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The Management of
WILD MAMMALSIN CAPTIVITY

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1953. She died on December 20, 1955, after 2 years, 3 months, 17 days, our best record for the species but certainly not a promising one. The cause of death in this case, as in that of Panchita, was tuberculosis. The skins and skeletons of all these animals have been preserved in the American Museum of Natural History, where they make an important addition to the scanty existing study material.

FAMILY RHINOCEROTIDAE

Rhinoceroses

The rhinoceroses, of course, are much the largest of the members of this order, being rivaled only by the hippopotamus as second to the elephants among the greatest of the living land animals of the world. Their heavy, thick-skinned bodies are usually hairless, except for ear fringes and tail-tips, only the small two-horned Asiatic species, *Didermocerus sumatrensis*, being lightly haired. Each foot has three toes carrying hoof-like nails, while the sole is tough and horny. Canine teeth are absent but a reduced number of incisors are present in the Asiatic species, two forming well-developed tusks in the lower jaw. Adult African rhinoceroses have no front teeth, so that the jaws are noticeably shortened. Characteristic are one or two horns borne on the median line of the forepart of the head; when two are present, the forward one is usually the longer. These horns are products of the skin, composed of closely compressed fibers often compared to hairs. There is no bony core, and while the horn is loosely attached to a roughened supporting area at its base, it is easily separated when the animal is skinned (Mochi and Carter, 1953). The horn grows continuously and may be replaced if lost. Jacobi (1957) gives an illustrated account of an instance in which a horn torn almost completely loose at its base and later removed entirely, was regrown to nearly its former length within 2 years, in the Zoological Gardens of Amsterdam (Artis). Belief in the value of rhinoceros horn in various medical capacities, especially as an aphrodisiac, widespread in Oriental countries, has been largely responsible over the years for the continuous slaughter that has reduced most of the forms almost to extinction.

All the rhinoceroses are entirely vegetarian, some feeding largely on grass, others relying chiefly on leafy vegetation. There is variation, too, in preferred habitat, some species living on open or broken plains, while

others frequent marshy areas or tall growths of reeds and grass. All swim well and bathe freely as well as rolling in mud or dust.

Actually the relicts of a once numerous and widely distributed group, the rhinoceroses of the present day are found only in southern Asia and in Africa. Five species, in three genera, are usually recognized. A key to the species is given by Pocock (1944–45). For the use here of *Diceros* for *Ceratotherium* for the white rhinoceros, see Ellerman, Morrison-Scott, and Hayman, 1953:163.

In all three species of rhinoceroses found in Asia, the thick skin is arranged in folds with thinner and more pliable areas lying between them, giving an armor-plated effect. This armature depends on its thickness for its defensive value and is far from being bullet-proof, as was once believed.

Largest and best known of this group is the Indian rhinoceros (*Rhinoceros unicornis*). Once apparently widely distributed from Kashmir to Indochina, the remnants of this fine species are now found chiefly in government reserves in Assam and Bengal, with a further number living under protection in the Kingdom of Nepal. Gee (1958) estimates a total of 400 animals in India and perhaps 35 in Nepal, while Stracey (1957) quotes the official figure for the latter area as 500–600. In a report of a more recent personal investigation of the situation in Nepal, Gee (1959) raises to 300 his previous estimate of the rhinoceroses present in that country.

The plates of the skin reach their greatest development in the Indian rhinoceros, and small rounded excrescences, often compared to rivet heads, add to the impression of impenetrability. Both sexes carry a single horn; Rowland Ward (1928) gives a length of 24 inches, measured on the front curve, for a record specimen in the British Museum. Blanford (1888–91) gives the shoulder height as from 5 feet to 5 feet, 9 inches, and the estimated weight is frequently quoted as about 4,000 pounds. An adult female recently living here measured 4 feet, 10 inches at the shoulder. A male which had lived here for 11 years had a standing shoulder height of 5 feet, 2 inches a month before his death, when his weight was found to be 2,620 pounds. In the *Annual Report* of the Zoological Gardens of Basel for 1959 (1960) the weight of the breeding male living in the collection is given as 2,070 kilograms (approximately 4,554 pounds) and that of the female as 1,680 kilograms (approximately 3,696 pounds).

