WILDLIFE MONOGRAPHS

Louis A. Krumholz, Editor
Department of Biology, University of Louisville, Louisville, Kentucky 40208

Consulting Editors for this Issue: Helmut K. Buechner, Washington State University, Pullman, Washington

Leonard J. Goss, Cleveland Zoological Society, Cleveland, Ohio

An important objective of The Wildlife Society, as stated in the bylaws, is the publication and dissemination of information pertaining to wildlife conservation.

Wildlife Monographs was begun in 1957 to supplement *The Journal of Wildlife Management*, the regular quarterly journal of The Wildlife Society. Articles in the *Journal* are short, whereas the *Monographs* are devoted to longer articles of a more inclusive nature. There is no set schedule for publication.

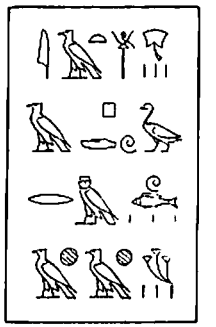
Each *Monograph* is sponsored financially by organizations or institutions interested in publication of the information contained therein. Usually, the sponsor is the organization that conducted the original research, but others interested in disseminating the information may assist in defraying the costs of publication. The sponsors pay for printing and editorial assistance, and The Wildlife Society provides skilled editors, and pays for distribution of the publication to all members, and to all libraries that subscribe to the *Journal*. Sponsors may order any number of additional copies at their expense. Additional copies may be ordered for later sale to new members and subscribers by The Wildlife Society at its expense. Thus, the sponsors receive free distribution of each *Wildlife Monograph* to a select group concerned with wildlife conservation, and members of the Society benefit by receiving well-prepared reports on subjects of direct interest to them.

There is a perpetual need for funds to sponsor publication of meritorious manuscripts in *Wildlife Monographs*. Any contribution will be accepted with gratitude. Memorial funds collected to honor and perpetuate the names of deceased members of the profession probably could not be put to better use.

In these diverse ways, individual numbers of *Wildlife Monographs* will be brought out as suitable manuscripts are received and arrangements made for financing them.

