February 5, 1901.

Howard Saunders, Esq., Vice-President, in the Chair.

Before proceeding with the ordinary business of the Meeting the Chairman made the following remarks:

This being the first meeting of the Zoological Society of London since the sad event which has placed the British Empire and the whole civilized world in mourning, it seems befitting that, even at a Scientific Meeting, allusion should be made to the great loss which this Society has sustained by the death of our beloved Queen, who was not merely our Patroness, but also a generous benefactor of the Society.

Inasmuch, however, as an Address of Condolence to His Majesty the King on this sad event will be prepared by the Council tomorrow, it seems unnecessary to say more upon the present occasion.

The Secretary read the following report on the additions to the Society's Menagerie during the month of January 1901:

The total number of registered additions to the Society's Menagerie during the month of January was 92, of which 31 were by presentation, 8 by purchase, 50 were received on deposit, and 3 were born in the Menagerie. The total number of departures during the same period, by death and removals, was 165.

Amongst these special attention may be called to the three examples of the Open-bill (Anastomus ositans) purchased on January 4th, being the first examples of this anomalous Stork received by the Society.

Mr. Sclater called attention to the fine specimen of Prejevalsky's Horse (Equus prejevalskii) now mounted and exhibited in the large Gallery of the Muséum d'Histoire Naturelle of Paris.

A recent letter from Mons. Oustalet had assured Mr. Sclater (in answer to enquiries) that there were, without doubt, callosities ("chestnuts") on the hind as well as on the fore legs of this animal, so that it would have to be placed in the typical section of the genus Equus, and was, in Mr. Sclater's opinion, in all probability a descendant of the original stock whence the Horse of domesticity (Equus caballus) had been derived. M. Oustalet would prepare a figure and description of this specimen very shortly.

The following papers were read:

1. On the Mammals of the Balearic Islands.
   By Oldfield Thomas, F.Z.S.
   [Received December 18, 1900.]

In the spring of last year Mr. R. I. Pocock and I made a trip to the Balearic Islands in order to procure zoological specimens.
of all sorts for the Museum collection. Up to that date there had been no Balearic mammals at all in the collection, and, as I gather from my colleagues, very few members of any other groups.

We were able to spend about 10 days in each of the two larger islands, Majorca and Minorca, and obtained fairly representative collections in each.

In Majorca our collections were made at Inca, a small town in the centre of the islands, on the low ground, but not far distant from the main mountain chain which runs the whole length of the north-western edge of the island.

In this place we had the advantage of the kind assistance of Don Miguel Riuort, himself an enthusiastic naturalist and collector, and were able to examine in his little Museum specimens of some species which we failed to capture ourselves.

From Inca we made collecting excursions to the “Albufera” or reclaimed swamp of Alcudia, to neighbouring lignite-mines in search of fossils, and to the local cave of Santa Magdalena, and the more distant and better-known one of Manacor in search of Bats. Of fossils from the lignite, although we found none ourselves, we were able to purchase some remarkably fine molars of Anthracotherium, which have been placed in the hands of Dr. Forsyth Major for determination.

In Minorca, acting on the good advice of Don Bartolomé Escudero, the British-Vice Consul at Mahon, we stayed at San Cristóbal¹, and found it in every way a most excellent locality for collecting. The natives took the greatest interest in our work, and constantly brought us in specimens which we should not otherwise have been able to get. Thanks to the suitability of both place and natives, we obtained examples of every land mammal known to inhabit Minorca, with the exception of the Weasel, and even this has since been obtained by the kind assistance of Mr. Escudero.

The mammals of the islands prove to be very similar to those of the neighbouring mainland of France and Spain, and I can find no evidence of insular specialization. The occurrence in them of the Algerian instead of the European Hedgehog is of remarkable interest, although this animal had been already recorded from Spain (see below).

Three species—the Wild Cat, Genet, and Hare—range eastwards from Spain to Majorca, but do not reach Minorca, where, when introduced, the last-named has failed to maintain itself and has again died out. All the other mammals are found in both islands.

The only previous list of any importance of the Mammals of the Balearics is the very excellent one by Prof. F. Barcelo², published in 1875. To this list we have been able to add one terrestrial species (Mus spicilegus) and several Bats, to disprove the presence of the Water-Vole, and to make some corrections in the determinations.

¹ San Cristóbal.
1. RHINOLOPHUS FERRUM-EQUINUM Schreb.
San Cristobal, Minorca.
The Greater Horseshoe Bat is evidently one of the commonest species in Minorca, as we ourselves found examples in two of the caves we visited, and the natives kept bringing in further specimens as they explored the different caves on our behalf. But in no case were large numbers found together, one or two being all that were to be obtained in any one cave.

2. RHINOLOPHUS HIPPOSIDEROS Bechst.
Inca, Majorca.
San Cristobal, Minorca.
All the specimens obtained of the Lesser Horseshoe Bat were found in caves.

3. PLECOTUS AURITUS L.
Recorded by Barcelo from Majorca and Iviza, and described to us as found in a cave at San Cristobal, Minorca. So windy a country is probably not very favourable to the Long-eared Bat. We ourselves did not see any specimens.

4. VESPERTILIO SEROTINUS Schreb.
Recorded by Barcelo from Majorca and Iviza.

5. PTERYGISTES NOCTULA Schreb.
Majorca (Barcelo).

6. PIPISTRELLUS PIPISTRELLUS Schreb.
Recorded as common by Barcelo. Not seen by ourselves, the Bats flying round the houses in Minorca proving to be the next species.

7. PIPISTRELLUS KUHLI Natt.
a-c. San Cristobal, Minorca.
Shot in the close neighbourhood of the village. The flight of this species struck us as very similar to that of its near ally our British Pipistrelle.

8. MYOTIS MYOTIS Bechst.
Minorca (Rami fis Barcelo). There was also a specimen, presumably from Majorca, in Don Miguel Riuort’s collection at Inca.

9. MYOTIS CAPACCINI Bonap.
Found in a crevice in the “Cueva de Santa Magdalena,” a limestone cave in a hill a couple of miles from Inca. In another crevice close by we found a pair of Miniopterus schreibersi, the occurrence together of the two species being just as described in
the Marquis Doria's paper on Ligurian Bats. And again, from Sardinia the Museum has since received examples of these two bats, taken together in the Grotto de Sardali. With regard to the identification of Bonaparte's species, I may express my entire accord with the conclusion arrived at by Dobson, Trouessart, and Doria.

As might be expected, the present forms an addition to the list of Balearic Mammals, the species not having been mentioned by Prof. Barcelo. Its nearest recorded locality is Marseilles; the Museum possesses examples from Cagliari, Sardinia; it occurs in Italy and Germany, and is said, though I venture to doubt the statement, to range eastwards to Japan and the Philippines.

10. MINIOPTERUS SCHREIBERSI Natt.

Inca, Majorca.
San Cristobal, Minorca.
New to the Balearic list.

Although not recorded by Barcelo, this species is evidently common. At Inca we found two specimens of it in the Cueva de Sta. Magdalena, in company with Myotis capaccinii, and at San Cristobal quite a large number of specimens were brought us from the caves in the neighbourhood. We failed to persuade captive specimens to eat anything, nor did we have the opportunity of seeing this species on the wing.

11. ERINACEUS ALGIRUS VAGANS, subsp. n.

a. Inca, Majorca.
b–f. San Cristobal, Minorca.

The "Erisso" is very common in both islands, and is eaten by the natives; we ourselves tried a hash of Hedgehog, and found it excellent.

It is of remarkable interest to find that the Hedgehog of the Balearic Islands is not the European species at all, as Prof. Barcelo not unnaturally supposed, but is the North-African E. algirus, from which, however, it is subspecifically distinguishable by size and colour. The same species has been recorded by Mr. de Winton as occurring in Andalucia, but with some doubt owing to the exact locality of the specimen not being known. Now, however, that E. algirus has turned up in the Balearics, the Andalucian record may be accepted as certainly correct, for it is through that region that the species must have reached the islands.

As a subspecies E. a. vagans may be distinguished from E. a. typicus by the smaller size of its skull and by the nearly uniform whiteness of its hairy parts. In some specimens the face, feet, and inguinal regions are faintly browner than the rest of the body, but are still far lighter than is the case in the African representatives of the species. The general colour of the upper surface of

2 P. Z. S. 1897, p. 856.
the body is very white, and quite different to what we are accustomed to see in our British Hedgehog. In the length and detailed coloration of the spines, and in the various cranial characteristics which Dobson and de Winton have described as distinguishing _E. algirus_ from _E. europaeus_, our Balearic specimens agree entirely with the former.

Dimensions of the type, an old male, the largest of the series, measured in the flesh:

Head and body 250 mm., tail 40, hind foot 37, ear 33.

Skull—greatest length from condyle to gnathion 53·8 mm.; basal length 51; zygomatic breadth 33; nasals, greatest (diagonal) length 16·5; interorbital breadth 17; intertemporal breadth 14; palate, length 32, breadth outside m.¹ 22, inside m.¹ 10·5.

The corresponding greatest length of a rather younger skull of _E. algirus typicus_ is 59 mm.

_Type._ Male, B.M. No. 0.7.1.36; original number 287; killed 10th April, 1900, at San Cristobal, Minorca.

The specimen selected as the type was brought to us with half a dozen others, and was considered by the natives as decidedly larger than usual. No doubt the persecution these animals undergo, owing to their edibility, tends to kill them off before they have the chance of attaining a good old age. On the other hand, no very young ones were met with, our smallest skull (♀) measuring 48·5 mm. in greatest length.

The range of _Erinaceus algirus_ is now shown to extend over North Africa from Tripoli westwards to Marocco, and in Europe from Andalucia to the eastern island of the Balearic archipelago. In Spain its exact distribution still remains to be worked out, and, especially, its geographical relationship to _E. europaeus_, which, in the subspecies _E. a. hispanicus_ B. Ham., occurs as far south as Seville.

12. _Crocidura russula_ Herm.

a–c. San Cristobal, Minorca.

The Garden Shrew is said by Barcelo to be very rare in Majorca, and this assertion is borne out by our catching none in that island and only three in Minorca; for when present it is easily trapped, and at Cintra in Portugal I captured as many as I wished of the same species.

By such natives as were observant enough to know it at all, it was called “_Rata aranera_,” while the Castilian name for it is “_Musarana_.”

