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CREATED AND PRODUCED
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LAST SURVIVORS

The Natural History of Animals
in Danger of Extinction

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sickness, which are transmitted by domestic livestock. Spillett refers to an occasion in 1964 when a forest guard found "about 100 asses between Jesda and Malvan". Recurrent outbreaks of these two diseases during the 1960s have caused heavy losses among the wild ass herds. Spillett suggests that "coupled with poaching and habitat destruction, disease [including rinderpest and anthrax] may be the 'coup de grace' for species such as blackbuck, chinkara and nilgai".

In 1961 the Government instituted and financed an annual vaccination programme. This well-conceived measure has not been entirely successful, however, as several owners have refused to allow their horses to be treated on the specious ground that they cannot afford to have them idle for the week or fortnight's rest that the treatment requires. Clearly this constructive programme cannot hope to achieve its purpose unless vaccination is made obligatory.

The rapid decline of the Indian wild ass since the end of the Second World War is shown by the series of population estimates made over a period of twenty-five years. When Salim Ali visited the Little Rann in 1946 he estimated the total number of wild asses at between 3,000 and 5,000. The population appears to have remained at about the same level during the ensuing decade: Wynter-Blyth estimated the total at about

4,000 in 1956, including several herds of more than 200 animals. Within a few years, however, more than three-quarters of the population had been destroyed, presumably by disease. Gee's careful census showed that by 1962 the total had dropped to about 870. Events during the Indo-Pakistan war resulted in the wild ass population again being halved: an aerial census carried out by Dharmakumarsinhji in October 1969 revealed that the total has been reduced to about 400 animals.

Gee could find no evidence of wild asses in the Great Rann of Kutch except for "a few stragglers". More recently, however, Mountfort has reported a group of about 20 to 30 asses which are said to be permanently resident in part of the Great Rann near Nagar Parkar. Several were shot during the Indo-Pakistan war, and others have since been either killed or captured.

These figures reveal both the extent and the speed of the decline; and underline the need to establish a legally constituted sanctuary, primarily for the wild ass and other relict native fauna, but, not least, to safeguard an unusually interesting desert environment. This should be done while the land is still available. There is also a need for a thorough ecological study of the wild ass and its habitat to provide the essential foundation on which to develop a programme for the proper management of the sanctuary.

JAVAN RHINOCEROS

A century ago the Javan rhinoceros was widely distributed in South East Asia; but because all three species of Asiatic rhinoceroses occurred in the same general region, and early reports failed to distinguish between them, it is impossible to be certain of the precise historical range. It is known, however, that the Javan form occurred as far west as the Sundarbans in Bengal, whence it extended along the Brahmaputra Valley into Assam. Authentic records from Burma are limited to Tenasserim, but the range included south-western China, thence

along the Mekong and other large river valleys into Laos, Vietnam, Cambodia, Thailand, Malaya, as well as Sumatra and Java.

Much of the uncertainty in early reports arose from the similarity between the Javan and Great Indian rhinoceroses which for many years were regarded as the same animal, and the fact that the ranges of the Javan and Sumatran species largely coincided. It is easy to see how this confusion arose. The Great Indian rhinoceros is only a little larger than the Javan (though its head is noticeably heavier); and both have

Rhinoceros sondaicus

prominent folds in the hide. The skin folds in fact differ slightly, notably on the neck and shoulders, while the skin of the Javan rhinoceros lacks the tubercles that are so conspicuous in the Indian species. Most accounts state that the horn of the male Javan is invariably about half the length of the Indian, and that Javan females have the distinction, unique among the five rhinoceros species, of being hornless or of having only a token horn in the form of a small horny boss. But Schenkel refutes this belief. His observations have shown that although some Indian rhinoceros bulls have longer horns than the Javan, the converse is sometimes true. "Furthermore, all the females which we have seen and which the guards saw during our presence in Ujung Kulon have horns quite similar to those of bulls."

An indication of the animal's former abundance in northern India is given by Pollock who spent seven years in Assam during the 1860s: "I never shot the lesser rhinoceros on the right bank of the Brahmaputra but I have no doubt that it exists; but it is fairly plentiful on the left bank south of Goalparah, where I have killed it. . . . I may here mention about them in Assam that I shot there 44 to my own gun, and probably saw some 60 others slain, and lost wounded fully as many as I killed."