WILDLIFE MONOGRAPHS

A Publication of the Wildlife Society

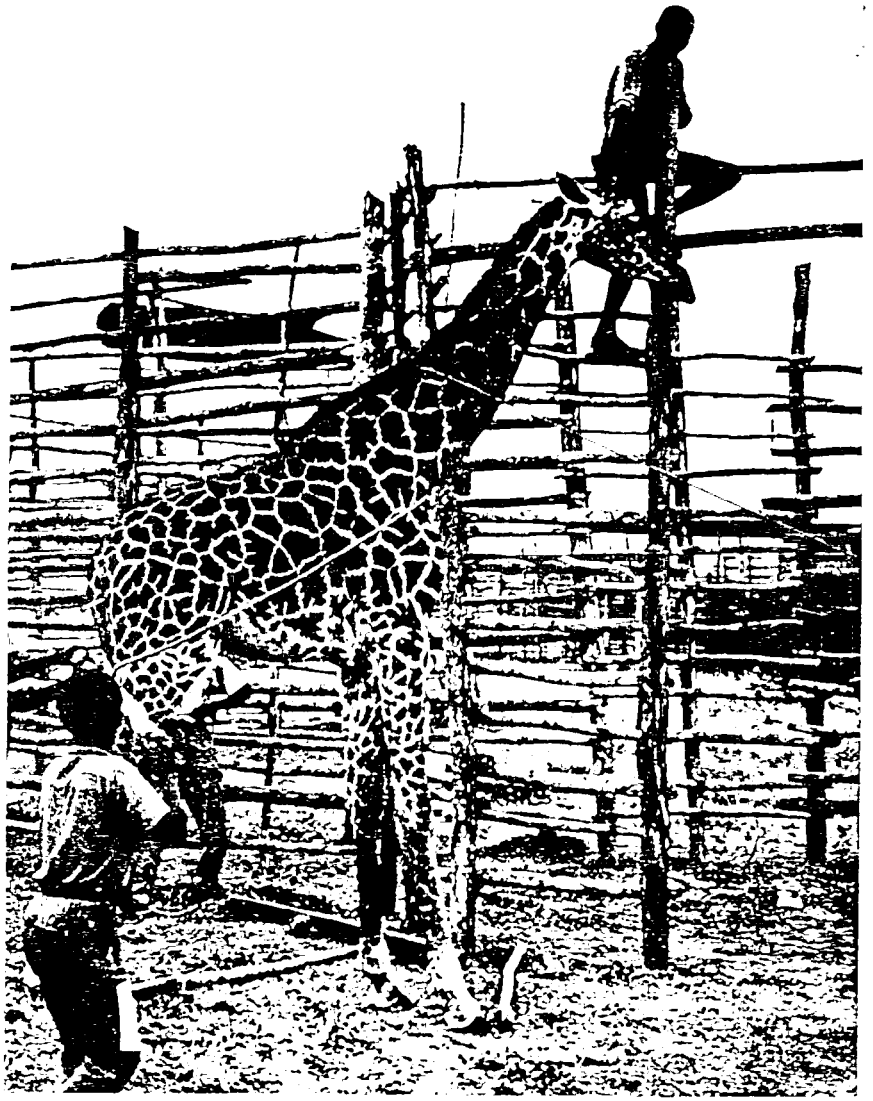


APPLICATION OF PHARMACOLOGICAL AND PHYSIOLOGICAL PRINCIPLES IN RESTRAINT OF WILD ANIMALS

by

A. M. HARTHOORN

MARCH 1965 NO. 14



FRONTISPIECE. The method of capture with centrally acting drugs eliminates the trauma of vehicle transport. A tranquilized giraffe being led into the enclosure after having been walked for several miles from the place of capture. The projectile syringe has not yet been removed

APPLICATION OF PHARMACOLOGICAL AND PHYSIOLOGICAL PRINCIPLES IN RESTRAINT OF WILD ANIMALS

A. M. HARTHOORN

University of East Africa, Faculty of Veterinary Science, Nairobi, Kenya

CONTENTS

homing instinct. With numbers of antelope, it allows them to drift away from the holding area quietly, thus permitting them to retain a semblance of herd structure. Even newly caught wild animals seem to acquire a feeling of connection with a place of captivity, and they may be reluctant to leave it, especially in a strange area. If the holding enclosure is opened quietly and all disturbance prevented, animals will move quietly out of the area, going only at a speed sufficient to pick up the landmarks. This is of especial advantage if the animals have been released near a watering point, or an area of specially suitable food, so that they can remember the way to this area and thus use the food and water. Often, other animals of the same species have been introduced into the area already, and it is of advantage for the newly introduced animals to stay in the relative vicinity, so that contact for breeding or herd structure can be ensured. Furthermore, control of the animal's movements can be exercised and a certain amount of protection given where needed against predators. If a small herd of antelope remains near a camp, much can be done to see that the animals are not excessively harried by predators. If, on the other hand, they disperse in all directions over several square miles of territory, as they are inclined to do if merely released from a truck, control becomes a near impossibility.

TECHNIQUES SUITABLE FOR THE CAPTURE OF RHINOCEROS

Originally, black rhinoceros were captured successfully with Flaxedil (Harthoorn and Lock 1960). It became apparent in 1958 that numbers of rhinoceros would be stranded on islands formed during the filling of the artificial lake made by completion of the Kariba hydroelectric dam. Methods used to bring other animals to safety were ineffective with rhinoceros. Other creatures marooned on the islands were either caught by hand or net, or after driving into the water, a method particularly suitable for the large antelope such as sable (*Hippotragus niger*). Fortunately, the other very large animals, such as elephant and buffalo, swam to safety. Attempts to drive the first stranded rhinoceros into the water were unsuccessful and it was impossible to rescue him.

The capture of these rhinoceros with Flaxedil proved to be relatively simple, and eight rhinoceroses were captured and floated off on rafts without difficulty (Fig. 3).