The Javan or lesser one-horned rhinoceros (*R. sondaicus*), once found from Burma, Thailand, and Indochina south to Sumatra and Java, appears now to be represented only by from thirty to forty animals living in the Udjung Kulon reservation in western Java (Boyle, 1959). There are occasional reports of supposed representatives of the species from other parts

of its former range (Anon., 1958), and it seems possible that some may survive in remote areas. Lighter in build than the Indian rhinoceros, the Javan appears to be practically as tall, for Blanford (1888–91) gives the height of a female as 5 feet, 6 inches. The surface of the skin shows a mosaic pattern and does not have the rounded "rivets" seen in the larger species. The male carries a rather short single horn, the greatest length given by Ward (1928) being 10¾ inches; the female is usually hornless.

Smallest of the rhinoceroses is the two-horned *Didermocerus sumatrensis*, of which two subspecies are known: the Sumatran rhinoceros, *D. s. sumatrensis*, from Sumatra and Borneo, and the hairy-eared, *D. s. lasiotis*, found in Burma, Thailand, and the Malay States. Both are thinly clothed in short, stiff hair, somewhat longer in the hairy-eared, which is further distinguished by its greater size and the development of the ear fringes. A colored plate of the type of *lasiotis* is given by Sclater (1872*a*), and one of *sumatrensis*, with drawings of the heads of both races, appeared subsequently (Sclater, 1872*b*). In both the young are rather heavily coated with hair which becomes much reduced as the animals mature. Photographs of a calf captured in Sumatra at the presumed age of 1 month are given by Ullrich (1955), and others of older examples are included by Antonius (1937*b*) in an extended coverage of the rhinoceroses. The latter reference quotes measurements made by Bartlett of animals living in the Zoological Gardens of London showing the shoulder height of an adult female *sumatrensis* as 3 feet, 8 inches and that of a female, the type of *lasiotis*, as 4 feet, 4 inches. Anderson (1872), in an account of the latter animal, seen in Calcutta before shipment, estimates her weight as "nearly 2,000 pounds." Both front and rear horns appear to be short, particularly in females. However, Ward (1928) records a horn measuring 32⅛ inches on the curve, in the British Museum, attributed to this species. While both races of the Asiatic two-horned rhinoceros still exist in scattered parts of their range and seem less in danger of complete extermination than the lesser one-horned, they nevertheless are in need of more stringent protection (see Harper, 1945; Talbot, 1960).

In the rhinoceroses of Africa, of which there are two species, the skin is comparatively smooth and unplated, although a deep fold between thighs and ribs and a transverse one at the elbows undoubtedly aid in the free movement of the limbs. There are two horns in each sex, often reaching great lengths. In adults, as already noted, there are no front teeth and, of course, no tusks such as those found in the Asiatic species.

Best known and most abundant of the African forms is the black rhinoceros (*Diceros bicornis*). Once common enough in East Africa, from

Ethiopia to the Cape and extending westward, avoiding the Sahara and the great rain forests, to the Cameroons and Angola, the black rhinoceros has been eliminated from much of its former range and is now found in greatest numbers in Kenya and Tanganyika. A race, *Diceros b. somaliensis*, said to be slightly smaller than the typical one, has been described. The black rhinoceros is not actually black but dark brownish gray, although the true color is usually obscured by such mud and dust as may overlie it. The upper lip is extended in a point which has some prehensile ability. The front horn, usually the longer, may reach a considerable length, the record given by Ward (1928) being 53½ inches for a female taken in Kenya. Shoulder heights given by Shortridge (1934) run from 4 feet, 9 inches to 6 feet and weight "about 2 tons." For a series of sixteen animals shot, weighed, and measured by Meinertzhagen (1938), shoulder heights ran from 58½ inches to 65 inches and weights from 2,199 to 2,896 pounds. A male that had lived here for nearly 13 years weighed 2,200 pounds at death, and a male now living here at the presumed age of 7 years has a standing height of 4 feet, 9 inches.

