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## Additional Data on Rhinoceroses in Captivity

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With 9 Figures

The recent literature on the rhinoceroses in captivity is extensive and enables a persistent student to retrieve the relevant information about most specimens ever exhibited. REYNOLDS (1961—1970) published the first retrospective catalogues listing all individuals of the 5 living species which have been kept in travelling shows, circuses, zoological gardens and private collections. These pioneer efforts unavoidably indicated some gaps and problems and stimulated further research.

The rhinoceroses displayed in the arenas of ancient Rome were briefly reviewed by TOYNBEE (1973). Between 1500 and 1800, 8 Indian rhinoceroses (*Rhinoceros unicornis*) were exhibited in many parts of Europe. Their life histories and iconographies have recently been discussed by ROOKMAAKER (1973a, 1978) and by CLARKE (1973, 1974, 1976). The papers by REYNOLDS (1961—1970) recorded the majority of specimens exhibited between 1800 and 1960. KOURIST (1969, 1970, 1973, 1974) presented additional information, and illustrations, of some little known animals of all species. The period since 1960 is largely covered by 3 international studbooks, which intend to register and keep an account of the individual animals comprising the captive populations of the Indian and African species. The Basel zoo keeps the studbook of the Indian rhinoceros. The 1st edition of their records (LANG 1975) must be used with considerable care due to the large number of inaccuracies (we counted some 25). Fortunately, the 2nd edition (RÜEDI and TOBLER 1980) is more carefully prepared and includes several new specimens. LANG et al. (1977) analyzed 36 captive births of this species recorded between 1856 and 1975. The West Berlin Zoo maintains the studbooks of both the black rhinoceros (*Diceros bicornis*) and the white rhinoceros (*Ceratotherium simum*). These have been published by KLÖS and FRÄDRICH (1970, 1971) and by KLÖS and FRESE (1977, 1978), and new editions of both studbooks appeared in 1981. The numerous captive births of the black rhinoceros, some 77 between 1941 and 1972, were reported by REUTHER (1972) and ROOKMAAKER (1973b). RAWLINS (1979) discussed the comparatively recent but growing number of births among captive white rhinoceroses.

This formidable mass of data clearly leaves no room for yet another comprehensive exposition. Several animals, however, are not, or are insufficiently treated in the publications mentioned above. The aim of the present paper (written during 1981) is to supplement, clarify, or correct the previous accounts, focusing primarily on the rhinoceroses in European travelling menageries of the 19th century (section I), in American circuses until 1930 (section II) and in zoological gardens after 1800 (section III).

### I. European Travelling shows 1800—1900

It is extremely difficult to discover the full itineraries of the rhinoceroses which were toured through Europe by travelling showmen during the 19th century. The histories of these menageries as a whole apparently have not yet been written. Concerning the rhinoceros, one sometimes encounters fragments of their lives in the literature. In most cases we are told that an unspecified rhinoceros was shown in a certain place on a certain date. It is rarely possible to be certain about links between events mentioned in these various sources. We have grouped the available data conservatively into as few cases as possible, with the consequence that some of the following histories may in fact combine the wanderings of more than a single specimen.

#### TOURNIAIRE'S rhinoceros (1810—1839)

This ♂ Indian rhinoceros arrived in London in 1810; it was brought to the continent in 1814 and toured through Western Europe until its death in 1839. An earlier compilation of the scattered literature and some pictorial representations of this specimen by ROOKMAAKER (1973a, 58—59) was rather unsatisfactory and excluded the important summary by FITZINGER (1860, 51—52). A few additional contemporary depictions of this rhinoceros were presented by SCHINZ (1824—29) (see fig. 1), KOURIST (1974, fig. 2) and HEIKAMP (1980, fig. 20). The animal belonged to TOURNIAIRE who took it to many European cities as summarized below, according to FITZINGER (1860) or to the sources cited in ROOKMAAKER (1973a) unless otherwise stated.

The rhinoceros arrived in London in 1810, it was shown in Amsterdam by A. ALPY in 1814 (KEYSER 1976, 146) and brought to Paris by JACQUES TOURNIAIRE in 1815.

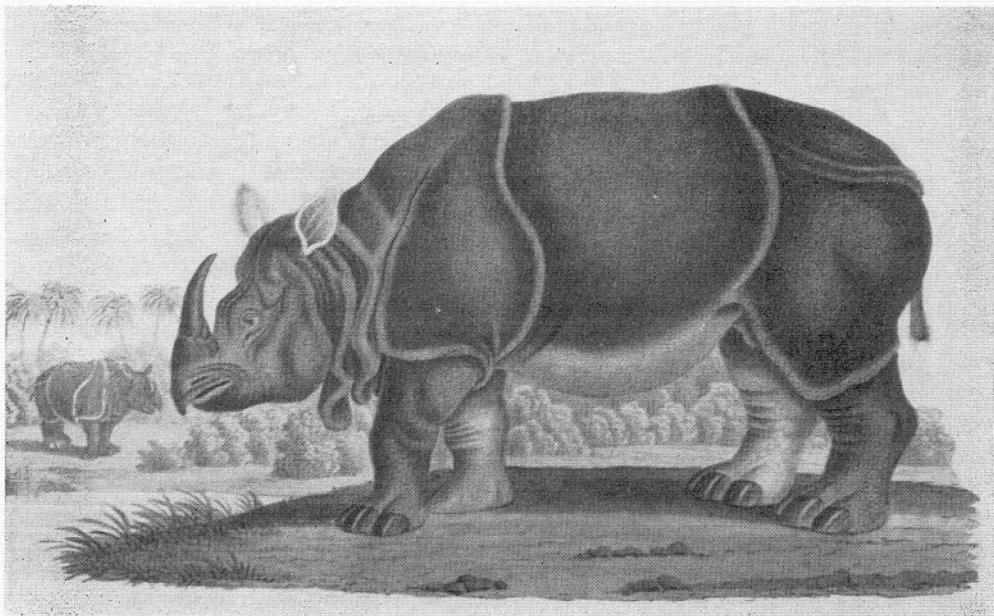


Fig. 1. TOURNIAIRE'S Indian rhinoceros in Germany, a plate published by HEINRICH SCHINZ

It visited Frankfurt a/d Oder (not am Main!) in 1816 (HUFNAGEL 1873), Nuremberg about 1816—1817, Munich in February and March 1817 (VOGEL 1817) and Vienna in 1818. Continuing its tour, it probably visited places in Germany, France and Switzerland (SCHINZ 1824—29, 11), being exhibited in Leipzig in April 1819 and in Hamburg in 1820 where it was drawn by C. SUHR (HEIKAMP 1980, 319). It was shown in Amsterdam in 1824 by Madame TOURNIAIRE (KEYSER 1976, 146), Paris in 1833, Berlin and Munich in 1834, Dresden in 1835, Vienna in 1836 and, finally, in Moscow and St. Petersburg in 1838. It succumbed during the heavy winter of 1839 while staying in Königsberg (the present Kaliningrad, U.S.S.R.). Its hide was stuffed and deposited in the Royal Museum of Königsberg (FITZINGER 1860). At present, these remains are no longer in the Regional Museum at Kaliningrad.

#### Liverpool rhinoceros (1834—1838)

This specimen was caught in India when still accompanying its mother. It was shipped from Calcutta and arrived in London in June 1834. A Mr. ATKINS bought this animal. He allowed the Dublin Zoo to hire it for one month in 1835 (T. MURPHY, in litt.). Subsequently, the rhinoceros was on exhibit in Glasgow and Edinburgh, the visit to the latter city being around September or October 1836. While in Edinburgh, it was said to be six years old, 4 feet 6 inches high and 129 and  $\frac{3}{4}$  inches long (JARDINE 1836, 171—173, pls. 8—9). Finally, the animal was shown in the Liverpool Zoological Gardens which were opened by Mr. ATKINS in 1833. It was still there in 1838 according to a contemporary guide-book, but its date of death and the disposition of its remains are not clear. It was a *Rhinoceros unicornis*.

#### SCHREYER's rhinoceros (1840—1843)

FITZINGER (1860, 52) mentioned a rhinoceros which "erhielt der Menagerie-Besitzer SCHREYER 1840 zu London ... und nachdem es in einem ziemlich grossen Theile von Deutschland zur Schau gestellt war, im April 1843 zu Stettin [Szczecin, N. Poland] zu Grunde ging." The Naturhistorisches Museum of Vienna received the skin and skeleton of this ♀ *Rhinoceros unicornis* in December 1844 and bought these remains in 1845 "von Herrn SCHREYER aus Berlin ... um 600 fl." (F. SPITZENBERGER, Vienna, in litt. 18. I. 1980).

#### HUGUET's rhinoceros (1840—1854)

KOURIST (1973, 149) discovered the informative account by GEORG v. MARTENS (1850, 107—110) about the visit of HUGUET's travelling menagerie to Stuttgart in January 1848. The French keeper of the rhinoceros, a man named CARRIÈRE, related the following story to VON MARTENS. CARRIÈRE had bought the animal at the auction of the menagerie which had belonged to the deceased Dutch governor of Sumatra. It had been caught 31 years earlier in the neighbourhood. The animal arrived in Europe around 1840. It was shown in Paris and while there, perhaps in early 1847, was purchased by the Jardin des Plantes for no less than 140,000 francs. However, the beast did not immediately become a resident of the zoo. Rather, the Jardin allowed CARRIÈRE to keep it on tour for another few months. Subsequently, while in Brussels, a grenadier was badly mauled by the rhinoceros and later died of his injuries. Finally, at the end of

1847, or early 1848, the menagerie with the rhinoceros arrived in Stuttgart. There its story was recorded by VON MARTENS (1850), who added about the specimen, called "Riese *Jotete*", that it had a single horn (sawn off) and was 12 feet long, 6 1/2 feet high, and 16 feet in circumference.

