THE TAXONOMIC HISTORY OF THE RECENT FORMS OF SUMATRAN RHINOCEROS (DICERORHINUS SUMATRENSIS)

by

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Abstract. William Bell gave the first description of a double-horned rhinoceros shot in Sumatra. Based on this report, the animal was named by G. Fischer in 1814. The arrival in the London Zoo of a specimen from Chittagong and another from Malaya in 1872 caused the first interest in the taxonomy of this group resulting in the description of three new species. At present, one species with three recent subspecies is recognised.

INTRODUCTION

The Sumatran rhinoceros, *Dicerorhinus sumatrensis* (G. Fischer, 1914), has an interesting though spasmodic taxonomic history. Its first description was published in 1793. At that time, the classification of the rhinoceroses was still in an undeveloped state. The most influential authority of the late 18th century, Petrus Camper (1722–1789), professor of anatomy at the University of Groningen, distinguished just two species at the end of his life: one African, double-horned and without skin-folds; and another Asian, single-horned with deep skin-folds (Rookmaaker & Visser 1982). Although the occurrence of a rhinoceros had been reported from many South-East Asian countries by that time, a double-horned rhinoceros in those regions was quite unsuspected. Since 1793, ten names have been proposed to denote specimens of the Sumatran rhinoceros. Remarkably, the first name appeared as late as 1814, while four names were given in 1872–1874 (Table 1). This paper will review the taxonomic history of the Sumatran rhinoceros explaining why there was only occasional interest in this subject and trying to establish the basis and present status of the available names.

EARLY REPORTS FROM SUMATRA

William Bell was responsible for the first detailed report of the Sumatran rhinoceros. He had been amanuensis to John Hunter (1728–1793) in London from 1778 to 1791 dissecting animals and preparing anatomical drawings, some of which are still preserved (LeFanu 1978). On receipt of the Diploma of the Company of Surgeons, he was appointed as surgeon in the East India Company's station at Bencoolen (Bengkulu, Sumatra) through the instrumentality of Joseph Banks. Bell arrived there in the first months of 1792, but died the next year (Dawson 1958: 292, 243). On 21 September 1792, Everard Home wrote to Banks that he had heard from Bell, who has shipped drawings and a description of a double-horned rhinoceros to Banks (Dawson 1958: 419). Banks, president of the Royal Society, inserted this report in the *Philosophical Transactions* of 1793. Bell (1793) examined a rhinoceros shot about 10 miles from Fort Marlborough, near Bencoolen: it was a male, double-horned, 4 feet 4 inches high, 8 feet 5 inches long, and

brownish-ash in colour. Possibly, Bell also sent a skull of a rhinoceros to Banks, later donated to the Hunterian Museum in the Royal College of surgeons of England in London (no. 2144 in Flower & Garson 1884). This skull was destroyed, but it was examined by Flower (1876 : 451), who doubted that it belonged to the specimen on which Bell based his description.

Bell's account remained unique for several years. It took over 20 years before more specimens became known in Europe. Sir T. Stamford Raffles (1781–1826), governor of Bencoolen and one of the first to encourage the exploration of Sumatra, employed two French collectors between 1818 and 1820. Alfred Duvaucel (1793–1824) and Pierre-Medard Diard (1794–1863) went out to India separately in 1817. While in the service of Raffles, they collected many animals on their way from Calcutta to Bencoolen and especially in Sumatra (Lady Raffles 1830, Rookmaaker 1982). As a result, Raffles was able to send a large shipment of zoological specimens to London on 29 March 1820. Its contents are listed in a "Memoranda respecting the collection of specimens in natural history lately received from Bencoolen" (manuscript in the Museum National d'Histoire Naturelle, Paris, ms. 625 no. 20). It included the skins and skeletons of a male and a female double-horned rhinoceros and their intestines in spirits. The anatomical preparations were placed in the East India House, while the skins and skeletons went to the museum in the Royal College of Surgeons where they were still present in 1884 (Flower & Garson 1884, nos.2141, 2142, 2143 – one probably acquired later). One skeleton was described and figured by Home (1821).

In Paris, Georges Cuvier (1769–1832) had a special interest in rhinoceros morphology and classification. Cuvier (1822) gave a list of specimens examined, but these did not include a rhinoceros from Sumatra. A biography of Duvaucel (de Lacaze 1856:536) mentioned the shipment of four rhinoceroses to Paris between 1820 and 1824. Probably, these were collected on Duvaucel's journey from Sumatra back to Calcutta. Cuvier (1833: 452–453) enumerated 2 skeletons and 1 skull of *Rhinoceros sumatrensis* in the Paris museum. He assumed that they were all collected on Sumatra, as this is the only locality given by Cuvier (1836:247), but there is a possibility that they actually came from the South-East Asian mainland.