The black rhinoceros feeds largely on browse, including both leaves and small branches, and on leafy plants. It seems to prefer brush-covered hilly country, although it may at times be found on open plains. While the senses of smell and hearing are certainly sufficiently keen, eyesight is reputed to be weak, which may account for the unpredictable charges attributed to this animal. Such rushes may be made at surprising speeds: Meinertzhagen (1955) reports 32–35 miles per hour at the gallop and 27.2 at the trot.

The white rhinoceros (*Diceros simus*) occurs in two races, geographically widely separated. The southern form (*D. s. simus*), once rather widely but spottily distributed in South Africa, is now confined to reserves in Zululand, Natal, where "not more than 300" were living in 1958 (Knobel, 1958). The northern subspecies (*D. s. cottoni*) still exists in some numbers in a restricted area including northwestern Uganda, southern Sudan, and northeastern Belgian Congo (Dorst, 1958). An excellent account of the white rhinoceros in Uganda is given by Heppes (1958).

While not really white, of course, the white rhinoceros is a lighter and clearer gray in color than the black, at least when the skin is free from discoloration. The long head, terminating in a broad, shovel-like muzzle, and a great hump on the nape are characteristic. The latter has been found by Cave and Allbrook (1959) to be formed simply by a specialized thickening of the dermis. This is a considerably larger animal than its congener, its dimensions, in fact, exceeding those of any other rhinoceros. Its shoulder

height as quoted by Shortridge (1934), presumably based on measurements of dead animals, runs from 6 feet, 6 inches, to 6 feet, 9 inches and weight from 3 to 4 tons. The longest horns listed by Ward (1928) are 62¼ inches for the southern race and 45¾ inches for the northern. The white rhinoceros subsists chiefly by grazing, a purpose for which the wide lips are well adapted, and is usually found in open, grassy areas. It is more social than the black, small groups sometimes forming, and it seems less given to the violent charges that characterize its relative (Shortridge, 1934).

Along with other large or savage beasts known to the ancient world, rhinoceroses were not infrequently kept in menageries or shown in the arenas popular in early days. Many accounts of such captives have been gathered by Loisel (1912), and while it is seldom possible to distinguish the species involved, it is evident that both Asiatic and African animals were included. Occasional records continued through the Middle Ages and the Renaissance. Beddard (1905:58) quotes an account of a rhinoceros or "unicorn," presumably an Indian, that East Indian merchants brought to England in 1684 and thought to be the first seen in that country. An Indian rhinoceros was received by the Zoological Society of London on May 24, 1834 (Flower, 1929), and a black that arrived on September 11, 1868 (Flower, *loc. cit.*), is said by Peel (1903) to be the first seen alive in Europe since the days of the Romans. Flower (*loc. cit.*) also gives February 14, 1872, as the date of arrival at the London Gardens of a hairy-eared rhinoceros which became the type of *lasiotis*; August 2, 1872, for a Sumatran; and March 17, 1874, for a Javan.

At the present time rhinoceroses of one sort or another are kept by most of the world's larger zoological gardens. By far the greater number, of course, are blacks, since more specimens of this species than of any other still exist in nature. However, the Indian was fairly well represented in this country in 1963 by pairs at the zoological gardens of Chicago, Philadelphia, and Milwaukee and a single male at Washington. In Europe there are the breeding pairs at Whipsnade and Basel, as well as scattered individuals elsewhere. As far as known, there is no specimen of the Javan rhinoceros presently in captivity, but a single female of the Sumatran, unique in modern collections, was received at the Basel Zoological Gardens in July, 1959 (Anon., 1959*a*). Unfortunately, this animal failed to survive. A second female, received at the Zoological Gardens of Copenhagen in November, 1959, was still living in 1963. An account of this arrival, with a figure, is given in the *Annual Report* of the Zoological Gardens of Copenhagen for 1959 (1960). The first record of a white rhinoceros in captivity appears to be that of a female calf of the southern race received

