser. 7, vol. iv. Nov. 1899, p. 313.



which is partly caused by the slighter contrast between the upper and under fur and by the lack of any gloss on the brown hairs, particularly on the paws and tail. The tail is very much less bushy and the fur shorter, in one specimen having an average length on the back of 25-26 mm., while in a skin from Vernoë, Turkestan (B.M. 83.4.21.2.), it is about 43 mm. The size and shape of the throat-patch seem to be even more variable in the Cretan race than it is in others; in one example of the former (No. 31) it is represented by only a few white hairs on either side of the throat close to the fore legs. The following measurements of the type (No. 34) were taken in the flesh:—

Head and body 403 mm., tail 255, hind foot 79, ear 39. The basal length of the skull is 75 mm., and the zygomatic breadth 58 mm.

It is perhaps worth noting that *M. f. bunites* also has much closer and shorter fur and a less bushy tail than the type of *M. f. mediterranea* Barr.-Ham.\*, from Andalusia, from which it further differs in colour.

The Beech-Marten is common in the island, both in the low ground and in the hills, where it is known to occur at Katharo, between 3000 and 4000 feet, though probably its range extends to a much greater height than this. It is killed in some numbers by the peasants, who bring the skins to the larger port-towns on the north coast, whence they are exported, chiefly to Trieste.

The Cretans call this Marten "Zouridha" (ζουρίδα), by which name it is also known in the neighbouring island of Karpathos†.

#### 9. *PUTORIUS NIVALIS GALINTHIAS*, subsp. n.

Only two specimens, without skulls or measurements taken in the flesh, were obtained of this Weasel, which is of large size. These I have been unable to identify with any one of the several races of *Putorius nivalis* represented in the collection of the British Museum. Therefore it seems necessary to regard it as a local form, which I propose to name after the mythological character changed into a weasel by the Moeræ and Ilithyia at the time of the birth of Herakles‡.

It was somewhat unexpected to find that, among all the material which I have been able to examine, this island race most closely resembles in general appearance the type (the only specimen in the British Museum collection) of *P. n. atlas* Barr.-Ham.§, from the Atlas Mountains, Morocco. Also there seems to be no appreciable difference in size between these two subspecies, which are amongst the largest of those belonging to the group of Weasels in which the colours of the upper and under surfaces are sharply divided.

\* Ann. Mag. Nat. Hist. ser. 7, vol. i. June 1898, p. 442.

† "Karpathos." Etude géologique &c. Prof. C. de Stefani, Dr. C. I. Forsyth Major, and W. Barbey. Lausanne, 1895, p. 70.

‡ Ibid. p. 65.

§ Ann. Mag. Nat. Hist. ser. 7, vol. xiii. April 1904, p. 323.



Considering the great distance by which the habitats of these two forms are separated, and that a number of other races occupy the intervening and neighbouring countries, the only plausible explanation of such a remarkable likeness seems to be that in this we have a striking case of similar characteristics independently acquired. This does not seem so improbable when it is remembered that among the Weasels variation acts only within very narrow limits; the chief points in which differences occur being in size, in the line of separation between the two colours, and in the presence and amount of white on the upper surfaces of the paws. In connection with the Cretan form it may be suggested that its large size is, at any rate partly, due to prolonged isolation in a locality where food is plentiful and competition not keen, owing to the absence of Stoats in the island.

*P. n. galinthias* may be distinguished from *P. n. atlas* by its richer colouring and in having only a scarcely perceptible "pencil" of darker hairs at the tip of the tail, which in one of the dried specimens measures 89 mm. exclusive of the terminal hairs. *P. n. sicula* Barr.-Ham.\*, although differing from these species in size and colouring, agrees with them not only in the well-defined line of separation of the colours along the flanks, but also in having white on the upper surfaces of the hind as well as the fore paws.