Ever since Bell (1793), the Sumatran rhinoceros was usually regarded as a valid species, but it did not receive a scientific name immediately due to the lack of interest in these matters and the confused state of rhinoceros systematics at the time. G. Fischer (1814:301) was the first to propose a scientific name *Rhinoceros sumatrensis,* based on the paper by Bell. The same name was often attributed to Cuvier (1816:240) but this, of course, is preceded by Fischer's name. It has been said that there would be a type specimen of "*Rhinoceros sumatrensis* Cuvier, 1817 [=1816]" in the Museum d'Histoire Naturelle et d'Ethnographie of La Rochelle, France (Groves 1967: 235 and R. Duguy in litt.). As I will show elsewhere (Rookmaaker, in press), this specimen cannot have reached Paris before 1817 and I suggest, therefore, that Cuvier too based the recognition of the species on Bell (1793). Raffles (1822:268) described *Rhinoceros sumatranus* after examining specimens in Sumatra.

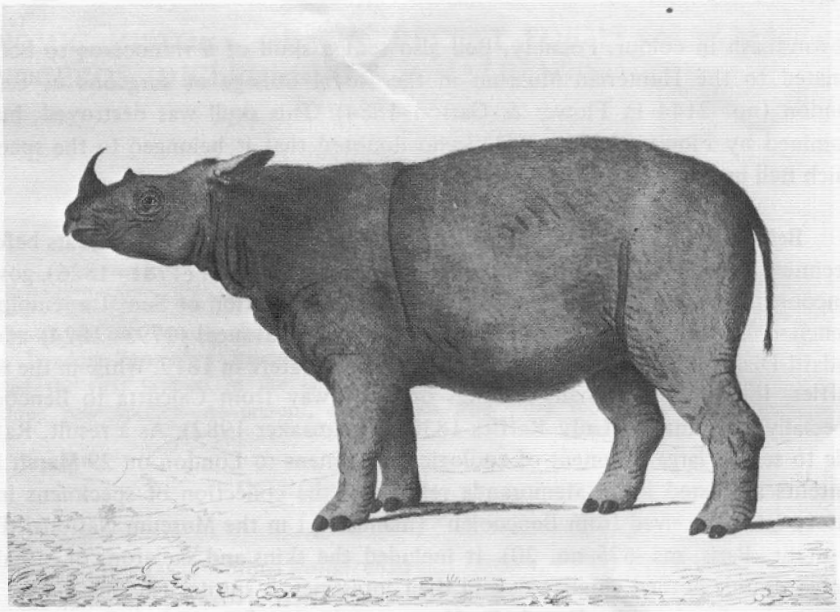

Figure 1. The Sumatran rhinoceros was first examined and drawn by William Bell in 1793.

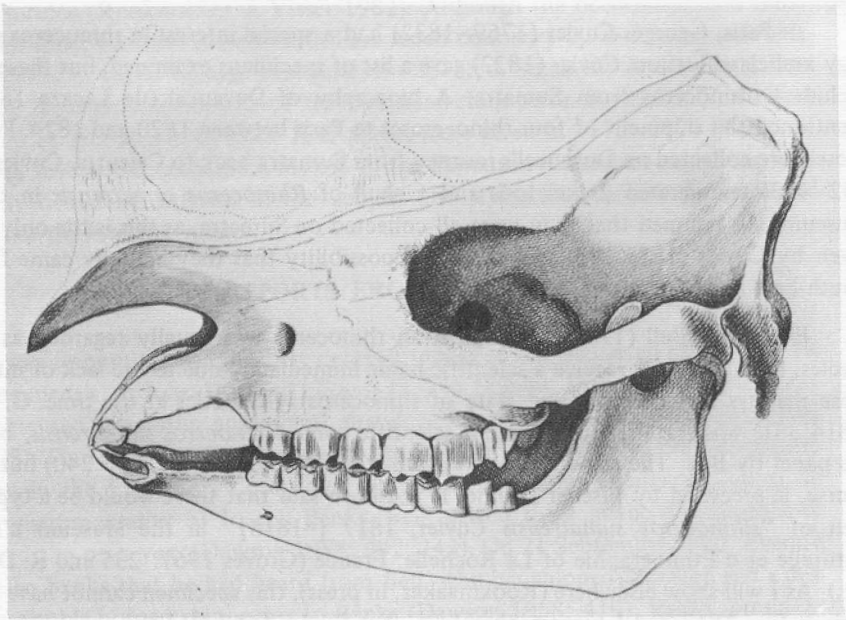

Figure 2. Skull of the Sumatran rhinoceros drawn by Bell (1793).

