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No. 27

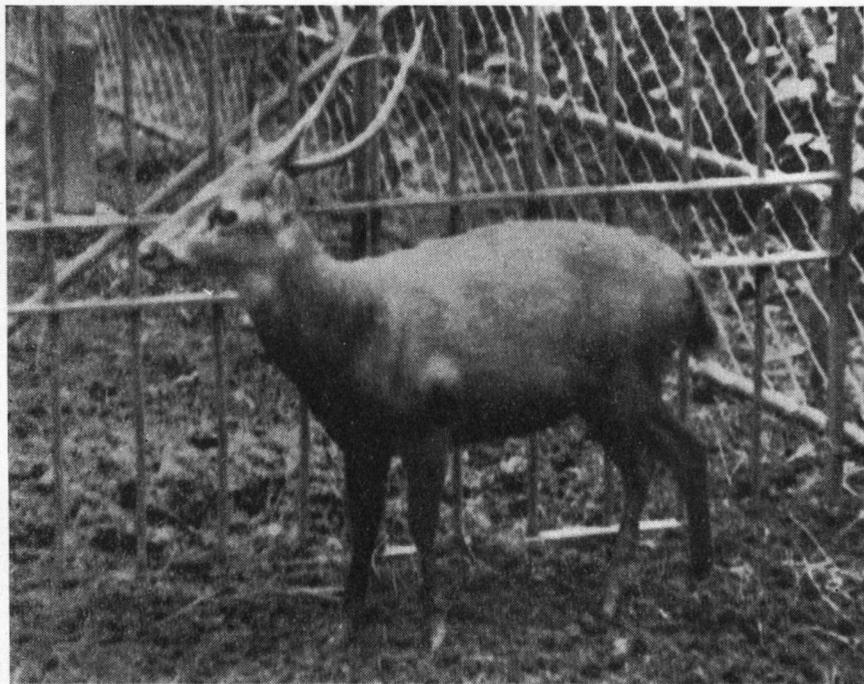
1953

FEBRUARY 18

One of the rarest deer of the world

by

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Bawean Deer, *Hyelaphus kuhlii* (M. & SCHIL.) living in Surabaya Zoological garden, 1937. The animal was approximately eleven years old at that moment. The same specimen is pictured at the age of approximately three years in Treubia 1944, pl. 2.

The days of big game seem to be numbered. Lists of mammals recently extinct are growing longer and longer and many more species are in danger of extinction. Of course, the last world war has hastened the fate of several species of animals. Eastern Asia and the Pacific region without doubt have suffered most in this respect. For example, the number of Javanese Rhinoceros, *Rhinoceros sondaicus* DESM., has diminished to such

extent that survival seems hardly possible, owing to the aftermath of the Pacific war, which put out of action all painstaking measures of protection.

Even before the last war two Asiatic species of deer were on the list of nearly extinct animals, viz. the Milu and Schomburgk's Deer.

Imagination has been engaged most by the Milu or Père Davids Deer, *Elaphurus davidianus* (MILNE-EDWARDS), of which no recent wild representative is known. It was discovered by Père ARMAND DAVID in 1866 in the Imperial deerpark at Peiping. Only a few fossils, found in the Chinese province of Honan point to the fact that once this deer must have been living in China in the wild state. At present, the only survivors are a few specimens in zoological gardens. The other species, Schomburgk's deer, *Rucervus schomburgki* (BLYTH) still lives in a limited area in inner Siam, but is on the verge of extinction.

Both rarities have drawn much attention. However, it seems less well-known that in Indonesia also an interesting and extremely rare species of deer occurs, viz. the Bawean Deer, *Hyelaphus kuhlii* (MÜLL & SCHLEG.). discovered by SALOMON MÜLLER in 1836, not on the island of origin, Bawean in the Java Sea, but in Tuban, a small town on the North Coast of Java, where the local Indonesian governor kept a small herd of these little deer in his garden. MÜLLER was well aware of the place of origin of his discovery and in 1841 DIARD succeeded in collecting some material of the new species on a trip to Bawean Island. Part of this material is still preserved in the collection of the Natural History Museum at Leiden. The zoological garden of the Royal Zoological Society "Natura Artis Magistra" at Amsterdam exhibited some live specimens as early as 1863, these animals even breeding successfully (SCLATER 1863). According to ERNA MOHR (1920) the species was represented in the Amsterdam Zoo in later years also. As far as I could find out, a skeleton and a skull in the collection of the Zoological Museum, Amsterdam, and a stuffed fawn in the Leiden Museum is all that is left of this material. The only other Zoo possessing a Bawean-deer on exhibition was the Zoological Garden at Surabaya (VAN BEMMEL 1944).