The colour of the under side in one of the skins from Crete (No. 33, ♂) is dirty white; while in the larger of the two (No. 15), the type, probably an old male, this colour is washed with buffish yellow. The "white" extends in a narrow line along the upper lips to the base of the nose.

This Weasel is common and frequently abroad in the daytime, when it may be seen running along the loosely-built stone dykes which are a noticeable feature of many parts of the country, being built for the purpose of ridding the ground of some of the overwhelming number of stones with which it is cumbered. It probably feeds largely on the lizards of various kinds that abound in the island: one day in an olive-grove at Phaestos a weasel was seen to spring out of some thick undergrowth at the edge of a stream and seize a large green lizard (*Lacerta viridis major* Blgr.), which, on becoming aware of my presence, it hurriedly carried off in its mouth.

It is known to the natives by different names in different parts of the island: in the west it is called "Kalajannou," in the east "Sinteknaria" (συντεκνάρια †), and in the Lasseth Mountains a modification of the former term which I neglected to make a note of at the time.

#### 10. *MUS RATTUS* Linn.

This Rat is found in the port-towns on the northern coast, but

\* Ann. Mag. Nat. Hist. ser. 7, vol. v. Jan. 1900, p. 46.

† "κάλοσυντεκνάρια," according to Dr. Forsyth Major, *op. cit.* p. 63.



no specimens were obtained in the country, although traps were frequently set for them in several localities. It is probably owing to the occurrence in considerable numbers of a weasel that this rat has not spread and increased in the interior of the island as it has already done in Cyprus.

11. *MUS MUSCULUS* Linn.

This species like the last does not, so far as I am aware, occur beyond the limits of the larger towns. In connection with the restricted range of this Mouse, it is interesting to note that a form of *Micromys sylvaticus* is abundant in the island.

12. *MICROMYS SYLVATICUS HAYI* (Waterh.).

Of all the subspecies of *M. sylvaticus* recognised by Major Barrett-Hamilton in his paper published in 1900\*, the specimens from Crete seem to agree most closely with *M. s. hayi*, though they are, if anything, slightly smaller. In colouring they cannot be distinguished from the darker examples of a series from Cintra, Portugal, in the British Museum collection. None of the Cretan skins shows any sign of a band of colour across the white of the throat. The following are the maximum and minimum measurements of the six specimens preserved :—

Head and body 80–88 mm., tail 86–89·5, hind foot 21–22, ear 16–17; total length of skull 25–26.

This Mouse, which appears not to have been previously recorded from Crete, is plentiful in the island and easily trapped. Two specimens, one of which (No. 11) is very dark, were caught not far from Khania in rocky ground close to some patches of cultivated land; the remaining four are from Katharo, a small valley in the Lassethi Mountains nearly 4000 feet above sea-level.

13. *ACOMYS DIMIDIATUS MINOÛS* †, subsp. n.

The Cretan Spiny Mouse, a richly coloured form with fairly large ears and tail equalling or exceeding in length the head and body, is evidently closely allied to *A. dimidiatus*. It may be distinguished from examples of this species in the British Museum collection from the vicinity of Aden, and one (somewhat faded) from Sinai, the typical locality, by the very restricted area occupied by the spines, which are exceptionally fine and have an average length of about 10·5 mm. Further, these are pigmented for a greater distance from the tip (about 4·5 mm.), which gives the spinous region a more richly coloured appearance owing to the proximal and semi-transparent portions of the spines not showing on the surface. The colours of the upper and under surfaces do not intergrade, the line of separation along the flanks being very sharply defined.

\* "On *Mus sylvaticus* and its Allies," P. Z. S. 1900, p. 387.

† "Minoüs" was employed by the early poets as equivalent to Cretan.