at the National Zoological Gardens of South Africa, Pretoria, on July 29, 1946, and safely reared on whole cow's milk and corn (maize) porridge (R. Bigalke, 1947; Bigalke, Steyn, de Vos, and de Waard, 1950–51). On January 16, 1949, a bull thought to be 1 year old was received at Pretoria and was followed on August 23, 1952, by a cow, also considered to be a yearling. These three animals came from the Umfolosi Game Preserve in Natal, where they had been orphaned or abandoned (R. Bigalke, 1957). All were in good condition at the time of the cited report. The white rhinoceros was not represented in collections outside Africa until April 7, 1950, when a young pair of the northern race, captured in the Sudan, arrived at the Zoological Gardens of Antwerp. Complete and well-illustrated accounts of these animals have been given by Van den bergh (1952, 1955) and Micha (1958). In 1955 a pair of the same race was received by the Zoological Gardens of London, followed, in quick succession, by young pairs at the National Zoological Park in 1956 and at the St. Louis Zoological Park in 1957. In August and September, 1962, eleven white rhinoceroses of the southern race were brought to the United States from the Umfolosi Game Preserve in Zululand, Natal, through the co-operation of the Natal Parks, Game and Fish Preservation Board. All arrived in good condition and were distributed among the zoological parks of Chicago, Milwaukee, New York, and San Diego, and also the Catskill Game Farm. Several pairs from the same area were also received by various European gardens.

Accommodations for rhinoceroses here are provided, traditionally, in the Elephant House, where required winter heat is available. There are only two stalls, already described in general (p. 461). Each is fronted with 2½-inch steel bars, on 20-inch centers, making an intervening space of 17½ inches. A concrete basin at one side is used for grain while a similar installation at the other provides running water. Walls and floors are as described for elephants (p. 462). As originally constructed, arrangements were far from convenient and also lacked provision for safety, since no shifting areas were provided and doors were manually operated. As a first step toward the improvement of this condition, a concrete wall 38 inches high was built from front to back across a stall occupied by a particularly obstreperous black rhinoceros bull. Spaces 5 feet wide were left at front and back, so that the animal could circulate freely. A heavy chain was so arranged that it could be drawn across the forward gap, hanging loosely about 12 inches above the floor. For 10 winters the rhinoceros struggled daily with this apparently slight obstruction, never succeeding in crossing it, so that servicing could be carried out on one side after the other in complete

safety. Nowadays hydraulically operated doors under remote control and a former storeroom doing duty as a shifting cage insure complete safety of operation.

The outer yards are floored with hard-packed earth and gravel and are surrounded by concrete walls, which originally rose 40 inches above the bottom of a shallow "ha-ha" moat. While it seems unlikely that a rhinoceros could surmount such a barrier, a black bull did actually place his front feet upon its top in order to reach the leaves of an overhanging shrub. As a precaution, the wall was raised 14 inches to a total of 54 inches, which certainly is adequate. One of the yards, lately occupied by an aged Indian female, has a pool about 10 by 12 feet with a sloping approach on one side. It is in almost constant use during the summer months. There are no pools indoors, but liberal use of the hose during the winter keeps the animals' skin in good condition.

More recent indoor exhibition areas for rhinoceroses have made use of the moat instead of bars for restraint. This can be done with little loss of space, the fully successful moats in the newly completed building in the Cleveland Zoological Park being only 5 feet, 10 inches across and 3 feet, 4 inches high at the front, with a gentle slope, heavily crosshatched, downward from the cage floor.