Blyth, writing in 1862, said that the rhinoceros was still common in the Sundarbans at that time, a statement that is corroborated by several other authors. The species is known to have been there until 1892 when Edmond de Poncins found three or four individuals, but, as poaching was rife at the time, the species is unlikely to have survived for many more years.

The last specimen to be taken in Burma was shot in 1920, and in 1933 Peacock wrote: "It is extremely doubtful whether there are now more than half a dozen specimens of *R. sondaicus* in existence in Burma, and it is unlikely that they will survive." The last Malayan specimen was shot in 1932.

Occasional reports of the continued existence of a few individual animals in Tenasserim still persist but these are unconfirmed, and probably refer to the Sumatran species. Guggisberg alludes to a report that rhinoceroses, possibly

Rh. sondaicus, may have survived into the 1960s in the mountainous part of Laos north of the Srepok River. This is a large and little-known region of extensive jungle and swamps.

As long ago as 1885 Neumann was saying that the rhinoceros had been hunted to excess in Sumatra and had become scarce. Sody, who undertook a comprehensive appraisal of the animal in Sumatra and Java, showed that it remained relatively abundant in Sumatra until the turn of the century, after which the decline was rapid. The last specimen of *Rh. sondaicus* in South Palembang was shot in 1928, according to Heynsius-Viruly and Van Heurn, who stated that the species still survived, though only sporadically, "in the plateaus and mountain swamps of Atjeh, especially in the Gajo and Alas districts, in the extensive forests in the hinterland of Langkat, at the salt springs on Sumatra's East Coast, at Indragiri (between Talok and the P.R.I.), in Riouw, Djambi as well as N. W. Palembang (Benarat). On the western coast they are still found in the Barisan Mountains, though in small numbers." In 1933, however, de Voogt warned that the species was practically extinct in South Sumatra.

In the 1930s the Netherlands Commission for International Nature Protection (founded in 1925) expressed hopes that the establishment of a system of reserves might remove the danger of extermination and also ensure the long-term protection of both the rhinoceros and other indigenous fauna. Among the 68 fauna and nature reserves in Sumatra two were of particular importance to the rhinoceros: the Löser Reserve (1,030,000 acres) in North Sumatra, established in 1934; and the South Sumatra Reserve (881,000 acres) in the Benkoelen/Lampungs districts, gazetted shortly before war broke out in the Pacific. Heynsius-Viruly and Van Heurn provide evidence which suggests that both the Javan and Sumatran species may have occurred in the Löser Reserve. Both species were reputed to have co-existed in the Lampungs also.

Talbot, writing in 1955, stated that the Javan rhinoceros "has been presumed extinct in Sumatra for at least two decades. I have found no evidence to the contrary." This is borne out by Hoogerwerf's belief that "there is nothing to

contradict the findings of some observers before the war that this rhinoceros had disappeared from Sumatra. It seems indeed the truth that the last specimens outside Java were shot by a European hunter in the southern part of Sumatra about 1934." It appears, however, that the species survived in Sumatra at least until 1959, in which year two immature specimens were said to have been captured. Sody, who records this information, unfortunately gives no details.

Sody also shows that the species was once abundant and widely distributed in western Java from the coast into even the highest mountains, confirming Horsfield's* and Neumann's earlier observations that the species occurred both "in the plains as well as on the highest and most impassable mountains".

The last free-ranging rhinoceros in Java was shot by Franck in 1934, since when the species has been restricted to Ujung Kulon, although Heynsius-Viruly and Van Heurn mention "the presence of a single rhinoceros in the district Karangnoengal . . . also a few specimens in the Garoet Mountains as well as near Pameungpeuk and to the west of Lake Kinder."

The decline of the species in Java has coincided with the eruption of the human population, which Talbot shows to have risen from an estimated 3 to 4 million in 1800 to 11 million in 1850; 28 million in 1900; 41 million in 1930 and 57 million in 1958. As Schenkel has shown, the preferred habitat of the Javan rhinoceros is secondary vegetation. The animal was therefore naturally attracted to the man-made clearings, temporarily cultivated and then abandoned, which accompanied the spread of human settlement; which at once brought it into conflict with man. As Talbot states: "with the tremendous population growth in Java the rhinos would have been excluded from most of the island by agriculture, even if they had not been hunted to death for their horns".