This method of capture failed, however, in an attempt to remove rhinoceros from areas where they were suffering heavy losses from poaching. It was discovered that the dose of Flaxedil necessary to bring the wild rhinoceros down in a sufficiently short time in bush environment was higher than that effective at Kariba, when 15 or 25 min between injection and paralysis presented no problem. However, in areas of bush where the rhinoceros suffered continuous molestation, such a time interval would be used in trying to escape, and the frightened animal might run as much as 5 miles, and following rapidly in bush country was virtually impossible. At the dosage rate required to bring the free rhinoceros down in about 12 to 15 min, serious respiratory embarrassment would be suffered by the immobilized animal within a few minutes after going down. Thus, the safety of the animal depended upon the ability to follow closely so as to be able to administer an intravenous injection of Prostigmin immediately after collapse. For various reasons associated with the terrain and with the violent movements of the head even under advanced paralysis, and a paucity of superficial veins except in the ear, this method was unsuitable for the capture of black rhinoceros.

Extensive experiments on cattle indicated that a suitable drug should (1) act with reasonable rapidity, (2) permit survival without recourse to an antidote, and (3) be reversible so as to be able to get the animal up as soon as feasible.

After trial and error with a considerable range of compounds including barbiturates, it was found that morphine and scopolamine mixtures induced a condition of "twilight sleep" very similar to the condition described for mankind. This condition, later also induced in other animals such as wild buffalo and wildebeest, induced them to walk about in a trance-like state (Fig. 4). The drawback to this method was the long time needed for the morphine to take effect. This was overcome by adding Sernylan or promazine to the mixture. The extraordinarily rapid effect of Sernylan induced a much quicker induction, rendering the animal disinclined to move, and even working synergistically with the narcotic and scopolamine to put him down on his brisket until the main narcotic dose was absorbed (Table 3).

This method was first tried on the southern white rhinoceros (*C. s. simum*) at the request of the authorities in that region. It was most successful, and it was possible to capture 12 rhinoceroses with complete recovery rate. More important still was the finding that the method could be used by Park Rangers to capture rhinoceros without losses due to the drug technique, and about 100 have been caught without loss by them, without expert help. There appears to be a bilateral safety margin on either side of the optimal dose of about 100 percent, which compares favorably with the margin of approximately 15–20 percent for paralyzing drugs such as Flaxedil. The wide lower margin ensures that no animals are lost through underdosage, and a dose for a medium-sized animal will, on the one hand, immobilize a fully adult bull of 4,500 lb and, on the other hand, permit recovery if used mistakenly on a calf of 1,000 lb. During this first exercise limited use was made

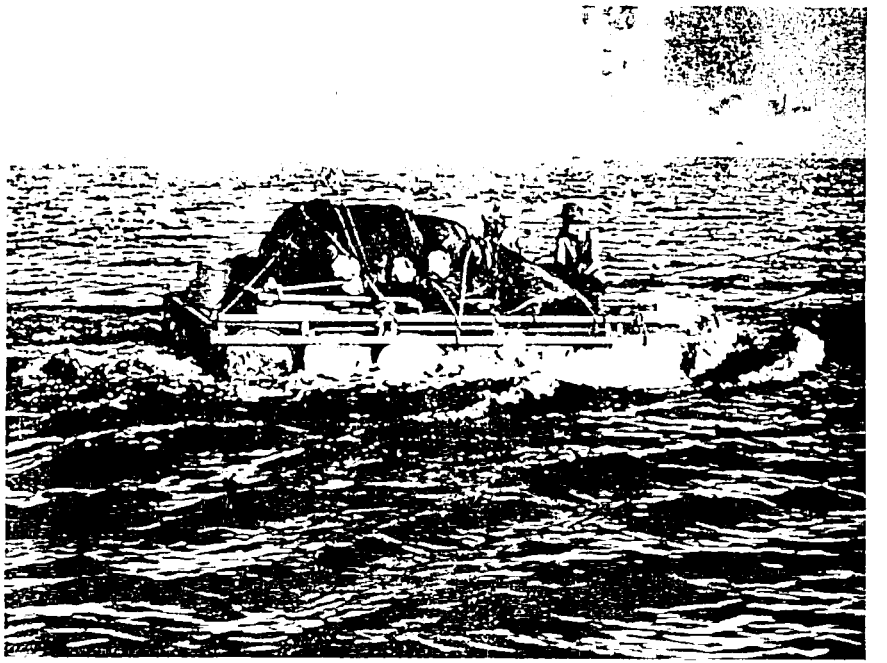


FIG. 3. Black rhinoceros being towed on a raft. The use of drugs at Kariba Lake, Southern Rhodesia, permitted a recovery of animals that could not have been handled otherwise.

