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orang is said to be widely distributed, but not numerous. North of Samarinda, as far as the Bay of Sangkoelirang, the mawas are a common occurrence and they are also known farther south. They are absent, though, from some regions, such as South Koetai and Central Koetai, while they live also on the boundary between the Subdistrict Kloea and North Tabalong, especially in Haupau-Ondan. In February, 1932, a specimen 165 cm. in length, was obtained there. Although they are not hunted, their numbers have greatly decreased in this district in the last twenty to thirty years.

RHINOCEROS (*Rhinoceros sumatrensis* Cuvier and  
*Rhinoceros sondaicus* Desmarest)

Native names: Badak, Warak.

Sumatra, so rich in rare and interesting animals, has also the good fortune to harbor two species of Rhinoceros, viz: the two-horned *sumatrensis*<sup>1</sup> and the one-horned *sondaicus*. In past geologic times, rhinoceros inhabited a large part of the Earth, including the Netherlands. Nowadays there are only five species living, two in Africa, one on the south side of the Himalayas, and two in Eastern India and the larger Sunda Islands. The occurrence of two species side by side in Sumatra is therefore most valuable to the State, to mankind, and to science. Of the two species, *sondaicus* occurs also in Java, where, however, it has been exterminated, except for a few specimens.

On the eastern coast of Sumatra both species of rhinos were known by the natives for ages past. In 1885 Neumann wrote:<sup>2</sup>

"The rhinoceros or "badak" knows how to move about in the plains as well as on the highest and most impassable mountains. The one-horned rhinoceros and the two horned rhinoceros are known. They are hunted for the horn (or soemboe badak). Formerly the export of this article was rather important, but at present it has largely

<sup>1</sup>Occasionally a three-horned specimen is seen, as happens also for the African species.

<sup>2</sup>Neumann l. c.

ceased, first because the rhino has become scarce and secondly because the natives no longer indulge much in hunting." A half century ago, then, the extermination of the rhinoceros had been impending.

Some years later, in 1890, Hagen<sup>1</sup> wrote from Serdang, a district on the East Coast of Sumatra, that the rhino still made his appearance from time to time in the tobacco plantations: "The Malays, moreover, distinguish two kinds, a large one, the Badak krbo, which is rather peaceful and quiet; and a smaller one, the Badak tingiling, which is claimed to be very wild and fierce and always to attack human beings." The word "tingiling" means "scaly" so that it refers, no doubt, to *sondaicus* in contrast to "krbo," the latter implying a comparison of the smoother *sumatrensis* with the carabao or water buffalo. The first reports of the occurrence of both species in Sumatra date, however, farther back. Marsden<sup>2</sup> writes in his "History of Sumatra" as follows:

"The rhinoceros, badak, both that with a single horn and the double-horned species, are native of these woods. The latter has been particularly described by the late ingenious Mr. John Bell.<sup>3</sup>

Following Marsden's account of 1811, new reports of the two rhinoceros of Sumatra appeared in the catalogue published by that eminent administrator and zoologist, Raffles.<sup>4</sup> He had not seen examples of the single-horned species, but wrote of it as follows, after pointing out that the British Indian Rhino was not known in Sumatra: "There is, however, another animal in the forests of Sumatra, never yet noticed, which in size and character nearly resembles the rhinoceros and which is said to have a single horn. . . . It has been seen at several places and the descriptions given of it by people quite unconnected

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<sup>1</sup> Hagen l. c. p. 105.

<sup>2</sup> William Marsden: The History of Sumatra, 1811, p. 116.

<sup>3</sup> Description of the double horned Rhinoceros of Sumatra by Mr. William Bell, Surgeon of the Service of the East India Company at Bencoolen, communicated by Sir John Banks, Bart. P.K.S. January 10, 1793. Philosophical Transactions of the Royal Society of London, 1793. Part I.

<sup>4</sup> Sir T. S. Raffles' Descriptive Catalogue of a Zoological Collection in Sumatra. The Transactions of the Linnean Society of London. Vol. XIII, 1822, pg. 269.

with each other coincide so nearly, that no doubt can be entertained of the existence of such an animal."

Even though this description includes some of the characteristics of the tapir, such as the presence of a white patch of skin, which is non-existent, this report is as definite as that of Marsden, Neumann, and Hagen. They therefore did not deter Koningsberger<sup>1</sup> in 1902, and later Robinson and Boden Klos<sup>2</sup> (1918-1922), in their carefully compiled lists of mammals of Sumatra, from including both species, *sumatrensis* and *sondaicus*, in the fauna of Sumatra.

Since then extensive literature has appeared on these two rhinoceros by Junghuhn, Mohnike, Blyth,<sup>3</sup> Jentink, de Beaufort,<sup>4</sup> Büttikofer,<sup>5</sup> Dammerman, and others.