RHINOCEROS CROSSII

John Edward Gray (1800–1875), the keeper of the Zoological Branch (later Department of Zoology) of the British Museum in London, in 1854 received a rhinoceros horn from the animal dealer Edward Cross. This hron of unknown origin was very long and curved backwards to such an extent that the tip of the horn may have touched the forehead in the living animal. Gray (1854) suggested that it could belong to an undescribed species, *Rhinoceros Crossii*. The length of the horn (BMNH, no.1854.12.8.1) was "along the curve alone" 31.5 inches (80 cm) and straight from base to tip 24 inches (61 cm). *R. crossii* is one of those species which were described on an insufficient basis resulting in persistent speculation and discussion. The specific identity of the horn described by Gray has always been uncertain. It has even been taken to belong to an African species (Allen 1939, Gray 1868:1022). Today, the horn is generally identified as *Dicerorhinus sumatrensis* having the record length of that species (Groves 1971: fig. 16, Groves & Kurt 1972:1, van Strien 1974:11). We shall encounter *R. crossii* again below in different meanings.

EDWARD BLYTH IN 1862

One of the first to assemble zoological data in the South-East Asian mainland in a systematic fashion was Edward Blyth (1810–1873), the Cuaator of the Museum of the Asiatic Society of Bengal in Calcutta from 1841 to 1863 (Fish & Montagu 1976:36). In 1862, he published a major paper on the living Asian rhinoceroses, a mine of information and original ideas albeit not easily read as many discussions now look very dated. Blyth (1862a) accurately observed the presence of only two single-horned species in the region: *Rhinoceros unicornis* confined to Assam and Bengal, and *R. sondaivus* ranging from the Sundarbans to Java. The latter would also occur in Borneo instead of the double-horned rhinoceros, then a common error (Rookmaaker 1977a). Blyth knew, of course, the occurrence of the double-horned rhinoceros, which he called *R. sumatranus*, in Sumatra. The animal had seldom been reported outside that island in the general literature. Blyth had found it personally in Burma in November 1861 at "Pahpoon, amid the forest of the Yunzalin district of upper Martaban" (17°23'N, 97°40'E) Blyth 1962a:158). Other reports had come from the Ya-ma-doung range separating Arakan and Pegu, from near Sandoway and from several localities in Tenasserim (Blyth 1862a: 151, 156). Its presence in the Malayan peninsula was suspected although *R.sondaicus* appeared to be more common (Blyth 1862a:152). Later that year, Blyth (1862b: 367) could report the animal from Assam.

Blyth tried to elucidate the classification of the Sumatran rhinoceros examining specimens in the museum in Calcutta. These were listed and figured by Blyth (1862a: 156, 163, pl.III and 1863:137–138) and may be enumerated here:

A, B. Skull, skin of head, axis vertebra and some limb bones of an adult female from Tenasserim, donated by E. O'Reilly in 1847.

C, D. Skull, two scapulae and long bones of four limbs of an adult male from Tenasserim, donated by E. O'Reilly in 1847.

E, F. Two skulls, one wanting the lower jaw, from Tenasserim, donated by T.H. Maddock in 1842.

G. Facial bones of an old specimen, purchased by Blyth at Pahpoon, Burma.

Blyth (1862a:154, 156) suggested that two types could be distinguished, also found in the other species: one short and broad, the other narrow in its skull "with every intermediate gradation." Blyth's material was obviously insufficient to comment on differences between the known populations of the double-horned rhinoceros on a specific or subspecific level. While in Burma, Blyth had been shown a very long anterior horn in the possession of col. Albert Fytche, collected in the Tavoy province (South Burma) near the Thai border. Considering its length, Blyth (1861, 1862a:156) suggested that there was a "near affinity" between this specimen and the horn described as *R. crossii.*

SUMATRAN RHINOCEROSES IN THE LONDON ZOO

In November 1867, a female Sumatran rhinoceros "was captured by some villagers on the Sungoo [Sangu] river, close to the Chittagong Hill Tract." The species had never before been reported in that area. The animal came in the hands of F.H.Hood, who wrote a short note about it accompanied by a sketch (Hood 1869). A few years later, he sold it to William Jamrach, the London based animal dealer. Jamrach transported it to Calcutta where it was examined by Anderson (1872) in the second half of 1871. It was 4 feet 6 inches high at the shoulder, some 8 feet long and it showed peculiar "long dropping hair" some 5 inches long on the ear margins (Anderson 1872:130). The specimen arrived safely in London on 6 February 1872 and it was purchased from Jamrach by the Zoological Society of London on 14 February 1872 for *£1250* (Sclater 1872e:185). It was the first Sumatran rhinoceros in a British zoo and only the second in captivity; the first arrived in the Hamburg zoo on 18 January 1872. The London female, called Begum, lived in the zoo until 31 August 1900. I shall refer to it as the "Chittagong rhinoceros."