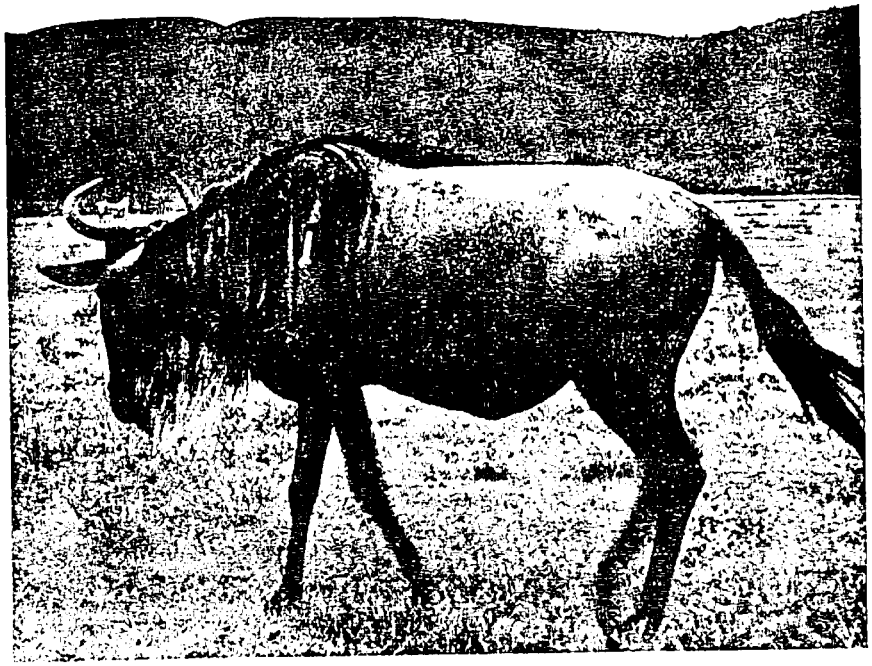


FIG. 4. Narcotized animals such as the wildebeest often walk close enough towards a standing person so that a horn or an ear can be seized.

of Themalon. This synthetic compound has an almost identical action to morphine, but has considerable advantages with regard to solubility, and is less toxic. Its ready solubility permits making up the narcotic solution after the rhinoceros has been sighted, thus effecting a distinct saving in drugs, both solutions having limited keeping qualities. The effects of Themalon and morphine on rhinoceros appear identical, although Themalon is more thoroughly reversible and less toxic than morphine. Later, oripavine (M99) was used owing to its smaller bulk and speedier absorption (Table 4). It is reversible in the same way as morphine and Themalon.

Medium-sized dosages permit the injected animal to remain upright, either standing or in upright recumbency. In either position, it is well situated to remain for a lengthy period of time without harmful effect due to drug action. Those animals that do fall in lateral recumbency due to the configuration of the terrain, or due to inadvertently high dosage rate, can be brought upright readily by a small dose of Lethidrone. It has been the practice to administer a small dose of Lethidrone (usually about 200 mg) to all animals that did not remain on their feet. This probably was unnecessary and may be discontinued in the light of greater confidence being gained with experience. Most of those that fall in difficult places, such as rocky hillsides, were the adult bulls making the greatest efforts to get away, and which

TABLE 3.—DOSAGES USED IN THE CAPTURE OF 30 WHITE (SQUARE-LIPPED) RHINOCEROSES, *CERATOTHERIUM SIMUM SIMUM*. The neuroleptic, narcotic, and scopolamine are all mixed in the same projectile syringe. Data taken in part from Harthoorn and Player (1963)