All accounts contain descriptions of the tunnel-like passages which they make through the dense jungle and seem to use repeatedly. These rhinoceros paths are much used by the Natives in remote districts. In "Mededeelingen No. 5, Appendix II" of the Netherlands Committee for International Nature Protection (p. 51), it was pointed out that the district in Atjeh, now set apart as a large game reserve, is criss-crossed by many such rhinoceros paths.

Much has been written about the fierceness of the rhinoceros. The prevailing impression gathered from these accounts, is that it is safest to keep out of this animal's way. They seem to have an especial dislike for naturalists. In 1827, G. von Raalten, anatomist of the "Natural History Committee of the Netherlands Indies," was attacked and seriously wounded by a rhinoceros at Krawang, Java. The same thing happened to the French naturalist, Duvaucel,<sup>6</sup> whose name was given to one of the most beautifully colored trogons of Sumatra. He was at-

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<sup>1</sup> J. C. Koningsberger. De zoögdieren van Java 1902. p. 59.

<sup>2</sup> H. C. Robinson en C. B. Kloss. List of the mammals of Sumatra. Journal of the Federated Malay States Museums. Vol. VIII, Part II, page 317.

<sup>3</sup> Edw. Blyth, Rhinoceros Crossii Gray-Rhinoceros Sumatrensis. Proceedings of the Zoöl. Society, London 1861, p. 306.

<sup>4</sup> Dr. L. F. De Beaufort. Zoögeographie van den Indischen Archipel, 1926.

<sup>5</sup> Büttikofer. Notes from the Leyden Museum, V, 19, p. 65.

<sup>6</sup> Dr. Otto Mohnike. Blicke auf das Pflanzen- und Thierleben in den Niederl. Malaienländern, 1883 p. 421.

tacked by *Rhinoceros unicornis* in Bengal. Moreover, the victim was a pupil of the great Cuvier, the naturalist who gave *Rhinoceros sumatrensis* his name.

Meanwhile the rhinoceros disappeared long ago from Krawang. In their original habitat in Java, which was restricted to the western and central districts, steady hunting during the past century has made them so scarce that their complete extermination is seriously feared. This is all the more immediate since one can expect, at the most, one young every five or six years.

Many fascinating accounts of rhinoceros hunts have been published, beginning with Müller's description of van Raalten's fatal encounter with *sondaicus*. The rhinoceros first seized him with his mouth and then tossed him up repeatedly with the horn, until he lay unconscious and severely wounded. This account is reproduced by J. H. van Balen: "De Dierenwereld van Insulinde," p. 217.

Otto's hunting descriptions are of particular interest to the Netherlands Committee because they relate to that part of Langkat lying along the Upper Lapan River, a district set apart long ago as a forest reserve and which connects, along the boundary of Langkat and Atlas, with the recently proclaimed game reserve. All rhinoceros shot by Otto<sup>1</sup> belonged to the two-horned species. He figures the skulls in his book. On the other hand Volz relates that he met with a pair of *sondaicus* on the Goudberg in North Atjeh. The female was shot and the head as well as an embryo were preserved. The head, showing only the beginning of a horn, is figured in Volz's<sup>2</sup> book (page 373). Since he discusses the two species one may infer that *sondaicus* also occurs in Atjeh. There is then much chance that both species will be found in the newly established game reserve. This is further supported by Terbeest's<sup>3</sup> description of an encounter with a rhinoceros in Atjeh. After the animal was killed the horn of the "unicorn" was cut off to be sold.

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<sup>1</sup> E. Otto. Pflanz- und Jägerleben auf Sumatra 1903 p. 139.

<sup>2</sup> Wilhelm Volz. Nord Sumatra Band II. Die Gajolländer p. 373.

<sup>3</sup> G. J. B. H. Terbeest. Eenige herinneringen uit mijn diensttijd bij het korps Marechaussee op Atjeh, plm. 1900. Delftsche Crt. dd. 11, 18 and 25 July 1931.

Of the older literature mention should be made of Schneider's<sup>1</sup> account of an encounter with *Rhinoceros sumatrensis*, when he could only save himself by jumping to one side.

In 1925 Mr. Hazewinkel had the good fortune to shoot a *sondaicus* in South Sumatra. Later he shot six more and two *sumatrensis*. In an interesting article in "De Tropische Natuur,"<sup>2</sup> illustrated with photographs, much valuable information is given on the rhinoceros: how they became aggressive through contact with man (and bullets), how they kill cattle, their fondness for salt springs (also observed by Verbeek<sup>3</sup> on the West Coast of Sumatra), how they harbor very large ticks, such as are found also on carabaos and tigers, and many more details about their habits.

