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HISTORICAL NOTES ON THE TAXONOMY AND NOMENCLATURE OF THE RECENT RHINOCEROTIDAE (MAMMALIA, PERISSODACTYLA)

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ABSTRACT

The historical background of sixteen taxa in the family Rhinocerotidae is examined in order to assess their types and present status unequivocally. Various taxonomic or nomenclatorial aspects are treated of the following specific names: *africanus, annamiticus, asiaticus, brucii, camperi, camperii, camperis, capensis, cucullatus, gordoni, inermis, jamrachi, javanicus, javanus, sondaicus* and *sumatrensis*. A short discussion on the definition of "iconotype" is added.

INTRODUCTION

The study of the taxonomy and nomenclature of the recent rhinoceroses is complicated by the large number of available names and the wide range of pertinent publications. Sixty-five names of the species group have been proposed in the course of time. It is in the interest of nomenclatorial stability and taxonomic clarity to assess the actual background or basis of each taxon. In my "Bibliography of the rhinoceros" (Rookmaaker, 1983a) I tried to list all names with the accurate bibliographic reference, with information on the type specimen and type locality. A full exposition of the validity and basis of each name, therefore, is now superfluous. A bibliography, however, is not the place to introduce new interpretations or to explain necessary decisions in great detail. In this paper, I have selected sixteen names whose historical background requires further comment or elucidation in conjunction with the references found in Rookmaaker (1983a). The results are summarized in Table 1.

THE BASIS OF A TAXON

New taxa are described because the author is convinced that the animals belonging to the new taxon differ in some important aspect from all other animals. In theory, all taxa in the species group have a single specimen as type, be it holotype, lectotype or neotype (International Code of Zoological Nomenclature, 1964, articles 61, 72). This specimen is the actual name-bearer (semaphorant or onomatophore). In practice, this one-to-one relationship between name and specimen often is far from evident. Many names are not proposed after the examination of one or more specimens, but on the basis of some other kind of evidence like an earlier description, illustration of field experience. As a rather simplified example, the 65 names given to specimens of recent rhinoceroses may be classed as follows according to the evidence or designation of the original describer:

Table 1. Specific names given to recent Rhinocerotidae, listed chronologically, with present status. Taxa treated in this paper are denoted by an asterix.[1])

NAME	PRESENT STATUS
1. *R. bicornis* Linnaeus, 1758	*Diceros bicornis bicornis*
2. *R. unicornis* Linnaeus, 1758	*Rhinoceros unicornis*
*3. *R. africanus* Blumenbach, 1797	= *Diceros bicornis bicornis*
*4. *R. asiaticus* Blumenbach, 1797	= *Rhinoceros unicornis*
5. *R. sumatrensis* Fischer, 1814	*Dicerorhinus sumatrensis sumatrensis*
6. *R. indicus* Cuvier, 1816	= *Rhinoceros unicornis*
7. *R. simus* Burchell, 1817	*Ceratotherium simum simum*
*8. *R. sondaicus* Desmarest, 1822	*Rhinoceros sondaicus sondaicus*
*9. *R. sumatranus* Raffles, 1822	= *Dicerorhinus sumatrensis sumatrensis*
*10. *R. javanicus* Geoffroy & F. Cuvier, 1824	= *Rhinoceros sondaicus sondaicus*
11. *R. camus* Griffith, 1827 (1826?)	= *Ceratotherium simum simum*
*12. *R. camperis* Griffith, 1827 (1826?)	= *Rhinoceros sondaicus sondaicus*
13. *R. burchellii* Lesson, 1827	= *Ceratotherium simum simum*
*14. *R. javanus* Cuvier, 1829	= *Rhinoceros sondaicus sondaicus*
*15. *R. cucullatus* Wagner, 1835	artefact
*16. *R. camperii* Jardine, 1836	= *Rhinoceros sondaicus sondaicus*
17. *R. keitloa* Smith, 1836	= *Diceros bicornis bicornis*
18. *R. ketloa* Smith, 1837[2])	= *Diceros bicornis bicornis*
*19. *R. inermis* Lesson, 1838	*Rhinoceros sondaicus inermis*
*20. *R. brucii* Lesson, 1842	*Diceros bicornis brucii*
*21. *R. gordoni* Lesson, 1842	= *Diceros bicornis bicornis*
*22. *R. camperi* Schinz, 1845	= *Diceros bicornis bicornis*
23. *R. niger* Schinz, 1845	= *Diceros bicornis bicornis*
24. *R. oswelli* Elliot, 1847	= *Ceratotherium simum simum*
25. *R. crossii* Gray, 1854	= *Dicerorhinus sumatrensis* (?)
26. *R. kiaboaba* Murray, 1866	= *Ceratotherium simum simum*
*27. *R. bicornis capensis* Gray, 1868	unavailabe (= *D. bicornis bicornis*)
28. *R. floweri* Gray, 1868	= *Rhinoceros sondaicus sondaicus*
29. *R. nasalis* Gray, 1868	= *Rhinoceros sondaicus sondaicus*
30. *R. stenocephalus* Gray, 1868	= *Rhinoceros unicornis*
31. *R. lasiotis* Buckland, 1872	*Dicerorhinus sumatrensis lasiotis*
32. "*Ceratorhinus blythii*" Gray, 1873	= *Dicerorhinus sumatrensis sumatrensis*
33. *Ceratorhinus niger* Gray, 1873	= *Dicerorhinus sumatrensis sumatrensis*
34. *R. malayanus* Newman, 1874	nomen nudum (= *D. s. sumatrensis*)
*35. *R. jamrachi* Jamrach, 1875	= *Rhinoceros unicornis*
36. *R. bicornis minor* Drummond, 1876	*Diceros bicornis minor*
37. *R. bicornis major* Drummond, 1876	= *Diceros bicornis minor*
38. *R. frontalis* Von Martens, 1876	= *Rhinoceros sondaicus sondaicus*
*39. *Atelodus bicornis* var. *plesioceros* Brandt, 1878	= *Diceros bicornis* subsp.
*40. *Atelodus bicornis* var. *porrhoceros* Brandt, 1878	= *Diceros bicornis brucii*
*41. *Atelodus bicornis* var. *platyceros* Brandt, 1878	= *Diceros bicornis*
*42. *Atelodus simus* var. *camptoceros* Brandt, 1878	= *Ceratotherium simum simum*
*43. *Atelodus simus* var. *prostheceros* Brandt, 1878	= *Ceratotherium simum simum*
*44. *R. annamiticus* Heude, 1892	*Rhinoceros sondaicus annamiticus*
45. *R. bicornis holmwoodi* Sclater, 1893	= *Diceros bicornis minor*
46. *R. bicornis somaliensis* Potocki, 1897	= *Diceros bicornis brucii*
47. *R. simus cottoni* Lydekker, 1908	*Ceratotherium simum cottoni*
48. *R. borniensis* Hose & McDougall, 1912	nomen nudum (= *D. sumatrensis harrissoni*)
49. *R. bicornis* var. *sinensis* Laufer, 1914	nomen nudum (= ? *D. sumatrensis*)
50. *R. unicornis* var. *sinensis* Laufer, 1914	nomen nudum (= ? *Rhinoceros* sp.)
51. *Opsiceros occidentalis* Zukowsky, 1922	= *Diceros bicornis minor*[3])
52. *D. bicornis palustris* Benzon, 1947	= *Diceros bicornis brucii*
53. *D. bicornis punyana* Potter, 1947	= *Diceros bicornis minor*