No.	Sex	Estimated Body Weight (lb)	Neuroleptic		Narcotic		Scopolamine (mg)	Time for Immobilization (min)	Antidote (Nalorphine, mg)
			Drug	mg	Drug	mg			
1	♀	1,700	Sernylan	350	Morphine	1,250	150	15	1,000
2	♂	1,500	"	350	"	1,250	150	8	1,000
3	♂	4,500	"	350	"	1,250	100	8	1,500
4	♂	4,500	"	175	"	500	60	60	None
5	♂	1,500	"	200	"	700	60	12	800
6	♀	2,700	"	200	Themalon	3,000	60	20	200
7	♂	2,700	"	200	"	3,000	60	15	200
8	♂	2,500	"	240	Morphine	830	80	18	700
9	♀	2,000	"	240	Themalon	2,000	50	25	800
10	♂	4,500	"	350	Morphine	1,250	150	6	1,500
11	♀	2,500	"	175	"	625	60	12	800
12	♀	3,000	Largactil	500	"	500	60	25	700
13	♂	3,500	"	705	"	1,500	175	45	725
14	♀	3,000	"	625	"	1,250	125	30	400
15	♀	3,000	"	725	"	1,500	150	22	900
16	♂	2,700	"	500	"	1,250	100	50	1,140
17	♀	2,000	"	700	"	1,250	100	45	700
18	♀	3,400	"	700	"	1,250	100	35	400
19	♀	2,800	"	725	"	1,500	100	55	600
20	♂	4,000	"	800	"	2,250	100	27	200
21	♂	1,000	"	525	Themalon	4,000	125	47	None
22	♀	2,500	"	800	"	3,000	150	25	400
23	♀	3,000	"	700	"	3,000	150	25	200
24	♂	2,800	"	700	"	2,000	100	40	200
25	♂	4,000	"	700	Morphine	2,000	100	35	400
26	♂	2,500	"	725	Themalon	3,500	100	32	160
27	♀	3,000	"	725	"	3,500	100	70	40
28	♀	2,800	"	725	"	3,500	100	35	360
29	♂	2,700	"	725	"	4,000	125	60	50
30	♀	2,900	"	725	"	4,000	125	20	120

usually were the ones that headed for difficult terrain. In practice, the indications for immobilizing adult bulls will be very limited, only females and half-grown bulls normally being destined for relocation.

Sernylan hastens the induction of narcosis and has a potentiating effect on morphine or Themalon. Furthermore, there seems to be a synergism between the Sernylan, Themalon or morphine, and scopolamine, considerably reducing the quantities of each drug required, and thus facilitating excretion. It is, however, not needed with oripavine (M99) to which only scopolamine need be added for rhinoceros.

Spontaneous recovery under light dosage has been demonstrated and is virtually certain under any but very heavy dosages. None of the animals at any time showed evidence of marked depression of respiration or any other vital body functions. Those transported for very long distances (about 450 miles) were first kept in a holding enclosure for taming, and some of those showed symptoms of constipation. On the other hand, all the marked rhinoceros have been observed and are in good health now for more than 9 months.

The dosages administered to the 30 rhinoceroses varied widely. The exercise was carried out on an experimental basis, not only to test the effectiveness of the immobilizing drugs but to determine the degree of safety, and to estimate its upper and lower dosage limits (Table 2). Thus, the feasibility of using this method for cap-

TABLE 4.—DOSAGES USED IN THE CAPTURE OF 15 WHITE (SQUARE-LIPPED) RHINOCEROSES, *CERATOTHERIUM SIMUM SIMUM*, WITH M99 AS THE PRINCIPAL DRUG. Each animal was given 100 mg of hyoscine with the M99. All animals were crated with the exception of No. 4, which was released, and No. 14, which was destroyed because of an apparently incurable eye condition