We failed either to catch or hear of the Southern Pigmy Shrew, _Pachyura etrusca_. It may also be safely asserted that neither the Water-Shrew (_Neomys fodiens_) nor the Common Shrew (_Sorex araneus_) occur in the islands.

The Mole is also entirely absent.

13. _Felis catus_ L.

Majorca and Iviza (Barcelo). Does not occur in Minorca.
I can offer no opinion as to whether this animal is a real Wild-Cat or not. A specimen in Don Riutort's collection looked as if of rather doubtful ancestry, but was not examined very closely.

14. Genetta genetta L.

Majorca and Ibiza (Barcelo; also in Don Riutort's collection). Does not occur in Minorca.

The Genet is common in Majorca, but unfortunately, owing to the bad weather, we were unable to procure any specimens of it.

15. Mustela martes L.

a. ♀. San Cristobal, Minorca.

The Marten is said to be by no means rare either in Majorca or Minorca. At San Cristobal a hunting-party of three men and eight dogs was organized in our interests, and succeeded in getting the specimen mentioned above. It does not appear to differ in any way from ordinary Southern specimens of _M. martes_.

Barcelo records _M. foina_ from Majorca, but I should hesitate to believe that both species occur in so small a country. Three Martens in Don Miguel Riutort's collection were, like ours, referable to _M. martes_.

Barcelo also states that Ramis records the Polecat (_Putorius putorius_) from Minorca. In the wild condition, however, it is not known to the natives, although ferrets are used for rabbit-catching, and it may have been these that were referred to by Ramis.


a-b. Inca, Majorca.

The "Mostel" is common both in Majorca and Minorca, although in the latter island we failed to secure specimens.

It is highly interesting to find that the Balearic Weasel is quite distinct from that of Spain or at least Seville (_P. n. ibericus_ B.-Ham.), which has a sharp Ermine-like division of the brown and white colours, and that it belongs instead to the group with this line vague and wavy\(^1\). To this group belong the Weasels of Sardinia, Italy, Malta, and Egypt, while those of Sicily and Spain are of the other type.

In the present group, which comprises _P. n. boccamela, italicus_, and _afric anus_, the differences are rather baffling, and it seems to me that the Balearic Weasel might be almost as well referred to one as the other. But _boccamela_ is the earliest name within the group, and its locality, Sardinia, is the nearest to the Balearics, and I therefore use that name.

The occurrence of a Weasel of this type within the Spanish dominions is a fact which should be borne in mind in connection

\(^1\) Although much smaller than _P. afric anus_, a Weasel from Oporto, received since the above was written, also proves to be of the same group; so that both wavy-lined and straight-lined Weasels occur in the Iberian Peninsula.
with the question as to which is the original home of the Weasel of the Island of St. Thomas, Gulf of Guinea, where, on zoogeographical grounds, it is difficult to believe a Weasel is really indigenous. The British Museum has recently received a fine example of the St. Thomas Weasel, and this is remarkably like the large forms from Malta and Egypt. It is therefore possible that there is a substratum of truth both in my own suggestion that *P. africanus* Desm. might be the large Maltese Weasel, and Prof. Bocage’s that the type specimen of that name might have come to Lisbon from St. Thomas.

17. **Eliomys quercinus** L.

   a-e. San Cristobal, Minorca.

   The “Rata Sarda” is a well-known animal both in Majorca and Minorca, but is said by Barcelo not to occur in Ibiza.

   We were unable to obtain any specimens in Majorca, although we saw one in Don Miguel Riufort’s collection, but succeeded in trapping several at San Cristobal, Minorca. There, among the Ilex-trees near the town, Schuyler traps baited with cheese took several specimens of this beautiful animal.

   The Minorcan examples appear to be precisely similar to the true *E. quercinus* of France and Germany, and show no approximation towards the fine South-Spanish species *E. amori* Graells. The geographical relationship of this animal is therefore markedly different from that of the Hedgehog, where the Balearic species is the South-Spanish and Algerian, not the European one.

   Younger examples are paler in colour than the old ones, and indeed the resemblance between our younger specimens and the *E. pallidus* of Sicily raises a suspicion as to whether old specimens of that form will not be as dark as normal *E. quercinus*.

   1 P. Z. S. 1895, p. 128.

   This form appears to me worthy of recognition as a species distinct from *E. quercinus*. The following are the characters shown by six specimens of it from Seville, which were obtained for, and presented to the Museum by, the late Lord Lilford:

   Size considerably larger than in *E. quercinus*, as shown by the skull-dimensions. General colour of the same character as in that animal, but very deep and strong, markedly different from that of the pale Sicilian *E. pallidus*. Facial and other markings as usual, but the black of the tail usually runs right round that organ, interrupting the white below for about the middle third.

   Skull similar in general characters to that of the typical species, but very much larger throughout.

   Dimensions, measured in skin:

   Head and body (c.) 139 mm.; tail 120; hind foot (wet) 31; ear (wet) 21.

   Skull—greatest length 41; basilar length 32.2; greatest breadth 23.2; nasals 15.8×4; interorbital breadth 4.7; palatal length from henselion 14; diastema 9; palatal foramina 5.4×3.9; length of upper tooth-row 61.

   I owe to the kindness of Don Angel Cabrera, of Madrid, several additional particulars about Dr. Graells’s type, beyond those that appear in the original description.
18. **Mus norvegicus** Erxl.

(Mus decumanus Pall., auctorum.)

Common in all the towns. It has also taken to an aquatic life in many places, and is the “Water-rat” of the workers in the Albufera of Majorca.

19. **Mus rattus alexandrinus** Geoffr.

*a–b.* San Cristobal, Minorca.

“Common in all the islands” (Barcelo).

This Rat was living a wild natural life, away from houses, among the trees on the hill-sides, and is probably perfectly indigenous in the islands. Unlike *M. spicilegus*, however, it also occurs in the houses, wherever it has not been ousted by the more powerful *M. decumanus*. In colour it is a fulvous grey above and white below, as unlike the typical Black Rat as could well be conceived.

20. **Mus sylvaticus** L.

*a–m.* Inca, Majorca.

*n–o.* San Cristobal, Minorca.

As is the case everywhere else in Europe, the Long-tailed Field-Mice are the commonest and most easily trapped of the Balearic mammals. They are of rather large size, running about 99 to 105 mm. in length of head and body, and are on the whole rather dark in colour, very few of them being rufous. In this respect the Majorca specimens are remarkably uniform, all being of a dark greyish colour, but the Minorca ones are more variable.

21. **Mus musculus** L.

Common, as usual, everywhere.

22. **Mus spicilegus** Pet.

*a–f.* Inca, Majorca.

*g–m.* San Cristobal, Minorca.

This is the Mouse which, under the name of a “wild-living form of the *Mus musculus* group,” I recorded some years ago as occurring at Cintra in Portugal. Further observation shows that it is quite a distinct animal from the house-haunting *Mus musculus*, and in searching for a name applicable to it I find that the Hungarian *Mus spicilegus* Petenyi is so closely allied to it that for the present it would be inadvisable to separate the two. The Algerian *Mus spretus* Lataste also belongs to the same group.

The Balearic specimens are quite like those which I first caught at Cintra, and show no sign of insular specialization.

We also found this species at Cerbère, at the eastern end of the Pyrenees, on the Franco-Spanish frontier, that being as yet the most northern locality in the west of Europe where this form

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1 See Behn, P. Biol. Soc. Wash. 1900, p. 167.
2 Zoologist (3) xx. p. 137 (1896).
has been taken. It does not occur in the collections made by M. Alphonse Robert in S.W. France to the north of the Pyrenees, nor do I know of its capture in other parts of France. On the other hand, so little careful trapping has as yet been done in Europe, that it may prove to be much commoner and more widely distributed than at present appears.

The differences in colour and proportion between this Mouse and the true *Mus musculus* we found to be exactly the same in the Balearics as in Portugal, and it is evident that it can always be distinguished from its parasitical ally by its smaller size, much shorter tail, and paler colour.

Like other previous writers, Barcelo did not distinguish this species from *Mus musculus*, and it therefore forms an addition to his list, the only addition that we have been able to make among the non-volant Mammalia.

["*Arvicola amphibius*."]

The Water-Vole is recorded by Barcelo as occurring in all three islands, but I am convinced that the animal known to the natives as the "Rata d'aygo" (i.e. Rata de agua) is *Mus norvegicus*, which in the Balearic Islands, as elsewhere, commonly takes an aquatic life.

In the water-courses of the Albufera of Majorca, Rats are exceedingly numerous and the banks are much damaged by them. They are therefore hunted down on every opportunity; and one of the Albufera Company's employees spent a happy afternoon chasing them for us with an excited cur, but we failed to secure a specimen. However, I had a fair view of one, and from that, from the character of the ditches and burrows, and from the accounts the natives gave me, I was quite convinced that the Albufera animal was not a Vole but a Rat. No other locality that we saw or heard of was at all suitable for Voles. I think, therefore, that the name of this animal may be safely deleted from the Balearic list.


Majorca and Iviqa. Does not occur in Minorca.

Owing to its being close time, when shooting was prohibited,
we were not able to get any specimen of the Majorcan Hare. Barcelo relates that it was introduced into Minorca by the English, but that it died out there after a short time. It certainly does not occur there now.

24. Oryctolagus cuniculus L.

The Rabbit (Cuni in Balearic, Conejo in Spanish) occurs in all the three islands of the group, but is nowhere very common.


(Received December 18, 1900.)

(Plate VI.)

The two specimens upon which the following observations were made are those described by Gray in 1864 in the 'Proceedings' of this Society (p. 170), and in 1866 in the British Museum Catalogue of Seals and Whales (p. 95). They are respectively catalogued at the Natural History Museum, where they are exhibited, as "epidermic excrecence from the median line of the fore part of the head; called by whalers the bonnet," and "smaller specimen of the same"; and they bear the register numbers 64.6.1.15 and 64.6.1.6. Both were presented to the Museum by Mr. E. W. Holdsworth in 1864. The larger specimen measures 11 inches by 8, and the smaller 6 inches by 2½. A rough woodcut of the former was given by Gray in the 'Proceedings' of this Society, and in the British Museum Catalogue of Seals and Whales.