There are some other sources which possibly refer to the same animal. In 1841, ESPEROU and the OUVRIER brothers showed a ♂ rhinoceros named "*Joyeté*", 35 years old, to the public in Amsterdam while it was about to be sold to Paris (KEYSER 1976, 146). This or another rhinoceros was exhibited in Amsterdam in 1846 (KEYSER, loc. cit.). KRAUSS (1851, pl. 26 fig. 2) published an illustration of an Indian rhinoceros "nach einem in Jahr 1847 zu Stuttgart vorgezeigten lebenden Thier" [See: fig. 2]. At about

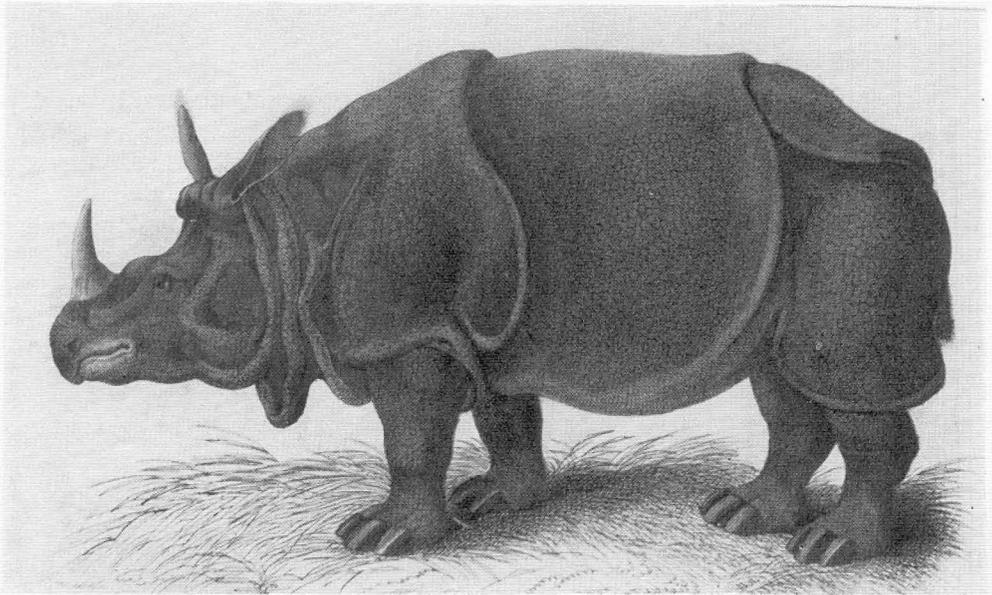


Fig. 2. An Indian rhinoceros shown in Stuttgart, Germany in 1847 (HUGUET's rhinoceros) from KRAUSS (1851)

this time, the German anatomist C. MAYER (1847, 60) examined a ♂ rhinoceros at an unspecified place and date. This specimen, "welches aus dem zoological garden von Liverpool herrührte", was 12 feet long, 6 feet high, 16 feet in circumference, weighed 5500 pounds and was 35 years old. While these measurements and age correspond closely to VON MARTENS 1850 description of the HUGUET rhinoceros, the reference to Liverpool is confusing. The age — 35 years — seems to bar any connection to the 'Liverpool rhinoceros' mentioned above, which had only reached age 6 by 1836.

The Paris part of CARRIÈRE's story of the HUGUET rhinoceros is supported by GERVAIS (1855, 165) who says that recently a large specimen of the Indian species was found in the "Ménagerie de Paris", and by CHENU and DESMAREST (1858, 4) who report that the Paris Ménagerie exhibited a rhinoceros from May 1850 until its death on 27. XI. 1854. This account certainly suggests that HUGUET's arrangement with the Jardin des Plantes allowed him to continue touring with the animal until May 1850, when it went on permanent display at the zoo.

There are some contradictory clues about the specific identity of this specimen. The figure in KRAUSS (1851) certainly depicts a *R. unicornis*. VON MARTENS (1850) called it a "*Rhinoceros javanus* Cuvier" but his reasons are not clear. He claimed, however, that it differed from a "früher gesehene indische Nashorn" which might refer to SCHREYER's rhinoceros. If HUGUET's rhinoceros in fact was caught on Sumatra, it must have belonged to the Javan species (*R. sondaicus*) due to its single horn and large size. According to CARRIÈRE, the animal was captured about 1815. At the time, the existence of the single-horned rhinoceros on Sumatra was practically unknown (HOOIJER 1946). RAFFLES (1830, 441) searched for it, after which he wrote to WILLIAM MARSDEN in March 1820: "as yet I can only trace the two-horned animal in Sumatra." A final judgment on the identity of HUGUET's rhinoceros requires further evidence.

#### WOMBWELL's rhinoceros (ca. 1870)

BUCKLAND (1882, 217–218) informed us that "Mr. EDMONDS has a very fine one-horned rhinoceros, which has been in the show twenty-one years, and which cost £1400 at the sale of the animals at the Manchester Zoological Gardens." JAMES EDMONDS was the proprietor of a travelling menagerie formerly owned by GEORGE WOMBWELL (1778–1850) since the early 19th century (BLUNT 1976, 20, 227). The Belle Vue Zoo Park of Manchester opened its gardens to the public in June 1836, but we have no knowledge that it sold its animals in the 1850's or 1860's. Instead, BUCKLAND may have been referring to a separate zoological garden which operated in Manchester from 1838 until 1841. According to C. H. KEELING of Guildford, England (in litt. 18. VIII. 1979), this other Manchester zoo was run very scientifically, and in 1840 published a list of its species which included a ♀ Indian rhinoceros. However, the 1840 date would seem rather too early for the animal described by BUCKLAND.

During 1872 the VAN AMBERGH circus in the United States imported a large collection of animals, including a rhinoceros with 2 horns, that had been purchased from the "WOMBWELL collection in Edinburgh" (see section II of the present paper for further details). This could have been the specimen mentioned by BUCKLAND (1882), but then it would be necessary to explain the difference in the number of horns.

#### Miscellaneous

Undoubtedly, there have been more rhinoceroses in European travelling shows during the 19th century. Some of them have left minor traces in the literature, and it may be clarifying to record these in one place.

According to C. H. KEELING (in litt. 18. VIII. 1979) there is brief and vague mention of a rhinoceros exhibited at PIDCOCK's Menagerie in the Strand, London in the early 19th century. In 1810 that show was visited by the poet, LORD BYRON, who asserted that he saw a *Hippopotamus*. That cannot be correct as the first such animal shown in England did not arrive there until 1850. Perhaps the famous bard really saw a rhinoceros and simply named the wrong pachyderm? (C. KEELING, in litt.). If so, this could be the same animal as the previously mentioned TOURNIARE's rhinoceros which was stated to have been exhibited in the Exeter Change Menagerie in London from 1810 (ROOKMAAKER 1973a, 58).

About 1857, the zoological garden of Marseilles received a rhinoceros "d'une ménagerie ambulante qui, pendant onze ans, l'a promené dans toute l'Europe enfermé dans une

cage étroite" (SACC 1861, 37). EVERSMAAN (1861) referred to it as a rhinoceros from Java, but the reliability of that identification is not clear (KOURIST 1970, 141). The animal would have reached Europe about 1845, or a few years later than HUGUET's rhinoceros. In August 1874, the menagerie of KALLENBERG showed an (Indian?) rhinoceros in Breslau, the present Wrocław, Poland (GLEISS 1967, 43). This is not the black rhinoceros (*Diceros bicornis*) which lived in the Wrocław zoo from May 1888 until ca. 1892. The latter specimen "war schon im Jahre 1878 mit einer Nubier-Karawane aus Afrika auf unseren Kontinent gekommen und hatte die längste Zeit seines bisherigen Daseins im engen Raum eines Menageriewagens zugebracht" (GLEISS 1967, 42). The menagerie of EHLBECK showed a Sumatran rhinoceros (*Dicerorhinus sumatrensis*) in Germany in 1895 (KRUMBEGEL 1960). Finally, for the sake of curiosity, we also would like to record a poster from the 1890's depicting an Indian rhinoceros pulling a wagon with "SAM HAGUE's original slave troupe at St. James' Hall, Lime Street, Liverpool" (PALMER 1976, 77).

## II. American Circuses 1830—1930

REYNOLDS (1968, 1970) wrote about the numerous rhinoceroses exhibited by American travelling menageries and circuses throughout the 1800's while VAIL (1956), POLACSEK (1973), and THAYER (1975) concentrated on the first ones arriving in America during that century.

The earliest references to these animals in America come from VAIL (1956, 21) who says that a "one-horned rhinoceros" was shown at PEALE's Museum in New York on 16. X. 1826 and that it reappears, 3 years later, in June and July 1829 at 350 Broadway in the same city. However, circus historian STUART THAYER (1975) believes the 1826 specimen was stuffed, basing his opinion on the failure of the advertisements to claim it as a living animal, a distinction which he says was almost invariably made when such was the case. As to the rhinoceros at 350 Broadway, THAYER's research of then contemporary advertisements causes him to conclude that this was the first living rhinoceros in America, but that the date of the exhibition was in June and July of 1830 — not 1829 as stated by VAIL.

American travelling menageries were both popular and numerous in the 1830's. However, they often assumed new names, changed ownership, and traded their animals, much of which was only poorly or obscurely recorded at the time. Given such conditions, it is most difficult to specifically identify and trace individual animals. Circus historians have done considerable research on the subject, but much work remains. Both POLACSEK (1973) and THAYER (1975) try to account for the different rhinoceroses imported between 1830 and 1835. The former offers the view that seven rhinoceroses came to America during those years while the latter, in response, says that POLACSEK overcounted and that there were only four. Based on FLINT (1970), REYNOLDS (1968), POLACSEK (1973), and THAYER (1975 and in litt. 20. VII. 1981) we offer the following composite of available information about the first 4 living rhinoceroses whose arrival in America can be established with reasonable certainty, to wit:

1. ♂, approximately 5 years old arrived at Boston, Massachusetts on 9. V. 1830. It was claimed to be, and would appear to have been, the first living rhinoceros ever brought to America. Captured when 3 months old in the foothills of the Himalayas near a branch of the Ganges River, it was sent to a rajah in Calcutta from whom it was purchased in January 1830 and shipped to America. Upon

arrival it was exhibited at Boston's Washington Gardens and then at 350 Broadway, New York in June and July 1830. Later that year it was shown in Philadelphia (September and October) and Washington (December). This animal became the property of Messrs. JUNE, TITUS, and ANGEVINE menagerie owners of New Salem, New York. They had it on tour with their American National Caravan (1831), National Menagerie also called Grand National Menagerie (1832 and 1833), and JUNE, TITUS, ANGEVINE & Co. (1834). Good drawings and detailed descriptions of this animal in advertising posters and heralds strongly suggest that it was *R. unicornis*. During the winter of 1834–1835 it was shown at permanent exhibition quarters in New York City. In January 1835 most of the major American menagerie owners organized an association known as the Zoological Institute. That spring, 1835, the New York branch of the Institute sent this first American rhinoceros on tour with "The Association's Celebrated and Extensive Menagerie and Aviary," but it died early in the itinerary.

2. ♂, 3 years old, weighing 1,590 pounds, arrived at Philadelphia from Calcutta in October 1830 aboard the ship "Georgian". It was said to have been taken in the interior of Asia on the Burrampooter (sic) River and imported by Doctor BURROW of Philadelphia where it was exhibited from 9. XII. 1830 to 3. I. 1831. Later that month it was sold at auction but was again shown in Philadelphia in March, 1831. It became the property of RAYMOND and OGDEN who exhibited it with their "New and Rare Collection of Living Animals" in Painesville, Ohio on 27. VII. 1831. It was shown throughout 1832 and 1833, and was possibly the rhinoceros at Marietta, Ohio with RAYMOND & OGDEN on 11. X. 1834. It is described in an account of the Association's Menagerie and Aviary at Pittsburgh, Pennsylvania on 11. VIII. 1835, and may have been the animal shown by RAYMOND & OGDEN at Piqua, Ohio in 1836. This rhinoceros seems to have been an example of *R. unicornis*.