No.	Sex	Estimated Body Weight (lb)	Acetyl Promazine (mg)	M99 (total)	Time for Immobilization (min)	1st Injection Lethidrone (mg)	2nd Injection Lethidrone (mg)	Time Interval (min)	Crated	Time Interval (min)
1	♀	1,500	47	0.5	7	60	200	7	Yes	3
2	♀	1,200	20	1	12	20	240	2	Yes	1.5
3	♀	3,000	35	1	3	200	200	2	Yes	1.5
4	♂	5,000	10	1	9	200	500	40	No	—
5	♀	3,000	20	1	4	400	—	—	Yes	2
6	♂	4,000	20	1	14	400	—	—	Yes	1.5
7	♂	4,500	20	1	13	200	200	?	Yes	2
8	♂	5,000	15	1	13	None	None	—	Yes	1.5
9	♀	3,000	25	1	48	200	200	5	Yes	3
10	♂	5,000	75	3	5	300	200	15	Yes	1.5
11	♂	3,500	25	1	5	200	—	—	Yes	1.5
12	♀	1,300	65	7	3	200	—	—	Yes	1.5
13	♀	1,500	20	1	7	200	—	—	Yes	1.0
14	♂	4,500	—	2	8	None	—	—	No	—
15	♂	5,000	—	2	12	700	—	—	Yes	2

turing rhinoceros by unspecialized personnel could be assessed.

Later, Largactil was used as tranquilizer in the immobilizing dose. This appeared to give a longer time for immobilization than Sernylan. Largactil and morphine or Themalon were used subsequently for the capture of 100 more rhinoceroses by the park's staff. The quantity of Lethidrone administered as antidote varied widely, and no fixed amount can be recommended. The amount required depends on the condition of the immobilized animal and the readiness of the crate or the completion of observations. Even without further administration of Largactil, the animal after light dosage or partial substitution exhibits the curious somnambulistic state where he can be handled like a domestic animal.

For measuring, it is advantageous to have the animal on its feet. The puncture of the ears for application of ear tags had no noticeable effect when carried out on the standing rhinoceros. Likewise, the removal of the projectile syringe and the insertion of terramycin into the puncture wound went unnoticed. Other manipulations carried out in this position were the injection of penicillin, the application of zinc and castor oil ointment to abrasions, and tick grease to infested areas such as dock and prepuce. Usually, the rhinoceros were tied with a light rope around the hocks to prevent their walking away. To induce them to move, the most effective way appeared to be to wobble the horn or sometimes to pull the tail.

The same method has been used for the capture of the black rhinoceros and seems equally applicable, but the use of Sernylan rather than promazine is mandatory. The mixture used was one of Sernylan, Themalon, scopolamine, and Rondase. The dosage was, as nearly as possible: Sernylan, 10 mg/100 lb body weight; Themalon, 120 mg/100 lb; and Hyoscine, 5 mg/100 lb, with the addition of about 1,500 IU Rondase per syringe. The efficacy of the Rondase as a spreading agent has not been shown definitely, but it probably hastens absorption.

With these dosages, it can be expected that the following time schedule of events will take place: in 10 min, *ataxia*, the rhinoceros will slow down and lose coordination of his movements; in 15 min, *standing still* and swaying; in 20 min, *down* in sternal recumbency; and in 25 min, *fixed* and unable to move.

If the dosage rate is doubled, the animal will go down sooner and probably will fall on his side after a short period of sternal recumbency. If halved, the time to go down may be increased to 30 min or more.

These times are only a general guide and depend on a number of factors such as the placement of the syringe, the activity of the muscles which are injected, the state of hydration of the animal, and the degree of excitement. Thirsty animals will absorb the drug more quickly. Excitement will induce a state of resistance to centrally acting drugs. A short needle or an oblique shot resulting in subcutaneous injection will decrease the effect of the mixture to about one-third. Assuming that a sufficiently deep injection will be made in good vascular muscle tissue, the neck, hump (avoiding the area of the callus on top), and shoulder being suitable areas, the dosage schedule in Table 2 may be followed. In bad country where there is danger of losing the quarry after injection, the Themalon and Sernylan dosage rate may be increased by one-fourth.

Methods of Capture

The sequence of events and the methods evolved for the capture and handling of the rhinoceros prior and subsequent to injection differs from one area to another, as well as in relation to the purpose of capture. Considerable differences can be demonstrated between the various systems evolved to catch and move: black rhinoceros at Kariba, and in the Tanganyika bush, white rhinoceros in Natal outside the Umfolosi Game Reserve and in the West Nile in Uganda. As further adaptations would have to be made in yet another area, a detailed description of these methods would serve little useful purpose. As a general guide, however, a summary of the main drill as evolved in Natal may be useful.