The Zoological Society of London purchased a second Sumatran rhinoceros from Jamrach for £600 on 2 August 1872, but it died one month later on 21 September. This old female had been caught in the "Sunghi-njong district of Malacca" (Sclater 1876:651), i.e. the Sungei Ujong district in Negri Sembilan. Its remains (skin and skull) were placed in the British Museum (Natural History), no.1872.12.31.1. Garrod (1873) studied its anatomy commenting that "it is an aged female' its skin is of a dark-slate colour, and is covered thinly with black hairs" and "the ears are lined, and not fringed . . . . . with black hairs."

The Secretary of the Zoological Society, P.L.Sclater (1872c, e) at first identified the Chittagong rhinoceros as a *Rhinoceros sumatranus*. That was to be expected as this

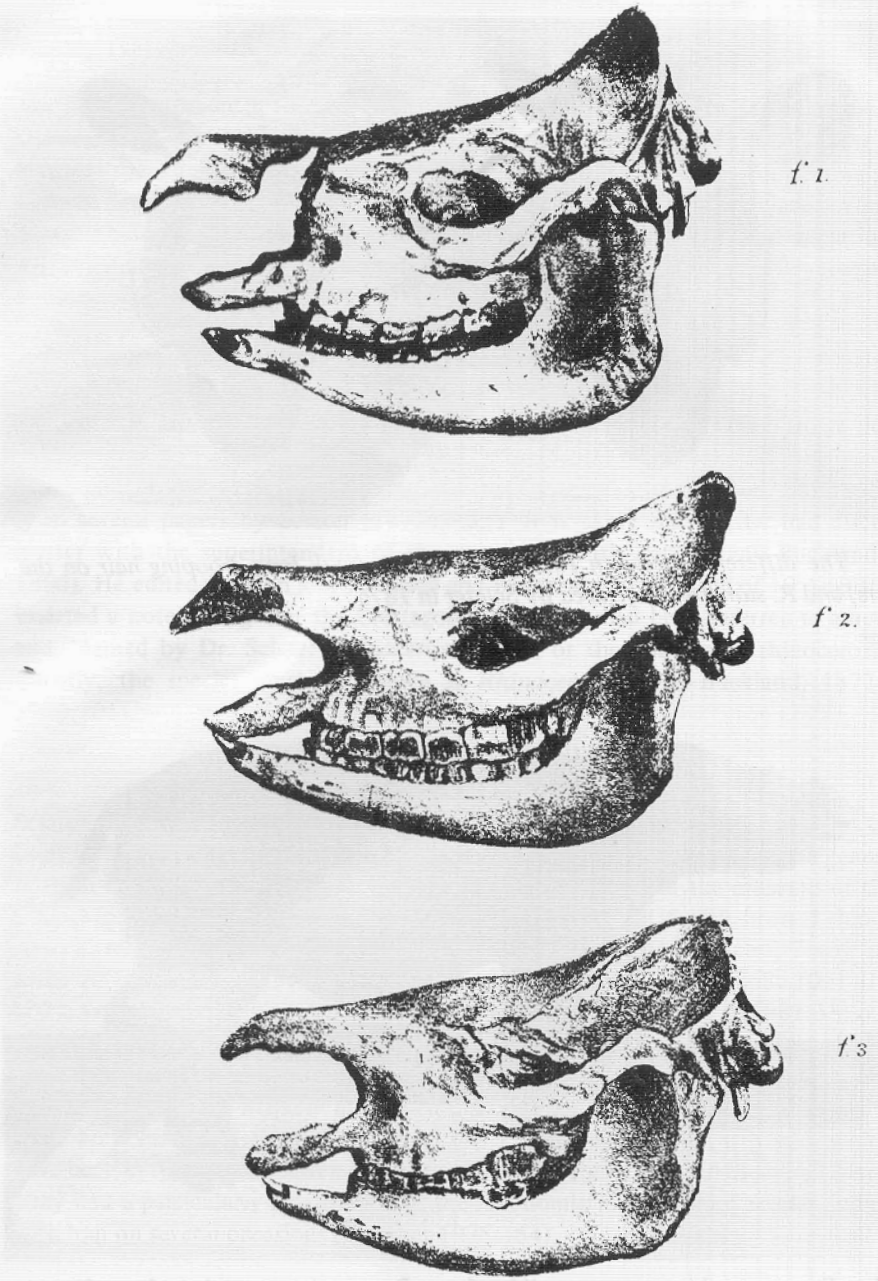

Figure 5. Skulls of the Sumatran rhinoceros, formerly in the Museum of the Asiatic Society of Bengal, figured by Blyth (1862, pl. III). The lower two figures represent the types of R. Blythii Gray, 1873.

