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ON THE IDENTITY OF CERVUS NIGRICANS BROOKE, 1877, WITH REMARKS UPON OTHER DEER FROM THE PHILIPPINES

by

L. J. DOBRORUKA

Zoological Garden, Prague

With 2 text-figures and 3 plates

A great number of papers deal with the deer of the Philippine Islands but in spite of this fact the taxonomy and the nomenclature are still not clear. The first author who recapitulated all known facts about the Philippine deer was Brooke (1877), who also described a new species, *Cervus nigricans*. The description is exact, with figures of the habitus and the skull of the indicated holotype (♀), and in my opinion Haltenorth (1963) had no reason to consider *C. nigricans* a nomen nudum. The validity of the name *Cervus nigricans* is in full agreement with the International Code of Zoological Nomenclature, adopted by the XVth International Congress of Zoology.

Cervus nigricans is rather rare in the collections of museums and, therefore, I am much obliged to Dr. A. M. Husson for allowing me to examine the material of the Rijksmuseum van Natuurlijke Historie in Leiden. The material of this museum was mentioned already in Brooke's paper (1877:59) and is therefore most valuable for a study of this species, apart from the type material, of course.

At the present time the following material of this species is available in the Leiden Museum:

No. 19605 ♂ — mounted specimen and skull from Manila, Philippines. Presented by M. van der Haas.

No. 19610 ♂ — skull from Manila. Purchased 15 June 1894 from the collection of C. L. Reuvens, who obtained this skull from P. K. A. Meerkamp van Embden (Husson, in litt., 8.9.1967).

No. 19611 ♂ — mounted specimen from the Marianas. Skull not taken out.

No. 19612 ♂ — very young mounted specimen from Manila, Philippines.

The specific validity or identity of *Cervus mariannus* Desmarest, 1820 and *Cervus philippinus* Hamilton-Smith, 1827 has already been referred to by Brooke (1877: 53): "Although, as I shall presently show, I have but little doubt that *Cervus mariannus,* Desm. and *Cervus philippinus,* Ham. Smith are specifically identical, I have considered it expedient for the present to leave the question open." Lydekker (1915: 83) wrote that *mariannus* "is closely allied to and perhaps really inseparable from" *philippinus.* Taylor (1934) records three species of the genus *Rusa* from the Philippines, namely *R. alfredi, R. philippinus,* and *R. nigricans.* Pocock (1943), judging by the skull characters only ("the external features, apart from the antlers, must be neglected until the war is over, when the skins will come back from the country whither they have been sent for safety from airraids"), considered the two species identical and regarded them merely as subspecies of *Rusa unicolor* (Kerr). *Cervus nigricans* was accepted by Pocock as a valid species.

A. C. van Bemmel (1949) revised the Rusine deer of the Indo-Australian Archipelago and concluded that there are in this region three species of Sambar, namely *Rusa unicolor* (Kerr), *R. equina* (Cuvier), and *R. timorensis* (Blainville). He proposed to recognize *R. nigricans* as a distinct species and wrote: "I want to lay stress on the possibility that representaives of the genus in Formosa, the Mariannes and the Philippines (excluding *nigricans*!) might be brought to one or two separate species and that *nigricans* could perhaps represent a separate (sub)genus". (l.c.: 214).

Haltenorth (1963) only accords to *Rusa* the status of subgenus and recognized three species: *C. unicolor, C. timorensis,* and *C. mariannus. Rusa alfredi* is regarded by him as a subspecies of *C. mariannus.*

As far as concerns the generic or subgeneric position of *Rusa,* some recent authors like Ellerman & Morrison-Scott (1951) and Haltenorth (1963) regard *Rusa* as merely a subgenus of *Cervus,* but I agree with Loomis (1928), who denied a direct relationship of *Rusa* with *Cervus* and accepted *Rusa* as a full genus, like Mohr (1918), Pocock (1943), and Van Bemmel (1949) did. My recent studies based on the differences between *Cervus* and *Rusa* in their moulting schemes confirm this opinion (Dobroruka, 1969).