(1) A ranger in a Land-Rover No. 1, equipped with a Pye "Reporter" wireless, and some scouts are sent out beforehand to likely areas. Contact is made with base on finding suitably sized animals.

(2) Land-Rover No. 2, carrying the drugs, gun, etc., goes to the areas after instructing the lorry to go to a rallying point.

(3) Contact is made with the 2 horsemen who have set out for the general area some hours previously. Each rider is equipped with a syringe, 4 rubber-capped 5-ml vials of antidote, holding 125 mg Lethidrone each, a packet of needles, and a short rope for hobbling the hind legs.

(4) The chosen animal is examined. A syringe is loaded with the correct quantity of drug, and the gun is tested if a gas gun is to be used.

(5) The rhinoceros is stalked. The shooter is kept in sight from a small distance by at least one of the horsemen.

(6) The dart is projected and success is signaled by the shooter by raising his gun vertically. No move is made unless the animal runs. If it runs, it is followed by the two riders at a distance commensurate with the type of country, and with assurance that the injected animal will not be lost to sight.

(7) Land-Rover No. 2 follows if the country permits easy sight of the rider. If not, it remains where it is.

(8) When the rhinoceros becomes immobilized, the riders check to see if it is well, and signal on whistles. If it needs help, they inject about 200 mg of the antidote. One rider remains with the rhinoceros and the other contacts the main party. If the rhinoceros chooses to walk away, he is hobbled.

(9) On arrival of the Land-Rover, the rhinoceros is examined. Tranquilizer is injected and then a partial dose of antidote. Ear tags are placed, penicillin injected, and measurements taken. A rider is sent to guide the truck carrying the crate. Tick grease is applied and antiseptic ointment where necessary.

(10) On arrival of the truck, the crate is unloaded and the rhinoceros and crate brought together on suitable ground. A full

dose of antidote is now given and more tranquilizer if required. The rhinoceros is led into the crate. A suitable quantity of grass is added. Ropes may be placed round his chest and fastened to the posterior end of the roof of the crate to prevent him from lurching forward.

(11) The crate is placed on the lorry with the rhinoceros tail forward. A stop for rest is made about every 1½ hr unless the animal is asleep. Sufficient tranquilizer should be administered to try to induce this desirable state, especially while traversing rough country.

Transportation and Release

To meet the requirements of large-scale capture of adult animals, methods of transportation had to be devised. If the principle of moving certain species of animals from areas where they can no longer be tolerated, or where they are being destroyed as an alternative to control by shooting, is to be accepted, the methods of capture and transport must be rapid and inexpensive.

A reduction in the number of animals that needs to be kept in a holding enclosure is effected by immediate crating in the field and the use of tranquilizing drugs during the subsequent journey. It is not possible to set arbitrary limits on the journey that can be undertaken immediately on capture, the length depending on the state of roads or tracks. Very approximately, adequate tranquilization permits a journey of maximum 200 miles or of 24 hr immediately after capture.

The prime essential for immediate crating is a heavy tranquilization. It is preferable that the animal goes down during the early part of the journey, especially if stream beds or other sharp declivities have to be negotiated. By the time the tranquilizer has lightened sufficiently to encourage him to rise, the animal will have accustomed himself to the crate and the motion of the vehicle.

The motion of the truck on a good surface usually has a soothing effect on the crate inmate, especially since his primary concern will be to keep his footing instead of trying to escape. Often the swaying motion will encourage him to lie down. The lying position, but with the ability to rise at will, is the most desirable condition for long-distance transport. When the animal cannot rise he may become cast, or may cut off the circulation of one or more limbs, or suffer chafe wounds on the side or back. In sharp contradistinction, rough, potholed, or corrugated surfaces will have an unsettling effect and induce the inmate to stand or to struggle.