NAME	PRESENT STATUS
54. *D. bicornis longipes* Zukowsky, 1949	*Diceros bicornis longipes*
55. *D. bicornis angolensis* Zukowsky, 1965	= *Diceros bicornis minor*
56. *D. bicornis atbarensis* Zukowsky, 1965	= *Diceros bicornis brucii*
57. *D. bicornis chobiensis* Zukowsky, 1965	*Diceros bicornis chobiensis*
58. *D. bicornis michaeli* Zukowsky, 1965	*Diceros bicornis michaeli*
59. *D. bicornis rendilis* Zukowsky, 1965	= *Diceros bicornis michaeli*
60. "*D. bicornis ladoensis*" Zukowsky, 1965	*Diceros bicornis ladoensis*, validated by Groves 1967b.
61. "*D. bicornis nyasae*" Zukowsky, 1965	invalid (= *Diceros bicornis minor*)
62. "*D. bicornis rowumae*" Zukowsky, 1965	invalid (= *Diceros bicornis minor*)
63. *Didermocerus sumatrensis harrissoni* Groves, 1965	*Dicerorhinus sumatrensis harrissoni*
64. "*R. unicornis bengalensis*" Kourist, 1970	invalid (= *Rhinoceros unicornis*)
65. *R. kulumane* Player, 1972	= *Diceros bicornis minor*

[1]) Abbreviations used in table:

D. bicornis	*Diceros bicornis*
D. sumatrensis	*Dicerorhinus sumatrensis*
R.	*Rhinoceros*
=	synonym of
"..."	proposed by implication.

[2]) *R. ketloa* Smith, 1837 generally is listed separately from *R. keitloa* Smith, 1836. It is probable, however, that it should be regarded as an inadvertent error like a mistake by the printer, which has no separate status in nomenclature (International Code of Zoological Nomenclature, article 32).

[3]) Groves (in litt.) informed me that this would be a taxon distinct from *D. bicornis minor*.

Holotype	24 taxa (37%)
Syntypes	4 .. (6%)
Living zoo animal	2 .. (3%)
Published report(s)	20 .. (31%)
Field experience	8 .. (12%)
Illustration	5 .. (8%)
Misunderstanding	2 .. (3%).

If there is no type specimen, because none was examined by the describer or because it was lost or destroyed, the taxonomist must look for information in other sources to establish the characteristics of the taxon. Sometimes this entails considerable historical excursions requiring the examination of illustrations, descriptions, and travel accounts, either published or not (Whitehead, 1976, 1978b; Schlawe, 1981: 100).

There has been some terminological discussion of the definition of "iconotype" being an illustration which has, or could have been, examined by the author of a new name. I agree with Whitehead (1978a: 25) who proposed that the iconotype is "strictly, an illustration that formed the *sole* basis for a new species name, not necessarily with a verbal description unless the illustration remained unpublished." There can never be both a type specimen (excluding a neotype) and an iconotype, even if the first is not now known, although in that case early illustrations are extremely important. This definition is useful to the taxonomist and to the historian of biology, because the iconotype in this sense is an illustration known to the original describer of the taxon while it does not deny the great value of other depictions of the same specimen or other sources of information.

This approach essentially agrees with that of Edwards (1978: 335) who writes from a botanical perspective. She argued that, when a new species is based on a published figure, "the type of such a name is, of course, the published illustration, the type of that illustration is the specimen or drawing from which it was made; that specimen or drawing is thus the type of the type of the name, a typotype." Schlawe (1980: 122, 1981: 101) proposed a totally different definition of iconotype or iconotypoide, being „die verschollenem Typus-Material nächsten bekannten Abbildungen, also etwa Skizzen,

Photonegative, Diapositive, aber auch — wenn nicht anders — die Publikation eines Bildes." Each taxon may have several iconotypes and the term may be transferred from a late illustration to an earlier more original representation of the specimen. I have no argument about the taxonomic significance of all illustrations made after a certain zoological type specimen whether known to the author or not. In fact, the most original (i.e. the first) drawing of an animal may show the important characteristics much better than later copies. It appears confusing, however, to apply the term "iconotype" to each of them.