The studied material, belonging to the following institutions: National Museum Prague, Zoologisches Museum Berlin, Rijksmuseum van Natuurlijke Historie Leiden, British Museum (Nat. Hist.) London, provided no proof in any way concerning conspecifity of *mariannus* with *philippinus.*

In *mariannus,* the space between the antlers is V-shaped, the tine is directed inwards, the nasalia are mostly "cruciform", or at least with a tendency to attain this form.

In *philippinus* the interspace of the antlers is lyrate, the tines are always

directed outwards, the nasalia are not cruciform (see also the figures in Pocock, 1943). Very characteristic is the difference in the condition of the dorsal hair which up to the present time appears to have been neglected: *mariannus* has a distinct hair-whorl above the shoulder, with cranially reversed hair, but in *philippinus* the dorsal hair is never reversed and the hair-whorl is always absent. This character was confirmed by Pournelle (in litt., 8-8-1969), who kindly examined four specimens of *R. marianna* living in the San Diego Zoological Garden.

With all these characters *mariannus* resembles Brooke's *nigricans*, in which the antlers are V-shaped with the tines directed inwards (pls. 1, 2), the nasalia are more cruciform (pl. 1) and above the shoulder there is a hair-whorl with reversal of hair direction (fig. 1). In the holotype of

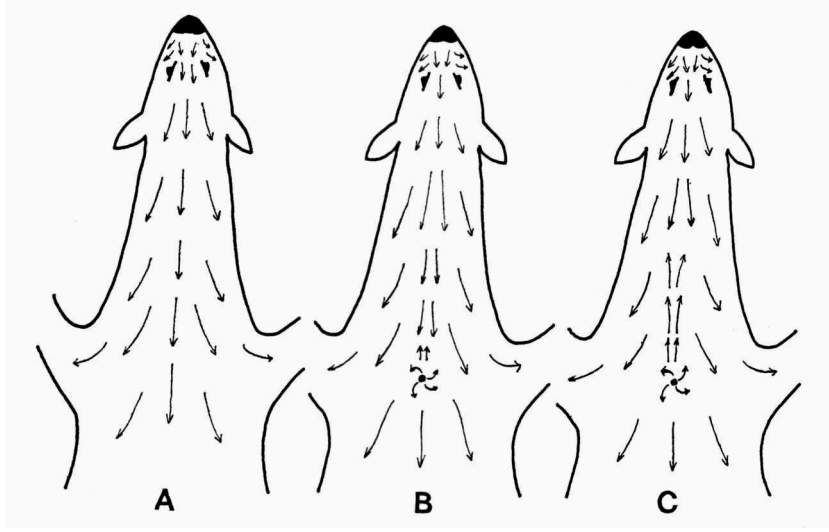

Fig. 1. Condition of the dorsal hair in *Rusa timorensis* (Blainville) (A), *Rusa marianna* (Desmarest) (B), *Rusa alfredi* (Sclater) (C).

C. nigricans (No. 85.4.22.1, British Museum (Nat. Hist.)) the area of reversal in the direction of the hair is about 20 mm long (Corbet, in litt., 6-11-1968).

Detailed studies of the material of the listed institutions confirmed the conspecifity of *mariannus* Desmarest, 1820, and *nigricans* Brooke, 1877. In this conclusion I agree with Haltenorth (1963), but I prefer to recognize *alfredi* Sclater, 1870, and *philippinus* H. Smith, 1827 as distinct from the aforementioned species.