This wart or "bonnet" on the snout has been the object of many ingenious speculations. Gray mentioned it as the opinion of a foreign zoologist, whose name is not disclosed, that the "bonnet" is an excrecence formed by the adhesion of the barnacles called Coronula. A second opinion of the same authority is that it is caused by the irritation of the whale-louse. Mr. Holdsworth suggested that it was a natural development, and was possibly characteristic of the species; while Owen considered it as due to disease of the outer layers of integument. Beddard, in his recent 'Book of Whales' (1900, p. 136), states that "it gives one the impression that it is a pathological structure, a kind of corn, perhaps produced by the animal rubbing itself against rocks, as this species has been observed to do in order to get rid of the barnacles which are apt to infest it."

1 For an explanation of the Plate see p. 47.

2 List of Cetacea in the British Museum, London, 1885, p. 3.
HORNY EXCRESCENCE OF WHALE'S SNOUT.
It is an interesting fact that the "bonnet" appears to be confined to the Southern Right Whale. Gray has expressed his inability to find mention of the structure in any account of the Greenland Whale; and the experienced whaling captain Mr. Robert Kinnes of Dundee writes, in a letter dated Oct. 4, 1900, that "the Greenland Whale has no excrescence on its nose." What is still further of interest is the fact that in the Whale figured by Gray in Dieffenbach's 'Travels in New Zealand,' vol. ii., as Balea antarctica, there is a prominence on the front of the lower jaw as well as on the front of the upper one.

The specimens are black in colour, and very irregular in shape. Two views of the larger specimen are now exhibited (see figs. 1 and 2, Plate VI.). The under surface is comparatively smooth, and the formative area is rather narrower than the total width of the structure.

To the naked eye the mass appears to be made up of a number of thin layers of horny matter, for in the dried condition the edges seem disposed to fray out in laminae. But by a study of microscopic preparations the structure is seen to be one of closely packed fibres or rods, disposed at right-angles to the broader surface of the mass. Each constituent is rod-like for the greater part of its length, but is slightly hollow towards the cutaneous surface; and in the cavity there doubtless resided a soft and vascular papilla, covered with prismatic epithelial cells, to the proliferating activity of which the increase in the bulk of the "bonnet" is due.

Sections taken at right angles to the fibres (Plate VI. fig. 3) fail to show any sharply defined outlines between these constituents, the main indications of their structure being the dark air-spaces arranged in concentric series. Very little can be made out by the use of sections taken at right angles to the cutaneous surface, for, probably owing to contraction in drying, the rods are bent and twisted in all directions, and it is not possible to trace any individual one for more than a fractional part of its total length.

Beddard has called attention to the resemblance which this form of structure bears to that of the nasal horn of the Rhinoceros, which has always been regarded as consisting of agglutinated coarse horny fibres, differing from true hairs in the fact that their papillae are not lodged in depressions, but exist as eminences on the surface of the skin. The constituent rods or fibres of the Rhinoceros horn, however, are sharply defined by intermediate agglutinating material of darker appearance (Plate VI. fig. 4: see also Daubenton, Hist. Nat. de Buffon, ed. 8vo, xxiv. p. 269, pl. 318. figs. 3-7), and of a less resistant nature than the fibres themselves, for the latter tend to fray out on the basal parts of the horn.

The formation of horny growths of considerable thickness by the activity of closely-set papillae, giving rise to coarse horny fibres or hairs connate from the first, is, however, by no means uncommon among Mammals. It occurs in the hoof of the Horse (fig. 5: see

1 'Book of Whales,' 1900, p. 136.
also Nathusius, Arch. f. Anat. u. Phys., Leipzig, 1869, pp. 76-80),
and in baleen or “whalebone,” in which a strongly marked,
superficial, stratified layer is present in addition, especially in the
basal parts (fig. 6: see also Milne-Edwards, Lecons sur la Physiol.
vi., Paris, 1860, p. 120). The stiff hairs on the tail of the Elephant
are described by Naunyn as intermediate in character between
simple hairs and Rhinoceros horn. Even the horns of Oxen and
Goats show, in their deeper, most recently formed layers, a closely
analogous structure. This becomes lost in the outer layers in
consequence of the compression which the fibres undergo—they
first become elliptical or crescentic in section, and finally so flattened
that the outer layers exhibit a marked stratification.

The skin of Whales is peculiar in structure. Not only is it
practically hairless in the adult condition, but it is devoid of
glands, and cutaneous nerves are scarce. The stratum corneum is
very thin, but the rete malpighii is strongly developed, and is
traversed by numerous very long, vascular papillae. The corium, as
a layer, is in most cases almost completely wanting.

Elongated, finger-like papillae of this kind are, be it observed,
not confined to Whales. They occur in most cases where the
skin attains an unusual thickness, and they serve the purpose, as
Leydig pointed out, of supplying nourishment to a thickened
epidermis, since the epidermis, being but slightly pervious, cannot
absorb the nourishing plasma through more than a limited thickness
of its substance. Long papille were remarked by Steller in the
skin of Rhytina; they occur in the skin of the Hippopotamus,
particularly in the region of the upper lip, in the hairless skin on
the muzzle of the Ox, in the snout of the Pig, and on the point of
the proboscis of the Elephant.

I have not had an opportunity of examining sections of the skin
of the Whale, but the published descriptions go to show that the
structure of the “bonnet” under consideration does not differ in
essential features from that of the stratum corneum of the normal
skin; for this exhibits just the same disposition of the cornified
cells. Heusinger, for instance, in describing the skin of Balena
mysticetus, writes:—“Die Lederhaut ist äusserst dünn oder fehlt
ganz; dagegen findet sich eine mehr als zolldicke Schicht, die aus
parallelen, dicht mit einander verklebten und verwachsenen Fasern
besteht; zu unterst, wo sie auf dem Fette standen, sind diese
Fasern am dicksten, nach oben werden sie dünn und sind schwer

2 Leydig, F., “Ueber die äusseren Bedeckungen der Säugethiere,” Arch. f.
iii., Jena, 1889.
3 L. c. p. 701.
5 Nathusius, W., “Ueber die Marks substanz verschiedener Horngebilde,” Arch.
f. Anat. u. Phys., Leipzig, 1869, pl. iii. fig. 11.
xxiv. 1890.
1. HEMIDACTYLUS LÆVIS. 2. H. BARODANUS.
von einander zu trennen, bis sie endlich in eine mehr blätterige als faserige, feste und hornartige homogene, ein paar Linien dicke Schicht verschmelzen, die dann noch mit einer dünnen, aber ihr ähnlichen Oberhautschicht bedeckt ist.” And Leydig, from whose paper the above extract is quoted, himself observes:—“Betrachtet man endlich die freie Fläche der Hornschicht vom Wallfisch, so unterscheidet das unbewaffnete Auge kleine scharf abgegrenzte Flecken, die mikroskopisch angesehen sich als besonders geartete Epidermispartien kund geben, indem sie von den gewöhnlichen Epidermiszellen genau umschriebene Haufen eigentümlicher rundlicher, mit concentrischen Ringen versehener Zellen darstellen. So viel ich gesehen habe, entsprechen diese Flecken den Stellen, wo die Spitzen der Lederhautpapillen liegen.”

The “bonnet” of the Southern Right Whale would thus appear to be but a circumscribed tract of skin, where, for some reason not yet apparent, the cornified layers fail to rub off at their normal rate, but remain and accumulate to produce a hard mass, projecting above the general surface of the epidermis as a kind of corn.

EXPLANATION OF PLATE VI.

Fig. 1. Upper surface of the horny excrescence or “bonnet” of the Southern Right Whale (Balaena australis). Two-sevenths natural size.
Fig. 2. Side view of the same structure.
Fig. 3. Section of the same structure, taken parallel to the cutaneous surface and at right angles to the cuticular fibres. (×30.)
Fig. 4. Section of the nasal horn of Rhinoceros indicus, taken at right angles to the axis and about halfway up the horn. (×16.)
Fig. 5. Section of the front part of the hoof of the Horse, taken halfway up and at right angles to the cuticular striations. (×30.)
Fig. 6. Section of one of the baleen-plates of the Southern Right Whale (Balaena australis), taken at right angles to the axis and about one-fourth of the total length from the point. (×16.)

3. A List of the Batrachians and Reptiles obtained by Dr. Donaldson Smith in Somaliland in 1899. By G. A. BOULENGER, F.R.S.

[Received December 23, 1900.]

(Plate VII. ²)

The following list refers to a small collection made by Dr. Donaldson Smith on behalf of H.H. the Gaikwar of Baroda, to whose generosity the British Museum is indebted for a selected series of specimens, including the types of the new species here described. The specimens were obtained in January and February at three localities south and south-west of Berbera:—Biji, Ania, and Gan Lebar (altitude 5900 feet).

¹ L. c. p. 681.
² For an explanation of the Plate see p. 4
BATRACHIA.

ECAUDATA.


REPTILIA.

LACERTILIA.

1. Tropiocolotes tripolitanus Peters.—Biji.
   New to Somaliland. First discovered in Tripoli, this little Gecko has since been found in Tunisia and in Egypt.

2. Pristurus phillipsii Blgr.—Gan Lebar.

3. Hemidactylus isolepis Blgr.—Gan Lebar.

4. Hemidactylus levis, sp. n. (Plate VII. fig. 1.)
   Head short, oviform; snout as long as the distance between the eye and the ear-opening, which is small and round; forehead concave. Body and limbs rather short. Digits moderately dilated, free, with rather short distal joints; 4 lamellae under the inner digit, 6 under the median finger, 7 under the median toe. Upper parts covered with uniform small granules, largest on the snout. Rostral quadrangular, twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 9 upper and 7 lower labials; symphysial large, trapezoid, entirely separating the chin-shields, of which there are two pairs. Ventral scales moderately large, cycloid, imbricate, smooth. Brownish above marbled with darker, white beneath; a dark brown streak on each side of the head, passing through the eye; a dark brown, light-edged cross-bar at the base of the tail.

   millim.

   Total length ... 62
   Head ............. 12
   Width of head .... 8
   Body .............. 27
   Fore limb ........ 13
   Hind limb ......... 16
   Tail (reproduced) 23

   A single female specimen from Gan Lebar.