The following measurements (in millimetres) of the three specimens preserved were taken in the flesh :—

	Head and body.	Tail.	Hind foot.	Ear.	Skull.	
					Extreme length.	Zygomatic breadth.
No. 3 (♀) .....	93	...	18.5	19	30	15
No. 12 (♂) .....	112	...	19	18	...	15
No. 16 (♀, type of subspecies.) }	94	113	18	19.5	...	15.5

The three specimens obtained were trapped in the same locality—in rocky ground close to cultivated land between Khania and Suda. It was not known to any of the natives questioned on the subject. This discovery of an *Acomys* in Crete is interesting, being an extension, in a somewhat unexpected direction, of the recorded range of the genus.

#### 14. *LEPUS EUROPÆUS CRETICUS* Barr.-Ham.

This Hare was described in 1903 by Major Barrett-Hamilton\* but as no measurements accompanied the four skins received by him, the following dimensions of a single example (a ♂), taken in the flesh, may be of interest :—

Head and body 514 mm., hind foot 123, ear 102. The basal length of the skull is 71 mm.

Hares are found all over the island, even near the summit of Mount Ida, which attains a height of over 8000 feet, where Admiral Spratt mentions† having disturbed a number out of their “forms” in the open snow. The same author remarks that those seen on Mount Ida “seemed to be a smaller species than the Hare of the lowlands.” Unfortunately no specimens were obtained from this locality, so that this observation still awaits confirmation.

Of late a close season has been instituted in the island, and the Hare is among the number of species so protected. It was recorded by Raulin‡ under the name of *L. timidus*.

#### 15. *ORYCTOLAGUS CUNICULUS CNOSSIUS* §, subsp. n.

This Rabbit is paler and decidedly more uniformly grey in colour than the typical form; this lightness is partly caused by the paleness of the reddish area on the back of the neck, which more or less affects the greater part of the dorsal region, and further by the absence of a markedly dark ring between the smoky grey of the proximal portion of the hairs and the sub-terminal light band.

In the one specimen preserved (a ♀), which lived for some months in the Zoological Society's Gardens, the hind paws are

\* Ann. Mag. Nat. Hist. ser. 7, vol. xi. Jan. 1903, p. 126.

† *Op. cit.* vol. i. p. 13.

‡ *Op. cit.*

§ “Cnossius” was employed by the early poets as equivalent to Cretan



almost entirely white, and its dimensions, taken in the flesh, are as follows :—

Head and body 341 mm., tail 65, hind foot 82, ear 70 ; weight 2 lbs.  $\frac{3}{4}$  oz. The skull's greatest length 75 mm., basal length 57·5.

It seems curious that this Rabbit does not occur on the mainland of Crete, and I have found no record of its having done so formerly. Raulin wrote\* of it as being very plentiful in the small islands off the coast, and a man who brought me three from Dhia, off Candia, said that it is still found there in considerable numbers.

#### 16. *CAPRA ÆGAGRUS CRETENSIS* Lorenz-Liburnau †.

The Cretan Wild Goat has been known from very early times, and has doubtless acquired an added interest on account of the legend of Zeus' upbringing on Mount Ida by the goat Amalthea. It is still found in the three main mountain masses of the island—the Aspro Vouno, Mount Ida, and the Lassethi Mountains. One skin, that of a ♂, was forwarded to me in the spring of the present year (1905), it having been obtained during the winter in the Sphakia district. The horns indicate an animal of eight years old, and measure 605 mm. along the front curve, while the circumference at the base is 175 mm. The greatest length of horn given by Dr. Lorenz-Liburnau ‡ for this subspecies is 81 cm. (810 mm.), this being in a seven-year old specimen preserved in the Vienna Museum.

November 28, 1905.

Dr. HENRY WOODWARD, F.R.S., Vice-President, in the Chair.

Mr. J. T. Cunningham, M.A., F.Z.S., exhibited some photographs of a Horse bearing structures that he interpreted as incipient horns, and made the following remarks :—

The peculiarity of the horse represented in these photographs was described by Dr. G. W. Eustace, of Arundel, before the Linnean Society in 1903. The horse, the name of which is "Domain," was then in the stables of Mr. Alfred Day at 'The Hermitage' near Arundel, and was still there when, by the kindness of Mr. Day, these photographs were taken for me in October last. A few other similar cases have been recorded, but the pedigree of Domain contains no individuals which are known to have possessed the peculiarity, and it appears therefore to be a new variation, not a result of reversion or heredity.