The close affinity of *nigricans* (i.e. *mariannus*) and *alfredi* was stated

already by Brooke (1877), who emphasized the similarity of some skull- and external characters of both species, namely the flattened wide face, the V-shaped antlers with the tines directed inwards, and the short, naked ears. In all these characters the forms mentioned above resemble each other. In *alfredi,* the shoulder hair-whorl is also present but the reversed part of the hair is much longer, reaching the upper part of the neck (fig 1). *R. alfredi* is spotted in all seasons, the ventral surface of the body is light coloured, dirty white or yellowish white; *nigricans* (i.e. *mariannus*) is unspotted, unicoloured in all seasons, the ventral part of the body being uniformly brown. There is a difference in the visceral anatomy too, especially in the shape of the liver. In *R. alfredi* the Spigelian lobe (lobus caudatus) is present, being broad at the base as in *R. timorensis,* while in *R. marianna* it is absent (Garrod, 1877) as in *Dama dama* (L.) or *Cervus elaphus* L.

The characters of *philippinus*, as given above, are very similar to those of the Timor Sambar, *Rusa timorensis.* Pl. 3 shows a fine male of the Philippine Sambar that lived in the Zoological Garden of Berlin in 1930. This animal was purchased 21 June 1927 by Director Weber from Manila (Klös, in litt., 28-3-1967). The characters in which the Philippine Sambar differs from *Rusa marianna* are evident: the lyrate form of the antlers with the tines directed outwards, the non-flattened narrow face, and the absence of the shoulder whorl.

In all these characters the Philippine Sambar is similar to the Timor Sambar, *Rusa timorensis* Blainville, 1822 and I see no reason to separate these two forms specifically.

If we compare all representatives of the "Rusine Group", we can characterize the genera *Axis* and *Hyelaphus* as the most primitive. The representatives of this group living on the extreme borders of its distributional area: *Dama* in the west, *Przewalskium* in the north, and *Rusa alfredi* and *Rusa marianna* in the east, all have the same specialized external character, viz., the hair-whorl on the dorsal surface of the body (spinal or lumbal) with the area of reversed hair of various extent. Both *Rusa alfredi* and *Rusa marianna* also differ from all other representatives of the genus *Rusa* in cranial characters, having the facial portion of the skull very wide and flattened, the nasals being more or less cruciform.

All these characters separate these two species from other representatives of the genus *Rusa* in such a typical way that I agree with Van Bemmel (1949) to place *Rusa alfredi* and *Rusa marianna* in a separate subgenus. The first name available for this purpose is *Ussa* Heude (1888: 31), which was proposed for *Rusa nigricans*, having only page priority to *Melanaxis* Heude (1888: 47), proposed for *Rusa alfredi.* The name *Ussa*, as a generic name,