5. Hemidactylus barodanus, sp. n. (Plate VII. fig. 2.)
   Head oviform; snout a little longer than the distance between the eye and the ear-opening, which is rather large, oval, and oblique; forehead concave. Body and limbs robust. Digits strongly dilated, free, with long distal joints; lamellae nearly straight, transverse, 7 or 8 under the inner digit, 9 under the median finger, 10 or 11 under the median toe. Upper parts covered with fine
granules intermixed with large, strongly keeled, trihedral tubercles, forming about 16 very irregular longitudinal series; these tubercles oval or elliptical on the back, subcircular on the sides. Rostral quadrangular, little broader than deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 9 or 10 upper and 8 lower labials; symphysial large, pentagonal; two pairs of chin-shields, the inner large and forming a suture behind the point of the symphysial. Ventral scales moderately large, cycloid, imbricate, smooth. Male with an angular series of preanal pores. The tail of the type specimen is lost; the base only remains, and shows the organ to have been strongly depressed, covered with small striated scales and transverse series of subconical, striated and keeled tubercles. Brownish grey above; head spotted with brown; three brown dark-edged bands across the body, bifurcating on the sides; lower parts white.

<table>
<thead>
<tr>
<th></th>
<th>millim.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>22</td>
</tr>
<tr>
<td>Width of head</td>
<td>15</td>
</tr>
<tr>
<td>Body</td>
<td>56</td>
</tr>
<tr>
<td>Fore limb</td>
<td>25</td>
</tr>
<tr>
<td>Hind limb</td>
<td>32</td>
</tr>
</tbody>
</table>

A single male specimen from Gan Lebar.

7. *Agama vaillanti* Blgr.—Ania.

**Ophiida.**


**EXPLANATION OF PLATE VII.**

Fig. 1. *Hemidactylus levis*, p. 48.

a. Side view of head; b. Chin-shields; c. Lower view of foot.

[Received February 4, 1901.]

(Text-figure 7.)

I have now had time to examine more carefully the two waist-belts, made of skin, forwarded to me by Sir Harry Johnston, K.C.B., F.Z.S., and already exhibited at the meeting on December 18th last (see P. Z. S. 1900, p. 950). I have come to the conclusion that, whether the native account of the animal from which they were taken is precisely correct or not, the specimens themselves cannot be referred to any of the known species of Zebra and must belong to an undescribed animal, which I propose, provisionally at least, to name after its discoverer, with the following characters, until better specimens are obtained:

_Equus (?) Johnstoni_, sp. nov.

_Supra saturate nigro-cinereus aut fulvus; cruribus intus albicantibus, cruribus extus et lateribus fasciis nigris, utrinque castaneo distincte limbatis, ornatis; capite longo extenso._

_Hab. in sylvis fluvio Semliki adjacentibus._

The chief peculiarity in the two pieces of skin, which are all the certain evidence we as yet possess of the existence of this Zebra, is that the black bands, which are separated from each other by pale buffy-white bands, as shown in the figures (text-fig. 7), are distinctly edged on both sides with pale rufous.

The two bandoliers, which I again exhibit, have been apparently taken from the external portion of the front or hind legs. The hairs are very short, thin, and closely adpressed. Their lay is downwards from the more regularly banded portion of the skins (which I take to be the highest on the sides) to that less banded (which I suppose to be low down on the legs).

The bandoliers measure—specimen _a_ about 36 inches, and specimen _b_ about 30 inches in length including the fringes.

In order to make the subject complete I read again the portion of Sir Harry Johnston’s letter (dated Fort Portal, Toru, Aug. 21, 1900) that refers to it:

“Reading Stanley’s ‘Darkest Africa’ I noticed that he mentions his Dwarf having a word for horse or ass, and stating that such animals were found in their forests. As the ordinary Zebra type of equine steadily avoids dense woodland, this statement seemed to me a curious one. While I entertained for months the pigmy band who had been captured by a filibustering German (and the restoration of whom to their homes was one of my motives for going into the Congo Free State), I questioned them on this subject and they were very explicit; they told me they called the animal ‘O’Api’ (‘stands for a gasping sound like an aspirate or Arabic H). They described it as being dun-coloured or dark grey over all the
Bandoliers made from the skin of Johnston's Zebra.
upper parts of the body, with stripes on the belly and legs. As soon as I reached the Belgian post of Mbèni I began questioning my host, who at once acknowledged the existence of this animal and promised to send me where I could shoot one. They stated that it frequented the deepest parts of the Forest, went usually in pairs, was dark iron-grey on the upper part of the body, and had brownish stripes on the belly and legs. I found the Bambuba natives dwelling alongside the dwarfs called it 'Okapi.' The Belgians state that the head is very long 'et très effilée.' One man said that the muzzle was particularly 'effilé'—or drawn out. At first they excited me by declaring that there was a skin lying about which I could have; eventually it was found that the skin had been cut up by the native soldiers to be made into waist-belts and bandoliers. Two of these fragments were found and given to me, and I shall send them home to you by first opportunity. Whatever the animal may be to which these pieces belong, it is not any one of the known Zebras or wild Asses; the pieces of skin unfortunately exhibit chiefly the stripes of the belly and legs. These are very irregular with a chestnut border, and they look as though from above they emerged from a uniform dun or dark grey."

5. On a Second Collection of Mammals made by Mr. Th. H. Lyle in Siam. By J. L. Bonhote, B.A.

[Received January 19, 1901.]

This second consignment of Mammals from Mr. Th. H. Lyle has proved to be of exceptional interest, almost every specimen having added to our knowledge of the species to which it belongs. One new race of *Sciurus macellandii* is now described, which, apart from being distinct in colour, differs in undergoing a seasonal change of pelage, a feature unknown among the other forms of that species. From a study of *Funambulus herdmorei* suggested by Mr. Lyle's specimens, that species also appears to have a seasonal change; and it should be observed that the seasonal change observed in these two species must be carefully distinguished from the breeding-pelage of two other species, viz., *Sc. caniceps* and *Sc. atrodorsalis*. In these latter a distinctive and brighter pelage is assumed in mid-winter during the rutting-season by both sexes; whereas in *F. herdmorei* the brightest pelage, which is merely a more intense form of the duller dress, is assumed, as one would expect, during the summer months.

A Bat, *Eonycteris spelaea*, is recorded for the first time from this region; and the specimens of *Megaderma spasma* are the first received in the Museum from Siam.

Another specimen of *Petaurista lylei* showing the immature pelage, and a Mongoose (*Herpestes exilis*) identical with Capt. Flower's specimen recorded in his paper, also form part of the consignment.

The collection is made in Mr. Lyle's usual careful style, each
specimen having full date, particulars, and measurements, and it is by these, and these alone, that local races and seasonal changes can be made out.

1. *Eonycteris spelaea* (Dobs.).


*Eonycteris spelaea* (Dobs.), Flower, *P. Z. S.* 1900, p. 341.

a. ♀. Nan, Siam. 10th May, 1900.
b. ♂. Nan, Siam. 3rd June, 1900.

As predicted by Mr. S. S. Flower last year, this species is now recorded for the first time from Siam.

2. *Megaderma spasma* (L.).


*Megaderma spasma* (L.), Flower, *P. Z. S.* 1900, p. 344.

a, b. Sokotai, Siam. 20th February, 1900.

3. *Herpestes exilis* Gerv.


*Herpestes javanicus* (Desm.), Flower, *P. Z. S.* 1900, p. 332.

a. ♂. Nan, Siam; alt. 200 m. 16th May, 1900.

Agrees in all respects with the specimen mentioned in Mr. Flower's paper quoted above.


a. ♂ imm. R. Mee Nan, Utaradit; alt. 61 m. 20th March, 1900.

This specimen is only about half-grown and differs from the adults in several respects. The tail is grizzled nearly to its tip, which is black, the grey hairs being very woolly. The edge of the parachute, which in the adults is rufous succeeded by a narrow black line, is in this specimen light grey; the fore half of the ear is grizzled rufous, not bright red; the underparts are lighter, and the long stiff black hairs at the edge of the shoulder are softer and grizzled with rufous.

5. *Sciurus finlaysoni* (Horsf.).


Type A. *Sc. finlaysoni*.

f. ♂ ad. sk. R. Mee Nan; alt. 75 m. 4th April, 1900.

Type B. *Sc. splendens* Gray.

d. ♂ ad. sk. Below Utaradit, R. Mee Nan; alt. 58 m. 11th March, 1900.

e. ♀ ad. sk. Above Utaradit, R. Mee Nan; alt. 64 m. 3rd April, 1900. Pregnant with two young.
Type C. *Sc. leucocephalus* Gray.

*a.♂ ad. sk. Cheimat, R. Menam; alt. 20 m. 21st January, 1900.*

Type D. *Sc. harmaudi* M.-Edw.

*b. c.♂ ♀ ad. sk. Kampeng, R. Mu Ping; alt. 110 m. 3rd February, 1900. ♀ pregnant with two young.*

I have again been most carefully through the series of this Squirrel in the Museum, and there seems but little doubt that we have here a true instance of a polymorphic species. Without going into the outlying forms, four distinct types may be found in Siam, and are, in fact, all represented among the specimens in this collection. They have all received names at various times, but I am unable to recognize their title to specific or subspecific rank.

Type A. The true *Sc. finlaysoni* is pure white all over, with the soles of feet and eyes black.

Type B (*Sc. splendens*) is of a uniform bright chestnut throughout, and, according to Mr. Lyle, is found in regions where the earth is similarly coloured.

Type C (*Sc. leucocephalus*) is of a grizzled brown above and white below.

Type D (*Sc. harmaudi*) is similar above and chestnut below; but amongst these last two varieties every possible mixture and combination is found.

Apparantly, although it must be understood that there is no such thing as an invariable rule in dealing with this species, the pure white (type A) and type C are found on the lower levels, and as one ascends the river the tendency to red underparts increases.

In the measurements of a series of skulls, they fall into two groups, separable by their size alone; the measurements of types A and B average larger than the rest, but a few skulls intermediate in size are also found to be those of individuals intermediate in colour. Furthermore, the skull of the type of *Sc. finlaysoni*, although quite adult, is the smallest of any in the series. There is therefore at present no alternative but to consider the various races as polymorphic forms of one species.

It may perhaps be of use to future workers if I add the average measurements of part of the series of skulls and skins; those imperfect in any of the measurements have been left out of the calculation, although measured and taken into account in my general remarks.