Dr. Eustace's paper was illustrated by plaster casts of the forehead of Domain which are now in the Natural History Museum, and Dr. Ridewood has presented to the Museum the frontal

\* *Op. cit.* vol. i. p. 253.

† 'Die Wildziegen der Griechischen Inseln &c.,' 1889.

‡ *Op. cit.* p. 24.



portion of the skull from another case whose history is unknown. 'Domain' was stated to be five years old in 1903, so that he was seven years of age when the photographs were taken.

The horns are about  $\frac{3}{4}$  inch in length, the left slightly larger than the right. There can be no doubt that they are outgrowths of the frontal bone. They are covered by normal skin and hair.

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Mr. Frank Slade, F.Z.S., showed three photographs of the Sea-Anemone (*Anemonia sulcata*), which had been taken from life in the Horniman Museum at Forest Hill, in the process of division. The first photograph showed the Anemone at rest after having made the initial tear in the body-wall. The second showed the animal, two days later, straining to increase the tear, whilst the third, taken after an interval of sixteen days, showed the division completed.

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Mr. Douglas English exhibited and made remarks upon a living albino Field-Vole (*Microtus agrestis*) which had been captured last July in Wales.

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Mr. G. A. Boulenger, F.R.S., exhibited a living Lizard, *Lacerta muralis*, from Brozzi, province Florence, which he had received from Dr. A. Banchi, through the mediation of Dr. J. de Bedriaga, C.M.Z.S. The lizard belonged to the typical form of the Wall-Lizard, but was remarkable for its black coloration, above and below. Melanistic forms of the Wall-Lizard were well known on small islands in the Mediterranean, but, so far as Mr. Boulenger was aware, no black specimen had ever been recorded from the mainland. The scales across the body numbered 58 and the lamellar scales under the fourth toe 25 in the specimen exhibited; these two numbers being sufficient to distinguish the Brozzi lizard from the melanistic insulars previously described.

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Capt. Albert Pam, F.Z.S., made some remarks on a living specimen of the Violet-cheeked Humming-bird (*Petasophora iolota*) which he had recently brought home from Venezuela and presented to the Society's Menagerie. He also gave a general account of the habits of these birds, as observed by him, in a wild and captive state, and notes on their management and feeding while in confinement.

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Mr. W. R. Ogilvie-Grant, F.Z.S., sent for exhibition a named set of the Birds collected in Japan by Mr. M. P. Anderson in connection with the Duke of Bedford's Exploration in Eastern Asia. No new species were discovered, but several of the specimens were of special interest as illustrating stages of plumage not represented in the British Museum.

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The following papers were read :—

1. Colour Evolution in Guereza Monkeys.

By R. LYDEKKER.