3. Another rhinoceros from the Burrampooter (sic) River arrived in America in December 1834 and was assigned to the menagerie firm of PURDY, WELCH and Company, the Philadelphia branch of the Association's Zoological Institute. This rhinoceros was on tour in 1835 and, like the examples imported in 1830, would appear to have been *R. unicornis*. It may have been a ♀ because a rhinoceros of that sex was offered for sale in an auction of Zoological Institute animals in August 1837.

4. Large ♂, arrived at Boston from Cape of Good Hope, Africa around 19. V. 1835 aboard the ship "Susan". The Newport "Rhode Island Republican" for 8. VII. 1835 says this was a two-horned animal. This is quite likely because it was imported by the Boston Zoological Association which had established animal collecting operations in South Africa and had received previous shipments from the Cape of Good Hope in 1833 and 1834. This presumed African rhinoceros was exhibited in Boston on 1. VI. 1835 with "The Entire New Menagerie" of MACOMBER and WELCH.

In the early 1870s a number of specimens that could be either black (*Diceros bicornis*) or Sumatran (*Dicerorhinus sumatrensis*) rhinoceroses were brought to America, all of them for the menageries of travelling circuses. The word "black" was indiscriminately and carelessly used by the showmen to refer to rhinoceroses of all species while descriptions of bicornity could apply to both African and Sumatran animals. For example, references to a "black" rhinoceros with the P. T. BARNUM and later the OLDER & CHANDLER circuses in 1872–73 caused REYNOLDS (1963 and 1968) to conclude that it was an example of *D. bicornis*. However, when the animal was offered for sale in March 1874, it was described as "a Black Sumatran rhinoceros" (REYNOLDS 1970).

Another rhinoceros, which might have been *Diceros bicornis*, arrived in North America in 1872 for the VAN AMBERGH circus. Its manager, HYATT FROST, wrote an interesting letter, dated 6. VI. 1872, wherein he says: "Mr. FERGUSON arrived from Europe two weeks since with a large and very valuable collection of animals and on last Saturday they arrived at St. Marys, Canada. Most of these animals were purchased of WOMBWELL Collection in Edinburgh, Scotland, among which is a Black 2 horned Rhinoceros the

first ever in America and the second ever in Europe" (F. PFENING, III, Columbus, Ohio in litt. 15. VI. 1968). If this had been an African rhinoceros, Mr. FROST's "first ever" claim should be tempered by the information that an earlier example arrived in Boston in June 1835, as pointed out above. On the other hand, if his rhinoceros had been a Sumatran, Mr. FROST's claim could well be accurate.

Between January and October 1872, at least 4 Sumatran rhinoceroses (*D. sumatrensis*) reached Europe, one of which was "purchased by an agent of one of the American travelling menageries and exported to New York" (SCLATER 1872). Then there was the ♀ that arrived in London on 7. XII. 1872, gave birth aboard the docked ship (calf did not survive), and was then shipped to the United States (BARTLETT 1873). These animals may have been 2 of the possibly 4 Sumatran rhinoceroses exhibited by American circuses in the 1870's, data about which we should summarize as follows:

1. The specimen with the P. T. BARNUM Circus in 1872 and then with the OLDER & CHANDLER circus mentioned above. The latter got into financial difficulty in Louisiana and was sold at auction in 1873. A list of its properties dated 19. IX. 1873 includes "one wagon containing rhinoceros appraised at 6,000." The purchaser was JAMES CUMPSTON, who, in turn, placed an advertisement in the New York "Clipper" for 21. III. 1874 offering to sell a black Sumatran rhinoceros and its cage wagon for \$ 5,000 (REYNOLDS 1970).

2. The JOHN ROBINSON Circus, headquartered in Cincinnati, Ohio, visited Atlanta, Georgia in November 1872. The advertisements claimed a "black Sumatran rhinoceros"; and the local newspaper reporter, who saw the show, verified that a "rhinoceros" was on display. In 1873, a JOHN ROBINSON advertising brochure stated that one of the features of the menagerie is a: "Black Double-horned Sumatran Rhinoceros, captured on the island of Sumatra, in the year 1869, at a cost of \$ 15,000 in gold ... arriving in this country, after a voyage of fourteen months, for Old JOHN ROBINSON's great tenting campaign of 1873" (F. PFENING collection, Columbus, Ohio). Disconcertingly, the brochure includes a drawing of an Indian rhinoceros, which, however, may reflect nothing more than carelessness in selecting the artwork (REYNOLDS 1970).

3. The ADAM FOREPAUGH Circus, headquartered in Philadelphia, exhibited an animal in 1874 which was advertised as "a monster two-horned hairy rhinoceros." It died as the result of injuries sustained on 13. X. 1875 when its cage wagon fell through a bridge while the caravan of circus wagons and teams was en route between Amsterdam and Schenectady, New York (REYNOLDS 1970).

4. In 1877 and 1878 the notable American showman JAMES A. BAILEY took his COOPER & BAILEY Circus on a tour of Australia, Java, and New Zealand. There were one or more rhinoceroses with that show. STUART THAYER (in litt. 17. III. 1979) furnished RJR with newspaper descriptions of the COOPER & BAILEY rhinoceros(es). According to a Melbourne, Australia newspaper of December 1877, the menagerie included "a double-horned hairy rhinoceros". Another account from early 1878 states that the rhinoceros "naturally possesses only one horn ... he is also hairy, which is not a common occurrence, the average rhinoceros being bald." The Auckland "New Zealand Herald" for 26. IV. 1878 said: "The two-horned rhinoceros is a huge and melancholy creature ... [T]he 'horns' are mere callosities, for he is a very young beast as yet ... [H]is ... hide gives growth to a few black bristles." While the bicornity and hairiness mentioned in these reports certainly suggest that the specimen was a Sumatran rhinoceros, a Wellington, New Zealand newspaper from April 1878 confuses the issue by identifying the specimen as "one of two (rhinoceroses) captured on the Nile by H. PAUL, both of which were shipped to the U. S."

REYNOLDS (1961a) earlier described a rhinoceros which escaped on board the ship "Colon", giving the date as 1879 and the animal's species as *R. sondaicus* because it was said to have come from Java. That date and place of origin came from the account

of the escape in "Der Zoologische Garten" (1879, 157). It now appears that the event took place in 1877, instead of 1879, and that the animal was *D. bicornis* and not *R. sondaicus*. The rhinoceros was en route from New York to the MONTGOMERY QUEEN Circus then wintering in the San Francisco bay area of California. According to the New York "Clipper" of 24. II. 1877: "a rhinoceros with two horns, one very large horned horse, a monster Bengal tiger, and two leopards were shipped to California for MONTGOMERY QUEEN's Circus and Menagerie, 15. II., per steamship Colon." This also agrees with other substantial information that MONTGOMERY QUEEN received a double-horned African rhinoceros in California in 1877 and kept it with his travelling show until it was sold to the SELL's Brothers of Columbus, Ohio on 21. II. 1878 (REYNOLDS 1968, 1970).

2 rhinoceroses exhibited with the RINGLING Brothers Circus during the early 1900's require some further comments. Probably the last *D. sumatrensis* kept in the United States was received on 25. III. 1902 by the New York Zoological Park (Bronx Zoo). It was a ♀ from Perak, Malaysia (REYNOLDS 1961a, 1967). Owing to then crowded conditions at the zoo, the rhinoceros had to be exhibited in a cage designed for an orangutan (New York "Daily Tribune", 30. III. 1902). This was an unsatisfactory arrangement and on 16. XII. 1902 the zoo sold the animal to the RINGLING Brothers and shipped it to their winter quarters at Baraboo, Wisconsin (REYNOLDS 1961a, 1967). The Circus World Museum, located on the former site of the RINGLING quarters in Baraboo, has the original correspondence pertaining to this transaction. On 20. XII. 1902, WILLIAM T. HORNADAY, director of the New York Zoological Park, sent the circus a receipt acknowledging payment of \$ 5,000 for "one female Sumatran rhinoceros." 2 days later, HORNADAY wrote to the RINGLING Brothers giving detailed instructions about the care of the animal, as follows:

"Our exact treatment of the Sumatran rhinoceros has been as follows: 'In the morning, after giving her water, the following mash was prepared: — 3 loaves of graham bread, cut in course cubes; 1/2 dozen medium sized carrots; 1/2 dozen potatoes; 1/2 head of cabbage; 1 pint of bran; 1/2 handful of salt. In the afternoon, (about 4 P.M.), after watering her the second time for the day, she usually drinking about a pail and a half of water, we gave her a bundle of clover hay, — about 16 pounds. We tried several ways of feeding her, and found she did best as stated above. She was given no hay in the morning, and provided with peat bedding during the day, as she would eat considerable quantities of the ripe straw bedding, when provided with the same. The mash given in the morning, when well mixed, just filled a sixteen quart pail.'

I regret to say that we never had an opportunity to procure a good photograph of this rare and interesting animal. If, next spring, you should ever have her in the open air, when a photographer is about, pray do us the favor to have a good photograph made of her, showing full side-view, for us to keep as a record. We had intended to take several pictures of her at the earliest opportunity; but were never able to get her in the open air. Of course it is impossible to photograph her in a building or cage."

The rhinoceros duly arrived at the circus winter quarters in Baraboo, and according to the New York "Clipper" (24. I. 1903) was said to be satisfied with conditions there. As to HORNADAY's request for a photograph, there is an undated picture of a two-horned rhinoceros inside its cage wagon under the menagerie tent of the RINGLING Brothers Circus (REYNOLDS 1967, fig. 5), but the animal is not revealed with sufficient clarity to make a positive identification of its species. While there is no definite proof of its continued existence after the "Clipper" report of January 1903, a Sumatran rhinoceros

is mentioned in RINGLING advertisements as late as 1917 (REYNOLDS 1961a, 1967). However long before that the RINGLING's had purchased an Indian rhinoceros (ca. 1907) and an African black rhinoceros (1909), transactions which hint that the 1902 Sumatran had died sometime earlier.