*Skins in flesh:*

<table>
<thead>
<tr>
<th>Types A &amp; B [5 skins]</th>
<th>Head and body mm.</th>
<th>Tail mm.</th>
<th>Hind foot mm.</th>
<th>Ear mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>219-5</td>
<td>221</td>
<td>49</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Types C &amp; D [16 skins]</td>
<td>201</td>
<td>209</td>
<td>44</td>
<td>19-5</td>
</tr>
</tbody>
</table>
Skulls:—

<table>
<thead>
<tr>
<th></th>
<th>Length of greatest palate from behind post-orbital process (mm.)</th>
<th>Width of nasals (mm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types A &amp; B [12 specs.]</td>
<td>52 (53-30)</td>
<td>19+</td>
</tr>
<tr>
<td>Types C &amp; D [17 specs.]</td>
<td>47 (49-46)</td>
<td>17+</td>
</tr>
<tr>
<td>Type of S. finlaysoni</td>
<td>44</td>
<td>17</td>
</tr>
</tbody>
</table>


a, b. (S. 2- Biver Mu Ping, Paknampo, Siam. 28th January, 1900.

Both these specimens are in the full breeding-pelage with a bright yellow back.

7. Sciurus atrodorsalis Gray.


a. *Sciurus atrodorsalis*. R. Mee Ping, above Paknampo; alt. 34 m. 26th January, 1900.

As in Sc. caniceps the brighter pelage is assumed during the winter months.

8. Sciurus maclellandii kongensis, subsp. n.

Sciurus m. barbei Blyth, Bonhote, P. Z. S. 1900, p. 194.

This collection contains three more specimens of this Squirrel, which, on a close comparison with specimens from other localities, is seen to form a distinct Siamese race of Sc. maclellandii. The form it most nearly approaches is Sc. m. barbei, from which it may be distinguished by the general coloration being much greyer and the outer light stripes of a much paler yellow; these characteristics will hold good at all seasons of the year, for from the material at hand it appears that this race has a seasonal change, which is not known among the Burmese specimens.

Description of type. (Winter pelage.)

General colour greyish, each hair being dark at its base with a very pale tip. The outer light stripes very broad and well-marked and of a very pale cream. The inner light stripes slightly darker in colour, but narrow and short. All the three dark stripes dull, owing to each hair having a rufous tip. Hairs of the ears long and conspicuously white, those near the tip having no black bases. Underparts pale ferruginous.

Dimensions:—

Head and body 122 mm.; tail 133; hind foot 29; ear 14.
Hab. Rahong, Siam; alt. 120 m. Several specimens also from Nan.

Type. B.M. 0.10.7.18. ♂. 7th February, 1900. Collected and presented by Mr. T. H. Lyle.

In summer the pelage is similar, only clearer and brighter; the central median dark stripe is black, and the ear-tufts much shorter and thinner. The general greyish coloration and the paleness of the outer light stripes are sufficient to distinguish this race from all the others.

Mr. Lyle procured two other specimens besides the type:—

a. ♂. Rahong, Siam; alt. 120 m. 7th February, 1900.
b. ♂. Nan, Siam; alt. 200 m. 31st May, 1900.

9. Funambulus berdmorei (Blyth).

Sciurus mouhoti, Gray, P. Z. S. 1861, p. 137.
Funambulus berdmorei (Blyth), Bonhote, P. Z. S. 1900, p. 194; Flower, P. Z. S. 1900, p. 359.

a. ♂. Rahong, Siam; alt. 120 m. 7th February, 1900.

On comparing this specimen with those mentioned in my former paper on Mr. Lyle's collection, one is able to note two distinct varieties among the series—some specimens (e. g., b, c, d of my former paper) differing from the other individuals in the greater intensity of their colouring. In these individuals the uppermost pale stripe is clear and distinct and is succeeded by a black stripe; the lower light stripe is very clear and broad, while there are traces of another black stripe below that. The colouring of the whole animal, moreover, is very light and the underparts are pure white. In other individuals, collected by Mr. W. Davison in Tenasserim during January, the whole animal is duller and the dark patch below the uppermost pale stripe is precisely of the same colour as the rest of the back; the second light stripe and the succeeding darker stripe are by no means so clearly defined, while the white of the underparts is tinged with yellowish.

The type of Sc. mouhoti Gray is intermediate between these two forms, as is also another specimen from Siam collected by Mr. S. S. Flower in March. Mr. Davison's specimens having been procured in January and the brighter individuals in June, these latter in all probability represent the summer pelage of the species; and Sc. mouhoti must be regarded as an individual of Sc. berdmorei assuming the brighter pelage.

10. Mus rattus L.

Mus rattus, Linn. Syst. Nat. i. p. 83 (1766); Bonhote, P. Z. S. 1900, p. 194; Flower, P. Z. S. 1900, p. 361.

a. ♂. Nan, Siam. 8th July, 1900.

Differs in no way from specimens in the former collection.

11. Lepus sp. inc.

6. On the Birds collected during the "Skeat Expedition" to the Malay Peninsula, 1899-1900. By J. L. Bonhote, B.A.

[Received December 31, 1900.]

In writing an account of the Birds collected by the "Skeat Expedition" in 1899, it is unnecessary to dwell on the geographical positions of the places mentioned, as they have already been fully dealt with in my former paper on the Mammals. Although among the 139 species of which examples were collected none are new to science, yet there are several of considerable rarity; it is worthy of notice that the eastern side produced nothing very striking or even scarce, and most of the interesting forms were procured by Mr. Laidlaw on Mt. Gunong Inas, in Perak, a locality which had previously been visited on various occasions, viz., in 1886, 1887, and 1888 by Mr. Wray, in 1889 by Mr. Hartert, and again quite recently by Mr. A. L. Butler.

Mr. Laidlaw was, however, successful in procuring examples of several species which, so far as I am aware, are known only from the specimens originally procured by Mr. Wray. Chief among these is a fine male example of *Chrysophlegma wrayi*, which hitherto has been known only by a single specimen, a female; among the rest may be mentioned *Pericrocotus croceus* (a doubtful species, possibly only a variety of *P. wrayi*), *Corythochilus leucosticta*, *Pteruthius auratus*, *Heliopais personata*, &c. Although the number of species is considerable, the number of individuals of the various species is somewhat restricted, so that this paper is more of the form of a mere list than I would wish it to be.

1. *Spilornis cheela* (Lath.).


a. Ad. sk. Patelung. 28th April, 1899.
b. δ. Bukit Besar, Jalar. 6th May, 1899.
c-e. δ. Biserat, Jalar. 13th May, 1899.
f. δ. Kota Bharu, Kelantan. 9th July, 1899.

2. *Spizaetus caligatus* (Hume).

*Limnaetus caligatus*, Hume, Str. Feathers, 1879, p. 44.

*Spizaetus caligatus* (Hume), Sharpe, P. Z. S. 1887, p. 433.


3. *Haliaetus leucogaster* (Gm.).

*Falco leucogaster*, Gm. S. N. i. p. 257 (1788, ex Lath.).


b. Kedah. 3rd May, 1900.
4. Haliastur Indus (Bodd.).
Falco indus, Bodd. Tab. Pl. Enl. 25 (1783).
a. b. $♀$. Bankok, Patelung. 6th April, 1899.
c. $♂$. Biserat, Jalor. 12th May, 1899.
e. Arrah Bukit, Kedah. 5th May, 1900.
f; g. Pull. Tale Nawry, Patelung. April 1899.
h. No particulars.

5. Microhierax fringillarius (Drap.).
a, b. $♀$. Aring, Kelantan. 2nd Sept., 1899.

6. Polioaetus ichthyaetus (Horsf.).
a. Tringganu. 15th July, 1899.
b. No particulars.

7. Syrniun sinense (Lath.).
a. $♀$. Bukit Besar, Jalor. 6th May, 1899.

a. $♀$. Bukit Besar, Jalor. 8th May, 1899.
b. $♀$. Biserat, Jalor. 14th May, 1899.

9. Corone enca (Horsf.).
a. $♀$. Bukit Besar, Jalor. 8th May, 1899.
b. $♂$. Pulau, Bidang. 6th Dec., 1899.
c. No particulars.
+10. **Platysmurus leucopterus** (Temm.).


+11. **Oriolus consanguineus** (Wardl.-Rams.).

*Analcipus consanguineus*, Wardl.-Rams. Ibis, 1881, p. 32, pl. i.


a. ♂. Gunong Inas, 3500 ft., Perak. 6th Dec., 1899.

Feet, bill, and iris slaty black.

+12. **Dicrurus annectens** (Hodgs.).

*Buchanga annectens*, Hodgs. Ind. Rev. i. p. 326.


a. ♂. Pulau Bidang. 7th Dec., 1899.

c. No particulars.

+13. **Bhringa remifer** (Temm.).


a, b, c ♂♀. Gunong Inas, 4000 ft., Perak. Dec. 1899.
c. No particulars.

Feet black; iris dark brown.

+14. **Dissemurus paradiseus** (Bp.).


*Dissemurus platurus* (Vieill.), Kelham, loc. cit. p. 507.

a. ♀. Nawry Chik, Patelung. 28th April, 1899.

+15. **Artamides sumatrensis** (S. Müll.).


a. ♂. Gunong Inas, Perak. 7th Dec., 1899.

Feet dark; iris brown.
16. **Pericrocotus croceus** Sharpe.


*a.* ♀. Gunong Inas, 4000 ft., Perak. 14th Dec., 1899.

Bill and feet black; eyes hazel.

This specimen is, I believe, the only one collected since the species was described from an isolated specimen procured by Mr. Wray near this same locality. It differs slightly from the type in having the cheeks dark grey, i.e. lighter than the crown, and in the throat being golden buff fading to white at the base of the bill, instead of dark slate-grey. As the type of *croceus*, however, shows signs both of the yellow on the throat and also of the grey on the cheeks, these differences are probably due to age.

Dr. Sharpe, in describing the species, suggests that it may be merely a yellow variety of *P. wrayi*, but more material is necessary before the matter can be definitely settled. I have carefully examined the series of *P. wrayi* at the British Museum; and those males that are still in their immature yellow dress or in process of assuming the red plumage are easily to be distinguished by the following characters:

(i.) In *P. wrayi* ♀ there is always a slight trace of red visible somewhere, which is not the case in *P. croceus*.

(ii.) In *P. croceus* the colour of the back is as deep and glossy as in specimens of *P. wrayi* in full red plumage; *P. wrayi* in yellow plumage is always duller on the back.

(iii.) In *P. wrayi* in yellow plumage the yellow does not extend over the throat to the base of the bill, but it has those parts of a dirty white which are afterwards to be black; in *P. croceus* the intensity of the yellow is not diminished.