The Bawean- or Kuhl's Deer is a small animal with an approximate shoulder height of 65 cm. It most resembles the Hogdeer, *Hyelaphus porcinus* (ZIMM.) of the East Asiatic mainland and India. The general colour is brown, each hair banded with yellow, the coat is smooth, short and soft, the tail not very long, brown above and white below. The belly is dark-brown, only the groins are white. The legs are somewhat darker than the body. Stags show no trace of a mane. Very young fawns show a row of white spots at both sides of the dorsal stripe, which vanish after a few days. A striking character is the crouching gait, already mentioned by MÜLLER. In this respect the Bawean deer also resembles the Hogdeer. The animals walk with a high convex back, the croup somewhat higher than the shoulders. The pedicles are long, the antlers slender and six-tined. The base of the antlers is short, the brow-tine straight, obliquely erect, at a sharp angle to the beam. The beam is long, divided into two branches. One of these branches is in line with the beam, the other shorter, rather strongly directed inward and almost perpendicular to the former. The skull characters also call to mind those of the Hogdeer. The nasals are straight and vaulted, the auditory bullae large and inflated, preorbital gland-pits are small and shallow. From a systematic point of view the

position of the scent glands is important. The metatarsal gland consists of a glabrous, horny, smooth, darkly coloured oval patch of skin, surrounded by a zone of long hair. The pedal gland on the hind legs is well developed and deep. The inside of this gland carries long protruding hairs. The dentition is typical. Canines in the upper jaw are always absent. Median incisiform teeth of the lower jaw enlarged and, as regards width, exceeding the total width of the three other teeth.

All these characters point to a close relationship with the genus *Axis* and there is every reason to place the Bawean Deer into the genus *Axis* and especially into the subgenus *Hyelaphus* (MOHR 1920, VAN BEMMEL 1944, 1948). These characters distinguish the Bawean Deer from all other deer species in Indonesia (VAN BEMMEL 1949), which belong either to the genus *Rusa* (Sambar-deer) or to the genus *Muntiacus* (Barking-deer).

Very little is known of the biology of the Bawean Deer. ERNA MOHR (1920) mentioned some data on the animals in the Amsterdam Zoo. Antlers were shed in February, the rutting-season started in August and ended in September. Pregnancy lasted 235 days. In the collection of the Museum Zoologicum at Bogor are two stags, both collected September 21, 1941, one of which is in velvet. The antlers of the other specimen are smooth and much worn. This points to the possibility of there being no pronounced rutting-season in this species, as, indeed there is none in any other species of Indonesian deer.

Not a single description of Bawean Island gives any particulars concerning occurrence, habits and number of our species. Most authors merely mention the occurrence of a deer on the island. Once the species is mentioned as "Barking-deer" (a species lacking on Bawean) and is said to be common. But, during a collecting trip to Bawean in 1928, not a single specimen was seen by the collectors and only a few trophies, bought from the local population, were brought home. No particulars are available concerning both stags purchased in 1941, but it seems that deer in Bawean are restricted to certain areas of the island. I suppose the animals prefer secondary forest.

MÜLLER, a very keen observer, was well aware of the special position of his new discovery, as is clear from his description (1845). That, in later years, the Bawean Deer has not had the attention of zoologists and especially zoogeographers which it deserved, is mainly due to the peculiar fact that the species has always been put unto the wrong systematic place. This seems the more curious, as the first authors, such as SCLATER, BROOKE and even the great authority on deer, LYDEKKER, already compared it with the Hogdeer, and even found a close relationship. Nevertheless they placed the Bawean deer into the *Rusina* group. The first author to draw the right conclusion from her findings was ERNA MOHR (1920).