It is impossible to shake the firmly held belief, prevalent throughout the East, in the infallibility of rhino horn as a powerful aphro-

disiac; and most Asians will go to any length and pay almost any price to obtain it. Not only the horn but every part of the animal is utilized by Chinese pharmacists, including the blood, bones, various organs, flesh and hide: even the urine is considered efficacious.

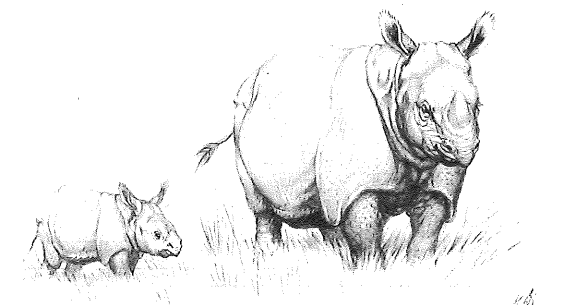
Thom states: "The blood especially, if drawn straight from the heart, is valuable. It is dried slowly in bamboos over a fire and sold for almost its weight in gold. The horn again is more valuable than the blood as it is ground down, mixed with other drugs and used as an aphrodisiac and as a sovereign remedy for all sorts of ills. The Javan and Sumatran rhinoceros are considered of particular value for medical purposes by the Chinese and Burmese. The Chinese seem to know more than any other race about the uses to which the blood and horn of a rhinoceros can be put to." Peacock notes that the horn and blood of the Javan rhinoceros were considered more valuable than those of the Sumatran.

The horn trade has been the principal reason for the eradication of the rhinoceros throughout virtually its entire range with the exception of the Ujung Kulon Peninsula at the westernmost tip of Java. This reserve, which extends to 130 sq. miles, is the species' last stronghold, and contains about two dozen animals.

The Netherlands Indies Society for the Protection of Nature, a private organization founded in 1912, was the initial driving force behind the development of conservation in the Dutch East Indies. It was largely at the Society's instigation that the Government introduced game laws and regulations and inaugurated a system of reserves, among them Ujung Kulon.

The peninsula was set aside as a Nature Monument in 1921, with the particular aim of protecting the Javan rhinoceros, the Javan

* The English physician who at the time of the Napoleonic Wars worked closely with Sir Stamford Raffles in studying the flora and fauna of Java.



tiger, and the banteng. Protection was only nominal, however, and poaching was of regular occurrence. In 1937 the status of the area was upgraded to that of a Nature Reserve, from which all human settlement was excluded.

But law enforcement remained difficult in Java, particularly in the outlying districts. "We have even been informed that natives were secretly shooting some of the few remaining rhinoceros in the Nature Monument Oedjoeng Koelon. Dr. Charles Bernard, Director of the Department of Agriculture, Commerce and Trade, who is in charge of Nature Protection, had to complain that a Chinese, caught in the act of shooting rhinoceros, had been freed by the Judge" (Kies).

The Society repeatedly urged the "Volksraad" to appoint an officer with specific responsibility for fauna protection, but this proposal was resisted for financial reasons. Eventually, in 1935, the Government created the new post of Nature Protection Officer, a position occupied with distinction by Mr. Andries Hoogerwerf until Indonesian independence.

In general the reserves were well maintained during the Second World War, and we have it on Hoogerwerf's authority that "during the whole of the Japanese occupation the guards remained at their posts, [but elsewhere] all efforts to induce the [Japanese] to take measures against poaching had no or only a very small result". Despite the total prohibition on possession of firearms by non-Japanese nationals, intensive poaching took place outside the reserves, and illegal clearance of forests occurred on a large scale. It was only after the Japanese withdrawal, and particularly from 1945 to 1949, that the reserves themselves were ravaged.

In the chaotic conditions prevailing immediately after the war, bands of insurgents armed with modern automatic weapons overran the reserves and devastated the fauna. They had a compelling motive for killing the rhinoceros because of their belief, as Hoogerwerf tells us, that "certain parts of a rhino give invulnerability to the bearer (so-called *Djimat*)".

In 1955 Talbot visited Ujung Kulon during the course of a mission to investigate the status of rare and endangered species in different parts

of the world. His report drew attention to the plight of the Javan rhinoceros and recommended an ecological study of the reserve to assess the animal's status and future needs, as the basis for a proper management plan.