17. **Rhipidura javanica** (Sparrm.).


*a.* Tringganu. 29th Oct., 1899.

Iris brown; bill and feet black.

[Local name "murai gila" (= mad murai), so called from its alleged eccentricity of flight.—R. E.]

18. **Terpsiphone affinis** (Blyth).


Bill and feet blue-black.

19. **Siphia rubeculoides** (Vigors).

*Phoenicura rubeculoides*, Vigors, P. Z. S. 1831, p. 35.

a. ♂. Aring, Kelantan. 28th August, 1899.

+ 20. Aegithina tiphia (L.).

Motacilla tiphia, Linn. S. N. i. p. 331 (ex Edwards).

a-c. ♂. Biserat, Jalor. 15th May, 1899.

d, e. ♀. Biserat, Jalor. 15th May, 1899.


+ 21. Hemixus cinereus (Blyth).


+ 22. Iole tickelli (Blyth).


Iole tickelli peracensis, of which these specimens are practically toptotypes, is distinguished by the crown being darker and less rufous, ear-coverts more dingy grey, and the breast and flanks more ashy.

+ 23. Criniger phœcephalus (Hartl.).


a. ♀. Perak. 26th Dec., 1899.

Feet pink; bill and iris brown.

24. Criniger gutturalis (Bp.).

Trichophorus gutturalis, Bp. Cons. i. p. 232 (ex Müll. MS. in Mus. Leyd.).
Criniger gutturalis (Bp.), Sharpe, Cat. Bds. Brit. Mus. vi. p. 80 (1881); Oates, op. cit. i. p. 185

a. No particulars.

+ 25. Tricholestes criniger (Blyth).

Tricholestes criniger (Blyth), Sharpe, Cat. Bds. Brit. Mus. vi. p. 89 (1881); Oates, op. cit. i. p. 186.


Bill blue-black; feet dirty yellow.

26. Trachycomus ochrocephalus (Gm.).


a. Blembing, Legeh. 27th July, 1899.

b. ♂. Aring, Kelantan. 6th Sept., 1899.

27. Pycnonotus analis (Horsf.).


b. ♀. Tringganu. 28th Oct., 1899.


d. No particulars.

28. Pycnonotus findlaysoni Strick.


b. No particulars.

29. Pycnonotus blanfordi Jerdon.


30. Pycnonotus simplex Less.


31. Otocompsa jocosa (Linn.).


a, b. ♀. Biserat, Jalar. 14th May, 1899.


32. Irene puella (Lath.).

Irene malayana, Moore; Hartert, loc. cit. p. 389.

a. ♂. No particulars.
b. ♀. Aring, Kelantan. 6th Sept., 1899.

+ 33. Myiophoneus eugenii Hume.

a. Imm. Biserat, Jalor. 5th July, 1899.

+ 34. Trochalopterum peninsulæ Sharpe.

a, b. ♀. Gunong Inas, Perak. 13th Dec., 1899.
Iris and feet dark brown. Feeds on rattan fruit.

t+ 35. Copsychus saularis (Linn.).

a. ♀. Biserat, Jalor. 13th May, 1890.
b. ♀. Blembing, Legeh. 28th July, 1899.
e. ♀. Kedah. 1st May, 1900.

+ 36. Hydrocichla ruficapilla (Temm.).


+ 37. Sibia similílima (Salvad.).


+ 38. Rhinocichla mitrata (S. Müll.).

a. ♀. Gunong Inas, 4000 ft., Perak. 16th Dec., 1899.
Iris dark brown; bill orange; bare skin under eyes white; feet yellow.
39. Turdus abbotti (Blyth).
Turdinus abbotti (Blyth), Sharpe, Cat. Bds. Brit. Mus. vii. p. 541 (1883); Oates, op. cit. i. p. 58.
Trichostoma abbotti (Blyth), Hartert, loc. cit. p. 383.
a. ♀. Bukit Besar, Jalor, 30th April, 1899.

40. Mixornis gularis (Raffles).
Motacilla gularis, Raffles, Tr. Linn. Soc. xiii. p. 312 (1822).
a. Biserat, Jalor, 16th May, 1899.

41. Mixornis erythroptera (Blyth).
Timalia erythroptera, Blyth, J. A. S. B. xi. p. 794 (1842).
Iris dark brown; bill black; feet greenish grey.

42. Corythocichla leucosticta Sharpe.
a. ♀. Gunong Inas, Perak, 17th Dec., 1899.
Iris dark brown; feet yellowish brown; beak brownish black.

43. Pteruthius äratalus Tickell.
a, b. ♀ ♀. Gunong Inas, 4000 ft., Perak, 18th Dec., 1889.
Iris slate-colour; feet yellowish brown; bill, upper mandible black, lower slate-colour.

44. Siva castaneicauda Hume.

45. Æthopyga siparaja (Raffles).
Certhia siparaja, Raffles, Tr. Linn. Soc. xiii. p. 299 (1822).

46. Arachnothera crassirostris (Reichenb.).

b-d. ♀. Aring, Kelantan. 17th, 22nd, 26th Sept., 1899.

47. Anthrothreptes malaccensis (Scop.).


Anthreptes malaccensis (Scop.), Oates, op. cit. i. p. 324 (1883).


a. ♂. Biserat, Jalor. 16th May, 1899.
b. ♀. Bukit Besar, Jalor. 6th May, 1899.
c, d. ♂. Pulau, Bidang. 14th Dec., 1899.


Certhia cruentata, Linn. Syst. Nat. i. p. 187 (1766).


h. No particulars.

49. Dicceum trigonostigma (Scop.).


a, b. ♂. Aring, Kelantan. 21st Aug. and 13th Sept., 1899.
c. ♀. Aring, Kelantan. 18th Aug., 1899.
d. ♂. No particulars.

Bill orange below, black above; feet blue-black; iris pale brown.

50. Dicceum ignipeotus (Hodgs.).

Macrura ignipeotus, Hodgs. Icon. ined. in Brit. Mus., Passeres, pl. 38. fig. 393.

Myzanthe ignipeotus (Hodgs.), Oates, op. cit. i. p. 337.


c. ♂. Gunong Inas (4000 ft.), Perak. 15th Dec., 1899.

51. Dicceum chrysorrheum Temm.

52. *Hirundo badia* (Cass.).


a. ♂. Aring, Kelantan. 11th Sept., 1899.

53. *Anthus rufifrons* Vieill.

*Corydalla rufula*, Oates, op. cit. i. p. 168.


a. ♂. Singgora, Patelung. 22nd April, 1899.
b. ♂. Bukit Besar, Jalor. 7th May, 1899.
c. Biserat, Jalor. 16th May, 1899.

Native name, "Gembala Kreban" (Buffalo-bird). Feet, beak, iris yellow.

55. *Mainatus javanensis* (Osbeck).

*Corvus javanensis*, Osbeck, Iter, p. 102 (1757).
*Gracula javanensis* (Osbeck), Oates, op. cit. i. p. 393; Hartert, loc. cit. p. 391.

a. ♀. Sungei Lebeh, Kelantan. 5th Aug., 1899.


a, b. ♂♀. Biserat, Jalor. 11th May, 1899.

57. *Calornis chalybea* (Horsf.).

58. **Munia maja** (L.).

*Loxia maja*, Linn. Syst. Nat. i. p. 301 (1766).

b. ♀. Biserat, Jalor. 20th May, 1899.

c. d. Biserat, Jalor. 14th May, 1899.

d. e. Biserat, Jalor. 17th May, 1899.

e. f. Biserat, Jalor. 20th May, 1899.

59. **Munia atricapilla** (Vieill.).

*Amadina atricapilla*, Oates, op. cit. i. p. 366.

a. ♂. Biserat, Jalor. 14th May, 1899.
b. No particulars.

c. d. Biserat, Jalor. 14th May, 1899.

d. e. Biserat, Jalor. 20th May, 1899.

e. f. Biserat, Jalor. 20th May, 1899.

60. **Ploceus atrigula** Hodggs.


a. ♂. Khota Bharu, Kelantan. 24th June and 10th July, 1899.

61. **Pitta cyanoptera** Temm.


b. c. ♂. Tringganu. 31st Oct., 1899.

Bill black; feet flesh-coloured; iris brown.

62. **Pitta cucullata** Hartl.


Bill black; feet flesh-coloured; iris brown.

63. **Calyptonema viridis** Raffl.


Bill and feet dirty green; iris pale.
64. Eurylaimus ochromelas Raffles.


a. Aring, Kelantan. 8th Sept., 1899.

65. Cymborhyncus macrorhynchus (Gm.).

Todus macrorhynchus, Gm. Syst. Nat. i. p. 446.

a. ♂. Biserat, Jalor. 16th May, 1899.


c. ♂. Tringganyu. 29th Oct., 1899.

Bill above blue, below yellowish brown; feet blue-black; iris green. “Rain-bird,” so called because its note is heard at the opening of the rainy season. Nests said to be rare.

66. Upupa indica Reichenb.


a. Singgora?

67. Collocalia innominata Hume.

Collocalia innominata, Hume, Stray Feath. i. p. 294 (1873);

a, b. No particulars.

68. Caprimulgus macrurus Horsf.


c. ♂. Bukit Besar, Jalor. 7th May, 1899.

69. Eurystomus orientalis (Linn.).

Coracias orientalis, Linn. S. N. i. p. 159 (1766).

a, b. ♂ ♀. Khota Bharu, Kelantan. 24th June, 1899.

c. ♂ juv. Khota Bharu, Kelantan. 24th June, 1899.


e. ♂. Aring, Kelantan. 31st Aug., 1899.

Bill and feet orange-red.
Merops sumatrensis Raffles.

Merops sumatrensis, Raffles, Trans. Linn. Soc. xii. p. 294 (1822);
a, b. ♂. Biserat, Jalor. 15th May, 1899.
c, d. ♀. Biserat, Jalor. 5th & 14th May, 1899.

Nyctiornis amictus (Temm.), Oates, op. cit. ii. p. 64; Sharpe,
a, b. ♂. Aring, Kelantan. 4th Sept., 1899.

Pelargopsis fraseri, Sharpe, P. Z. S. 1870, p. 65; id. Cat. Bds.
a. ♂. Parit Buntar, Perak. 17th Jan., 1900.
Bill and feet red.

Alcedo ispidica Linn.