Immediate crating rests largely on the ability and willingness of the rhinoceros to enter the crate under his own locomotory powers. Other ways of getting a 4,000-lb animal into a closely fitting box may be within the bounds of human ingenuity, but are not very practicable under field conditions, so that field crating can be considered as unworkable for the paralyzed or unconscious animal on the one hand as the tied, but fighting animal, on the other. The time that the animal can be kept lying on its side is limited strictly by humanitarian and physiological principles, and a temporary holding area in the vicinity usually is dictated under these conditions.

The deportment of rhinoceros once they have entered the crate depends on the sex, the degree of tranquilization, and the extent to which the narcotic drug has been reversed. In the "twilight sleep" stage predominantly under the effect of morphine and hyoscine, the unrestrained subject will wander about without thought of aggression and largely oblivious to his surroundings. If, on the other hand, he is confronted with a solid obstacle in his path, his remaining faculties will be concentrated in pushing through this impediment to his progress. For example, a lightly dosed rhinoceros was found pushing as hard as he could against the base of a single bush, sweating profusely with his effort; no attempt was made to go around it. Particularly the male rhinoceros will similarly apply himself to the anterior part of his crate, moving forward until he is in danger of closing his trachea through bending his neck and occluding his nasal orifice in the angle between front of crate and floor. This peculiar behavior is exhibited only by a small proportion of animals crated and then usually by bulls. It can be prevented by placing ropes around the chest to preclude access to the front of the crate, but more effectively by a sufficiently high dose of Largactil to insure that he lies down soon after entry. A problem presents itself here. If the Largactil is given too soon and he lies down when only halfway in, there is no way of getting him moved the remaining distance. If the effect is delayed, a very difficult 10 min or so may be experienced while he insists in attempting to go forward. It is possible that simple modification to the crate, such as a solid instead of a slatted front, and the placing of the crate tail foremost on the lorry will be sufficient to prevent this. In any case, it is of short duration. Once the journey has started, the rhinoceros will accustom himself rapidly to the crate and motion. One female in particular showed no resentment during 24 hr which elapsed in the middle of her journey while the lorry carrying the crate was extricated from the mud resulting from an unexpected cloudburst. During this time, she alternately stood and lay down according to her inclinations without any attempt to struggle or fight in spite of the fact that the floor was tilted at an uncomfortable angle, and the particular early design of crate had no small opening through which to administer a further dose of tranquilizer. A similar accident to a truck carrying a tied rhinoceros would almost certainly mean the death of the incumbent.

Stops for about 15 min during which food and drink are offered should be made approximately every 1½ hr. These stops are necessary to allow for defecation and urination. If the animal is lying down, however, such stops may be dispensed with, permitting a longer halt when he does get up. A responsible person should be in the back of the truck with the animal permanently in view, and in contact with the driver.

Adequate precautions should be taken against wet and cold, particularly during the night, and heat and direct sun during the day. The people in charge should be conversant with the effect of Largactil on the body temperature regulating center. On arrival, the back of the crate should be presented to the holding boma, because the passenger can be easily restrained from backing with a plank thrust through the slats of the crate, but may be impatient of delay in going forward and wish to assist by exerting pressure against the half-released door.

Needless to say, food and drink should be placed in the enclosure before the animal is released from the crate. Water is best given in a shallow puddled depression, and food tins or water tins should be avoided if at all possible. A period of several hours of absolute peace is highly desirable after the animal is placed in the enclosure.

THE CAPTURE OF HIPPOPOTAMUS

The hippopotamus merits a special section because it is the only large African mammal that may be immobilized with suxamethonium. The animals listed in Table 5 were the first series of large mammals on which immobilization was attempted, and much of the mortality suffered should be ascribed to inexperience in judgment of weight of the animals and their reactions to drug dosages. The question of possible use of suxamethonium in relation to cropping justifies a description of the reaction of the hippopotamus to this drug.

In March 1960, the immobilizing dose of suxamethonium for the hippopotamus was determined and 3 animals were successfully immobilized. The dose was reported as 0.06 mg/lb of body weight, this being sufficient to prevent the animal from walking and to permit it to be marked on the posterior half of the body.

Later, the immobilization of a larger series was attempted as a pilot scheme for large-scale marking of hippopotamuses in the Queen Elizabeth National Park in western Uganda. The purpose of the marking operation was to determine the possible movement of hippopotamuses from the park