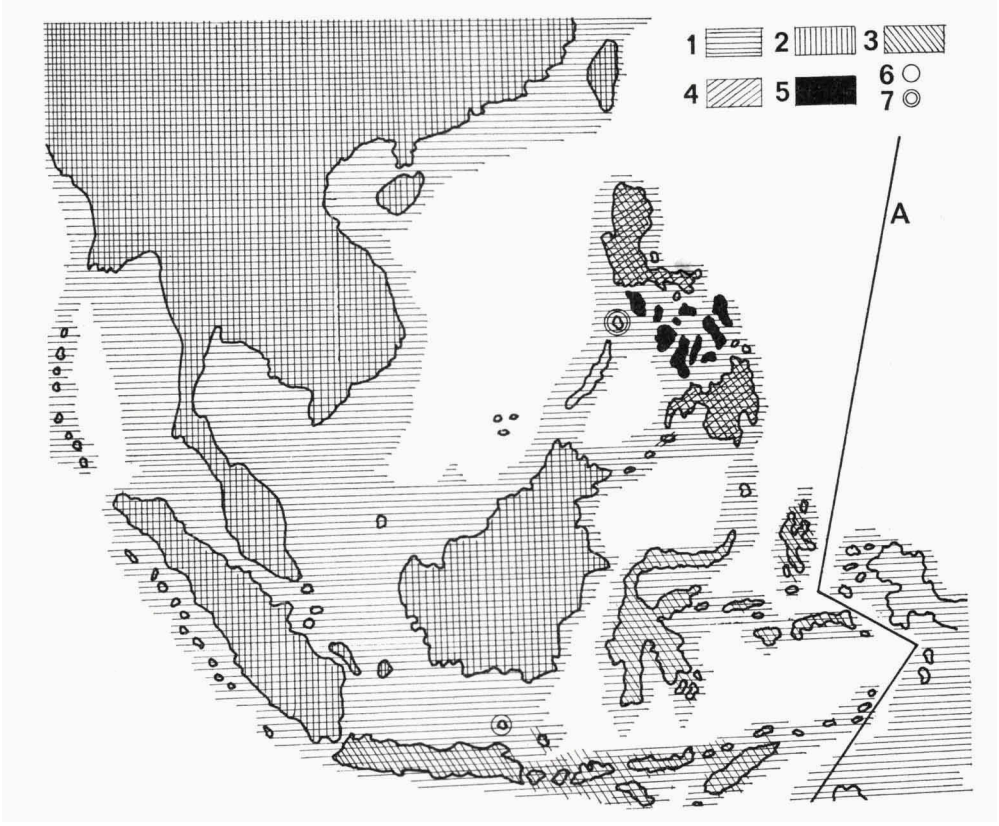

Fig. 2. Schematic map of Pleistocene land extent in the Indo-Australian region together with the present distribution of deer. Explanation: A — Lydekker Line; 1 — Pleistocene land extent; 2 — Distribution of *Rusa equina* (Cuvier); 3 — Distribution of *R. timorensis* (Blainville); 4 — Distribution of *R. marianna* (Desmarest); 5 — Distribution of *R. alfredi* (Sclater); 6 — Distribution of *Hyelaphus kuhlii* (Müller & Schlegel); 7 — Distribution of *H. calamianensis* (Heude).

was not accepted by Pocock (1925) because the character relied upon, the relatively large size of the median incisors, was correctly considered insufficient. As we are now able to add further discriminating characters, i.e., the broad flattened facial portion of the skull, the cruciform nasalia, and the dorsal (spinal) hair-whorl with reversed hair, the validity of *Ussa* as a subgeneric name can be confirmed.

The distribution of the deer of the Philippines is also worth considering. From the centre of origin in the southern part of the continent of Asia, the deer during the Pleistocene period reached the Indo-Australian Archipelago, and in the east spread to the eastern border of Wallacea (Lydekker Line). This was made possible by the eustatic lowering of the sea level in the Sunda

region of about 200 m during the Pleistocene period (see also Darlington, 1957; De Lattin, 1967). In this way we may also explain the recent disjunct distribution of the genus *Hyelaphus*: *Hyelaphus porcinus* (Zimmerman) on the continent, *H. kuhlii* (Müller & Schlegel) on Bawean Island, and *H. calamianensis* (Heude) on Culion Island (Calamianes), north of Palawan.

In the same way, the genus *Rusa* came to the Philippines. The species *R. timorensis* and *R. marianna* live on Luzon and Mindanao only, leaving the central group of the Philippine Islands to be occupied by *R. alfredi*. This group of islands, Cebu, Guimares, Leyte, Masbete, Negros, Panay, Samar and some other, smaller islands, perhaps never has been connected with the other islands for a longer period. This hypothesis is also supported by the distribution of fresh-water fishes in the Philippines (Darlington, 1948). The present circumstance furthered the development of a separate species of Sambar, *R. alfredi*, in which some primitive and some highly specialized characters occur together. A schematic map of the Pleistocence land extent together with the present distribution of deer is shown in fig. 2.