An African *Diceros bicornis* joined the RINGLING circus in 1909. In a letter from their Baraboo winter quarters on 18. II. 1909 (F. PFENING collection), the RINGLINGS wrote to LOUIS RUHE confirming their purchase of "one Male, African, Double Horned Rhinoceros, about 44 inches", to be delivered to the circus at Madison Square Garden, New York between 20. and 25. III. 1909. The purchase price was \$ 4,000 (S. BRAATHEN, in litt. 28. II. 1967). This may be the "Largest Two Horned Rhinoceros in Captivity" exhibited in the menagerie of the RINGLING Brothers Circus at Atlanta in 1916 (Atlanta "Georgian", 9. X. 1916).

Finally we have obtained specifics about yet another circus rhinoceros from the early 20th century — a young African black acquired by the BARNUM & BAILEY Circus during the early months of 1905 (New York "Clipper", 11. III. 1905, p. 63). At that time BARNUM & BAILEY was a separate circus from RINGLING Brothers, the 2 shows

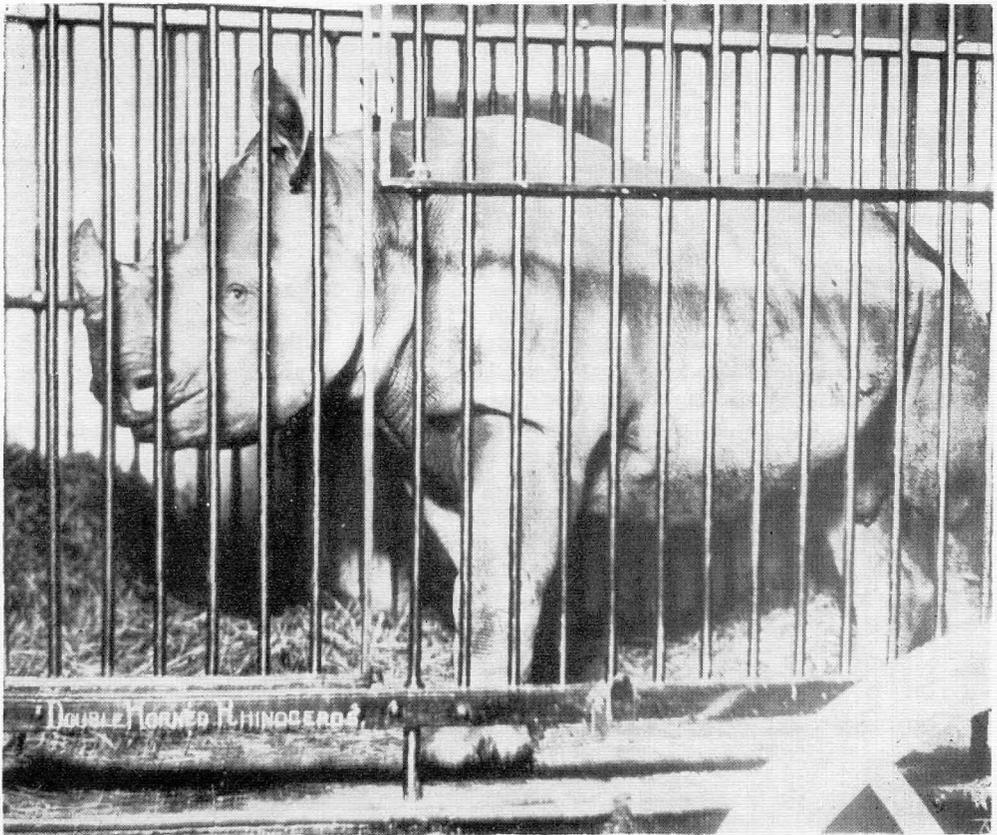


Fig. 3. African black rhinoceros in its cage wagon in the menagerie of the BARNUM & BAILEY Circus, 1905. Photograph by F. W. GLASIER (by courtesy of the RINGLING Circus Museum, Sarasota, Florida, U.S.A.)

not being combined until 1919. This rhinoceros was photographed by F. W. GLAZIER in 1905 and the picture clearly identifies it as a *D. bicornis* (see Fig. 3). It died on 17. VI. 1913 at Brantford, Ontario, Canada while on tour with the BARNUM & BAILEY circus (Brantford "Expositor", 18. VI. 1913, and "Billboard", 28. VI. 1913, p. 25).

### III. Zoological Gardens 1800—1980

#### The white rhinoceros (*Ceratotherium simum*)

The first white rhinoceros in captivity was the celebrated calf 'Zuluana', found in the Umfolozi Game Reserve, Zululand (Natal) and taken to the Pretoria zoo, arriving on 29. VII. 1946 (BIGALKE 1947, 1975). 15 years later, REYNOLDS (1961b) found that only 13 specimens had been in captivity until that time, all of which were then living. The total was comprised of 10 examples of the northern subspecies *C. s. cottoni* and 3 of the southern form *C. s. simum*, all of the latter residing in the Pretoria zoo. REYNOLDS (1961b) wrote just before the great explosion of southern white rhinoceros imports from Natal. According to PLAYER (1967, 245—249), between 1. I. 1961 and 31. III. 1972 (a period of 11 years and 3 months), 811 specimens were relocated from Zululand to other African game reserves, national parks, farms and zoos, with another 298 being exported to various locations throughout the world. More have been shipped from South Africa since 1972 but in decreasing numbers (KLÖS and FRESE 1978).

Several open range or safari park zoos exhibit veritable herds of white rhinoceroses. On 5. VIII. 1970, 7 ♂♂ and 13 ♀♀ arrived at the Whipsnade Park, operated by the Zoological Society of London, joining a pair already on hand (RAWLINS 1979). San Diego zoo's new Wild Animal Park received a shipment of 6 ♂♂ and 14 ♀♀ on 17. II. 1971, with 18 being displayed there on 31. XII. 1976 (RAWLINS 1979). Between 1967 and 1974, Lion Country Safari, Inc. opened 6 animal parks, one near each of the following American cities: West Palm Beach, Florida; Los Angeles, California; Dallas, Texas; Atlanta, Georgia; Cincinnati, Ohio; and Richmond, Virginia. To stock those facilities, Lion Country imported large numbers of white rhinoceroses, and by the mid-1970's harboured more than 100 of them in these 6 parks (L. C. S. Guidebook, ca. 1975). On 2. XI. 1973, RJR saw 29 (11. 18) in the Lion Country park at Stockbridge near Atlanta.

The key to the successful breeding of the white rhinoceros appears to be their keeping in a large space with a large number of ♀♀ (KLÖS and FRESE 1978). The studbook of the species as of 31. XII. 1975 records 39 captive births before that date (KLÖS and FRESE 1977). The achievements of the Wild Animal Park of San Diego are most notable. A total of 37 calves were born there in only 7 years, between October 1972 and December 1979 (M. JONES, in litt. 18. II. 1980).

The Northern subspecies *C. s. cottoni* might be called the most endangered form of rhinoceros today, even more threatened than the rare Asian species. It would be advisable to stop further imports from Africa, and to focus on their breeding in captivity. In 1975, the zoological park annexe safari park in Dvůr Králové nad Labem (Czechoslovakia) imported a group caught near Shambe, 250 km northwest of Juba in southern Sudan. 3 years later, in 1978, this park exhibited 8 (2, 6) specimens with one of the ♀♀ having been born there in 1977 (J. A. VAGNER, in litt. 4. VII. 1978).

The black rhinoceros (*Diceros bicornis*)

A young ♂ black rhinoceros from Upper Nubia (Sudan), obtained in September 1868 by the London zoo through animal collector LORENZO CASANOVA and dealer CARL HAGENBECK, is reputed to have been the first of its species in captivity since the time of the Roman Empire (REYNOLDS 1963). However, there are some vague references indicating that the London animal might have been preceded by several others.

As noted above, (Section II), a two-horned rhinoceros is said to have arrived in Boston from Africa in 1835 or 33 years before the reputed first one. According to GLIJZEN (1960, 16), who undertook to list the years of first exhibition of mammals in the Antwerp zoological garden, this zoo would have shown its first *Rhinoceros bicornis* in 1858, i.e. 10 years ahead of the London ♂. There is also some circumstantial evidence of an 18th century black rhinoceros in Europe. ROOKMAAKER (1973a, 36) cited a popular book of 1793 where it was stated that a rhinoceros with two horns died in a shipwreck on the Rhine near Mannheim, Germany. BLUMENBACH (1791, 283, pl. 45) published a drawing of a double-horned rhinoceros owned by the 'Naturalienkabinet' in Mannheim. The plate of this stuffed specimen has the external appearance of an Indian rhinoceros with the typical folded skin, but it also shows 2 good sized horns on the nose. Later, the animal was transported to a collection in Munich where the name *Rhinoceros cucullatus* Wagner, 1835 was bestowed on it (WAGNER 1850). This taxon has been surprisingly persistent, although it was repeatedly suggested that the Munich specimen was an artifact, like a similar rhinoceros (without data) in Vienna. In fact, ZUKOWSKY (1965, 133) wrote, after an examination of the then available material of the skulls, that both animals probably were black rhinoceroses with the hide artificially shaped like that of an Indian rhinoceros. Maybe further enquiries will still shed some light on the enigmatic Mannheim specimen(s).

There is a small gap in the published records of captive black rhinoceroses between the end of the research by REYNOLDS (1963) and the start of the lists maintained in the studbook. We have not undertaken to remedy that situation. However it is appropriate to correct and amplify the earlier list (REYNOLDS 1963) based on information which has since been discovered, as follows:

Adelaide, Australia. In January 1929, a pair of black rhinoceroses arrived in Melbourne, destined for the Adelaide zoo. The ♀ died in Melbourne and the ♂ at the Adelaide zoo on 4. II. 1929. A second ♂, named 'Sinya' (studbook no. 97 ADL 1) was captured in Tanzania in January 1947, arrived at the Adelaide Zoo in August of that year and was still living in 1976 (M. JONES, in litt. 5. VII. 1969; KLÖs and FRESE 1977).

Buenos Aires, Argentina. REYNOLDS (1963) indicated black rhinoceros births in Buenos Aires in both 1959 and 1961, and both dates are erroneous. There were births in this zoo (ROOKMAAKER 1973b, KLÖs and FRESE 1977), as follows:

1. ♂ Born April or December 1956; died within a few days.
2. ♂ Born 3. I. 1958, studbook no. 118 BUE 2.
3. ♀ Born 22. III. 1962, studbook no. 119 BUE 3.
4. ♀ Born 23. IV. 1973, studbook no. 231 BUE 4.

Chicago (Brookfield), Illinois, U.S.A. The Chicago Zoological Park (Brookfield zoo) obtained its first rhinoceros, a ♀ *D. bicornis*, from the private zoo of GEORGE F. GETZ near Holland, Michigan, where it had lived since April 1929 when it was purchased from the dealer SCHULZ (P. STOUT, Brookfield zoo, in litt. 26. VI. 1981). In the autumn

of 1933, GETZ donated his entire animal collection to the new zoo then under construction at Brookfield (BILLBOARD, 28. X. 1933, 40 and 18. XI. 1933, 31; Parks & Recreation, IV. 1934, 309 and 314). His rhinoceros arrived at Brookfield on 28. X. 1933 but died there on 9. XI. 1933 (P. STOUT, in litt. 26. VI. 1981).