Nevertheless, the Bawean Deer has since been looked upon by many authors as a small island-race of the Javanese Deer, *Rusa timorensis* cum subsp. Not a single zoogeographer made any fuss about it. Moreover, zoogeography has a dislike to deer and is always inclined to accept a priori that deer, occurring in any island, must have been introduced there by man. It is most obvious that this is utterly impossible in the case of the Bawean Deer. Our animal has to be looked upon as a true endemic species holding an isolated position in the whole of the Indo-Australian ar-

chipelago (VAN BEMMEL, 1949, map!). Its closest relative is, as has been said, *Hyelaphus porcinus* from the East Asiatic mainland. VON KOENIGSWALD (1933, 1939) pointed to the fact that *Cervus oppenoorthi* V. K. from the upper Pleistocene of Java, bears a close resemblance to the Bawean-deer. This fossil species is mainly represented by antlers and therefore proof cannot be given that the two forms are conspecific, though I consider this highly probable.

So *Hyelaphus kuhlii*, as occurring in Bawean, seems to be relict. Perhaps this species reached Bawean during the Diluvial period, at the time when the Sunda Shelf was still above sea-level (VON KOENIGSWALD 1933). The occurrence of fossil rests of *Cervus oppenoorthi* in Java would support this view. The migration of the Chital (*Axis axis*) from the continent by way of the Sunda Shelf to Java has been proved by the discovery of a fossil race of this species in Java (ibidem). Perhaps the same route was taken by the ancestors of the Bawean Deer. Either the ancestral form on the continent would have to be regarded as being extinct, or *H. porcinus* would be the original form. Certainly the difference is too large for considering *H. kuhlii* and *C. oppenoorthi* geographic representatives of *H. porcinus*.

Perhaps there exists a relationship between the Philippine species "*Hyelaphus*" *calamianensis* HEUDE, *H. porcinus* and *H. kuhlii* (MOHR 1920). The Calamianes Deer is very rare in collections; I have never seen a specimen myself. Judging from the descriptions I think the Calamianes Deer cannot be considered the ancestor of *H. kuhlii*, but should itself be brought back to *H. porcinus* or a common ancestor with *H. porcinus*. At first, I was led astray myself by a specimen in the collection of the British Museum N.H., wrongly labelled *H. calamianensis* (VAN BEMMEL 1944, 1948).

It is very serious indeed that owing to neglect by systematists and zoogeographers, the Bawean Deer has not been noticed by Nature protectionists either. APPELMAN was the first in Aug. 1949 to draw attention to the Bawean Deer in a working paper submitted to the International Technical Conference on Nature Protection at Lake Success. As a matter of fact all deer were more or less protected in Indonesia, but in this case special precautions ought to have been taken. However, conditions in Indonesia are not yet favourable for any opportunity of making up for this omission.

As an inhabitant of a single small island, the Bawean Deer is in a most vulnerable position. Before the war most of the Bawean people earned a living as seafarers and fishermen, while agriculture and hunting were being practised only occasionally. So in this remote part of the world the natural fauna was not in great danger of disturbance. During the war, the island got more and more isolated. In 1948, a famine threatened and help had to be given both to population and garrison. Most likely the animals were hunted for food during that time, without any restraint. Perhaps an even more serious disturbance was caused by the deforestation taking place in Bawean on a most alarming scale during the last years. Already in 1937, forests were to be found in Bawean on the summit of steep hills and in some scattered plots in the lowlands only. Sixty percent of the island was more or less cultivated, the rest was waste-land or poor secondary forest (BUWALDA, unpublished). According to recent reports

of the Indonesian Forestry Service nearly all forest still existing in 1938 has been turned into wasteland now, and even secondary forest cut down for timber and fire-wood. Erosion is quickly wearing down the soil and total devastation is threatening the whole island. This may by now already have had a fatal influence on the occurrence of the deer. A game census has never been held in Bawean, nor has there been any opportunity of holding one recently. We may therefore find, after normal conditions will have been restored in Indonesia, that the Indo-Australian fauna has been deprived of one of its most valuable elements.

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