In any indoor construction for rhinoceroses a shifting cage should always be provided, and all doors should operate by remote control. No keeper, of course, should ever enter an inclosure occupied by an adult animal of any species or of either sex. That any black rhinoceros, however quiet it may appear to be, is likely to charge at any time is well understood. In this species the horns are the usual offensive weapons, but while the Indian may use its horn on occasion, it has a real predilection for biting. I once saw a supposedly gentle female of this species savage a steel cage-bar with her teeth after just missing the rapidly departing rear of a too-trusting keeper. The use of horns by both black and white rhinoceroses and of teeth as the principal weapons by the Asiatic species is discussed by Pitman (1956), while instances of the latter are given by Glover (1956) and Talbot (1957).

Since the horns of rhinoceroses are constantly growing, it follows that the animals must abrade them to keep them in order. This is accomplished by rubbing against solid objects and probably to a lesser extent by digging in the earth. In consequence, it is important to avoid sharp-edged members in bar construction or other projections within the animals' reach, for serious damage to horns may result from too frequent contact with cutting surfaces, a point which has been discussed by Hediger (1950:103). We

had thought that a tree stump set in the yard used by our black rhinoceros might serve as a gentle abrasive, but a succession of animals have ignored it.

The use of chosen spots for defecation by rhinoceroses in nature as well as scraping of the deposits with the hind feet are mentioned by Shortridge (1934:418). The scraping action, commonly seen in captive animals, is treated in some detail by Bigalke, Steyn, de Vos, and de Waard (1950–51), as observed in a young white rhinoceros in the Pretoria Zoological Gardens; its function is obscure. Deposition of feces in special places is a common habit of rhinoceroses in captivity and, as pointed out by Hediger (1950:137), is advantageous in the maintenance of sanitation. An Indian recently in our collection made use of two such depositories, an African of only one. Male rhinoceroses normally eject urine toward the rear, often with such force that it may carry several feet. There seems to be some selectivity in the locale for such action, perhaps for marking purposes, and here we have had to erect a high glass barrier in front of one of the stalls to protect the public from unwelcome showers.

An adult female Indian rhinoceros recently living here received a daily allowance of about 60 pounds of hay, usually alfalfa, with clover or fine timothy sometimes substituted, and 10 pounds of commercial feeding pellets containing mineral and vitamin supplements. In addition she was given during the day raw white potatoes, carrots, cabbage, or other greens and two or three loaves of bread. A male black rhinoceros is supplied with the same items but in somewhat smaller quantity. Captive rhinoceroses seem as much subject to rectal prolapse as do tapirs, and as a possible preventive we are careful to provide only fine hay, of whichever sort, free from coarse or heavy stalks. Salt blocks are sometimes supplied to rhinoceroses, but we feel that the feeding pellets used contain an amount sufficient for the animals' needs. Fresh water is always available in the basins provided for that purpose.

Until comparatively recently, births of rhinoceroses in captivity were rare indeed. For one thing, the animals were so costly that few zoological gardens, in older days, were able to own pairs. For another, even when male and female of the same species were maintained simultaneously, the violent battles that took place were so alarming that the combatants were promptly separated to save them from serious injury. It appears that the numerous births that have occurred in recent years have been due largely to the determination of those in charge to allow the animals to fight it out, sometimes with horns carefully blunted. Accounts of such brawls, often less serious than they appear to be, have been given by Ulmer (1958) and Jacobi (1959). The frequent happy results attest success

in many cases, but often the continuing antagonism of the animals involved has brought the experiment to an end, so that many potential breeding pairs remain irreconcilable.

The first recorded birth of a captivity-bred rhinoceros appears to be that of a racial intergrade between a male Sumatran and a female hairy-eared, born in the Zoological Gardens of Calcutta on January 30, 1889 (Sányál, 1892). This calf was fully reared by the mother and had reached the age of 2 years, 7 months at the time of Sányál's writing. It is presumable that Sányál's reference to a previous birth is to a calf born in 1872 to a wild-caught Sumatran rhinoceros on arrival in London (Bartlett, 1873), an incident which led to Bartlett's frequently quoted but questionable estimate of 7 months as the gestation period.