From 1946 to 1951 at least ten Javan rhinoceroses were known to have been killed in and around Ujung Kulon (Hoogerwerf). In 1963-64 a further seven were killed in the reserve, and in the conditions then prevailing there was no likelihood of the poachers being apprehended. This situation was a matter for grave international concern, and caused the I.U.C.N. Survival Service Commission and the World Wildlife Fund to send special advisers to collaborate with the Government of Indonesia in safeguarding the remnant population. Preliminary visits by Talbot (1964) and Verschuren (1966) were followed by the mission of Rudolf and Lotte Schenkel, commencing in 1967, which aimed: "Firstly to study the Javan rhino, the size and reproductive capacity of its population, and the suitability of Ujung Kulon as a habitat; secondly to assist the Indonesian authorities in their effort to save the species."

This important work was further advanced and placed on a more permanent footing when, in January 1968, in close conjunction with the University of Basle, the World Wildlife Fund established the "Basle Patronage Committee for Ujung Kulon", under the chairmanship of Professor R. Geigy, Director of the Swiss Tropical Institute, Basle. The committee was formed with the object of giving practical help to the Indonesian authorities, above all in ensuring continuity of the work of studying the rhinoceros population and its ecology.

The salient fact is that the future of *Rh. sondaicus* is inseparably bound up with Ujung Kulon — the only place in the world where there is a known population with any prospect of survival under natural conditions. Since the eruption of Krakatau * in 1883 the reserve has

* Schenkel (*pers. comm.*) remarks that up to the time of the Krakatau eruption there was human settlement in Ujung Kulon, mainly on the north coast. The ensuing tidal wave wiped out all settlement, as well as destroying most of the lowland primary forest.

not been modified by man, except for small clearings along the coast, made during the Japanese occupation, where artificial grasslands were established to improve grazing for the banteng (*Bos javanicus*) and the Javan deer (*Cervus timorensis*).

The survival of the Javan rhinoceros is entirely dependent on maintaining an efficient guard system to prevent poaching. The World Wildlife Fund has therefore provided practical assistance in the form of a boat and a Land Rover (including running costs) and the construction of guard-posts, as well as by giving money to provide the rangers with regular wages, uniforms and medicaments.

But, even assuming that poaching can be successfully contained, the rehabilitation of the species is certain to be protracted. The reproductive rate is naturally low. A single calf is born after a prolonged gestation of about 16 months, the calf remaining with the mother for up to two years; and even under ideal conditions mature females probably do not breed more often than every third year or so. Concern has been expressed that the population has reached such a low level that adequate reproduction might no longer occur, in which connection it is interesting

to note Thom's statement that "during the 49 years I have been in Burma I have never seen either a young rhinoceros or tracks of one". These fears, however, have been dispelled by Schenkel who saw immature rhinoceroses on four separate occasions, three of them accompanied by their mothers. He also came across numerous juvenile footprints.

Schenkel makes the important observation that Ujung Kulon does not contain large stands of the saplings and plants that comprise the rhinoceros's diet: these are scattered and scarce, and in many parts of the reserve have been replaced by unfavourable plant species. As the rhinoceros population increases it will therefore be essential to develop a programme for managing the habitat in a way that will be most beneficial to the rhinoceros.

Continued protection, research, and management are the essential requirements for Ujung Kulon. The Indonesian Government recognizes that the future of the reserve depends primarily on their own efforts, but because of the depressed economic situation their most effective contribution, at this stage, consists of good will and support for those scientists and others who are prepared to provide practical help.