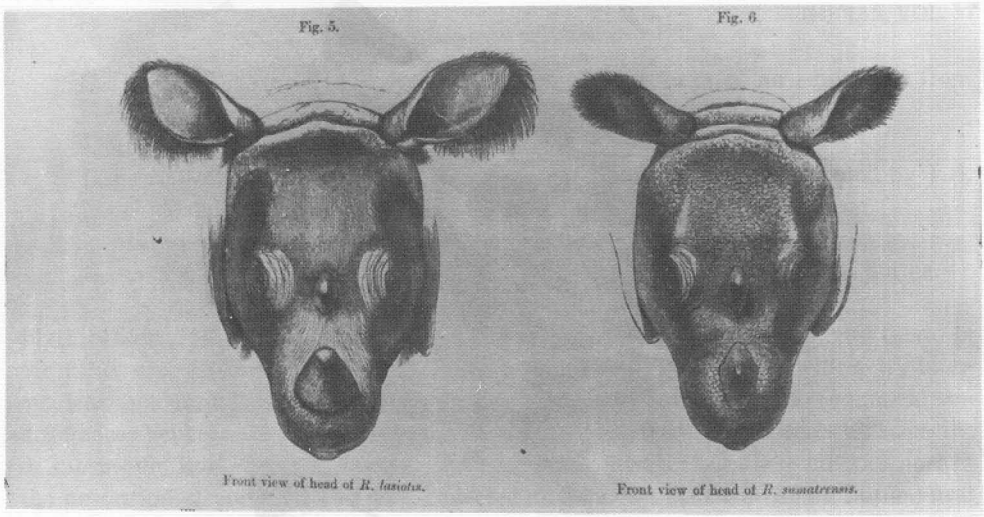

Figure 6. The difference between Rhinoceros lasiotis (with long drooping hair on the ear fringers) and R. sumatrensis figured by Sclater in 1876.

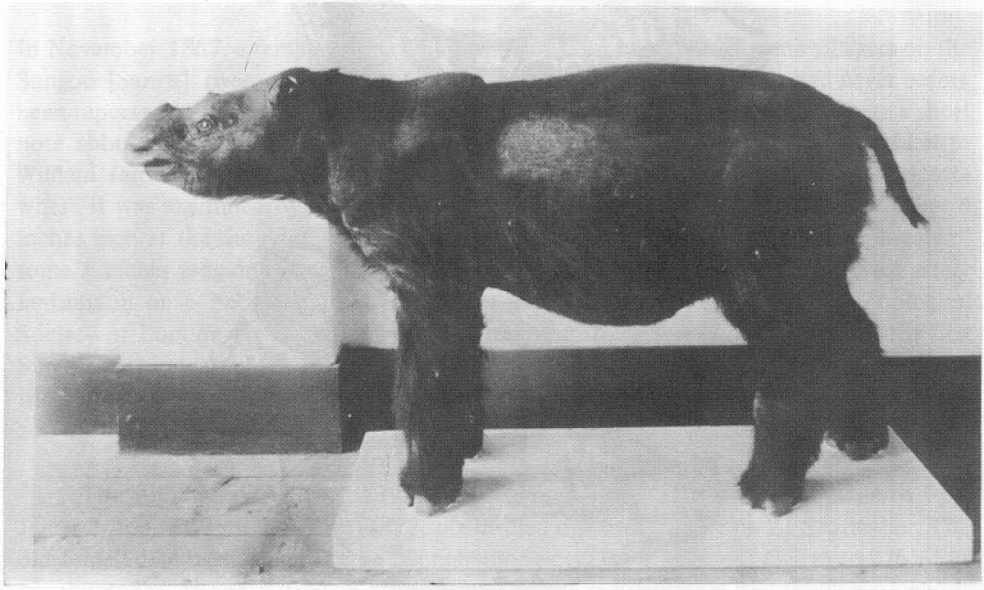

Figure 7. Sumatran rhinoceros, possibly from Borneo (representing the subspecies Dicerorhinus sumatrensis harrissoni), which lived in the zoological garden of Amsterdam in 1896 and now preserved in the Zoological Museum of Amsterdam (no. 7001). The reverse of the original coloured photograph has the following handwritten note of February 1913 (in translation): "Rhinoceros sumatrensis Cuv. ♀ juv., 1.75 m long in straight line, 0.89 m high, arrived in Aryis on 3. VI. 1896, died 16. XII. 1896. The bald patches on shoulder and side etc. originally were as thickly covered with hair as the other parts, they are abraded. – From W.J. Krolin, Singapore".

was the only species in this group yet described. Shortly after the arrival of the Malayan rhinoceros in the London Zoo, Sclater compared the two animals deciding that the Malayan specimen probably was a typical *R. sumatranus* while the Chittagong specimen differed and should belong to a new species. Sclater reviewed the classification of the Asian rhinoceroses in a lecture presented to Section D of the British Association for the Advancement of Science meeting in Brighton on 16 August 1872. He recognised two double-horned species (Sclater 1873):

1. *R. sumatrensis* Cuv., in Sumatra and peninsular Malaya.