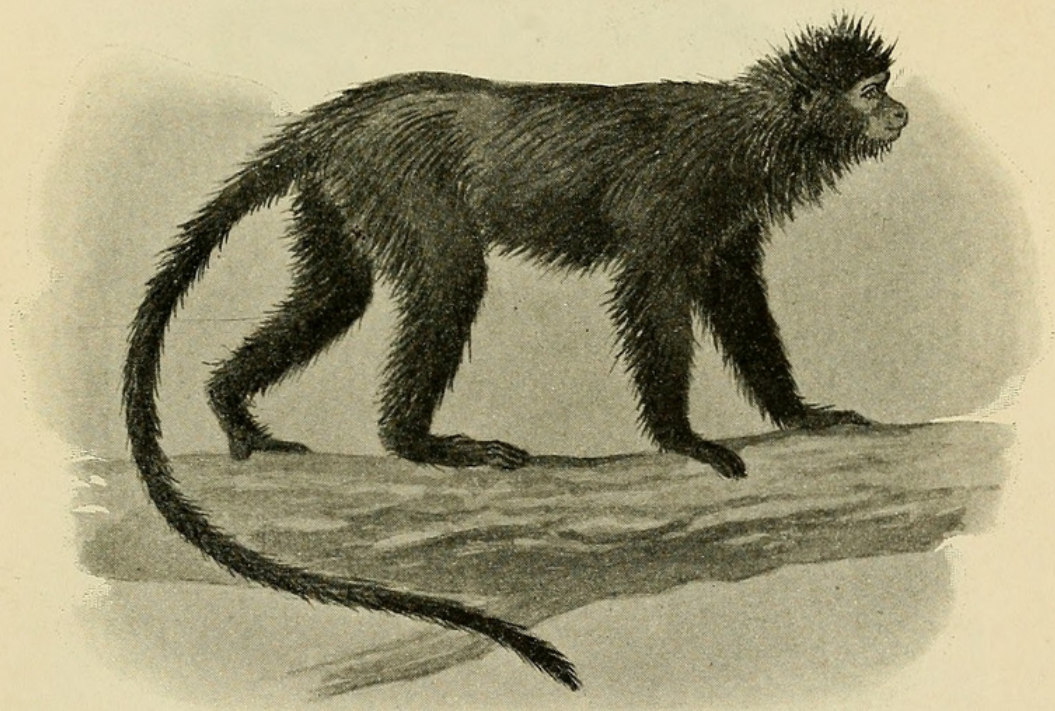
[Received November 7, 1905.]

(Text-figures 54–58.)

An interesting example of the progressive evolution of specialised features in colouring (if we may thus term combinations of black and white) is afforded by the black and black-and-white African long-haired monkeys included in the genus *Colobus*, and which may be collectively designated Guerezas, although the name “guereza” refers properly only to the north-east African representative of the group.

Beginning at one end of the series, we have the Black Guereza (*Colobus satanas*), of West Africa, which, as shown in text-fig. 54,

Text-fig. 54.



Black Guereza (*Colobus satanas*).

is wholly black with tufts of long hair on each side of the face and throat, a pointed crest on the crown of the head, and the long tail short-haired from base to tip. Following on this we may take a variety of the Mantled Guereza from East Central Africa which I have recently described as *Colobus palliatus cottoni*, in which the face-tufts, chin, and narrow pendent tufts of long hair on the shoulders are white, while the terminal half of the tail is grey with a white tip, which shows a slight tendency to



expand into a brush. A further development is exhibited by the typical form of *Colobus palliatus* (text-fig. 55), from British East Africa and the neighbouring districts, in which the two lateral white face-tufts are connected by a white band across the brow, while the shoulder-tufts are of considerably larger size, a small whitish patch beneath the tail occupies the perineal region, and the tail has its terminal third whitish, the middle third grey, and the remainder black. A nearly allied type is found in the form of the Mountain Guereza (*C. ruwenzorii*), of the Ruwenzori district, in which the white perineal patch has assumed much larger proportions, although the extreme tip of the tail is alone greyish; the latter feature placing the species, so far as the colouring of this appendage is concerned, next to the Black Guereza.

Text-fig. 55.