The second rhinoceros at the Brookfield zoo was a ♂ *D. bicornis* named 'Karongo' which arrived on 13. VI. 1934 and was sent to the Milwaukee zoo on 8. VII. 1943 (M. JONES, in litt. 18. IV. 1967).

'Mary' and 'Pharo' (or 'Pharaoh') were the 3. and 4. black rhinoceroses at Brookfield (studbook nos. 60 and 61). There has been some confusion over the actual date of their acquisition. Based on a 1960 sign on their cage, REYNOLDS (1963) said they arrived in May 1934. Brookfield director ED. H. BEAN (1941) wrote that they arrived in June 1935, but CRANDALL (1964, 514), based on a letter from ROBERT BEAN, gave the date as 19. V. 1935, while an old Brookfield zoo inventory, dated in 1948, lists their arrival as 16. VII. 1935 (M. JONES, in litt. 18. IV. 1967).

Further research rather conclusively shows that 'Mary' and 'Pharo' arrived at the Brookfield Zoo on either 26. or 27. VI. 1935. According to zoo keeper PATRICK STOUT (in litt. 10. VII. 1981) a daily diary maintained by the director's secretary in 1935 shows that the pair entered the zoo on 26. VI. 1935. A detailed, illustrated account of the event appears in the Chicago Daily Tribune for 28. VI. 1935 (p. 13) and states that both rhinoceroses arrived "yesterday" meaning 27. VI. 1935. The newspaper says the animals were obtained from CHRISTOPH SCHULZ for \$ 9,000. They had been in their crates for 55 days, including 41 at sea. The ♀ was reported to be 2 years old on arrival and to weigh 600 pounds, while the ♂ was 19 months old and weighed 500 pounds.

Establishing the correct arrival date of the Chicago pair is important because of the longevity records they compiled. The ♂ 'Pharo' died at Brookfield on 16. VIII. 1967, a captive longevity record of 32 years, 1 month, and 20 or 21 days. While that is one of the best such records, the ♀ "Mary" went on to set the all-time longevity record for the species in captivity. She died at Brookfield on 18. III. 1980 (P. STOUT, in litt. 26. VI. 1981), thus establishing a record (from 26. or 27. VI. 1935) of 44 years, 8 months and 20 or 21 days. That is the best longevity record for any rhinoceros of any species except possibly a ♀ *R. unicornis* which died in the Calcutta zoo in May 1880 after having lived a reputed 47 years in captivity (REYNOLDS 1961a, 19). 'Mary' also was the dam of the first 2 black rhinoceros calves born in captivity (1941 and 1944), and she may have been the last of the pre-World War II captive rhinoceroses.

Denver, Colorado, U.S.A. REUTHER (1972) lists a birth at the Denver zoo on 29. I. 1958, which probably is simply a confusion with the birth on 20. I. 1968 (cf. ROOKMAAKER 1973b).

Dublin, Ireland. The ♀ *D. bicornis* which arrived in V. 1962 (REYNOLDS 1963) was not the first. An earlier specimen came from East Africa in September 1960 but died in the zoo in January 1962 (D. GOODHUE, in litt. 25. III. 1981).

Edinburgh, Great Britain. A young ♂ named 'Bill' arrived at this zoo in 1922 but lived only 6 months, dying as the result of swallowing a sharp object (C. KEELING, in litt. 18. VIII. 1964).

Hamburg-Stellingen, Federal Republic of Germany. In 1979, MARVIN JONES reviewed the post-war files at Tierpark CARL HAGENBECK. There is a record of a ♂ *D. bicornis*, imported in 1954 and sent to Cirque AMAR, France on 26. IV. 1955

(M. JONES, in litt. 16. XII. 1979). This would appear to be an additional animal beyond the 12 listed by REYNOLDS (1963).

Houston, Texas, U.S.A. There was no pair obtained during 1961—1963 as reported by REYNOLDS (1963) because Houston Zoo Director JOHN E. WEHLER (in litt.) wrote that as of January 1964 the zoo had never had any rhinoceros of any kind.

Hudson, New Hampshire, U.S.A. Dealer JOHN BENSON housed all types of animals at his Hudson compound while they were awaiting sale or shipment to other zoos. Boston zoo director DAN HARKINS made many trips there, and 2 of his diary entries are interesting:

1. June 1928: "Visited BENSON ... saw Mr. & Mrs. SCHULZ ... (and) a baby rhino..." (presumably *D. bicornis*);
2. June 1934: "Drove to BENSON's Animal Farm ... visited CHRIS SCHULZ and son WALTER ... and one large African rhino."

When E. H. BOSTOCK visited BENSON's animal farm around May—July 1934, he saw 2 young "double horned rhinos" recently arrived from East Africa (BILLBOARD, 21. VII. 1934, 34).

Leningrad, U.S.S.R. According to ISIUMOV, a black rhinoceros arrived at the Leningrad zoo in 1940 (D. LEVY, in litt. 6. XII. 1963). This specimen must have perished during the World War II siege which began in September 1941.

Sydney, Australia. MARVIN JONES obtained details about 22 animals exhibited at the Taronga Park Zoo up until his visit in June 1969 which, with subsequently obtained data, may be listed here.

- 1. ♂ '*Rupert*' 10. X. 1938 from SCHULZ — died 8. VI. 1947.
- 2. ♀ '*Ruby*' 10. X. 1938 from SCHULZ — died 27. VIII. 1943.
3. ♀ '*Sonya*' 11. I. 1947 from South Africa — died 12. VIII. 1974 (studbook 196 SID 6).
4. ♂ '*Ferdinand*' 10. VII. 1947 — living in 1976 (studbook 99 SID 1).
- ✓ 5. ♂ '*George*' 10. VII. 1947 — died 29. V. 1951.
- ✓ 6. ♀ (no name) 10. VII. 1947 — died 23. II. 1950.
- ✓ 7. ♀ '*Dianne*' 24. V. 1948 — died 5. X. 1963.
- ✓ 8. ♀ '*Tiga*' 24. V. 1948 — died 7. VII. 1955.
9. ♀ '*Peggy*' 23. V. 1948 — died 3. VIII. 1974 (studbook 100 SID 2).
- ✓ 10. ♂ '*Peter*' 16. VIII. 1948 — sent to Melbourne Zoo 1. III. 1950. No record of it found at Melbourne.
- ✓ 11. ♀ (no name) 16. VIII. 1948 — died 16. VII. 1953.
- ✓ 12.—14. 3 rhinoceroses are said to have been deposited by HALLSTROM on 13. II. 1950, but the records do not indicate sex or departure.
15. ♀ '*Taronga*' born 23. VIII. 1958 to nos. 4 and 9 — on exhibit in 1976 (studbook 197 SID 7).
- ✓ 16. ♂ Stillborn on 11. X. 1958 (11. IX. 1958 following R. STRAHAN, see ROOKMAAKER 1973b) to nos. 4 and 3.
17. ♀ Born 17. IV. 1960 to nos. 4 and 3 — died 8. V. 1966.
18. ♀ '*Squeaker*' born 11. I. 1963 to nos. 4 and 7 — sent 14. VIII. 1969 to ASHTON's Animal Kingdom (studbook 102 SID 4).
19. ♀ '*Beauty*' born 2. V. 1965 to nos. 4 and 9 — on exhibit in 1976 (studbook 101 SID 3).
- ✓ 20. ♀ Born 19. VIII. 1965 to nos. 4 and 15 — died 21. VIII. 1965.
21. ♂ Born 26. V. 1967 to nos. 4 and 9 — died 24. VI. 1971 (studbook 106 SID 5).
- ✓ 22. ♀ Died at birth 26. VII. 1967 to nos. 4 and 15.

Tokyo, Japan. The black rhinoceros brought to Tokyo by the CARL HAGENBECK circus in the spring of 1933 did not remain in Japan as previously suggested (REYNOLDS 1963). According to SOTANI (1974), this circus animal was the first *D. bicornis* shown in Japan. However, no Japanese zoo was able to purchase it, and the animal left the country with the circus. The first post-war rhinoceros in Japan was a ♂ black rhinoceros which arrived at the Ueno Zoo, Tokyo, on 28. VII. 1952 (SOTANI 1974). SOTANI estimated that at least 33 black rhinoceroses had been exhibited in various Japanese zoos up until August 1973.

#### The Sumatran rhinoceros (*Dicerorhinus sumatrensis*)

REYNOLDS (1961a) listed some 55 Sumatran rhinoceroses in captivity. The history of 10 of these specimens is very uncertain and concrete, clarifying data continue to elude us. Our knowledge is particularly unsatisfactory respecting the animals formerly in the Calcutta zoo, those in the possession of the HAGENBECK firm, and the examples imported for travelling American circuses during the period 1870–1900 (see section II).

Amsterdam, Holland. The zoo archives record 2 specimens:

1. (sex ?) 18. IV. 1881–11. XI. 1881. Possibly from Sumatra.
2. ♀ 1. VI. 1896 (possibly 3. VI.)–16. XII. 1896. It was bought from H. OWEN for 2400 guilders and arrived on the ship ss. "Telemachus". It appears to be the only rhinoceros ever exported alive from Borneo that reached Europe (ROOKMAAKER 1977b, 57). Its skeleton is preserved in the Zoological Museum of Amsterdam.

Antwerp, Belgium. According to GLIZEN (1960, 16), the first Sumatran rhinoceros exhibited here came in 1879. The zoo annually auctioned some of its animals and an advertisement for the sale in September 1898 offers a ♀ '*Rhinoceros sumatrensis*' (poster in Artis-library, Amsterdam). However, it must not have been sold, for it was seen at the Antwerp zoo in 1902 and is mentioned in their guide book the year after that (REYNOLDS 1961a, 35). If all these references are to the same animal, it had an exceptional zoo longevity of well over 20 years.

Berlin, Germany. The specimen exhibited in 1879 (REYNOLDS 1961a, 35), presented by the BARONS VON SCHICKLER, possibly was bought by director BODINUS in Antwerp. Its arrival in Berlin is recorded in Isis for 21. XI. 1878, meaning that it was already in Germany at a time when, according to REYNOLDS (1961a, 35), the dealer JAMBACH still had it on deposit at the London Zoo. This conflict in dates suggests that the Berlin ♀ was a different animal. It died in the zoo early in March 1880 (SCHLAWE 1969).