Alcedo ispidica, Linn. Syst. Nat. i. p. 179 (1766); Anders. Zool.
p. 141 (1892).
Alcedo bengalensis, Oates, op. cit. ii. p. 72.

Ceyx erythraea Sharpe.

b, c. Aring, Kelantan. 31st Aug., 1899.

Halcyon smyrnensis (Linn.).

Alcedo smyrnensis, Linn. Syst Nat. i. p. 181 (1766).
(1879); Oates, op. cit. ii. p. 182; Sharpe, Cat. Bds. Brit. Mus.
xvii. p. 222 (1892).
Halcyon fusca, Hartert, Journ. für Orn. 1889, p. 401.
a, b. ♂ ♀. Bukit Besar, Jalor. 1st May, 1899.
c. Biserat, Jalor. 21st May, 1899.
d, e. Tringganu. 29th Oct., 1899.
f. No particulars.
Bill and feet red; iris brown.

Halcyon humii Sharpe.

a. Patani. 28th June, 1899.
g, h. No particulars.
Bill black above, bluish white below; feet bluish black; iris
brown.
† 77. Buceros rhinoceros L.

  a. ♂. No particulars.

† 78. Diceros bicornis (Linn.).

* Buceros bicornis, Linn. Syst. Nat. i. p. 153 (1766).

  a. ♂. Biserat, Jalor. 16th May, 1899.
  b. c. Imm. Biserat, Jalor. 18th May, 1899.

† 79. Anthracoceros convexus (Temm.).

* Buceros convexus, Temm. Pl. Col. ii. p. 82, pl. 530 (♀) (1832).

  a. ♀ juv. Bukit Besar, Jalor. 8th May, 1899.
  b. Biserat, Jalor. 17th May, 1899.
  c. Tremangam. 12th July, 1899.
  e. ♂ juv. Aring, Kelantan. 6th Oct., 1899.
  f. No particulars.

† 80. Anthracoceros malabaricus (Gm.).

* Buceros malabaricus, Gm. S. N. i. p. 359 (1788).

  Anthracoceros albirostris, Oates, op. cit. ii. p. 90.

   a. Koh Nam Kam, Patelung. 12th April, 1899.
   b. Tremangam. 12th July, 1899.
   c. No particulars.

† 81. Anorrhinus galeritus (Temm.).


   a. ♀. Gunong Inas (4000 ft.), Perak. 17th Dec., 1899.
   Feet black; iris dull red; bare skin blue-black.

† 82. Harpactes duvauceli (Temm.).

* Trogon duvauceli, Temm. Pl. Col. no. 291 (1824).

   a. ♂. Aring, Kelantan. 11th Sept., 1899.
   b. No particulars.
   Bill bluish black; feet black; iris bluish.
83. *Cheysophlegma malaccense* (Lath.).

*Picus malaccensis*, Lath. Ind. Or. i. p. 241 (1790).

*Callolophus malaccensis*, Oates, op. cit. ii. p. 147.


Bill black above, pale below; feet dirty green.

84. *Cheysophlegma wrayi* Sharpe.


a. ♂. Gunong Inas (4000 ft.), Perak. 16th Dec., 1899.

Bill slate-colour; feet black; iris red-brown.

This specimen, which is, so far as I am aware, the first male known, is somewhat larger than the type; its dimensions being: head and body 180 mm., tail 126, wing 150, tarsus 25. It differs from the female in the malar stripe being light buff instead of chestnut, and is still further distinguished in having the chin (which in the males of *C. styani* and *C. ricketti* is dark) of the same colour, viz. light buff, separated from the malar stripe by a narrow line of dark brown. The crown of the head is more rufous than in the female and the bill lighter, being bluish slate in colour; the quills and tail are black, not dark brown.

With regard to *C. flavinucha*, apart from size (for *C. wrayi* is considerably smaller) it differs in the presence of the brown band separating the buff malar stripe from the buff of the chin. The colour of the nape, which is of a golden yellow in *C. wrayi*, is of a deep orange in *C. flavinucha*, and the buff of the throat in the last named is also of a much deeper tint. As regards the primaries, taking the outer web of the 2nd primary for comparison, we find that in *C. ricketti* there are six complete chestnut bars, in *C. styani* five, in *C. pierri* from Cochin China four, and in *C. wrayi* and *C. flavinucha* three; in all cases there is in addition a small incomplete bar or dot at the distal end.

In regard to the size of these species, *C. ricketti* is the largest, then come *C. pierri* and *C. flavinucha* in order, and lastly *C. styani* and *C. wrayi*, which are about equal, but it is noticeable that *C. styani* has the largest bill of any.

85. *Miglyptes grammithorax* (Malh.).

*Phaiopicus grammithorax*, Malh. Picidae, ii. p. 12, pl. xlviii. figs. 4 & 5 (1862).


86. *Miglyptes tukki* (Less.).


- a. ♂. Biserat, Jalor. 16th May, 1899.

Bill black above, grey below; feet dirty green; iris chocolate.

87. Micropternus brachyurus (Vieill.).


- a. ♂. Biserat, Jalor. 27th May, 1899.

88. Tiga javanensis (Ljung).


- b. ♀. Biserat, Jalor. 10th May, 1899.
- c. ♂. Biserat, Jalor. 5th July, 1899.
- e. ♂. Ulu Selama, Perak. 10th Jan., 1900.

Bill and feet dark brown; iris brown.

89. Chrysocolaptes validus (Temm.).


- a. ♂. Aring, Kelantan. 8th Sept., 1899.

Bill above dark brown, below yellow; feet and iris yellow.

90. Chotorhea chrysopogon (Temm.).


- a. ♀. Bukit Besar, Jalor. 5th May, 1899.

91. Cyanops henrici (Temm.).

Bucbo henrici, Temm. Pl. Col. iii. pl. 524 (1831).

Megaclea henrici (Temm.), Hartert, Journ. für Orn. 1889, p. 402.


Bill and iris black; feet greenish grey.
1901.]

**+92. Cyanops ramsayi (Wald.).**


- *a. b.* Φ. Gunong Inas (4000 ft.), Perak. 17th Dec., 1899.
  Iris dark brown; feet slaty brown.

**+93. Cyanops mystacophanes (Temm.).**


*Chotorhea mystacophanes* (Temm.), Oates, op. cit. ii. p. 130.


- *b.* Φ. Biserat, Jalong. 19th May, 1899.
- *d.* Φ. Aring, Kelantan. 7th Sept., 1899.
- *e.* Φ. Ulu Selama, Perak. 6th Jan., 1900.

Feet and bill black; iris dark brown.

**+94. Cyanops lineata (Vieill.).**


*Cyanops hodgsoni* (Bp.), Oates, op. cit. ii. p. 132.


- *a.* Kedah. 6th May, 1900.

**+95. Mesobucco duvauceli (Less.).**


- *a.* Aring, Kelantan. 7th Sept., 1899.

Bill and feet black; iris dark brown.

**+96. Xantholema hematocephala Marshall.**


Bill black; feet brownish red; iris brown; skin round eye striped with brownish-red stripes.
97. *Surniculus lugubris* (Horsf.).


*a, b* 


*a. *♀*  

*a. *♀*  

*b. *♂*  

*b. *♂*  

Blimbing, Legeh. 24th July, 1899.

Aring, Kelantan. 2nd Sept., 1899.

Bill above black, below yellowish; feet yellow; eyelid yellow.

99. *Cacomantis merulinus* (Scop.).


*Cacomantis threnodes* (Cab.), Oates, op. cit. ii. p. 111.


*b. *♂*  

*b. *♂*  

Tringganu. 28th Oct., 1899.

Bill black, yellowish at base of lower mandible; feet yellow; eye purplish brown.

100. *Eudynamis honorata* (Linn.).

*Cuculus honorata*, Linn. Syst. Nat. i. p. 179 (1766, ex Briss. pl. ii. fig. 2).


*a, b* 

*a, b* 

*b. *♂*  

*b. *♂*  

Bukit Besar, Jalor. 30th April, 1899.

Biserat, Jalor. 5th July, 1899.

Khota Bharu, Kelantan. 8th July, 1899.

101. *Centropus sinensis* (Steph.).


*a. *♂*  

*a. *♂*  

*b. *♂*  

*b. *♂*  

Bukit Besar, Jalor. 6th May, 1899.

Aring, Kelantan. 31st Aug., 1899.

The nestling, which has unfortunately no data, is in an interesting stage of plumage, and I therefore add a short description:—The feathers of the crown, nape, and neck are black,
glossed with greenish and barred with chestnut. Scapulars, wings, and primaries chestnut, narrowly barred with black; down on the rump tipped with rufous; tail barred with white. The whole of the underparts and sides of the head barred with whitish. The white bars below and the black bars on the scapulars persist long after the rest of the plumage is adult.

102. Centropus javanicus (Dumont).


a. ♂ imm. Kedah. 18th May, 1900.

103. Zanclostomus javanicus (Horsf.).


b. e. ♂, ♀. Aring, Kelantan. 8th Sept., 1899.

Bill red; feet bluish black.

104. Rhopodytes tristis (Less.).


a. ♀. Khotha Bharu, Kelantan. 8th July, 1899.

b. e. ♀. Khotha Bharu, Kelantan. 5th Oct., 1899.

d. e. ♀. Kedah. 3rd May, 1900.

Bill green; feet blue-black; skin round eye red.

105. Rhopodytes diardi (Less.).


b. ♀. Blimbing, Legeh. 28th July, 1899.


e. f. ♀. Aring, Kelantan. 2nd Sept., 1899.

g. ♀. Aring, Kelantan. 7th Sept., 1899.

Bill green; feet black; skin round eye red.

106. Rhinortha chlorophea (Raffles).

*Cuculus chloropheaus*, Raffles, Tr. Linn. Soc. xiii. p. 288 (1822).


d. e. ♂. Aring, Kelantan. 28th Aug., 1899.
107. Urococcyx erythrognathus (Hartl.).

a. ♂. Blembing, Legeh. 28th July, 1899.
Bill green, red at base of lower mandible; feet black; skin round eye red.

108. Paleornis longicauda (Bodd.).

Bill and feet dark grey.

109. Psittinus incertus (Shaw).

Psittacus incertus, Shaw, Nat. Misc. pl. 769 (1790).
b, c. ♂ ♀. Aring, Kelantan, 12th Sept., 1899.
Bill, ♂, above red, below yellowish black; ♀, above brown, below yellowish grey; feet green; iris yellow.