As a result of our studies we can give the following list of Philippine deer (the distribution is given in accordance with Brooke, 1877; Lydekker, 1898, 1915; Hollister, 1912; Taylor, 1934; Pocock, 1943; Haltenorth, 1963; and information provided by the consulted museum specimens with exact localities):

Rusa (Rusa) timorensis philippina (H. Smith, 1827).
Distribution: Luzon.
Rusa (Ussa) marianna marianna (Desmarest, 1822).
Syn.: *R. nigricans* Brooke, 1877; not *nigricans* sensu Lydekker, 1898; partim *nigricans* sensu Lydekker, 1915.
Distribution: Luzon, introduced to Guam and to the Marianas.
Rusa (Ussa) marianna basilanensis (Heude, 1888).
Syn.: *R. nigellus* Hollister, 1913; partim *nigricans* sensu Lydekker, 1915. Distribution: Basilan, Mindanao.
Rusa (Ussa) alfredi (Sclater, 1870).
Distribution: Cebu, Guimares, Leyte, Masbate, Negros, Panay, and Samar Islands.
Hyelaphus calamianensis Heude, 1888.
Distribution: Calamianes (or Culion).

I have not seen any examples of *C. francianus* Heude, 1888, and therefore have to accept the results of Pocock (1943), who examined the Basilan skulls in the British Museum (Natural History) erroneously identified by Lydekker as *nigricans*. This error was repeated by Hollister (1912) and Haltenorth (1963). I suppose that *francianus* is rather a subspecies of *Rusa timorensis* than of *Rusa marianna*. If this consideration will be prove to be correct, *Rusa timorensis franciana* will have to be added to the list of Philippine deer.