Hamburg (Old zoo), Germany. In addition to the ♀ of 1872–1876 and perhaps a calf in 1886 (REYNOLDS 1961a, 36–37), the old Hamburg zoo probably exhibited another 2 Sumatran rhinoceroses briefly in March 1884 (SCHLAWE 1972, 181). Possibly they were deposited by CARL HAGENBECK (KOURIST 1973, 139), and therefore may have belonged to the group of 5 animals which HAGENBECK claimed to have imported. VAN STRIEN (1974, 49) mentioned "a female that arrived around 1868 in the zoological garden of Hamburg". This misrepresents his source (SCLATER 1872) which clearly refers to the specimen of 1872 without stating the date.

Osaka, Japan. In 1921 2 Sumatran rhinoceroses were shipped from Singapore to Japan, but one of them died en route. The survivor (sex unknown) arrived at the

Tennoji Zoo in Osaka in June 1921 at a cost of 25,000 yen (K. KAWATA, in litt. 11. II. 1975). This was the first rhinoceros of any species to be introduced into Japan, and the only Sumatran ever shown there (SOTANI 1974). The health of the Osaka animal gradually declined, and it died in either January or February 1925, the exact date being obscured by differences in the several reports of that event (K. KAWATA, in litt. 11. II. 1975). The skeleton was donated to the University of Tokyo, while the hide was stuffed and kept in Osaka. The mounted skin was still at the zoo in 1975, but it was off exhibit and in very poor condition, the horns having been stolen from the specimen after World War II (K. KAWATA, in litt. 11. II. 1975).

Rangoon, Burma. The ♂ received in 1909 and seen by FLOWER (1914, 90, pl. 10), was still alive in 1916 (CHRISTOPHER 1916, 231, figure facing p. 228).

Singapore (Botanic Gardens). The 2 Sumatran rhinoceroses shown in Vienna (1900—?1908 and 1902—?1919) were first exhibited in the Botanic Gardens of Singapore probably for a short period (RIDLEY 1901). RIDLEY (1901) at first only mentioned 2 specimens, but later he (1906, 161) wrote about "three of these ... kept temporarily before shipping to ... Vienna ... in 1901." RIDLEY may have been somewhat confused about the shipments to Vienna, as only two specimens arrived there, and one of these as early as 1900. RIDLEY (1906) also claimed that "there was one in the gardens as early as 1875", which probably refers to a specimen hitherto unrecorded.

Sumatra expeditions of 1959. The last Sumatran rhinoceroses to arrive in captivity were all captured on the Siak river (Riau province) in Central Sumatra. It is little realized that 2 'teams' were operating simultaneously in this area, one consisting of the animal dealer PETER RYHNER, the other sent by the Copenhagen and Bogor zoos and led by A. DYHRBERG and H. SKAFTE. RYHNER was the first to go after the Sumatran rhinoceros. His adventures were recorded by LAPHAM (1964) based on an interview. RYHNER also told his story to RJR during a visit to Atlanta in October 1963, and we have an account (via June 1981 correspondence) provided by JOHN P. ROTH, now with the Albuquerque Zoo, U.S.A., who was with RYHNER in southeastern Asia in 1958—59 although not in Sumatra. We now summarize and synthesize these stories.

RYHNER originally planned to obtain Sumatran rhinoceroses from Burma. As early as May 1957, and into 1958, he corresponded with that country's noted naturalist U TUN YIN exploring the possibilities. TUN YIN was encouraging, reporting that the animals could be found in the Kachin State and offering suggestions as to permits and catching arrangements. By the autumn of 1958 RYHNER was in Europe trying to obtain support for an expedition. That was accomplished in October when the Basel Zoo commissioned him to obtain a pair. On 10. XI. 1958 TUN YIN wrote RYHNER stating: "Government has agreed to permit us to take out a pair of rhinos," and RYHNER made plans to travel to Burma via Singapore.

Meanwhile, in MARTIN (1958), RYHNER had read about an American named HARRY GILLMORE who managed Standard Vacuum Oil Company pipeline terminal at Buatan on the Siak River in central Sumatra and who was studying *D. sumatrensis* and planning to capture some examples. When rumors circulated that he had succeeded, RYHNER wrote GILLMORE, but the latter did not promptly respond and plans for the Burma expedition went forward. In November 1958 RYHNER finally heard from GILLMORE that the latter had a pair of Sumatran rhinoceroses which could be purchased. Cancelling plans to go after Burmese animals, RYHNER resolved to acquire the GILLMORE pair

working in concert with LOUIS F. DE JONG, a Singapore animal exporter, who was to work on the arrangements while RYHINER was en route from Europe.

RYHINER arrived in Singapore on 27. XI. 1958 and then went to Sumatra to see GILLMORE. They met on 5. XII. and GILLMORE showed RYHINER a full grown ♀ Sumatran rhinoceros called 'Dimples' behind his house in Buatán. The other specimen, a ♂, was said to be kept within a stockade in the forest, 20 miles away (RYHINER does not appear to have seen it). On 11. I. 1959, RYHINER returned to Singapore bringing with him the photographs which are shown here [see: Fig. 4—7]. Later that month he went to Java for the necessary export permits, which were not granted until the end of February. When RYHINER returned to Sumatra, he found that GILLMORE had been forced to release both his rhinoceroses. "A week later, however, the faithful 'Dimples' obligingly walked back into the stockade in which GILLMORE had first trapped her" (LAPHAM 1964, 68). This took place on, or just before, 17. III. 1959. RYHINER renamed the animal 'Betina'. When RJR questioned him about the identity of 'Dimples' and 'Betina', RYHINER was positive that the animals were one and the same. In a letter to JOHN ROTH dated "Siak River, 15. V. 1959" RYHINER says: "a beautiful male which was caught in the trap last week just escaped, also a small calf. But we have its mother in the trap now. 'Betina' was taken to Singapore last week together with a small tapir". At Singapore the animals were quartered at the farm of exporter DE JONG. On 30. VI.



Fig. 4. HARRY GILLMORE in his compound with ♀ *Dicerorhinus sumatrensis* "Betina" at Buatán, Sumatra in December 1958 or early January 1959. GILLMORE appears to be spraying the wallow for insects (by courtesy of JOHN ROTH, Albuquerque, New Mexico, U.S.A.)



Fig. 5. Sumatran rhinoceros in wallow at GILMORE's compound, Buatan, December 1958 or January 1959 (by courtesy of JOHN ROTH, Albuquerque, New Mexico, U.S.A.)

'*Betina*' left Singapore (M. JONES, in litt. 20. XI. 1972). She was flown to Switzerland aboard a chartered DC-3, arriving at the Basel Zoo on 2 VII. 1959 (LANG 1959).

RYHNER, who had come to Singapore during '*Betina*'s' stay there, returned to Buatan to try for a ♂. There he found the DYHRBERG-SKAFTE expedition busily looking for Sumatran rhinos along the Siak river. RYHNER resented the presence of the other animal collecting team, but reluctantly agreed to join them. For the rest of the summer they tried, without success, to capture a ♂ *D. sumatrensis*. Late in August 1959 RYHNER had to go to Bogor to renew his visa and was absent when, at the end of September, his chief skinner caught a ♂ in one of the wooden stockade-type traps. In a letter from Djakarta on 25. XI. 1959 RYHNER wrote ROTH that this ♂ had followed a ♀ in heat into the trap. Alas, both DYHRBERG and SKAFTE were also unavailable, the trap could not be properly attended, and the ♂ escaped after 3 days.

Based on a letter from Copenhagen zoo director SVEND ANDERSEN (9. V. 1960), REYNOLDS (1961a, 35) reported that RYHNER had actually purchased '*Betina*' from the Copenhagen Sumatran Rhinoceros Expedition and had, in turn, sold her to the Basel Zoo. In his 1963 discussions with RJR, RYHNER vigorously asserted that this was not true and that he had obtained his rhinoceros on his own.

The events met by the Danish expedition were related by the journalist HAKON SKAFTE (1961, 1962, 1964). During the summer of 1959, 3 rhinoceroses were captured at the Siak river:

1. a full grown ♀ '*Mulia*' which died (by poisoning?) after several weeks. Skin and skeleton were taken to the Copenhagen natural history museum.



Fig. 6. Sumatran rhinoceros standing in GILLMORE's compound, at Buatan. It is assumed that this, as well as the animal shown in figs. 4 and 5, is the ♀ 'Dimples' later known as 'Betina' (by courtesy of JOHN ROTH, Albuquerque, New Mexico, U.S.A.)

2. another ♀, "a young and vigorous animal" named 'Subur'; it went to the Copenhagen Zoo.
3. a ♀, which went to the Bogor Zoo.

ANDERSEN (1963) wrote that the 1959 expedition caught 10 Sumatran rhinoceroses consisting of 9 ♀♀ (6 of which were released) plus a ♂ that escaped. While the sex ratio is different, the accounts from RYHINER and SKAFTE can be read to total the same number as follows: the 3 ♀♀ just mentioned; 'Dimples' renamed 'Betina' and sent to Basel; GILLMORE's ♂ which RYHINER does not appear to have seen; the ♂, plus calf, and its mother of May 1959; and, finally, the ♀ and ♂ that went into the trap in September. Regardless of the number captured, it is certain that only the 3 ♀♀ were ever sent out of Sumatra.



Fig. 7. Rhinoceros trap, from PETER RYHINER Siak River area, Sumatra, Dec. 1958–Jan. 1959 (by courtesy of JOHN ROTH, Albuquerque, New Mexico, U.S.A.)

Basel's '*Betina*' (or '*Dimples*') died on 8. IX. 1961 from chronic nephritis after having been at the zoo for just over 2 years (H. WACKERNAGEL, in litt. 14. IV. 1962). '*Subur*' lived in the Copenhagen Zoo from 4. XII. 1959 until her death on 24. II. 1972 (SONNE-HANSEN 1972). The specimen in Bogor lived from 1959–1961 in the grounds of the presidential palace at Bogor. MEDWAY (1972, 1977, pl. 24b) photographed it late in 1960 in a "fenced-off section of a smaller, shadier enclosure. Most of the ground had been trodden into mud. In one corner she had developed a wallow, where most of her time was spent."

SKAFTE and RYHINER both gave the impression that the rhinoceros was fairly plentiful in the Siak River area. RYHINER estimated the number between 40 and 60 animals, but only a few years later, in 1963, OLIVER MILTON was unable to find any traces in the same region (cf. VAN STRIEN 1974, 29).

Vienna, Austria. REYNOLDS (1961a) recorded the usually accepted dates of arrival and death of the 2 ♀ Sumatran rhinoceroses shown in Schönbrunn in the early 1900's: '*Jenny*' 26. X. 1900 until 11. XI. 1908 and '*Mary*' from 17. VII. 1902 until the summer of 1919. However, the ledgers of the natural history museum in Vienna show receipt of the remains of these animals on 15. XI. 1910 and 16. IX. 1920, respectively (M. JONES, in litt. 20. XI. 1972); and W. FIEDLER (in litt. 21. XI. 1959) reported that '*Jenny*' died at the zoo on "11. XI. 1910". Possibly, the 1910 and 1920 death dates would be more accurate than those listed earlier.