On October 9, 1925, an Indian rhinoceros was born, also in the Zoological Gardens of Calcutta (Ali, 1927). This birth was thought to have been somewhat premature, and the calf lived for only a few hours. Its weight is given as 74 pounds and the gestation period estimated as about 19 months.

No further births of captive rhinoceroses were recorded until October 7, 1941, when a black rhinoceros calf was born at the Chicago Zoological Park (Edward H. Bean, 1941), followed by a second, to the same parents, on September 19, 1944 (Robert Bean, *in litt.*). Both young animals were successfully reared. Another hiatus of nearly 10 years was ended on February 14, 1954, with the birth of a black rhinoceros calf in the Zoological Gardens of Rio de Janeiro (Ulmer, 1958), a second birth occurring in 1956. In that year and the two following breeding successes were numerous. Saporiti (1957) reports the birth of a black rhinoceros in the Zoological Gardens of Buenos Aires in April, 1956. This calf lived for only a few days, but a second, born on January 2, 1958, is figured at the age of 20 days. apparently in excellent condition. The first birth of a black rhinoceros in Europe occurred at the Zoological Gardens of Frankfurt on December 24, 1956 (*Internatl. Zoo News*, 4 (3): 74), followed by another on December 10, 1958 (*Internatl. Zoo News*, 6 (1): 24), and one at Bristol, England, in the same year (Ulmer, 1958). The list continues, in America, with births in three zoological gardens: Pittsburgh, October 27, 1960, Cincinnati, July 27, 1961, and Detroit, April 19, 1962; in Europe, Rotterdam, August 29, 1960, and a second at Bristol, December 28, 1961. When visiting here in May, 1962, Sir Edward Hallstrom reported a total of three births in the large herd maintained at Taronga Park, Sydney, the first in August, 1958. These mounting successes indicate that the black rhinoceros, at least, is definitely established as a breeding species in the zoological garden.

Following the premature birth in the Calcutta Zoological Gardens in

1925, no further breeding successes with the Indian rhinoceros occurred until 1956, when on September 14 a male calf was born in the Zoological Gardens of Basel (Lang, 1957). This was the first rhinoceros to be bred in Europe and naturally caused a great sensation. During the night of October 29–30, 1957, a female Indian calf was born at Whipsnade and was quietly nursing when discovered by the keeper in the morning (Tong, 1958). On August 17, 1958, a second calf, this time a female, was born to the Indian pair at Basel (Geigy, 1959:12) and the Whipsnade pair produced another female calf in August, 1960. All these Indian calves were fully reared by their mothers. The 1956 male at Basel and the 1957 female at Whipsnade were transferred to the Milwaukee Zoological Park in 1959, making the first pair of captivity-bred rhinoceroses in zoological-garden history.*

No white rhinoceros calf has yet (1963) been born in captivity, but since both races of this species are now represented by mature or maturing pairs, there is an excellent possibility that breeding may occur.*

In general, female rhinoceroses have proved to be excellent mothers in captivity, and most of the calves born have been reared. The greatest obstacle to successful breeding continues to be the difficulty in persuading potential parents to tolerate each other long enough for the purposes of procreation.

Rhinoceroses appear to have no well-defined breeding seasons. Single young per birth are the rule (Asdell, 1946). From reports of breeding in captivity, the gestation period for the black rhinoceros seems to be between 15 and 16 months (Ulmer, 1958). For the Indian, 474 and 477 days were recorded at Basel and 488 days at Whipsnade, the average of approximately 16 months being in the area of that established for the black.

Recorded weights of newborn captive black rhinoceroses, either actual or estimated, average 63.2 pounds (Ulmer, 1958). An accurate birth weight of the male Indian calf born at Basel in 1956 is given by Lang (1957) as 60.5 kilograms or approximately 133 pounds. At the age of 2 years, 9 months its weight was 1,300 kilograms or 2,860 pounds (Anon., 1959*b*).