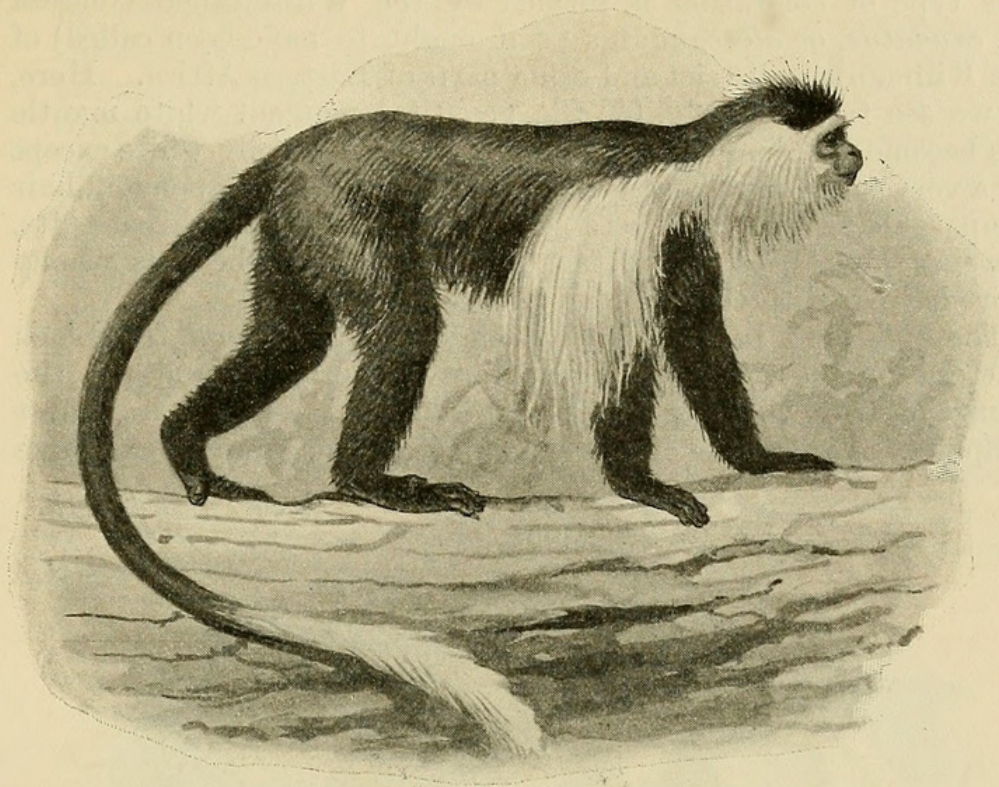


Mantled Guereza (*Colobus palliatus*).

From the three foregoing black-and-white forms there is an easy transition to Sharpe's Guereza (*C. sharpei*), of Nyasaland, in which, as shown in text-fig. 56, p. 327, the white brow-band, face-, throat-, and shoulder-tufts have become very long and pronounced, the hairs of the last hanging down the outer side of the fore-limbs. Moreover, the white terminal third of the tail has developed a distinct tuft, not dissimilar in relative size and form to that of a lion's tail. A step still further in advance is taken by the typical Guereza (*C. guereza*) of Abyssinia and North-east Africa generally. In this handsome monkey the white shoulder-tufts extend backwards to form a long mantle, falling down each side of the body



Text-fig. 56.

Sharpe's Guereza (*Colobus sharpei*).

Text-fig. 57.

White-tailed Guereza (*Colobus caudatus*).



and uniting on the lower part of the back. The culmination of this type of coloration is formed by the White-tailed Guereza (*C. caudatus*, or *albocaudatus* as it ought to have been called) of the Kilimanjaro district and other parts of Eastern Africa. Here, as we see from text-fig. 57, the beautiful pendent white mantle has become still longer, and the tail, which is wholly white except for a very small length at the root, is clothed with long pendent hair comparable to the "flag" of a setter; the cheek- and throat-tufts, however, have been completely lost, so that the head is wholly short-haired, with the face and throat white.

The difference between the species last-named and the Black Guereza in the matter of colouring is enormous, and yet the transition from the one to the other in this respect is almost complete. In the case of the white-tailed species the excessive

Text-fig. 58.