2. *R. lasiotis*, new species, in Chittagong, with "long hairs which fringe the ears."

These conclusions were first announced in the *Times* of 19 August 1872 and subsequently in several papers by Sclater (1872a,b,d,f). It is likely that Sclater had discussed the matter with the superintendent of the zoo in Regent's Park, Frank Buckland (1826–1880). He edited his own journal, *Land and Water*, and in the issue of 10 August 1872 he inserted a note telling that the Chittagong rhinoceros had been referred to a new species and "named by Dr. Sclater *Rhinoceros lasiotis*, or the hairy-eared rhinoceros." Consequently, the species must be known as *Rhinoceros lasiotis* Buckland, 1872 (Harper 1940:201).

GRAY VERSUS SCLATER

Sclater's statement caused a heated controversy between him and J.E.Gray. Gray had been working in the British Museum since 1824. In 1867 he had proposed a general classification of the rhinoceros specimens in that collection and in the museum of the Royal College of Surgeons. At that time, he recognised only one double-horned rhinoceros in Asia, *Ceratorhinus* [=*Dicerorhinus*] *sumatranus* known from Sumatra, Tavoy and Pegu, while *R. crossii* would be synonymous with that species (Gray 1868: 1021–1023). In 1872, Gray had become a difficult man to work with, or as Stearn (1981:38) put it: "In the 1860's Gray's health began to deteriorate and he broke down completely in 1869; a stroke in May 1869 paralysed his right side and, often frustrated in his activities, he became increasingly irritable and often discourteous. Nevertheless, he taught himself to write with his left hand and produced paper after paper, some, it is said, which would have been better left unwritten." he retired in December 1874 and died on 7 March 1875. Gray had a particularly low opinion of the taxonomic judgement of Sclater and disagreed with him on several occasions (Gunther 1975:164).

Concerning the two double-horned rhinoceroses in the London zoo, Gray was diametrically opposed to the views advanced by Sclater. The different positions held in this matter are summarized in Table 2. The central question was which specimen most resembled the description given by Bell (1793). As we have seen above, Sclater thought that the Malayan animal resembled the rhinoceros found in Sumatra (*R. sumatrensis*) while the Chittagong animal differed (*R. lasiotis*). This was not clearly supported by morphological evidence. To Gray (1872), the Chittagong rhinoceros was most like the Sumatran specimen described by Bell. Its long hairs on the ears would be unusual

presenting "only an individual peculiarity." This would be *R. sumatrensis*. The Malayan rhinoceros differed from the other species in "the hedge-hog-like bristles and long slender tail." Gray called it *R.crossii* because Blyth (1862a:156) had reported that species in Tenasserim.

Gray (1872) was answered by both Sclater and Blyth. Sclater (1872a) merely repeated his earlier arguments and failed to explain the points made by Gray. Blyth (1872), much more thoroughly, reviewed all evidence available at that time. He essentially agreed with Sclater and, possibly primarily on zoogeographical grounds, distinguished two Asian double-horned rhinoceroses. The first, a larger species found in Chittagong and possibly also in Arakan (Burma) and Assam, was considered synonymous with *R.crossii* of Tenasserim, because such a very long and curved anterior horn "would suit *lasiotis* rather than" the smaller *sumatrensis*. The Malayan specimen in the London zoo was relatively small, blackish and coarse-haired. Blyth considered that it resembled the rhinoceros of Sumatra (*R. sumatrensis*) also occurring in the Malayan peninsula and sympatric with *R.crossii* in Tenasserim. The same classification was presented by Blyth (1875:51–53).

Gray was not satisfied and wrote two papers which might have been better left unwritten. When the Malayan rhinoceros was added to the collection of the British Museum, Gray compared its skull with specimens from Sumatra. In agreement with his earlier opinions, Gray (1873a) found many differences and proposed to call the Malayan population *Ceratorhinus niger*, the black rhinoceros. The other points made in this paper are confusing. Gray discussed the three skulls from Tenasserim in the museum in Calcutta, listed above, and figured by Blyth (1862a, pl.III figs. 1,2,3). The two younger skulls shown in Blyth's figures 2 and 3 appeared to differ from other specimens and Gray provisionally referred them to another new species, *Ceratorhinus Blythii*. The older skull of the first figure, like the others from Tenasserim, was taken to represent *R.crossii*. Remarkably, the Chittagong rhinoceros was not even mentioned and the status of *R.lasiotis* was left in the air, possibly because its osteological characteristics were quite unknown. Later, Gray (1873b) devoted a short note to this problem paying particular attention to the colour of the animals. Sumatran specimens were "brownish ash" (Bell 1793), the Chittagong rhinoceros was "ashy-grey" (Anderson 1872), while the Malayan animal was black. This strengthened Gray in his classification, and he repeated that *C.sumatrensis* occurred in Sumatra and Chittagong, and *C.niger* in the Malayan peninsular.