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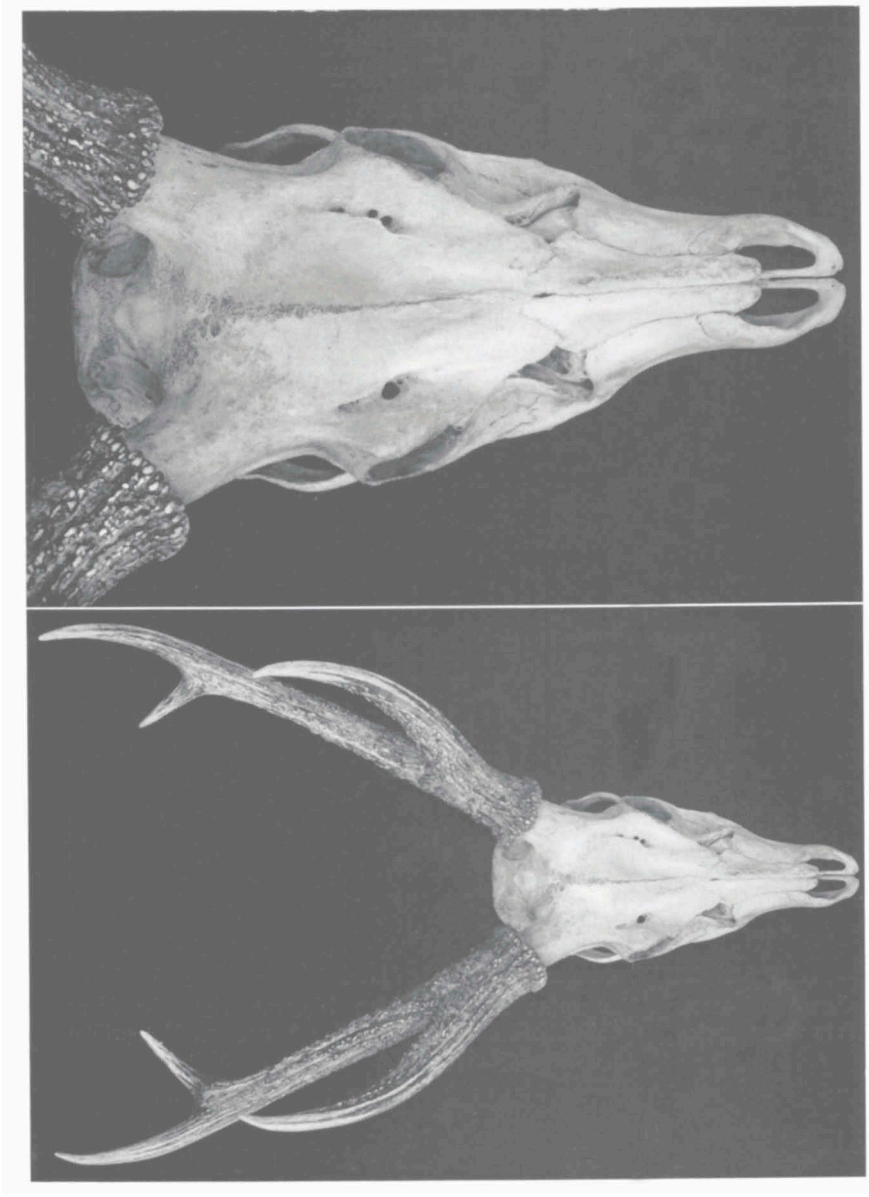
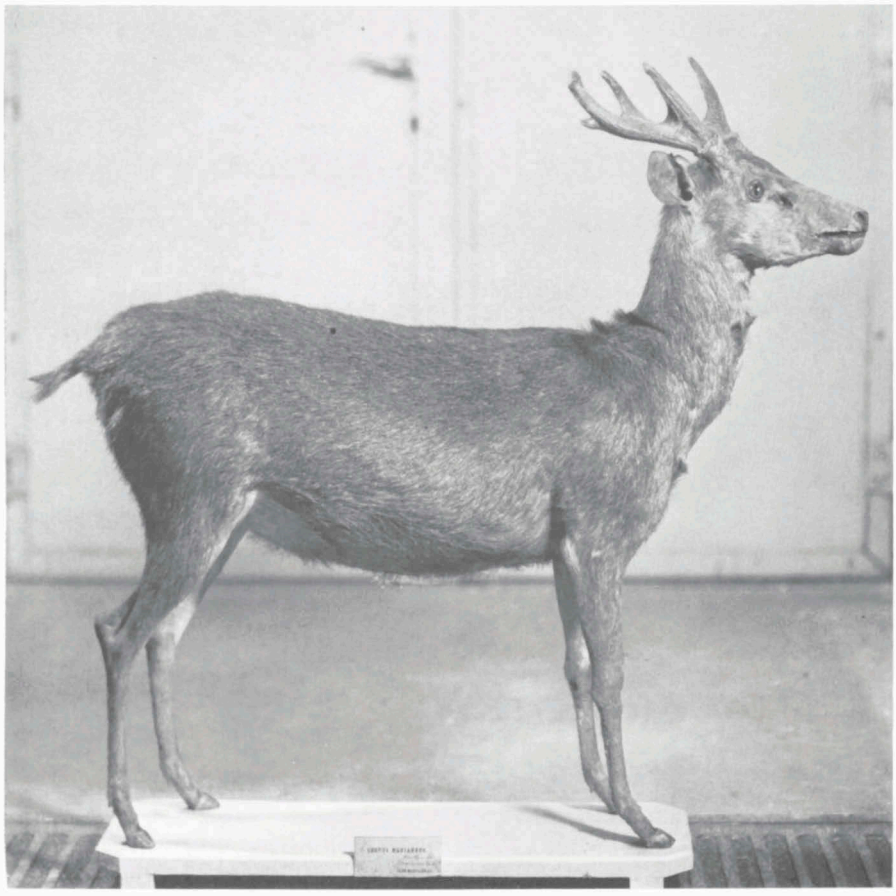
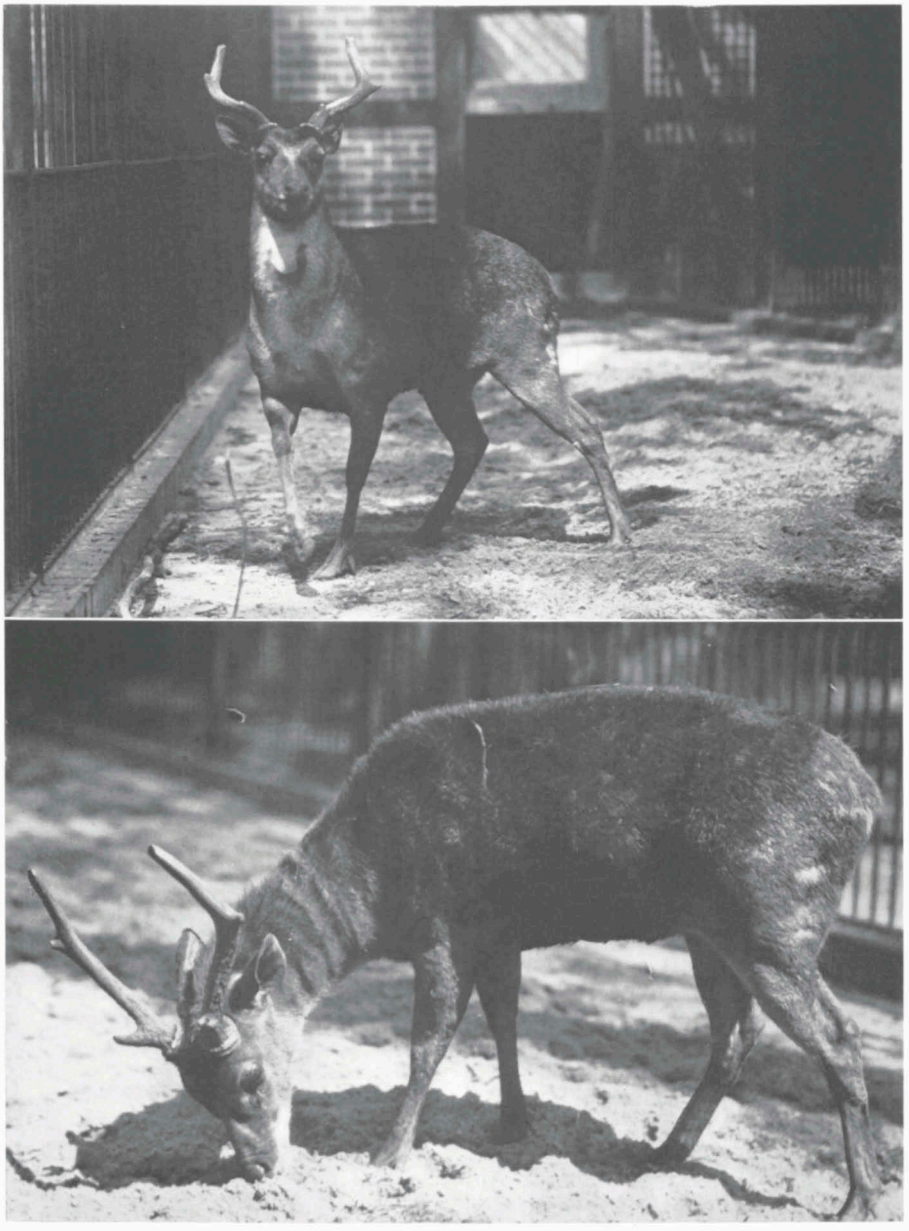


Left, skull of *Rusa marianna* (Desmarest), No. 19610 of the Leiden Museum. Note the V-shaped form of the antlers with the tines directed inwards. Photograph Rijksmuseum van Natuurlijke Historie, Leiden. Right, the cruciform nasalia in the skull of *Rusa marianna*, No. 19610, Leiden Museum. Photograph Rijksmuseum van Natuurlijke Historie, Leiden.



Rusa marianna (Desmarest), No. 19611 of the Leiden Museum. Note the form of the antlers and the shoulder hair-whorl. Photograph Rijksmuseum van Natuurlijke Historie, Leiden.



Upper figure, *Rusa timorensis philippina* (H. Smith) in the Zoloogischer Garten at Berlin in 1930. Note the lyrate form of the antlers with the tines directed outwards. Photograph Zoologischer Garten, Berlin. Lower figure, *Rusa timorensis philippina,* same animal as in upper figure. Note the shape of the antlers and the absence of the shoulder hair-whorl. Photograph Zoologischer Garten, Berlin.