The Indian rhinoceros (*Rhinoceros unicornis*)

REYNOLDS (1961a, 18–30) recorded particulars about 94 Indian rhinoceroses exhibited in zoological gardens and circuses between 1500 and 1960. The 2nd edition of the studbook (RÜEDI and TOBLER 1980) included 92 or 93 specimens, 43 of which were born in captivity. There have been some additional specimens in American circuses (REYNOLDS 1967, 1968, 1970), while a few more are recorded here. In total, there are records of roughly 180 Indian rhinoceroses in captivity.

Amsterdam, Holland. The date of arrival of the first Amsterdam specimen is usually stated as 19. VI. 1864 (REYNOLDS 1961a, 25). According to the zoo archives (reported by KOURIST 1970, 147), the first *R. unicornis* would have lived from 20. VII. 1867 to 21. III. 1873. It is unlikely that Amsterdam exhibited 2 specimens during this short period.

Antwerp, Belgium. GIJZEN (1960, 16) mentioned 1861, instead of 1858 (REYNOLDS 1961a), as the year of arrival of Antwerp's first ♂ Indian rhinoceros, which died on 7. IX. 1898. This specimen is depicted in 2 drawings by A. HEINS, made about 1880, one of which is illustrated here (see Fig. 8). GIJZEN gave no information about a possible further 19th century specimen of this species as suggested by REYNOLDS (1961a, 21, no. 2).

Bangalore, India. S. S. FLOWER's (1914, 40) empty cage in Bangalore remains unsolved, although an identification of its presumed inhabitant with the Javan rhinoceros in Madras would seem remotely possible (see below).

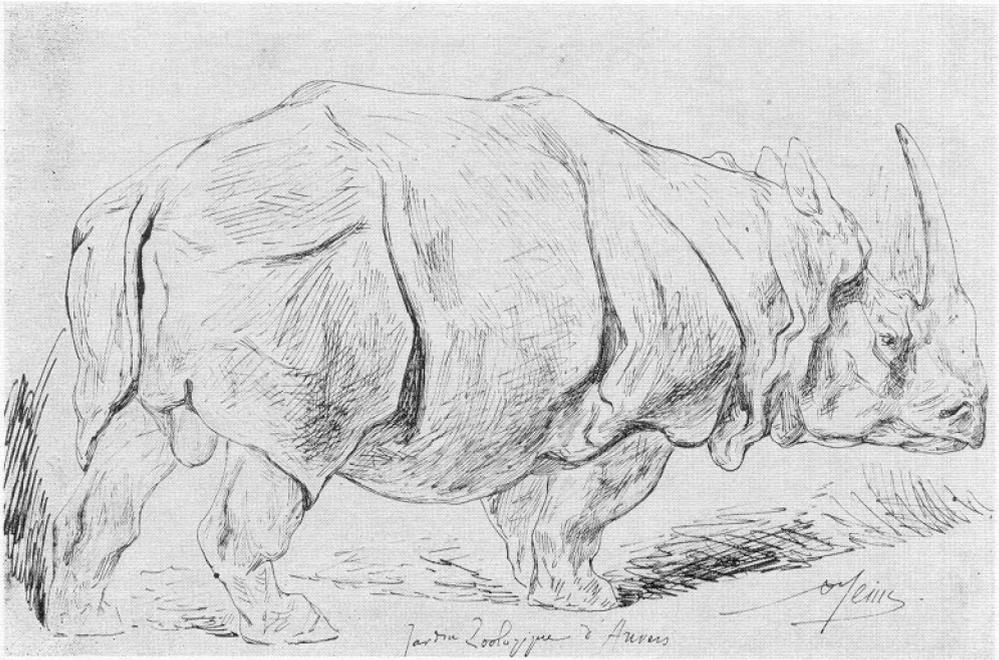


Fig. 8. A drawing by A. HEINS, made around 1880 in the Antwerp Zoo [by courtesy of the Koninklijke Bibliotheek Albert I (Prentenkabinet), Brussels; inv. no. F 3437]

Berlin, Germany. Before the arrival of the pair in 1872, another specimen was exhibited from 21. IX. 1871 until 30. IX. 1872, after which it was sent to WILLIAM JAMRACH (SCHLAWA 1969).

REYNOLDS (1961c) reviewed the debate over the identity (Indian or Javan?) of the enigmatic ♀ rhinoceros that arrived in Berlin in 1874. It was at the zoo until ca. 1884, and ROOKMAAKER (1977a) tried to identify it more positively. The main reason for identification as *R. unicornis* is the reasonably sized horn carried by the animal on GUSTAV MÜTZEL's print of 1882. ♀♀ of the Indian population of *R. sondaicus* did not grow horns of any length. The animal in question was captured in Manipur district, a rather unexpected location for *R. unicornis*. It is the only published record of this species from Manipur, which was also inhabited by *R. sondaicus* (ROOKMAAKER 1980). There is, however, no good reason to doubt the occurrence of the Indian rhinoceros in Manipur as the species was also found in adjoining parts of northern Bangladesh.

Brownsville, Texas, U.S.A. In addition to the ♀ at the GLADYS PORTER Zoo from 1972 to 1974 (studbook 45 BASE 10), there was also a short lived ♂. The latter was imported from India through RUHE and ZEEHANDELAAR and arrived at the zoo on 12. IX. 1973 when about 1 and 1/2 years old. It died in XI. 1973 (M. DEE, Los Angeles, in litt. 11. I. 1975).

Burdwan, India. BUCKLAND (1882) mentions 2 examples (presumably *R. unicornis*) in a Maharajah's collection at Burdwan. Perhaps these animals have some relationship to the pair exhibited at nearby Barrackpore (cf. REYNOLDS 1961a, 19).

Calcutta, India. The pair obtained by the Alipore Zoo in 1932 (REYNOLDS 1961a, 19) is no longer there. The ♀ died from rabies on 10. XII. 1965 and the ♂ from cancer on 30. VIII. 1970 (A. K. DAS in litt. 29. VIII. 1981). 4 additional Indian rhinoceroses have been at the zoo since the 1950's. Their particulars — from Director DAS (in litt. 14. IV. 1980 and 29. VIII. 1981), except as otherwise noted — are:

1. ♀ '*Sneha*', (studbook 23 INDI E) born 12. VI. 1961 at the zoo while the mother was in transit. MARVIN JONES (in litt. 29. XI. 1961 and 25. I. 1962) after Dr. KOGA/Tokyo reported that the mother (now identified as studbook 21 INDI C) was at the Alipore zoo awaiting shipment to Japan, that the birth took place on 13th instead of 12th VI., and that the baby was weaned to bottle feedings before the mother left Calcutta on 19. VII. 1961.
2. ♂ '*Meghnad*', arrived 14. III. 1974 from Kaziranga.
3. ♀ '*Kadambiri*', arrived 14. III. 1974 from Kaziranga.
4. ♀ '*Gomoti*', born in the zoo on 9. I. 1979 (parents nos. 1 and 2).

Cincinnati, Ohio, U.S.A. An example acquired in IV. 1923 (REYNOLDS 1961a, 27) is found to have been a ♀ from Nepal, named '*Ruby*' [see Fig. 9]. It died at the zoo in V. 1929 (BILLBOARD, 26. V. 1923, 77; 6. IV. 1929, 62, and 18. V. 1929, 68).

Cuttack, India. The Nandankanan biological park near Cuttack (Orissa, India) received a ♀ Indian rhinoceros on 8. IV. 1976 from Kaziranga at the age of 1 year and 7 months (L. N. ACHARJYO in litt.). LCR saw it in III. 1980.

Delhi, India. In VII. 1963 CAROLINE JARVIS reported (in litt.) that there was then a ♂ Indian rhinoceros in the Delhi Zoo. This animal would appear to have preceded the ♂ which arrived there on 1. XII. 1965 (studbook 33 KAZ 9).

Dublin, Ireland. The Dublin zoo exhibited an Indian rhinoceros for a short period in 1835 on loan from a Mr. ATKINS. This is the same animal as discussed under the name of 'Liverpool rhinoceros' in section I, supra. The second specimen was purchased

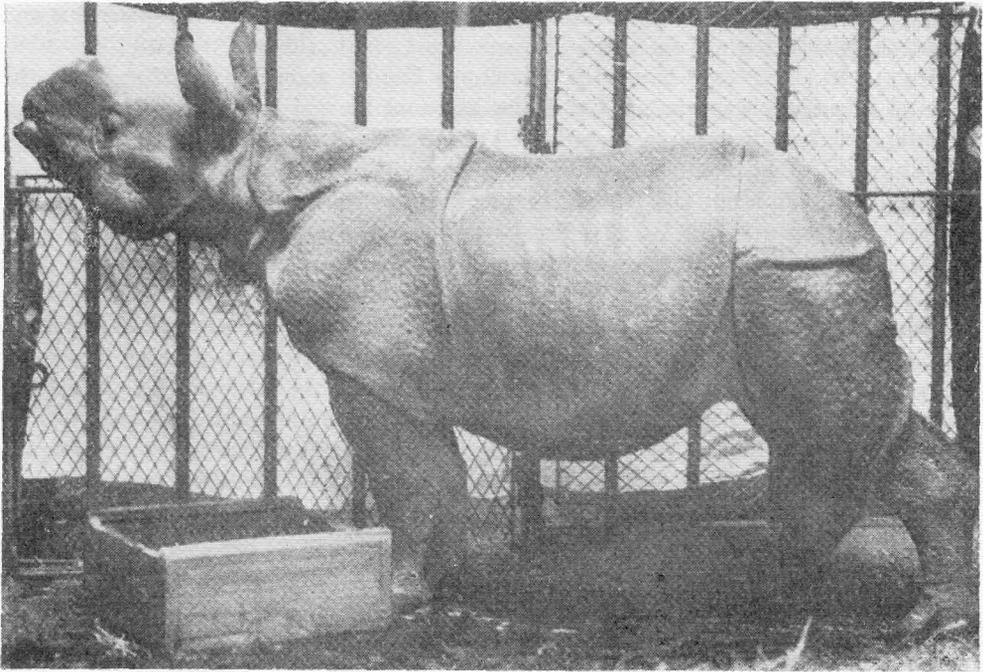


Fig. 9. 'Ruby,' ♀ Indian rhinoceros at Cincinnati Zoo, U.S.A. in 1923 (by courtesy of Zoological Society of Cincinnati)

in VII. 1864 from Calcutta, arrived at the zoo on 3. VIII. 1864 and died there on 6. (or 26.?) IV. 1865. The body was bought by Trinity College in Dublin (T. MURPHY, in litt. 19. V. 1959 and V. 1981).