PRESENT CLASSIFICATION

The classification of the rhinoceroses followed by most present workers and in this paper is that given by Groves in a series of papers. Certainly there are five rather well-defined species. It is unlikely, however, that the definite classification on the subspecific level has yet been proposed, which is at least partly due to the scarcity of specimens in museums. The latest published revisions may be summarized as follows.

1. *Ceratotherium simum* (Burchell, 1817), white rhinoceros, with 2 subspecies: *simum* and *cottoni* (Groves 1972, 1975);
2. *Diceros bicornis* (Linnaeus, 1758), black rhinoceros, with 7 subspecies: *bicornis, chobiensis, minor, michaeli, brucii, ladoensis* and *longipes* (Groves 1967b);
3. *Dicerorhinus sumatrensis* (Fischer, 1814), Sumatran rhinoceros, with 3 subspecies: *sumatrensis, lasiotis* and *harrissoni* (Groves 1967a, Groves & Kurt 1972);
4. *Rhinoceros sondaicus* Desmarest, 1822, Javan rhinoceros, with 3 subspecies: *sondaicus, inermis* and *annamiticus* (Groves 1967a, Groves & Guérin 1980);
5. *Rhinoceros unicornis* Linnaeus, 1758, Indian rhinoceros, monotypic.

ANALYSIS OF SPECIFIC NAMES

Below sixteen names receive some comment in alphabetical order.

Rhinoceros africanus Blumenbach, 1797

Blumenbach recognised two species of rhinoceros, one Asiatic (discussed under *R. asiaticus*), another African. In the first four editions of his *Handbuch der Naturgeschichte* (1779-1791), the African rhinoceros is called *Rhinoceros bicornis* following Linnaeus (1758). In the fifth (1797) and subsequent editions Blumenbach changed this into *Rhinoceros africanus*. Although Blumenbach (1797: 126) only diagnosed *R. africanus* very briefly ("Rh. incisoribus et laniariis nullis"), the name clearly is a junior subjective synonym of *R. bicornis*.

Blumenbach (1797: 126) referred to an illustration of the African rhinoceros which he had published one year earlier. On that plate, Blumenbach (1796, pl. VII) copied two skulls from an engraving privately distributed by Petrus Camper in 1787 (fig. 1). Camper (1722-1789) started his work in a period when most authors were inclined to distinguish a single-horned (Asiatic) and a double-horned (African) rhinoceros, although the appearance of the latter was almost unknown and the available material very deficient (Rookmaaker 1981, 1982a). In 1771, Camper received the head and skull of an African rhinoceros from the Cape of Good Hope. This gave him the opportunity to describe the morphology of the animal in detail and to discuss the characteristics separating this specimen from the Asiatic rhinoceros (Camper 1780, 1782). The head and skull later came to the University of Groningen (Holland), where they were destroyed during a fire in 1913. Zukowsky (1965: 13) suggested that „dagegen dürfte es wahrscheinlich sein, dass die beiden Hörner des von Camper beschriebenen Nashornschädels noch im Anatomisch-embryologischen Institut der dortigen Universität vorhanden sind." In fact, a catalogue of the memorial exhibition of all retrievable remains of Camper's collection listed "119. Two rhinoceros horns of a *Rhinoceros bicornis*" (Anonymous 1939: 36). Recent examination of these horns, however, showed them to belong to different individuals of a *Rhinoceros* species (Rookmaaker & Visser 1982, fig. 7).

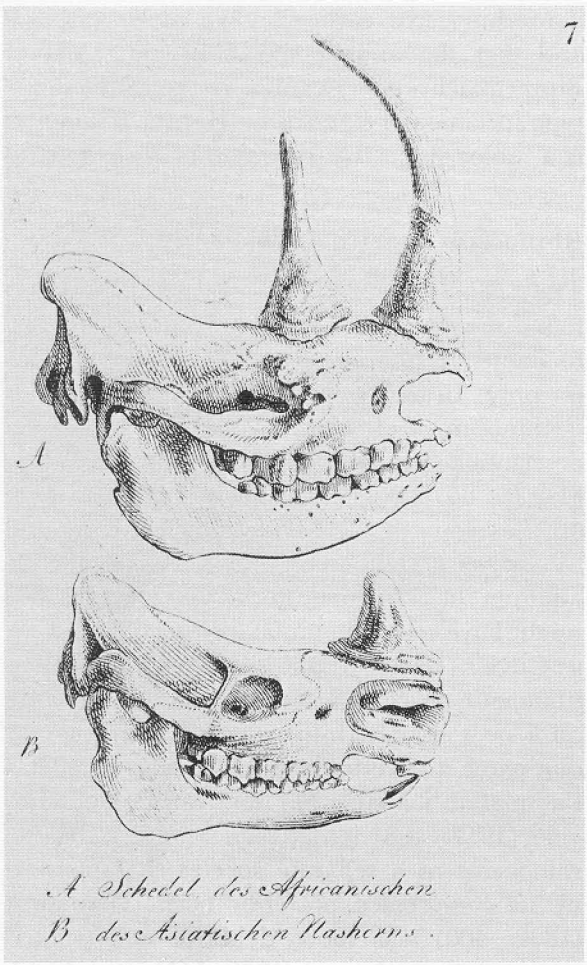

Fig. 1. The skulls of an African and Asiatic rhinoceros published by Blumenbach (1796, pl. 7) after an engraving privately distributed by Petrus Camper in 1787.

Rhinoceros annamiticus Heude, 1892

The common rhinoceros of the Indochinese region appears to be *Rhinoceros sondaicus* (Rookmaaker 1980a). Groves & Guérin (1980) examined the few museum specimens available from this area and referred them to a separate subspecies of *R. sondaicus*. They found that Heude (1892) had described and figured some rhinoceros teeth collected in Indo-China (or Cochin-China) with the name "*Rhinoceros annamiticus*." Groves & Guérin correctly used this name, validly published but long forgotten, to denote the Indochinese subspecies, *R. sondaicus annamiticus*. Unfortunately, their bibliographic reference is incorrect.