It was also possible for the Zoölogical Museum in Buitenzorg to obtain authentic material from Sumatra. A few years later it obtained an old male *sondaicus* from Java. The capture of this specimen is described in detail by Appelman and Franck<sup>4</sup> in the journal above-mentioned. These writers also give many measurements and anatomical data. Concerning the anatomy we refer to the previously mentioned dissertation by Bell and the old work of Camper,<sup>5</sup> which devotes some fifty pages to the several species of rhinoceros. Camper's book gives a complete account of our present knowledge of the rhinoceros from the time of the Greeks and Romans up to the early 19th century. Finally we mention also an account by Forbes.<sup>6</sup>

The Netherlands Committee for International Nature Protection formerly described how the Natives hunt rhinoceros by means of a spear-trap. The account was based upon a report by Snouck Hurgronje<sup>7</sup> and was pub-

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<sup>1</sup> Gustav Schneider l. c. p. 123.

<sup>2</sup> J. C. Hazewinkel. *Rhinoceros sondaicus* in Zuid-Sumatra. *De Tropische Natuur* XXII (1933) p. 101.

<sup>3</sup> R. D. M. Verbeek. *Topografische en Geologische Beschrijving van een gedeelte van Sumatra's Westkust* 1883, p. 659.

<sup>4</sup> F. J. Appelman en P. F. Franck. *Rhinoceros sondaicus* in West-Java. *De Tropische Natuur* XXIII 1934 p. 73.

<sup>5</sup> *Natuurkundige verhandelingen van Petrus Camper*, 1782.

<sup>6</sup> Forbes. *On the male generative organs of the Sumatran Rhinoceros*, 1880.

<sup>7</sup> C. Snouck Hurgronje. *Het Gajoland en zijne Bewoners*. 1903 p. 360.

lished with the Committee's suggestions for the Atjeh Reserve,<sup>1</sup> established since.

It is generally known that rhinoceros-hunting is greatly stimulated by the fact that almost all parts of the animal, and particularly the horn, are reputed to be valuable. The high value all Orientals place on rhinoceros horn is based upon the age-old superstition that this material is endowed with special, more or less magical powers over the human body. Rumphius mentions it in his "Amboinesche Rariteitenkamer" poking much fun at it. Presumably the magic power manifests itself in three ways:

1. A poisonous snake bite may be healed by placing a small piece of the horn on it.

2. A poisonous drink may be detected by putting it in a tumbler made of rhinoceros horn. If it contains poison, the liquid will foam.

3. It works as an aphrodisiac when taken in powder form or mixed with water.

Belief in the first and second of these superstitions is to be found all the way from Arabia to China and Japan. Bombay is one of the most important markets for rhinoceros horn. A letter by P. W. Hofland, in Pasoeroean, published in the "Tijdschrift voor Nederlandsch-Indie,"<sup>2</sup> shows that even Indo-Europeans sometimes believe in it. The problem has often been discussed.<sup>3</sup> J. Kreemer Jr.<sup>4</sup> supplies a good bibliography of the matter. The general opinion is that the effect is nil or based upon suggestion. The belief is on a par with that of our ancestors in a similar virtue of the unicorn or tooth of the narwhal (*Monodon monoceros*).

Little is known as yet of the action as an aphrodisiac mentioned above. However, the chemical nature of the several substances that cause the so-called oestrus is now

<sup>1</sup> Mededeelingen No. 5 der Commissie, Bijlage II, p. 51. See: a figure in Mededeelingen No. 7 p. 30; also in: Otto l.c. p. 64.

<sup>2</sup> Tijdschrift voor Nederlandsch-Indie. Vol. VIII, Part 4, 1846 p. 110.

<sup>3</sup> See: Verslagen en Mededeelingen. Kon. Academie van Wetenschappen. Afd. Natuurkunde, Vol. XII, Part 1, 1861, p. 130.

<sup>4</sup> J. Kreemer Jr. Volkshoelkunde in den Indischen Archipel. Bijdragen tot de Taal-, Land- en Volkenkunde van Nederlandsch-Indie, vol. 70, Part 1, (1914) p. 77.

much better known; they belong to the group of sterines and their derivates. It will probably be shown in the near future whether or not the supposed action of rhinoceros horn can be correlated with its chemical contents.

The Committee's circular brought out many reports of the two species of rhinoceros, but they were not very encouraging.