Gauhati, India. The Gauhati (Assam) zoo regularly keeps Indian rhinoceroses, often in transit to other collections. RUEDI and TOBLER (1980) mention 10 specimens, 4 of which were born in this park. It seems that the studbook does not include the "rhinoceros calf which died at Gauhati zoo from fascioliasis" about ? 1970 (BHATTACHARJEE and HALDER 1971).

Hamburg-Stellingen, Federal Republic of Germany. The pair seen by KUHN in VIII. 1960 (REYNOLDS 1961a, 25) was composed of the ♀ "*Nepali II*" (studbook 16 KAZ 7), who was at Stellingen from 1957 until 1968, plus a ♂, imported on 12. VII. 1960 when about 5 years old, that died at the zoo the next year on 26. VI. 1961 (C.-H. HAGENBECK, in litt. 15. I. 1963).

Houston, Texas, U.S.A. For clarity we should point out that a pair shown in this city in the early 1970's (♂ studbook 44 BASE 9 and ♀ studbook 45 BASE 10) was not exhibited at the Houston Zoological Gardens (Hermann Park) but, rather, at the Bush Gardens which operated for several years in Houston (M. DEE, in litt. 11. I. 1975 and 22. III. 1975).

Jamrach's, London, Great Britain. During the mid to late 1800's this animal dealer played a prominent role in bringing Asiatic rhinoceroses to Europe. Probably most of the Indian animals he imported are already recorded in the recent literature,

but we have found references to others which may represent additional specimens and are worth mentioning.

BUCKLAND (1882) says he visited JAMRACH's London shop in I. 1867 and saw the skulls of 2 Indian rhinoceroses. The dealer had sent his son to India to obtain these animals. Both had died at sea aboard the Persian Empire while the younger JAMRACH was returning to England with them.

When the Schönbrunn Gardens, Vienna received a ♀ Indian rhinoceros from JAMRACH in 1856 (cf. REYNOLDS 1961a, 21), FITZINGER made a note in the zoo's files that she was one of 4 animals (all presumably *R. unicornis*) imported by JAMRACH in 1855 (M. JONES, in litt. 20. XI. 1972). We do not know what happened to the others. However, 2 of them may have been the examples offered for sale in an advertisement in Liverpool's "The Daily Post" for 11. VI. 1855. These animals were described as a ♂ and ♀ rhinoceros caught in the wilds of Assam and just arrived from Calcutta. They were to be sold to the highest bidder at LUCAS's Repository on 14. VI. 1855 (C. H. KEELING, in litt.).

Kathmandu, Nepal. In V. 1824 a ♂ Indian rhinoceros was born in the menagerie of the Rajah of Nepal in Kathmandu. It remained there until 1834 when it was transported to Calcutta, but its further fate is not known (ROOKMAAKER 1979). The animal was captive bred, implying that the Rajah must have kept at least one adult pair in those years. Maybe this includes the rhinoceros which was exhibited for 35 years in Kathmandu (HODGSON 1834, 98).

The present Kathmandu zoo is said to have had a ♂ Indian rhinoceros since 1939 (K. TOBLER, in litt.). There may have been others, because in V. 1964 CAROLINE JARVIS reported (in litt.) that a pair was then at the zoo and that a single ♂ was said to be in the possession of the Forest Department at Kathmandu. Also, ULLRICH (1967, 61, fig. 8) took a photograph in the Kathmandu zoo, somewhere in the 1960's, showing 2 Indian rhinoceroses. A single ♀ was reported there in 1965 (JARVIS 1966, 432, 445) and another single example (sex unknown) was reported in 1968 (LUCAS 1969, 275, 291). Recently, however, VAN DEN BRINK (1980) was unable to find a trace of a rhinoceros enclosure.

Leningrad, U.S.S.R. The first Indian specimen in this zoo arrived in 1882 and lived 2 or 3 years. The second of the same species was present from 1911 to 1918 (D. LEVY in litt.).

Lucknow, India. The studbook lists only a single ♂ (90 ASSA 14) at the zoo from 1959 until 1979. However, TOBLER (in litt.) refers to a ♀ said to have been acquired in 1940, and an annual census of rare animals in captivity shows a ♀ at the Lucknow zoo each year from 1965 to 1972 (JARVIS, LUCAS, DUPLAIX-HALL, 1966—1973).

Manchester, Great Britain. Prior to the ♂ which lived at the Belle Vue Park from 1876 to 1904 (REYNOLDS 1961a, 22) there may have been another rhinoceros, possibly of the Indian species. PEEL (1903, 207) observed that the 1876—1904 specimen was "very savage in marked contrast to the preceding rhinoceros which was allowed to roam the grounds" (our emphasis). Perhaps this earlier animal had some connection to the example at the other Manchester zoo (different from Belle Vue) in 1840 or to the one in EDMONDS' WOMBWELL menagerie of the 1870's (see Section I).

Moscow, U.S.S.R. The Moscow zoo first showed an Indian rhinoceros in 1866, but the length of its life is unknown (D. LEVY, in litt.).

New York (Central Park), New York, U.S.A. An Indian rhinoceros (sex unknown) was deposited in the Central Park zoo on 16. III. 1871, thereby becoming the first rhinoceros in an American zoo. This specimen, or a different one of the same

species, was deposited there again in I. 1872 (M. JONES, in litt. 18. II. 1963). No further details are known. Possibly, these were circus rhinoceroses temporarily loaned to the zoo (cf. REYNOLDS 1970).

Peking (Beijing), China. In addition to the 1959—1978 male (studbook 72 NEPA 6), the Peking zoo once had a ♀ that died there (C. JARVIS, in litt. 31. XII. 1965). It would appear to have been at the zoo from ca. 1959 to ca. 1961 because there was no Indian rhinoceros in Peking in V. 1958 (H. DEMMER, in litt. 12. IV. 1963), and by IV. 1962 the zoo itself was reporting only the ♂ (C. JARVIS, in litt. 23. I. 1963).

Portland, Oregon, U.S.A. In 1964 animal dealer MORGAN BERRY obtained from Nepal a young ♂ Indian rhinoceros, named 'K Allen', which he deposited in the Portland zoo on 3. V. 1964. It stayed there until 1966 when it was sent to the Omaha zoo. The studbook lists it for Omaha (63 NEPA 5) without reference to its previous years in Portland.

Rangoon, Burma. In I. 1962 the zoo received, as a gift from Nepal, a young ♀ named 'Khin Way Way' (Assoc. Press wirephoto in Atlanta "Journal and Constitution", 28. I. 1962). It does not appear to have been at the zoo after 1964, because that is the last time Rangoon listed it for the annual census of rare animals in captivity (JARVIS 1965, 382).

Tokyo-Tama, Japan. Studbook No. 21 is definitely the ♀ which gave birth to the calf (studbook No. 23) at Calcutta's Alipore zoo in 1961. The mother had been captured in Kaziranga in 1960 specifically to be sent to Tokyo as a gift from India (E. P. GEE in litt. 14. V. 1960). As pointed out above, the calf stayed at the Alipore zoo when the mother left for Japan. After a sea voyage, the latter arrived at the Tama zoo on 16. VIII. 1961 (M. JONES, in litt. 25. I. 1962).

Udaipur and Jaipur, India. The Udaipur zoo obtained a 3 year old ♀ Indian rhinoceros in 1941 and kept it until 1946 when it was sold to the Jaipur zoo (C. JARVIS, in litt. 26. IX. 1962 after YADAV/Jaipur). It was last reported at Jaipur in the census taken in 1964 by the Zoological Society of London (JARVIS 1965, 382).

#### The Javan rhinoceros (*Rhinoceros sondaicus*)

The Javan rhinoceros has been a rare exhibit. REYNOLDS (1961a, 30—33) listed 10 specimens in zoological collections, one of which died en route to Austria, and a few others kept in private menageries in South-East Asia. *R. sondaicus* is often confused with its congeneric *R. unicornis*, especially when the living animal could not be examined properly. Some specimens of *R. unicornis* were sometimes taken to be this species, like the Liverpool rhinoceros of 1836. No debate is possible, however, about the identity of the rhinoceros shown in Venice in 1751 and depicted by PIETRO and ALESSANDRO LONGHI. KRUMBIEGEL (1962) suggested that it was a *R. sondaicus*. Numerous illustrations combined with the history of this particular specimen which toured through Europe between 1741 and ca. 1758, leave no doubt that it was a *R. unicornis* (ROOKMAAKER 1973a, CLARKE 1974). The rhinoceros travelling on the ship "Colon" to San Francisco now appears, almost certainly, to have been *Diceros bicornis* instead of *R. sondaicus* (see Section II), meaning that with such conclusion we no longer have any probative evidence of a living Javan rhinoceros in America.

Bangkok, Thailand. LOCH (1937, 134) cites W. W. FEGAN ("Bangkok Sport and Gossip" 1933): "About the year 1886 a one-horn was captured and brought alive to Bangkok from a place near Krabin, to the west of the capital. It was kept in captivity here for some time ere it passed out." If the animal indeed was single-horned, it must have been a Javan rhinoceros because *R. unicornis* has never been recorded from Burma or Thailand (ROOKMAAKER 1980).

Madras, India. In IX. 1905, a rhinoceros was trapped in the Dindings (Perak, Malaysia) and transported to Penang. O'HARA (1907) witnessed the operation and remarks that "it was a magnificent specimen of a three quarter grown bull rhinoceros, it had a horn about 2 1/2 and 3 inches long and stood from 4 1/2 to 5 feet in height; its skin was of a dark reddish brown in colour". The distribution and size could indicate both the Javan and Sumatran species, but with one horn it would have been *R. sondaicus*. The animal was sold to a Singapore dealer for \$ 500 and then to the People's Park in Madras for Rs. 1500 (O'HARA 1907, 388). The arrival in Madras is not substantiated by other sources and the length of its life is not known. When S. S. FLOWER visited Indian zoos in 1913, he saw in the Madras zoo a ♀ *D. sumatrensis* "which has now been [there] about 14 years" (FLOWER 1914, 73) and an empty cage formerly inhabited by a rhinoceros in Bangalore (FLOWER 1914, 40). The Dindings ♂ therefore probably died or left Madras before 1913, and it may have gone to Bangalore.

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### Summary

Almost all rhinoceroses ever shown in captivity have been detailed in the literature. Earlier publications and the studbooks of the Indian and African species are supplemented and corrected. Data are presented on rhinoceroses exhibited in European travelling menageries during the 19th century, in the collections of American circuses before 1930 and in zoological gardens after 1800.

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