White-thighed Guereza (*Colobus vellerosus*).

length of the white hair forming the mantle and the tail-fringe appears to have been evolved in order to render the creature as inconspicuous as possible amid the long pendent greyish-white lichens which clothe the branches of the trees of an East African forest. The evolution of such a type is, of course, easy to comprehend; but, as in so many other cases, the difficulty comes in with regard to the purpose of the coloration in the intermediate types connecting this species with the Black Guereza. What purpose do these incipient attempts at the development of a pied coat serve?

The line of evolution culminating in the white-tailed species by no means, however, brings us to the end of the modifications in the colour and local development of the hair in this group of monkeys,



for the West African White-thighed Guereza (*C. vellerosus*), text-fig. 58, appears to exhibit a kind of retrograde development in these respects. The body, for instance, has entirely lost the mantle of long white hair and the tail its white "flag," while the white of the perineal patch has spread on to the hinder and outer sides of the thighs. In this case we find, indeed, a practical reversion to the type of the Black Guereza, with the exception that the band on the forehead, the sides of the face and throat, the thighs, and almost the whole of the tail have become white, while the long hair has entirely disappeared from the face.

That the colouring and special development of the long hair in the White-tailed Guereza form a protective modification, there seems to be little doubt. Whether, however, the colour-phases and hair-growth in the other forms are of a protective nature, or are merely due to what is commonly called sexual selection, must be left for those to decide who have the opportunity of seeing these beautiful monkeys in their native haunts.

## 2. The White-maned Serow. By R. LYDEKKER.

[Received November 11, 1905.]

(Plate VIII.\*)

In 1888 the very appropriate name of *Nemorhædus argyrochaetes* was bestowed by the Rev. Père Heude † on a large and strikingly coloured species of Serow inhabiting the mountains of Central China in the neighbourhood of Che-kiang in the Upper Yang-tse-kiang district.—Later, a fuller notice, with a figure of the skull, was given by the same writer ‡; while in 1890 Dr. A. Henry § contributed a note on skins of the species which had come under his notice while in China. Hitherto, however, so far as I am aware, no coloured figure of the entire animal has appeared; and since the colouring is of a very remarkable and striking type, somewhat different from that of the ordinary Serow, I think the opportunity ought to be taken of remedying this deficiency.

This opportunity has been afforded by the recent addition to the Collection of the British (Natural History) Museum of a mounted male specimen of this Serow and of the Tibetan Takin (*Budorcas taxicolor tibetana*). They were acquired by Rowland Ward, Ltd., from a French dealer, by whom they were stated to have come from Tibet; but I should think that Sze-chuen, or thereabouts, is more probably their place of origin, unless, indeed, the Serow was procured still farther east. The two are, I believe, the first representatives of their respective kinds ever received in England, and it is quite probable that in the case of the Serow this statement may be extended to European museums in general.

\* For explanation of the Plate, see p. 331.

† Mém. Hist. Nat. Emp. Chinois, vol. ii. p. 4, note (1888).

‡ T. c. p. 228, pl. xxxi. (1890).

§ Proc. Zool. Soc. London, 1890, p. 93.



In his note of 1890, Dr. Henry described the White-maned Serow as being as tall as a cow, and employed by the natives of Central China for riding and as a beast of burden. This, I think, is somewhat exaggerating matters (unless a very small breed of cattle is referred to), and a good-sized donkey would seem to be a better standard of comparison. Although, from the circumstance that the skull still retains the last two premolars, and therefore indicates an animal not yet fully mature, it is possible that the specimen in the Museum does not quite represent the full height attained by the species, yet it certainly cannot fall very short of this, and, as mounted, the skin indicates an animal only about three inches taller than the ordinary Himalayan or (as it may well be called) Black-maned Serow.

The general build and type of coloration approximate to those of the last-named animal, although in two respects there are marked peculiarities in the matter of colouring. The horns are small and very thickly ringed for more than half their length, differing, I think, in these respects to some extent from those of the Himalayan animal, although, on account of the immaturity of the Museum specimen, I cannot be confident on these points. The ears certainly appear to be larger, but here again it is difficult to say that there may not have been shrinkage in the mounting of the Himalayan specimens.