In Java, according to reports, *sondaicus* will soon be a thing of the past, if it does not prove possible to sufficiently guard the few remaining specimens in Southwest Bantam and in the Nature Monument Oedjoengkoelon. Although poachers are now punished more severely than before, three corpses of rhinoceros were found in the Nature Monument in 1932. The presence of a single rhinoceros in the district Karangnoengal was reported; also a few specimens in the Garoet Mountains as well as near Pameungpeuk and to the west of Lake Kinder. Reports received from Sumatra also are not at all optimistic. The last *sondaicus* seen in South Palembang is said to have been shot in 1928. In the Lampong Districts the same distinction, reported by Hagen from the East Coast, is made between the "Badak karbo" and the "scaly badak," the latter seemingly being *sondaicus*. In Djambi a distinction is made between the shore badak and the forest badak. Both kinds are said to grow to about the same size. Sometimes they have two young; both sexes then having one horn, that of the female being smaller and shorter. The leaves of the nangka tree are a favorite food. It is difficult to determine which of these two species is *sondiacus* and which is *sumatrensis*.

Reports from all other parts of Sumatra where rhinoceros are said to occur, always mention that they are found very sporadically only. On the whole, rhinoceros still occur 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 Taloek 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 num-



bers. In the early 19th century, rhinos were quite numerous in the vicinity of the Peak of Korintjih, but they *are* practically extinct there since 1915, mainly owing to intensive hunting by means of pit traps. They are threatened with rapid extermination in Bangko, where the controller BB. reports that "they may perhaps hold their own for some ten years more."

Because of their shyness, these animals remain in the hills and do not venture into the bog forests of the lowland.

All of these alarming reports about the status of the rhinoceros in Sumatra agree strikingly with the warning expressed by de Voogd in "De Tropische Natuur":<sup>1</sup> "The Rhinoceros of South Sumatra is now almost extinct." He remarks with some sarcasm that since or due perhaps to the hunting expeditions of Hazewinkel about 1925, the rhinos have decreased at a terrific rate.

We hope that the planned reserve in Benkoelen and the Lampongs will prevent their extermination from soon becoming an accomplished fact.

Reports from Borneo are hardly more favorable. We are told that in West Koetai rhinoceros are quite scarce and confined to remote and inaccessible spots. The area it occupies is said to be large, but the numbers few and steadily decreasing, once more due to hunting.

In some subdivisions their survival is seriously threatened, while they are already extinct in Martapoera. They occur nowadays mainly north of the Mahakam River, where they extend high up into the mountains.

The recorder speaks here of the Javanese species, which would indicate *sondaicus*, but presumably this is due to an error. *R. sumatrensis* is also reported from Boentok and Apau-Kajan; and is said to be fairly numerous in the highlands near the boundary of British North Borneo, outside inhabited districts, as well as at the headwaters of the Malinau and Toeboe.

The foregoing localities are shown on the map accompanying an article by J. L. P. Zondag.<sup>2</sup> Although there

<sup>1</sup> C. N. A. De Voogd. De Tropische Natuur. XXII (1933) p. 159.

<sup>2</sup> J. L. P. Zondag. Het voorkomen van eenige diersoorten in de Zuideren Oosterafdeeling van Borneo. De Tropische Natuur XX (1931) p. 221.

are quite a few of these places, the small number of specimens gives food for thought. May the establishment of large reserves soon remove all danger of their extermination in Borneo also.

ELEPHANT (*Elephas maximus sumatrensis* Temm).

Native name: Gadjah

Very detailed reports on the elephant were received from many districts. While some believe they will be exterminated within the next twenty-five years, others think that they are holding their own as there are yet about 2000 elephants in Southern Sumatra alone. This estimate is, however, called in doubt by competent observers. In the subdivision Ogan Oeloe there were at the most about 45 elephants in 1926. There is much difference of opinion about the damage these animals do. In Rokan they have increased so rapidly that they have become a nuisance; nevertheless they are not hunted much.

A report from Soengi Radja relates that in 1929 a herd of 14 head was discovered; efforts are being made to preserve them. Elephants were also seen near Soengi Roka in May 1932. In Siak their number is estimated as still quite large, likewise in Indragiri, although they do not appear there in the swampy coastal districts. In the lowlands they are found only in Reteh, and the largest herds in South Seberida in the Boekit Tiga Poeloeh. In the first-named district a reward of twenty-five Dutch guilders is offered for every elephant tail. The controller of the district, which comprises the middle course of the Siak River, paid twenty-eight such premiums in 1930. A correspondent estimates that about 200 elephants roam over Siak and urges the repeal of the old local regulation concerning the premiums, as well as not extending the permits for the fire-arms kept in the kampongs.

In Djambi, Moeara Tambesi and Moeara Tebo they are fairly common; also even now, in South west Bangko, where the controller estimates they will be extinct within 10 years. They are very rare in Moeara Boengo. In Djambi they are estimated at about 250-350.