Heude published much of his work in the *Mémoires concernant l'histoire naturelle de l'Empire Chinois par des Peres de la Compagnie de Jésus*, a periodical, or book published in parts, appearing in Shang-Hai (Brongersma, 1939). The "second cahier" of the second volume (1892) contained two papers and nine plates, as follows: pp. 65-84 Etudes odontologiques, première partie: Herbivores trizygodontes et dizygodontes (by Heude); pp. 85-112 Etude sur les suilliens. Chapitre II (by Heude); pp. 113-115 Explications des planches; plates XIXA, XX, XXA, XXB, XXVII, XXVIII, XXIX, XXIXA, XXIXB. The first four plates (XIXA-XXB) illustrate the first paper in this issue, the other five belong to the second paper. According to the explication of plates (p. 113), figs. 1, 3 and 4 of plate XIXA depict teeth of *R. annamiticus*, and figs. 2 and 5 of the same plate those of "*R. javanus*". Groves & Guérin (1980) referred to this plate, but cited the second paper in their list of references. Plate XIXA is mentioned in the first paper in this issue, on p. 74 describing ,,la molaire inférieure du rhinocéros de Cochinchine." The name first appeared in a footnote on page 75: ,,La fig. 3 pl. XIXA reproduit la troisième prémolaire de lait du *Rh. annamiticus*." The correct citation is thus: *Rhinoceros sondaicus annamiticus* Heude, 1892: 75, pl. XIXA figs. 1, 3, 4.

Rhinoceros asiaticus Blumenbach, 1797

Similar to *R. africanus*, Blumenbach (1797: 126) substituted in the fifth edition of his Handbuch *R. asiaticus* in the place of *R. unicornis* used in the earlier editions. This was accompanied by a change in the diagnosis. At first, it read: "Rh. dentibus primoribus utrinque binis, inferioribus conicis, superioribus sublobatis; laniariis nullis" (Blumenbach 1788: 136). In 1797, this became "Rh. dentibus primoribus utrinque quaternis ...," i.e. there would be two incisors instead of one in each half of both jaws. Blumenbach (1797) also added a reference to plate VII in Blumenbach (1796), discussed above under *R. africanus* (fig. 1). The Asiatic skull copied from Petrus Camper's engraving,

belonged to an adult rhinoceros collected in Java by Jacob van der Steege and received by Camper in 1785. In 1801, the skull was donated to Georges Cuvier in Paris, but its present location is unknown (Rookmaaker & Visser 1982). Considering its collection in Java, the skull must have belonged to the species now known as *R. sondaicus*.

It might be argued that the specimen depicted in the figure published by Blumenbach (1796, pl. VII fig. B) is the type specimen of *R. asiaticus* and consequently that *R. asiaticus* is not synonymous with *R. unicornis* (as it has always been considered), but a valid name for the Javan rhinoceros antedating *R. sondaicus* Desmarest, 1822. Clearly, that would be a most unfortunate conclusion leading to all kinds of nomenclatorial problems. Three points may be made against this argument. First, it may be remarked that *R. asiaticus* has rarely been considered valid and I have only found a single-record outside Blumenbach's work (Rookmaaker, 1983a); it is not even mentioned by Hooijer (1946). Secondly, there is no reason to suspect that Blumenbach wanted to name a taxon differing from the Indian rhinoceros, the species which he had indicated with his *R. unicornis*. The two single-horned Asiatic rhinoceroses of the genus *Rhinoceros* were generally confused before 1800 and many of the early indications could be composite depending on the material available to the author. This is an awkward problem which cannot always be solved satisfactorily. Parallel cases concerning the names presented by Linnaeus (1758) were mentioned by Hopwood (1939: 453) and Rookmaaker (1980a: 258). Thirdly, and most significantly, the characteristics given in Blumenbach's diagnosis were not actually present in the figured skull. Blumenbach (1797: 126) stated the presence of four incisors in both upper and lower jaw. The skull in the figure, later described by Cuvier (1812: 13), had the usual dentition of the genus: two large and two small incisors in the lower jaw and just two large incisors in the upper jaw.

I believe it to be legitimate to say that Blumenbach (1797) intended to describe the Indian rhinoceros earlier known as *R. unicornis* and that the animal shown in plate VII of Blumenbach (1796) cannot be considered the type specimen of *R. asiaticus*. Hence, *R. asiaticus* is a junior subjective synonym of *R. unicornis*.

Rhinoceros brucii Lesson, 1842

The English traveller James Bruce (1730-1794) found the rhinoceros in Ethiopia and described its habits and properties. While its appearance is only briefly mentioned, a plate of a "Rhinoceros of Africa" accompanies the description (Bruce 1790: 85-107, plate facing p. 85—see fig. 2). The animal in this plate is an obvious copy of the Indian rhinoceros figured by Buffon & Daubenton (1764, pl. 7) with the addition of a second horn. Even so, Bruce might have seen an animal looking like that, or as Cuvier (1804a: 3) put it: „Mais pour sauver l'honneur de ce Voyageur, il faut bien croire qu'il ne s'est déterminé à ce plagiat apparent que parce que cette figure ressemble en effet à l'animal qu'il a vu." For that reason, De Blainville (1817: 168) tentatively admitted Bruce's rhinoceros as a separate species characterized by its compressed posterior horn. Desmarest (1822: 400) was more doubtful and wanted more evidence. Lesson (1838: 514) agreed with De Blainville and later he (1842: 159) named the animal as a variety of *R. bicornis*: „var. A. *Rhinoceros Brucii*, Blainv."