The general colour of the upper-parts is mingled black and white, but the face and outer surface of the ears are blackish brown, with an admixture of chestnut hairs on the upper part of the forehead and the sides of the upper lips. The insides of the ears and part of the muzzle are white, but the white area on the latter is of much smaller extent than in the Himalayan species, being confined to the margins of the upper lips, although wider on the lower lips, whence it extends as a streak on the sides of the jaws. A large patch on the throat, another on the chest, and the whole mane are dirty white. On the other hand, the lower portion of the buttocks, the whole hind limb (except a light streak inside), and the middle third of the tail are bright mahogany or ferruginous red. The fore legs from the knees downwards, and to some extent on their inner and outer sides above the latter, are of a lighter and more chestnut-red.

The upward extension of the red of the legs and its deeper tone are features of this species as contrasted with the Himalayan and Sumatran Serows, which are best regarded as varieties of one species, the latter distinguished by the legs being chestnut in place of wholly white. It appears, however, that in some cases the Sumatran Serow has the mane white, as in the present animal.

The prevalence of bright red, reddish yellow, and yellow in the colouring of mammals of the West Tibetan province, as exemplified by *Rhinopithecus roxellanae*, *Budorcas taxicolor tibetana*, and the present species, is very remarkable, and stands in need of explanation.

The skull belonging to the same individual as the skin is in a



somewhat damaged condition, having a large portion of the parieto-frontal region cut away, and also lacking the nasal and premaxillary bones; it still, however, serves as a basis of comparison between the present species and *N. bubalinus*. The third and fourth milk-molars are still retained, the second premolar is just piercing the gum, and the third molar has its summits slightly abraded by wear. The animal may therefore be considered to have been sub-adult at the time of its death, and may perhaps have not quite attained its full stature.

As it is, the skull is fully as large as that of an aged individual of *N. bubalinus*, but appears to have been of a relatively broader, deeper, and shorter type, although from its imperfection I cannot be sure on all these points. The palate is, however, evidently wider, the interval between the bases of the second molar being about a quarter of an inch more than in the Himalayan species. The basioccipital and basisphenoidal rostrum is also markedly wider and more tapering, with less prominence of the anterior tubercles for muscular attachment, which are, however, much larger.

Perhaps the most important distinctive feature of the skull of the white-maned species is the much greater backward extent of the nasals on to the frontal region, in consequence of which the fronto-nasal suture is situated only a short distance in front of the vertical line formed by the anterior border of the orbit, instead of very considerably in advance of the same. The pit for the face-gland also occupies nearly the whole extent of the lachrymal bone, instead of leaving a large flat surface along the upper border of the same. The palatine bones likewise extend much further forward on the palate, so that the palato-maxillary foramina are situated on the line of the hinder lobe of the first molar instead of opposite the cleft between the two lobes of the second tooth of the same series.

#### EXPLANATION OF PLATE VIII.

The White-maned Serow (*Nemorhædus argyrochætes*), from the specimen in the British Museum.

### 3. The Duke of Bedford's Zoological Exploration in Eastern Asia.—I. List of Mammals obtained by Mr. M. P. Anderson in Japan. By OLDFIELD THOMAS, F.R.S.\*

[Received October 9, 1905.]

(Plate IX.†)

As I announced at the last Meeting of the Society, our President, His Grace the Duke of Bedford, K.G., has consented, in order to

\* [The complete account of the new species described in this communication appears here; but as the names and preliminary diagnoses were published in the 'Abstract,' such species are distinguished here by the name being underlined.—EDITOR.]

† For explanation of the Plate, see p. 363.





Evaks, G H. 1905. "3. Notes on the Goriil fouiicl in Burma." *Proceedings of the Zoological Society of London* 1905, 311–331.

<https://doi.org/10.1111/j.1469-7998.1906.tb08399.x>.

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