As pointed out by Flower (1931), the average longevity of captive rhinoceroses is comparatively short, although the greater spans achieved by some individuals indicate that the potential maximum is much greater than the age usually reached. This supposition is well supported by Flower's (*loc. cit.*) figures for the Indian rhinoceros: about 40 years in the Antwerp Zoological Gardens and 40 years, 4 months, 11 days in the Zoological Gardens of London and the less definite span of about 47 years in

*See Addenda, p. 736.

the Zoological Gardens of Calcutta given by Sányál (1892). A female of this species received here on May 24, 1923, died on January 25, 1962, after 38 years, 8 months, 1 day. Her weight at death was 3,065 pounds.

Longevities recorded for other species are less favorable. Flower (1931) gives 10 years, 10 months, 16 days for a Javan rhinoceros in the Zoological Gardens of London, while Sányál (1892) says a female of this species received at the Zoological Gardens of Calcutta in 1887 and still living in 1892 had previously lived "for about 10 years" in the menagerie of the king of Oudh, making a total of over 14 years. The hairy-eared that was the type of *lasiotis* lived in the Zoological Gardens of London for 28 years, 6 months, 16 days; since she had been captured just over 4 years before her arrival in London, her actual captivity span was about 32 years, 7 months (Flower, *loc. cit.*).

Flower's best record for a black rhinoceros is 22 years, 7 months, 1 day for a female in the Zoological Gardens of London. A male received here on May 25, 1906, lived until November 5, 1931, or 25 years, 5 months, 11 days, and Jones (1958) reports that a specimen received at the National Zoological Gardens of South Africa at Pretoria on December 31, 1914, died on November 15, 1942, after 27 years, 10 months, 15 days. The breeding pair of black rhinoceroses at the Chicago Zoological Park, received on May 19, 1935, were still living there in 1963.*

As already noted, the first white rhinoceros known to have been kept in captivity, a female of the southern race, was received at the National Zoological Gardens of South Africa at Pretoria on July 29, 1946, and was still living there in 1963. Its present span must be taken as the greatest longevity so far established for this species.

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*See Addenda, p. 736.

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P. 436 par. 1

Three Weddell's seals (*Leptonychotes weddelli*) captured in the Antarctic by Dr. Carleton Ray and received at the New York Aquarium on November 15, 1963, appear to have been the first representatives of this species to reach North America alive (Carleton Ray, 1964. Studying the Weddell seal in Antarctica. Animal Kingdom, 67 [2]: 34–43). The largest of these animals was a female weighing 750 pounds. All seem to have accepted captivity well.

P. 489 par. 3

The fifth issue of the *Pedigree Book of the Przewalski Horse*, edited by Jiří Volf and published by the Zoological Gardens of Prague, 1964, shows that as of January 1, 1964, there were 110 animals living in captivity, an increase of 20 over the total of the previous year.

P. 513 par. 1

Further births to the female Indian rhinoceros at Basel were a male born on August 3, 1962, and a female born in the period May–June, 1964, making a total of four young produced by this remarkable pair (H. Wackernagel, 1964. Internatl. Zoo News, 11 [4]: 133–4). A calf is reported to have been born in August, 1964, at the Hagenbeck Zoo, Stellingen, Germany, to a female Indian rhinoceros that had been sent to be bred by the Basel male (Marvin L. Jones, *in litt.*).

P. 513 par. 2

A white rhinoceros calf was born on April 11, 1964, at the Loskop Dam Reserve in the Transvaal, to a female captured in Zululand a year previously, when presumably pregnant (World Wildlife News, 27 [June, 1964]: 1).

P. 514 par. 3

A male black rhinoceros is reported to have lived in the Municipal Zoological Gardens, Johannesburg, Transvaal, from March 7, 1914, to March 21, 1948, or 34 years, 14 days (Richard J. Reynolds, 1963. The black rhinoceros (*Diceros bicornis*) in captivity. Internatl. Zoo Yrbk., 4: 98–113).

P. 546 par. 3

That dromedaries may accustom themselves to entering shallow water is shown by a report from James Coder, manager of the Farm-in-the-Zoo in