Lesson's name was recently accepted as the valid name of the black rhinoceros in Ethopia, as *Diceros bicornis brucii* (Zukowsky 1965: 129-133, Groves 1967b: 274).

Rhinoceros camperi Schinz, 1845

Rookmaaker & Groves (1978: 125) stated that Schinz's description was based on Camper (1780) and that the type specimen of *R. camperi* was the animal described in that paper. However, Schinz (1845: 335) himself wrote: „Da dies das Nashorn ist, welches Camper zergliederte, so nenne ich es nach ihm, da *Rh. Bicornis* nicht bleiben kann." As *R. camperi* thus was explicitly intended to replace *R. bicornis*

Fig. 2. The "African rhinoceros" encountered by Bruce (1790, pl. 25).

Linnaeus, 1758, both taxa must have the same type specimen. Moreover, the name is a primary homonym of *R. camperii* Jardine, 1836. It was later used again to denote a variety of *Rhinaster Keitloa* by Gray (1868: 1025).

Rhinoceros camperii Jardine, 1836

The classification of Jardine (1836) was copied from Griffith (1827). That book is the direct source of Jardine's remark that "De Blainville gave to another, which he characterized from the skull, the title of *R. Camperii.*" Like *R. camperis* (below), therefore, *R. camperii* Jardine, 1836 is a junior subjective synonym of *R. sondaicus* Desmarest, 1822.

Rhinoceros camperis Griffith, 1827

In a note following the description of "*R. indicus*", Griffith (1827: 291) wrote: "Camper has described a rhinoceros with two incisors in each jaw as distinct from this. M. Cuvier thinks it is the same species, but M. de Blainville otherwise. He has called it *R. Camperis.*" To explain this, it is necessary to look more closely at the classifications found in the works of Camper and Cuvier.

Petrus Camper described and illustrated a very young Asiatic skull in a note published by Pallas (1780). It had two large and two small incisors in the lower jaw and the two usual large incisors in the upper jaw besides the socket of a very small tooth on the outside of the left upper incisor (figured by Pallas 1780, pl. 9 fig. II). The dental arrangement of this skull presented considerable difficulty to Georges Cuvier. In his earliest notes on the rhinoceros, he had indicated that it might belong to a separate species besides the African, Asiatic (Indian) and Sumatran species (Geoffroy & Cuvier 1795, Cuvier 1797; further discussed by Rookmaaker & Visser 1982). In 1812, Cuvier reviewed the whole problem extensively, but his material was too limited to arrive at a satisfactory conclusion. He observed a rudimentary incisor in one side of the upper jaw in the adult skull of the rhinoceros which had lived in the menagerie of Versailles from 1770 until 1793. That skull resembled the young skull described by Pallas (1780) and they could belong to the same species. On the other hand, Cuvier found only very minor differences between the Sumatran animal described by Bell (1793) and an adult skull from Java which had been in Camper's collection (see *R. asiaticus*) except in the number of horns. Cuvier (1812: 14) had to conclude that there were either one or two Asiatic species of rhinoceros, but at least one of those would have a variable number of horns. This was very unsatisfactory and unlikely, and later Cuvier (1816: 239-240) just accepted *R. indicus, R. sumatrensis* and *R. africanus*. Soon after, Cuvier received additional specimens from Java and from the Cape of Good Hope enabling him to

provide a better classification with some confidence. Cuvier (1829: 152-153, 1836a: 247) distinguished *R. indicus, R. javanus, R. sumatrensis* and *R. africanus*.

De Blainville (1817) essentially followed Cuvier in his recognition of three Asiatic rhinoceroses: ,,le rhinocéros unicorne ou de l'Inde'', ,,le rhinocéros de Camper'' and ,,le rhinocéros de Sumatra.'' The second species was based on the skull described by Pallas (1780) which had troubled Cuvier. Despite the interpretation of Griffith (1827) cited above, De Blainville's (1817: 166) conclusion was that this animal ,,n'est qu'une variété de l'unicorne car il paroît assez hors de vraisemblance qu'une corne de plus, caractère si singulier, ne soit qu'une chose accidentelle.''

R. camperis Griffith, 1827 then was based on the ,,Rhinocéros de Camper'' of De Blainville (1817) describing an immature skull of the Javan rhinoceros. It is a junior subjective synonym of *R. sondaicus* Desmarest, 1822. Cowan (1969a) gave some bibliographic details about the ''Animal Kingdom'' by Edward Griffith noting that the part on the mammals was authored by E. Griffith, C. H. Smith and E. Pidgeon and that this part could have been issued as early as 1826 although ''considerable caution, obviously, should be observed at this stage before applying them to any problem in nomenclature.'' In the present case, there is no reason to discuss this further.

Rhinoceros bicornis capensis Gray, 1868

This name was included in a list of synonyms and attributed to Camper (1780) who never used it in technical form. It has never appeared outside a synonymy and it is unavailable for that reason (International Code of Zoological Nomenclature, article 11d).

Rhinoceros cucullatus Wagner, 1835

The species was described after a stuffed rhinoceros with two nasal horns and skin folds resembling those of *R. unicornis*, formerly in the Zoologische Staatssammlung in Munich. Its locality was unknown but taken to be Ethiopia. It is generally accepted as an artefact whose taxonomic status is irretrievable and of little immediate interest. Even though the specimen may have been artificially shaped or composite, the hide and skull still must belong to some species. Zukowsky (1965: 133) still had the chance to examine the skull and suggested that it belonged to *Diceros bicornis*. For that reason I tentatively listed the taxon in the section on the black rhinoceros in Rookmaaker (1983a), but this was a practical decision rather than a taxonomic judgement. If it was in fact a black rhinoceros, its presence in Germany must be explained. Rookmaaker & Reynolds (in press) gave some early and not too clear references which vaguely suggest that it may have been a specimen which drowned near Mannheim in 1793, put in a natural history collection in that city from where it was later transported to Munich.