STABILISATION

The question of rhinoceros systematics could only again be reviewed after the death of Gray in March 1875. The challenge was taken up by William Henry Flower (1831–1899), since 1861 Conservator of the Hunterian Museum of the Royal College of Surgeons in London. He examined 38 skulls of Asian rhinoceroses, 18 in the Hunterian museum and 20 at the British Museum, probably seven of which belonged to *Dicerorhinus sumatrensis*. All observed variation "may well be considered within the limits of individual variation", Flower (1876) stated, although there were doubts about a skull from Pegu. Flower did

not want to decide about *R. lasiotis* because the only known specimen was still alive in the zoo. He provisionally recognised *C.sumatrensis* and *C.lasiotis* without providing further details about their distribution. Soon after, he was able to elucidate the systematic position of *R.lasiotis*. Sclater had given him a young adult skull of a double-horned rhinoceros collected in Tipperah, which was unlikely to differ much from the Chittagong specimen. The Tipperah rhinoceros differed from the other skulls in its greater breadth in proportion ot its length and in the greater size of the teeth. This confirmed the earlier proposed distinction of*R.sumatrensis* and *R.lasiotis* (Flower 1878).

In August 1900, the Chittagong rhinoceros died in the zoological garden after some 33 years in captivity. Its remains went to the British Museum (Natural History), where they were examined by Oldfield Thomas (1858–1929), the curator of mammals. Thomas (1901) observed that the external characteristics mentioned by Sclater had disappeared: the eartufts were less than 2 inches in length and the colour resembled other specimens. Its skull was relatively large. Therefore, Thomas (1901:156) considered "*R.lasiotis* as a tenable northern subspecies of *R.sumatrensis*, characterized mainly by its greater size."

RECENT CLASSIFICATION

From the turn of the century we can proceed at once to the 1960's because there were no new developments concerning the taxonomy of the Sumatran rhinoceros in the meantime. Dr. Colin P. Groves took a new interest in the family and he has tried to study all available museum specimens as well as interpret older data in the light of this new information. In 1965, he had examined 13 skulls and found that the Bornean specimens were markedly smaller than the other populations, and he described it as *Didermocerus sumatrensis harrissoni* (Groves 1965:130). In addition, Groves (1965) recognised three subspecies: *D.s.sumatrensis* in Sumatra, *D.s.niger* in Malaya (north to the isthmus of Kra) and *D.s.lasiotis* in continental S.E.Asia north of Kra. Later, he had been able to study 49 skulls of the species and decided that there was no reason to separate the Malayan and Sumatran animals, i.e. *D.s.niger* was synonymous with *D.s.sumatrensis* (Groves 1967). The same classification was again summarized by Groves & Kurt (1972):

1. *Dicerorhinus sumatrensis sumatrensis* (Fischer, 1814) in Sumatra and the Malayan peninsula, and S.E. Thailand,
2. *Dicerorhinus sumatrensis lasiotis* (Buckland, 1872) in N.E. India, Bangladesh and Burma,
3. *Dicerorhinus sumatrensis harrissoni* (Groves, 1965) in Borneo.

This classification is preliminary in the sense that there are still many questions. It is unlikely that many more specimens will become available which might help to refine the present picture. The former distribution is known in some detail. Many available records were reviewed by van Strien (1974), while the literature on Borneo was analysed by Rookmaaker (1977b), that on the Indochinese countries (where the species is practically unknown) and on India and Bangladesh by Rookmaaker (1980).

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Table 1. Chronological list of specific and generic names used to describe specimens of the Sumatran rhinoceros, with their present status following the classification of Groves & Kurt (1972).