110. Loriculus galgulus (Linn.).

b. ♂. Patani. 26th April, 1899.
c. No particulars.

111. Butreron capelli (Temm.).

Colomba capelli, Temm. Pl. Col. 143 (livr. 24, 1823) (Java).
a. ♀. Aring, Kelantan. 5th Sept., 1899.
Bill pale green; feet deep yellow.

112. Osmotreron vernans (Linn.).

Colomba vernans, Linn. Mant. p. 526 (1771) (ex Briss.).

b. No particulars.

+113. Osmotreron olax (Temm.).

Columba olax, Temm. Pl. Col. 241 (livr. 41, 1823) (Sumatra).


Bill green; feet red; iris whitish.

+114. Ptilopus Jambu (Gm.).

Columba jambu, Gm. S. N. ii. 2, p. 784, no. 63 (1788).

a. Aring, Kelantan. 18th Sept., 1899.
Bill and iris orange; feet magenta.

+115. Turtur Tigrinus (Temm.).

Columba tigrina, Temm. & Knip, Pig. i. p. 43 (1808-1811).

a. ♂. Tale Nowy, Patani. 3rd April, 1899.
e. Tringganu. 22nd Oct., 1899.
f. No particulars.

+116. Chalcophaps Indica (Linn.).

Columba indica, Linn. S. N. i. p. 284, no. 29 (1766) (ex Edwards).


a. ♀. Biserat, Jalor. 22nd May, 1899.
b. Imm. Aring, Kelantan. 4th Sept., 1899.

+117. Caloenas Nicobarica (Linn.).

Columba nicobarica, Linn. S. N. i. p. 283, no. 27 (1766).


+118. Excalpactoria Chinensis (L.).

Tetrao chinensis, Linn. S. N. i. p. 277 (1766).

a. ♂. Bukit Besar, Jalor. 30th April, 1899.
b. ♂. Biserat, Jalor. 11th May, 1899.

119. Gallus gallus (L.).

Phasianus gallus, Linn. S. N. i. p. 270 (1766).

a. ♀. Khota Bharu, Kelantan. 8th July, 1899.
b. ♂. Kwala Selama, Perak. 15th Jan., 1900.

120. Polyleptodon bicalcaratum (L.).

Pavo bicalcaratum, Linn. S. N. i. p. 268 (1766).

a. ♀. Sungei Lebeh, Kelantan. 5th Aug., 1899.
Bill and feet black; iris white; skin round the eye orange.

c. $ No particulars.

d. $.

e. Pull. No particulars.

121. Argusianus argus (Linn.).

Phasianus argus, Linn. S. N. i. p. 272 (1766).

a, b. ♂. Biserat, Jalor. May 1899.
c. ♀. Sisa Kwan.
e. Pull. No particulars.

122. Pavo muticus Linn.

a–c. 5 specimens, no particulars.

123. Turnix taigoor (Sykes).

Hemipodius taigoor, Sykes, P. Z. S. 1832, p. 155.

a. ♂. Patellung. 31st March, 1899.
b. ♀. Bukit Besar, Jalor. 3rd May, 1899.

124. Rallina fasciata (Raffles).

Rallus fasciata, Raffles, Tr. Linn. Soc. xiii. p. 328 (1822).


125. Porzana pusilla (Pall.)

126. Gallicrex cinerea (Gm.)
Fulica cinerea, Gm. Syst. Nat. i. p. 702 (1788).

127. Heliopais personata (Gray)
Podica personata, Gray, P. Z. S. 1848, p. 90.

128. Glareola orientalis Leach.

129. Charadrius dominicus Müll.

130. Aëgialitis alexandrina (Linn.)
Charadrius alexandrinus, Linn. S. N. i. p. 258 (1766).

Malay name, “Kedidi.”
ON THE BIRDS OF THE "SKEAT EXPEDITION." [Feb. 5,

131. Tringoides hypoleucus Linn.

Tringa hypoleucus, Linn. S. N. i. p. 250 (1766).
Tringoides hypoleucus (L.), Oates, op. cit. ii. p. 399; Sharpe, Cat.

a. ♀. Pulau Bidang. 10th Dec., 1899.

132. Hyracophilus glareola (L.).

Tringa ochropus, β. glareola, Linn. S. N. i. p. 250 (1766).
Totonius glareola (L.), Oates, op. cit. ii. p. 401.
p. 491 (1896).

a. ♂. Patellung. 7th April, 1899.
b, c. ♀. Tringanu. October 1899.

133. Sterna sinensis Gm.

Sterna sinensis, Gm. S. N. i. p. 608 (1788, ex Lath.); Saunders,

a. ♀. Patellung. 7th April, 1899.

134. Phoyx manillensis Sharpe.

Phoyx manillensis, Sharpe, Bull. B. O. Club, iii. p. xxxviii (1894);

a. ♀. Tale Nowy, Patellung. 2nd April, 1899.

135. Bulbucus coromandus (Bodd.).

Bulbucus coromandus (Bodd.), Oates, op. cit. ii. p. 251; Hartert,
p. 217 (1898).

a, b. ♂ ♀. Tale Nowy, Patellung. 2nd April, 1899.

136. Podicipes philippensis (Bonnat.).

Colymbus philippensis, Bonnat. Tabl. Encycl. Méth. i. p. 58,
pl. 46. fig. 3 (1790).
xxvi. p. 511 (1898).

a. ♀. Patellung. 30th March, 1899.

137. Asarcornis scutulata (S. Miill.).

Anas leucoptera (Blyth), Oates, op. cit. ii. p. 281.
xxvii. p. 61 (1895).

a. ♀. Patellung. April 1899.

Resembles in all respects a female from the Hume Collection, but
is rather more mottled on the neck. According to Mr. R. Evans,
it is a migratory species in Patellung.
There are at present only two species of this peculiar genus of Tubificidæ known: they come from such widely separated localities as the neighbourhood of Prague¹ and the neighbourhood of Buenos Ayres². I believe that the facts ascertained from an examination of specimens from the Malay Peninsula justify me in the creation of a third species.

The worms are of about the same size as average specimens of Tubifex rivulorum, and thus present no divergence from the two other species of Bothrioneuron.

The prostomium is conspicuous and of the ordinary form that it exhibits among the Tubificidæ, as will be seen from an inspection of the two drawings (text-fig. 8, A, B, p. 82).

_Prostomial sense-organs._—I find in the present species the same prostomial sense-organ which I described and figured (in section) in Bothrioneuron americanum. It is, moreover, also unpaired in the present species. The position of the organ, however, varies: it is usually on one side, which is preferably the left, just at the junction of the convex upper surface of the prostomium with the lower surface. In one specimen, however, it is exactly in the middle of the lower surface, and in another it is as distinctly upon the upper surface, and also fairly median in position. The organ is very decidedly upon the prostomium itself; it is not situated at the junction of the prostomium with the peristomial segment, as is the case with the corresponding organ of _B. americanum._

The one specimen in which the sense-organ happened to be ventral in position is shown in the accompanying drawing, by

which it will be seen that a semicircular depression with the concavity directed forwards is the external manifestation of the organ, of which the mass of cells lie behind.

In a specimen in which the prostomial organ is lateral in position (text-fig. 8, B), an external depression is to be seen with equal clear-

Text-fig. 8.

Bothrioneuron iris.

Fig. A. Prostomium from below. Fig. B. Ditto from above.
S, sense-organ symmetrically placed in A, asymmetrically in B.

Text-fig. 9.

Bothrioneuron iris.

Longitudinal section through the prostomium.
S, sense-organ; B, supra-oesophageal ganglion.

ness, but naturally in profile. In a longitudinal section (text-fig. 9) of a specimen in which the sense-organ happens to be median and quite anterior in position, the following appearances are observable: the supposed sense-organ consists of a mass of cells which are rather deeper than are those of the surrounding epidermis; this is especially
to be seen at the periphery of the organ, the central part corresponding to the external depression consisting of rather less elongated cells. The considerable size of the organ as compared with the entire prostomium is apparent from the figure and is rather remarkable. It is probable, therefore, that a corresponding organ in other Tubificidæ has not been overlooked.

The *setae* are, as in the other species, all uncinate and without further complications: there are no subsidiary hooklets between the two prongs in which the free extremity of the seta ends. There appear to be not more than four setae to a bundle, and very often there are only two.

In this species, as in other Oligochaeta, there would appear to be no setae upon the first segment of the body. However, in longitudinal sections I was able to observe a small mass of muscles upon the first segment of the body, entirely similar in appearance to those which upon ensuing segments enwrap the setae, and corresponding exactly in position. The mass of muscular fibres was small, but I regard it as a vestige of the seta-bundles of that segment. Setae are certainly absent ventrally in the neighbourhood of the male pore—a feature in which the present species agrees with *B. americanum*, and differs from the European *B. vejovskyanum*, in which there are specially modified genital setæ of peculiar form replacing the ventral bundles. The lateral setæ, however, corresponding to the missing ventral setæ are present.

Clitellum.—*Bothrineuron iris* differs from its allies in the position of the clitellum, which is pushed back a segment and occupies segments xii. and xiii. In the middle of segment xii. lies the

Male generative pore.—This aperture, single and median, is also a segment farther back than it is in *B. vejovskyanum* and *B. americanum*. It is interesting to note that there is an apparent connection between the male pore and the clitellum in that an alteration in the position of one is accompanied by an alteration in the position of the other.

The oviducal pores I have not seen.

*Spermatoheal* pores are not present. The absence of spermatoheæ is one of the characters of the genus.

*Spermatothophores.*—Dr. Stole figures in *B. vejovskyanum* a crowd of spermatothophores attached to the body-wall round the male generative pore. In *B. americanum* I did not find these structures, though perhaps I was a little premature \(^1\) in using their absence as a specific character. In three out of six mature examples of *B. iris*, I find a single spermatothophore apiece also attached close to the male pore. The structure of these spermatothophores is similar to those of *B. vejovskyanum*. There is a thick stalk by which they are attached to the body-wall, which is of a yellowish colour. This stalk is merely attached to the epidermis superficially: it does not penetrate between the cells. Nor can I find any evidence of its

\(^1\) Monogr. Oligochaeta, Oxford, 1895. The comparative rarity of the occurrence of spermatothophores in *B. iris* may explain the failure to find them in *B. americanum*. They are probably distinctive of the genus.

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