Rhinoceros gordoni Lesson, 1842

The story of Gordon's rhinoceros is easily the most remarkable I have yet encountered. Robert Jacob Gordon (1743-1795), a Dutch officer stationed at the Cape of Good Hope, made some expeditions into the South African interior between 1777 and 1786 (Cave & Rookmaaker, 1977; Rookmaaker, 1980b). Some of the results were sent to J. N. S. Allamand in Leiden, who was editing a new edition of Buffon's *Histoire Naturelle* published by J. H. Schneider in Amsterdam. In one of its supplementary volumes, Allamand (1781) published some notes by Gordon on the rhinoceros and reproduced one of his drawings (fig. 3). Gordon had reported that the rhinoceros ,,a 28 dents en tout, sept molaires à chaque coté des deux machoires'' without incisors (Allamand, 1781: 11; see one of Gordon's drawings reproduced by Cave & Rookmaaker, 1977, pl. 4). Several of Allamand's additions to his edition of the *Histoire Naturelle* were reprinted in the supplements to the Paris edition supervised by Buffon. The description of the rhinoceros looks like a faithful citation of Allamand (1781), but the

animal's dentition is silently changed to be ,,vingt-huit dents en tout; savoir six molaires à chaque coté des deux machoires, & deux incisives en haut & en bas'' (Allamand, 1782: 81).

This latter version was known to the French authors of the early 19th century and they had to try to fit an African double-horned rhinoceros provided with incisors into their classifications. Cuvier (1812: 16) believed that Gordon was mistaken. De Blainville (1817: 168), Desmarest (1822: 401) and Lesson (1827: 332) were more doubtful and suggested that the animal may be identical with the rhinoceros described by Burchell (1817). Lesson (1842: 159) finally listed the animal as a variety of *Rhinoceros bicornis*: ,,var. B. *Rhinoceros Gordoni*, Blainv.'' Zukowsky (1965: 33) stated that it was a nomen nudum, although he admitted *R. brucii* as described validly. I consider *R. gordoni* to be available and synonymous with *Diceros bicornis bicornis*.

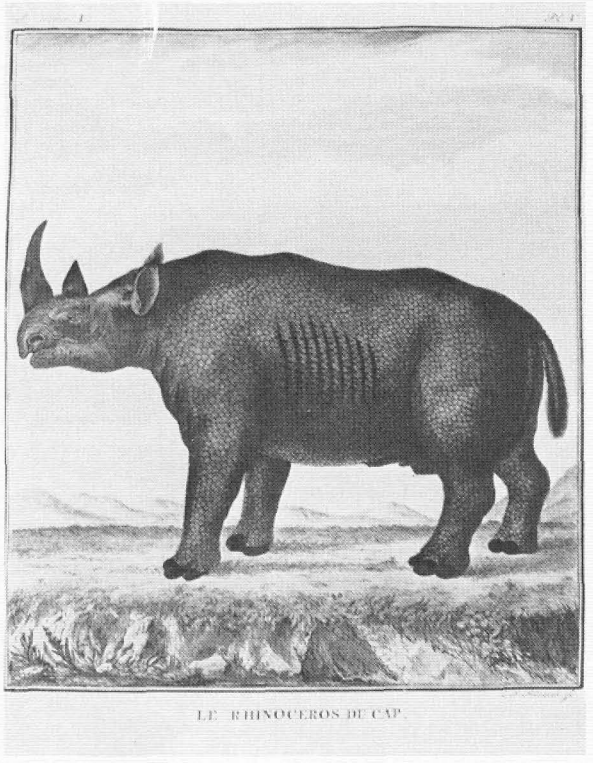

Fig. 3. The black rhinoceros drawn by R. J. Gordon, and published by Allamand (1781, pl. V).

Rhinoceros inermis Lesson, 1838

Lesson (1838: 514) in his description of *R. inermis* referred to a rare booklet by F. Lamare-Picquot (signed ''Lamarepicquot''). Lamare-Picquot (1835) told how he hunted in the Sunderbunds in November 1828 shooting a female rhinoceros and her young of four months. The first must be the animal later described as the holotype of *R. inermis*. The mother ,,était privé de corne'' and probably never had one. Lamare-Picquot thought that it concerned a new variety, if not a species, but he did not propose a binomen. It is not possible to restrict the type locality on the basis of this account.

Rhinoceros jamrachi Jamrach, 1875

This taxon is generally attributed to Sclater (1876: 650 note), who stated that ''Mr. Jamrach ... in October 1874 printed an account of the proposed new species on a sheet of green paper, and proposed to call it *R. jamrachii*.'' The name was given to a rhinoceros caught in Manipur (India) and exhibited in the Berlin zoo from August 1874 until at least 1884. William Jamrach, the importer, believed that it represented an undescribed species and he published this opinion in a pamphlet of 3 (green) pages dated October 8th, 1875. The description is discussed and cited in full by Rookmaaker (1983b). The pamphlet was printed and probably available to anyone interested, although the copy now in the library of the Muséum National d'Histoire Naturelle in Paris appears to be unique. I would consider this to be a ''publication'' in the sense of the Code. The remains of the animal in Berlin are lost. On the basis of morphological characteristics visible in the only known drawing depicting this specimen, I have suggested that it is an example of *R. unicornis* (Rookmaaker, 1977, see Groves & Guérin 1980: 206).