Specific names

Rhinoceros sumatrensis G. Fischer, 1814	*Dicerorhinus s. sumatrensis*
Rhinoceros sumatranus Raffles, 1822	= *Dicerorhinus s. sumatrensis*
Rhinoceros crossii Gray, 1854	uncertain
Rhinoceros lasiotis Buckland, 1872	*Dicerorhinus s. lasiotis*
Ceratorhinus niger Gray, 1873	= *Dicerorhinus s. sumatrensis*
Ceratorhinus blythii Gray, 1873	= *Dicerorhinus s. sumatrensis*
Rhinoceros malayanus Newman, 1874	nomen nudum (= *Dicerorhinus s. sumatrensis*)
Rhinoceros borniensis Hose & McDougall, 1912	nomen nudum (= *Dicerorhinus s. harrissoni*)
Rhinoceros bicornis var. *sinensis* Laufer, 1914	nomen nudum
Didermocerus sumatrensis harrissoni Groves, 1965	*Dicerorhinus s. harrissoni*

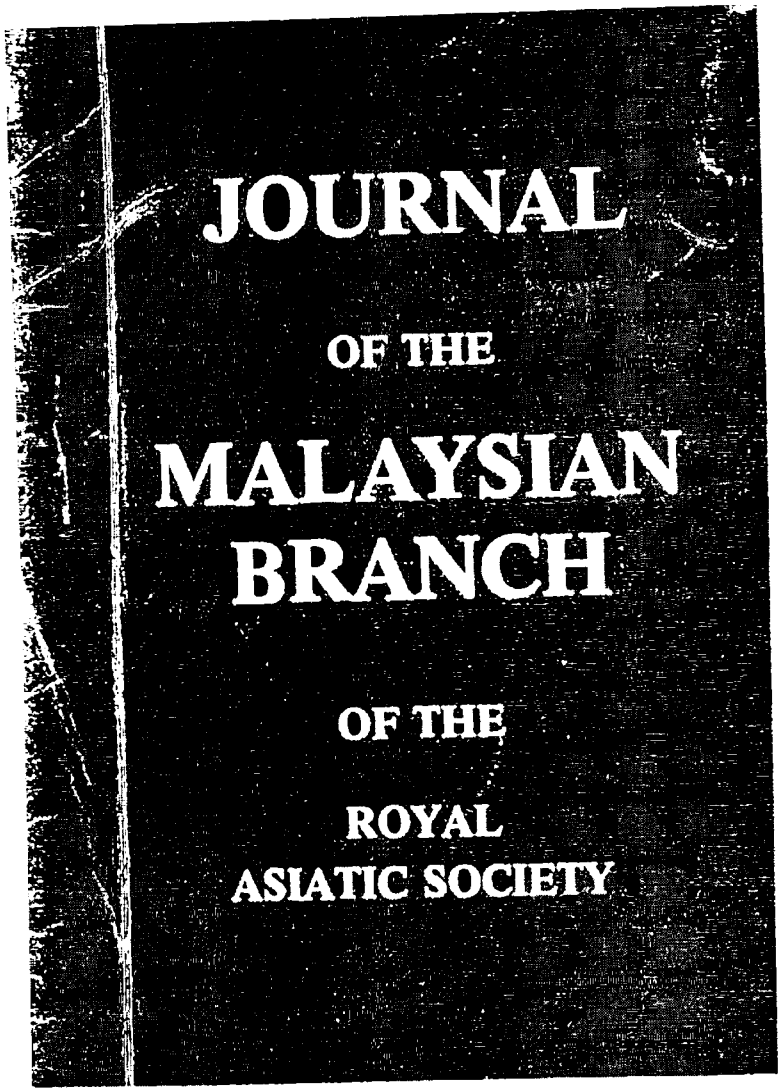
Generic names

Rhinoceros Linnaeus, 1758.	Used for all recent species of rhinoceros.
Didermocerus Brookes, 1828.	Suppressed in Opinion 1080 of the International Commission on Zoological Nomenclature in favour of *Dicerorhinus.*
Dicerorhinus Gloger, 1841.	Type species *D. sumatrensis.*
Ceratorhinus Gray, 1868.	Type species *C. sumatrensis.*

Table 2. The different opinions about the (sub) specific taxa in the genus *Dicerorhinus* related to their distribution.

Author	Chittagong	Tenasserim	Malaya	Sumatra
Blyth 1862a	?	sumatrensis	sumatrensis	sumatrensis
Sclater 1872b	lasiotis	–	sumatrensis	sumatrensis
Gray 1872	sumatrensis	crossii	crossii	sumatrensis
Sclater 1872a	lasiotis	–	sumatrensis	sumatrensis
Blyth 1872, 1875	crossii	crossii and sumatrensis	sumatrensis	sumatrensis
Gray 1873a	sumatrensis	blythii and crossii	niger	sumatrensis
Gray 1873b	sumatrensis	–	niger	sumatrensis
Flower 1876	? lasiotis	sumatrensis	sumatrensis	sumatrensis
Thomas 1901	lasiotis	sumatrensis	sumatrensis	sumatrensis
Groves 1965	lasiotis	lasiotis	niger	sumatrensis
Groves 1967	lasiotis	sumatrensis	sumatrensis	sumatrensis

Groves & Kurt 1972



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