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as vegetative and reproductive organs. In this case the bracket leaves are erect and remain green for some time, while the vegetative leaves are pendulous, and repeatedly equally forked. The sporangia completely cover a special lobe of the leaf, which arises at the basal fork. This is one of the most highly specialised types of fern known.

Acrostichum aureum L. This fern is found in tidal swamps throughout the tropics. In Singapore it is also found in some places where it is now out of reach of the sea. It has tufts of tall pinnate fronds, of which the upper leaflets are completely covered with brown seri.

A Preliminary Account of the Mammals of Singapore Island.

BY F. N. CHASEN.

These rough notes are offered rather as an introductory survey of the local mammalian fauna than as a serious contribution to the scientific literature of the subject. There are no publications dealing with the mammals of the island in any degree of completeness but the papers included in the bibliography given below provide a number of references. Little attempt has been made to work out the correct synonymy of the various species and therefore arrive at the valid name from the systematist's point of view but it is hoped that no glaring inaccuracies have been perpetrated.

The paper includes notice of all those mammals known from Singapore with very brief notes intended to assist in their identification, remarks on the local status of the various species and in some cases a word or two about the habits. For these purposes the writer has drawn freely from the publications given in the bibliography.

Order PRIMATES.

(Man, Apes, Monkeys and Lemurs)

Sub-Order Anthropoidae.

(Mankind and Monkeys)

It is not within the province of this paper to discuss the heterogeneous human population of Singapore which should be included in the *Hominidae* or first family of this sub-order but a brief allusion to the aborigines of the island may not be out of place.

Skeat and Ridley ("The Orang Laut of Singapore," *Journal Straits Branch, Royal Asiatic Society* No. 33, 1900, p. 247) state, "at the time of the occupation of Singapore by the British, there were living on the island, then densely afforested, one or two races of natives, known as the Orang Kallang and Orang Selitar. The former of these lived on the river of the same name, the latter along

water and even in mountain streams. Otters of any species are either not common in Singapore or adepts at concealment, possibly the latter.

14. *Lutra sumatrana* Gray. The Hairy-nosed Malay Otter.
Malay name as above.

In general aspect very similar to the last named species but much larger (head and body without the tail about 30 inches) and easily distinguished by the presence of well developed claws on the toes.

Order UNGULATA.

(Hoofed Quadrupeds).

As may be expected there is no record of the Elephant, Tapir or Sladang for Singapore although all of these occur in Johore. One still hears of a Rhinoceros having once visited the island and this is by no means as improbable as it sounds for one was definitely known to have lived on an island in the Rhio-Archipelago for a number of years.

Family Bovidae.

(Hollow-horned Ruminants).

Domestic Cattle. The Water-Buffalo or "Kerbau" (*Bos bubalus*) is much less frequently seen in Singapore than in the Federated Malay States. The domestic cattle of Singapore, so familiar in the streets of the city are of almost infinite variety. The long-horned humped Indian cattle (*Bos indicus* = Zebu) are especially conspicuous.

Family Cervidae.

(Solid-horned Ruminants).

Only two species of deer are found in the Malay Peninsula and, excluding the possibility of the "Kijang" having been exterminated, we have both of these on the island. A recent Ordinance prohibits the killing of both Rusa and Kijang within the Settlement of Singapore.

Key to the Species.

- a. Height at the shoulder about 48-54 inches = *Cervus equinus*
b. Height at the shoulder about 22 inches = *Cervus peninsular*

15. *Cervus peninsular* Lydekker. The Large-horned Bark-ing Deer or Rib-faced Deer.

Malay name, "Kijang."

In general appearance, roughly "goat-size" and of a rich tawny brown in colour. The feet are darker and there are two dark longitudinal stripes down the forehead. Underneath the tail, the throat and inside the upper parts of the legs white. The fawns are spotted. The males alone have short two-tined antlers and one of the most striking features about the animal is that the pedicels

sexes but the males have long sharp canines in the upper jaw with which they can give sharp cuts. In appearance they are very similar but Singapore animals should be easily identified by the key given below. Mouse-deer are fortunately still fairly numerous in Singapore and even frequent the Botanic Gardens. Some notes were given in a previous issue of this journal (No. 2, p. 20, 1923).

Key to the species.

- a. Size larger, greyish in colour, white outer throat stripe broken or deflected in centre = *Tragulus napu*.
- b. Size smaller, brownish in colour, white outer throat stripe unbroken and straight from jaw to shoulder = *T. fulviventris*.

17. *Tragulus napu* (F. Cuv.). The Large Mouse-deer.
Malay name, "Napu."

Length of head and body taken together about 22 inches.

18. *Tragulus fulviventris* (Gray). The Small Mouse-deer.
Malay name "Plandok" or "Kanchil."

Length of head and body about 18 inches.

Family Suidae.

(Pigs).

Wild pigs of one small species are still to be found in certain parts of Singapore. In the Rhio-Archipelago, on islands within sight of Singapore, the large Bearded Pig (*Sus barbatus*) also occurs. It would appear that the Singapore pig has never been critically examined although there is probably little room for doubt that it is *peninsularis*.

19. *Sus peninsularis*. The Malay Peninsula Pig.
Malay names, "Babi utan" or "Babi bakau."

Height at the shoulder about 28 inches. Blackish or brownish in general appearance with a whitish patch behind the angle of the mouth and a slight mane along the spine.

(To be continued).

MISCELLANEOUS NOTES.

**On the Occurrence of a Javanese bird,
Pycnonotus a. aurigaster (Vieill.) in Singapore.**

On November 10th last I shot a specimen of this bird in the garden of Government House and presented it to the Raffles Museum. It is the typical Javanese form, in good plumage and showing no signs of having been kept in captivity. In the afternoon of the same day I identified, with glasses, five more of this species. They were frequenting the same trees as *Pycnonotus analis*, a very abundant bird in the garden, and the two species appeared to be in amicable association. In view of the dense cover afforded by the