Rhinoceros javanicus Geoffrey & Cuvier, 1824
and
Rhinoceros javanus Cuvier, 1829

Both these names were proposed without much specific information. There is no reason to suspect that they were supposed to indicate a taxon different from *R. sondaicus* Desmarest, 1822. They could even have the same holotype. This is uncertain because it is not known exactly when the different specimens of the Javan rhinoceros arrived in the Paris museum to be examined by Cuvier. The holotype of *R. sondaicus* came in 1821, while Cuvier (1833: 452) could list three complete skeletons of "*R. javanicus*". In any case, both *R. javanicus* and *R. javanus* are junior (objective or subjective) synonyms of *R. sondaicus*.

Rhinoceros simus Burchell, 1817

The first description of the white rhinoceros by William Burchell (1782-1863) appeared, curiously, in French in the ,,Bulletin des Sciences" (Paris) of June 1817, accompanied by one plate with two figures (Burchell 1817). Exactly the same text and plate are again presented in the ,,Journal de Physique" of August 1817 with additional notes on the classification of the rhinoceros by De Blainville. Only in this last paper, it is acknowledged that Burchell wrote his short note on the new rhinoceros in a letter to De Blainville dated ,,Fulham, 3 avril 1817." Burchell later expressed his unhappiness about the plate accompanying the description as De Blainville "has added, in my name, a pair of horns which I knew nothing about" (see Cave, 1947: 144). Figure I in that plate shows a head of a white rhinoceros with Burchell's name below it. Figure II immediately next to it shows a double horn. It remained unexplained in Burchell (1817), while De Blainville (1817: 168) referred to them concerning his ,,Rhinocéros d'Abissinie" saying that these horns were collected by Mr. Satt and that they were preserved in the collection of the Royal College of Surgeons of England in London.

Rhinoceros sondaicus Desmarest, 1822

The type specimen of this taxon is a hide and skeleton (fig. 4) sent to the Muséum National d'Histoire Naturelle in Paris by ,,Diard et Duvaucel" (Desmarest 1822: 399-400). It has been uncertain where this specimen was collected because Desmarest changed his indication of the locality from Sumatra (p. 400) to Java (p. 547). A detailed examination of the published and unpublished sources clearly revealed that the animal was collected by Pierre-Médard Diard in Java (Rookmaaker 1982b). The type locality of *R. sondaicus* is Java.

Rhinoceros sumatrensis Fischer, 1814

Rookmaaker (in press) has presented the taxonomic history of the Sumatran rhinoceros, i.e. *Rhinoceros sumatrensis* Fischer, 1814 and related taxa: *sumatranus, crossii, lasiotis, niger, blythii, malayanus, borniensis, sinensis* and *harrissoni*. The description by Fischer (1814) was based on the account of the species provided by Bell (1793). The same name, *R. sumatrensis*, was proposed independently two years later by Cuvier (1816: 240). Cuvier's *Règne Animal* (1st edition) bears the date 1817, but it was certainly available as early as November 1816 (Whitehead, 1967; Cowan, 1969b; Roux, 1976). Groves (1967a: 235) mentioned the presence of "the type specimen of *Rhinoceros sumatrensis* G. Cuvier, 1817 ... in the Musée d'Histoire Naturelle of La Rochelle (France)." This is confirmed by Dr. R. Duguy (in litt. 29.10.1982) adding that ,,il s'agit d'un mâle adulte donné par Diard et Duvaucel dont le montage (M. 275) a été offert par le Pr. Bourdelle (Muséum National, Paris) au Museum de La Rochelle, en 1931." Neither Alfred Duvaucel (1793-1824) nor Pierre-Médard Diard (1794-1863), however, left Paris before 1817 to collect animals in India and S. E. Asia. While the specimen in La Rochelle is certainly most interesting, it cannot have been examined by Cuvier in 1816. It is probable that Cuvier's description too was based on Bell (1793).