PERSIAN FALLOW DEER

Dama dama mesopotamica

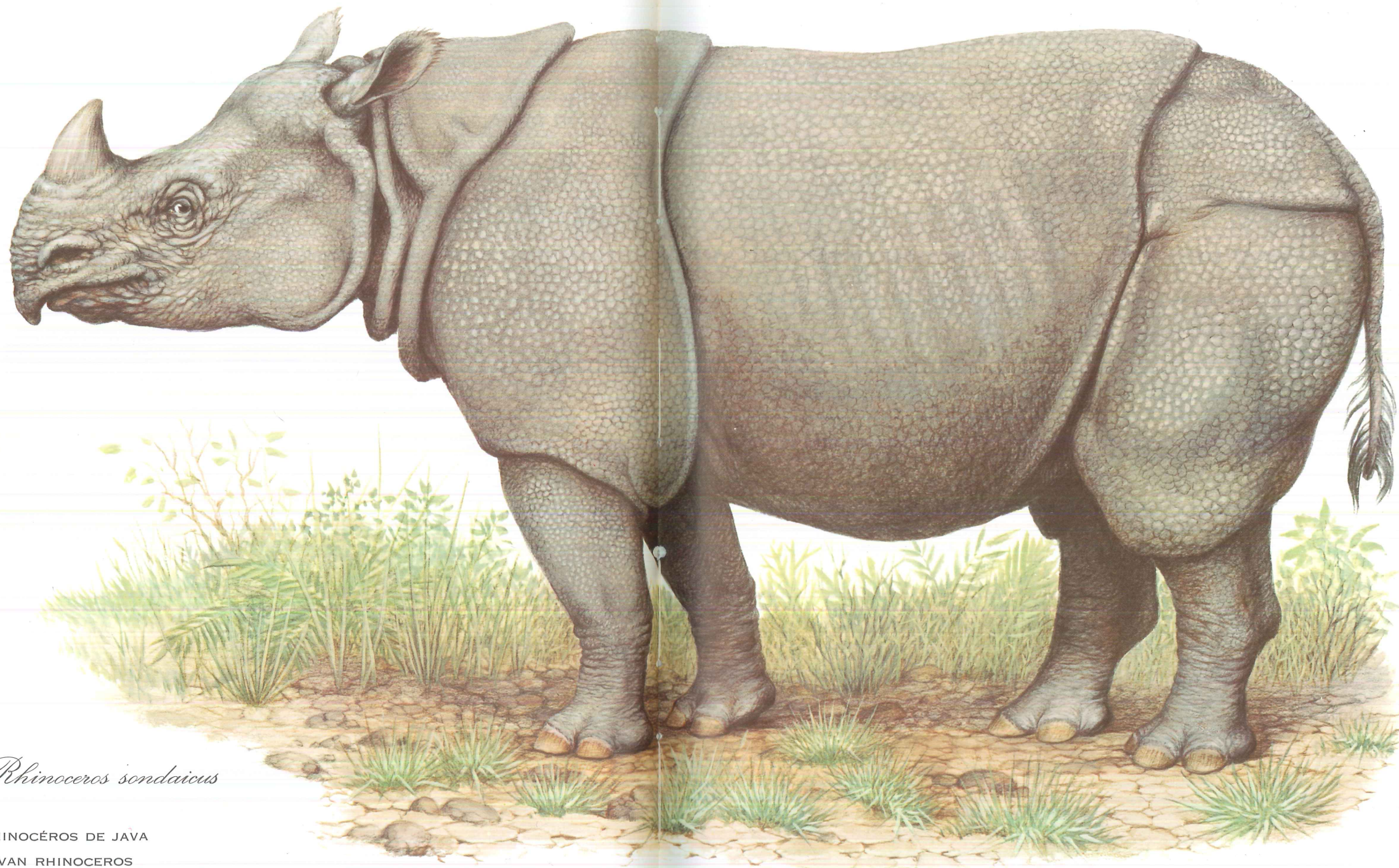
The fallow deer originated in the Mediterranean region and Asia Minor but has been widely introduced into many parts of western Europe where it has become successfully established in numerous forests and deer parks. The common European fallow deer is abundant and in no danger, but its close relative, the Persian race, is one of the rarest mammals in the world.

The Persian form is substantially larger than the common fallow deer and the antlers, which are present only in the male, are conspicuously different. Those of the nominate race are terminally flattened whereas those of the Persian race normally terminate in three principal tines, the

extremity of the antler being either not at all or only slightly palmated. The brow tines of the latter are much less prominent.

The Persian form is also more brightly coloured. The ground colour of males in summer coat is light brown, darkening to red-brown in winter. The upper part of the body is flecked with prominent white spots which along the spine fuse together to form a continuous stripe. The lower parts are lighter, becoming whitish on the belly and chest. Females are smaller than males with a darker ground colour and whiter spots.

The original range extended from south and south-west Iran through Mesopotamia into



Rhinoceros sondaicus

RHINOCÉROS DE JAVA
JAVAN RHINOCEROS