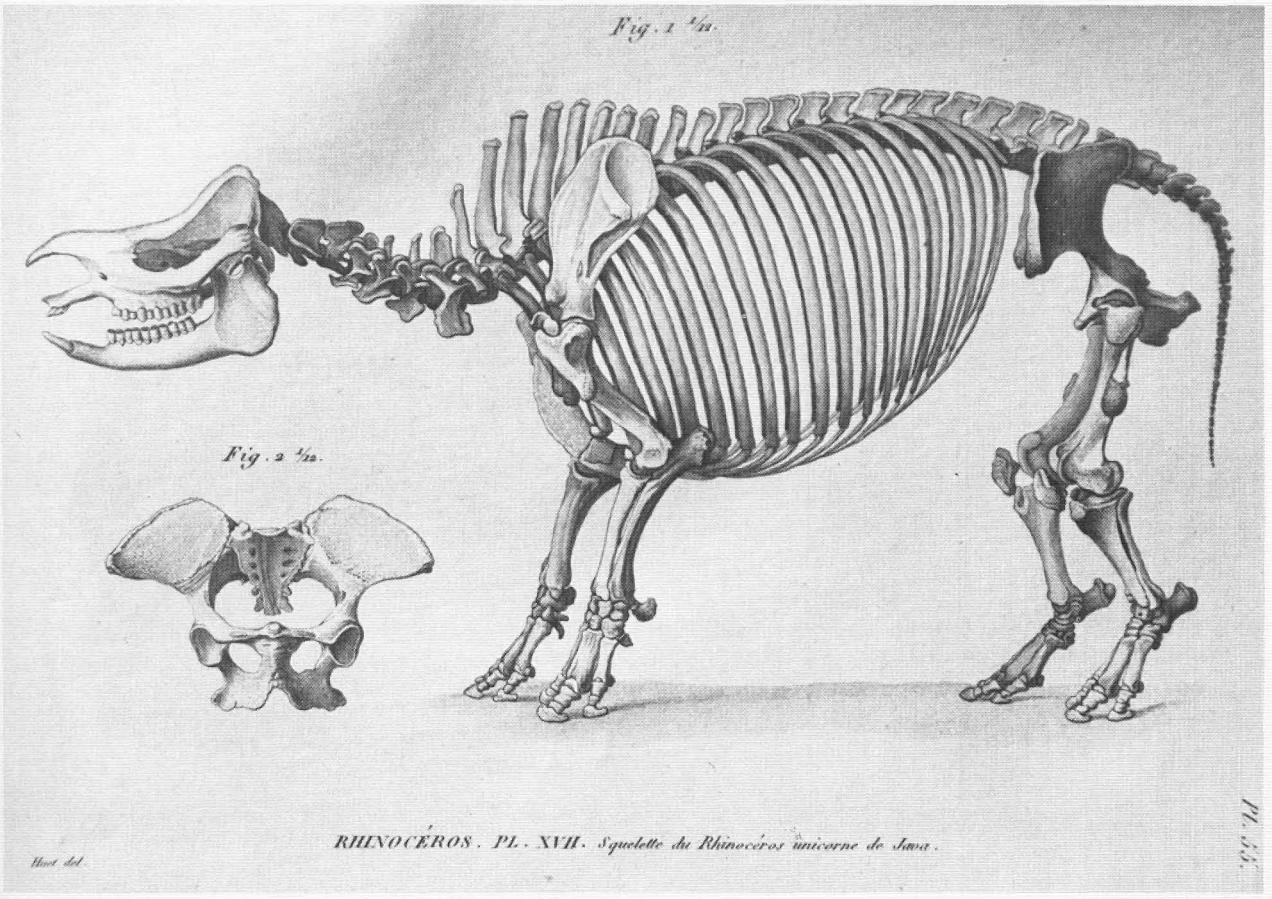

Fig. 4. The skeleton of the type specimen of *Rhinoceros sondaicus* in the natural history museum of Paris, figured by Cuvier (1836b, pl. 55).

THE CLASSIFICATION OF J. F. BRANDT (1878a)

Brandt (1878a) presented an extensive and intricate classification of all (fossil and recent) known rhinoceroses. It was written in Latin and consequently it did not receive the attention it deserved. His results concerning the recent species are given in Table 2. This shows that Brandt recognised a multitude of subdivisions which have remained unemployed since his publications. He admitted several varieties within the two African species on the morphology of the horns with the assertion that these could have a geographical foundation. Rookmaaker (1983a) did not list these names among the other valid taxa, but at present I don't think there is any reason not to accept them as described validly in the species group. Brandt (1878a) gave the following diagnoses:

Atelodus bicornis

varietas α: *Plesioceros*, horns shaped conically, bases together; posterior horn much shorter than anterior one. Figured by Sclater 1876, fig. 7.

varietas β: *Porrhoceros*, with some distance between the two horn bases: posterior horn shorter than anterior one. Figured by Sclater 1876, fig. 9.

varietas γ: *Platyceros*, horns shaped differently. Figured by Sclater 1876, fig. 8 and pl. XCIX. Is "*Rhinoceros bicornis* capensis P. Camper, *Rhinoceros camperi* Schinz".

Atelodus simus

varietas α: *Camptoceros*, anterior horn bent backwards.

varietas β: *Prostheceros*, anterior horn bent forwards.

It would appear possible to define these names further on the basis of the figures in Sclater (1876). This presents difficulties because Brandt defined his varieties according to the morphology of the horns, while the subspecies presently recognised are defined on general morphology in connection with zoogeography. Sclater (1876, fig. 7) shows the head of a *R. bicornis* "from a specimen in the British Museum", but I am unable to be certain which specimen this would have been. Sclater's figure 9 shows the head of the black rhinoceros in the Berlin zoo (1870-ca. 1884/7) which had been captured in upper Nubia (Sudan). On geographical grounds, it would be *D. bicornis brucii*. Sclater's figure 8 is the head of *R. keitloa* in the British Museum, probably the type specimen of *R. keitloa* Smith, 1836. The plate XCIX shows the black rhinoceros exhibited in the London zoo from September 1868 until 1898, also caught in Sudan and representing *D. bicornis brucii*. *Porrhoceros*, then, would be synonymous with *D. b. brucii*, but the subspecific status of *plesioceros* and *platyceros* remains uncertain. There is no reason to assume that the two varieties of the white rhinoceros, *camptoceros* and *prostheceros*, would differ from *Ceratotherium simum simum*.

The result of Brandt (1878a) were summarized very briefly by himself (Brandt 1878b, c, 1879). The classifications presented there are not identical in every detail, e.g. some subdivisions were deleted, subfamilies were named differently and the order is changed. It may be noted that *Dihoplus* Brandt, 1878 is spelled *Dyhoplus* in Brandt (1878b, c).

Table 2. Classification of the genera and recent species of the subfamily Rhinocerotinae as presented by Brandt (1878a).

Subfamilia IV: Rhinocerotinae
- cohors A: Holodemnodontes
  - [Tribus] a: Ecornes
    - Genus 1: *Aceratherium*†
    - Genus 2: *Diceratherium*†
  - [Tribus] b: Unicornes
    - Genus 3: *Rhinoceros*
      - Recent species: *R. inermis, R. sondaicus, R. unicornis*
  - [Tribus] c: Bicornes
    - Genus 4: *Ceratorhinus*
      - Recent species: *C. sumatrensis, C. lasiotis, C. cucullatus*
    - Genus 5: *Dihoplus*†
- cohors B: Colobotemnodontes
  - Genus 6: *Atelodus*
    - Subgenus 1: *Tichorhinus*†
    - Subgenus 2: *Mesorhinus*†
    - Subgenus 3: *Colodus*†
    - Subgenus 4: *Colobognathus*
      - Sectio A: Dactylochilus
        - Species: *A. bicornis*
          - Varietates: plesioceros, porrhoceros, platyceros
      - Sectio B: Cyclochilus
        - Species: *A. simus*
          - Varietates: camptoceros, prostheceros

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