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THE IMMOBILIZATION OF AFRICAN ANIMALS IN THE FIELD, WITH SPECIAL REFERENCE TO THEIR TRANSFER TO OTHER AREAS (U.S. TRANSLOCATION)*

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The need for urgent measures to preserve African game for study and assessment of ecological importance is briefly discussed. The use of paralysing drugs for the capture of these animals is described. The applicability of the method for the transfor of animals threatened by poaching, farming and other agrarian activities is dicussed, together with problems associated with removed populations.

CONTENTS

INTRODUCTION

The preservation of African wild life is a matter of the greatest concern. The rate of destruction of animals in this country has reached such proportions that unless strenuous efforts are made, the majority of large species may be almost extinct within a generation. Even the existence of game parks does not completely safeguard larger animals, whose normal migratory habits are increasingly curtailed, and so may ultimately be deprived of essential food stuffs.

It is desirable to preserve African wild animals, not only for aesthetic and scientific reasons, albeit many would consider these adequate, but also for their possible importance in the proper use of land.

Large scale and permanent destruction of land by wasteful and erroneous methods of arable and stock farming has been and is a matter of concern in many countries, and there is an increasing tendency to reserve large tracts of land in a state of natural balance to act as catchment areas and as barriers against erosion. These natural areas can be made productive by controlled

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game cropping, under careful management, to yield valuable protein and also as a source of revenue as controlled hunting areas. A particularly African problem is the spread of bush which is steadily encroaching on considerable areas in East Africa alone. It is well known that many of the larger species—giraffe, eland and rhinoceros—are browsers and feed on this type of vegetation ; their reduction may well contribute to this serious spread. It is a slightly hopeful trend that in some areas where game has been exterminated, there is an increasing demand by farmers to have their land restocked with wild antelope.

It is certain that the value and position of these animals in the economy of the country is not known. In the absence of agreed and extensive policies directed to the proper use of wild life and natural resources, one of the urgent problems concerned with the preservation of wild animals is their removal from areas where they are not tolerated, to places of greater safety. In the past, the control of animals in real or apparent conflict with man has been through destruction, by poisoning, shooting or snaring. More recent attempts to capture them by driving and netting, with the object of removing them from specific areas, has failed, particularly as far as adult animals are concerned. Either the animals will not be driven, or a high mortality attends their capture in nets due to fright and the necessary force to control them.

METHODS

The technique of paralysing animals by the use of drugs offers a humane and practical alternative to former methods. The marking of animals as a means of study has been considered desirable for a decade (Worthington 1950) and the use of paralysing drugs for this purpose envisaged at least as early as 1956 (Kinloch 1956). Recently this method has been developed into a practical technique (Crockford *et alia* 1957). A drug, for example nicotine salicylate, is administered by a dart or automatic syringe delivered to the animal by a gas powered gun. The animal, paralysed by the drug, can then be marked with an identification disc or ' tag ', and its subsequent movements recorded.

This technique has greatly facilitated the study of wild animals their migration cycles, birth and death rates.

Grzimeck in 1953 (Gimbel 1959) used this technique for marking several species in ungulates in the Serengeti National Park and it has been used in Uganda for the study of the kob (*Adenota kob thomasi*) (Buechner 1959). This method was later adopted for the capture of animals for their transfer.

A preliminary stage in this work is the investigation of suitable drugs and doses for a wide range of animals.

For smaller species nicotine salicylate is undoubtedly effective, but has many disadvantages. It is extremely toxic, dangerous and unpleasant to handle, and the recovery of the animal may take as long as four hours. Also its effects on the animal are such as to lead us to deprecate its use on humanitarian grounds.

Succinylcholine chloride has been investigated on a considerable number of species and a preliminary report has been prepared (Buechner, Harthoorn & Lock, 1959). Since this report paralysing doses have been found for the hippopotamus (*Hippopotamus amphibius*), namely 0·1 milligram per kilogram, and the buffalo (*Syncerus caffer*) at 0·055 milligrams per kilogram. The addition

of atropine, 0·11 milligrams per kilogram, was found essential for this animal. In the absence of atropine, excessive bronchial secretion, provoked by the paralysing drug, caused death. d-Tubocurarine was also tried on buffalo and the drug was found to be effective when combined with atropine. It had, however, the disadvantage of slow onset of paralysis—about forty-five minutes —recovery taking place in one hour. Succinylcholine, with all species so far tried, produced paralysis in about ten minutes, recovery occuring within half an hour. This is of course an important factor where animals may seek cover before the onset of paralysis.

Considerable species variation is shown in the response to the drug. Kob (*Adenota kob thomasi*) and waterbuck (*Kobus defassa ugandae*) may be paralysed completely with a certainty of recovery. Hippopotamus are best given a dose which renders then incapable of walking, but leaving other bodily activities, including jaw movements, little impaired. Since for identification of individuals, hippo are probably better branded than earmarked, this is no disadvantage.

The black rhinoceros (*Diceros bicornis bicornis*) and elephant (*Loxodonta africana*) have both proved difficult subjects. Early attempts were abortive, largely owing to needles of inadequate length. The hard skin of the rhinoceros tends to damage the syringes used, but indications are that successful injections may be made in the neck and hump and an effective dose has been found. Complete success has not yet been achieved with the elephant, but indications are that the effective dose is a little under 0·70 milligrams per kilogram.

Much remains to be done before this aspect of the work can be considered complete; particularly other drugs and adjuvants are to be tried to increase the margin of safety, especially since, for general field work on a large scale, people not trained in accurate dispensing may have to be employed.

Following successful paralysis, animals are then captured, given, if necessary, a suitable tranquillizing drug, and conveyed to other areas. Possibly this method is equally suitable for capture for zoological gardens.

APPLICATION

In June 1959 we moved two female kob 75 miles from Lugari to West Suk in Kenya, demonstrating that the method is practicable. The tranquillizing drug used was Largactil (chlorpromazine) given in a dose of 2·2 mg. per kilo, and the animals were handleable and apparently unfrightened by the experience. This trial has provided some of the necessary knowledge for the removal of 200 to 300 kob from the Lugari farming area, which is the only place they now exist in Kenya, to suitable habitats elsewhere in the country. During the same field operation it was also demonstrated that the Rothschild giraffe (*Giraffa camelopardalis rothschildi*), could be immobilized and six of these rare giraffe now wear ear tags and are under observation for possible undesirable after effects. It is planned to move twenty-five of these animals to the West Suk where their behaviour and health will be observed. If this pilot experiment is successful, and the animals seem to become established in the new surroundings, further groups will be removed to the same area leaving behind only a small number compatible with farming interests.

Ten years ago about 1000 black rhinoceros were shot in the Makeuni area of Kenya prior to native settlement. Further bush will have to be cleared and it is hoped to avoid shooting by transporting at least a proportion of these animals, also heavily threatened by poaching, to the Northern Frontier Province.

Lessons learnt from the black rhinoceros may be applied to the rare white rhinoceros (*Ceratotherium simum cottoni*) and it is hoped ultimately to remove some of these from the West Nile district of Uganda, where they are at present heavily poached, to a National Park.

The inoculation of wild animals with rinderpest vaccine has also been shown to be a practicability at least in National Parks (Harthoorn & Lock 1959).

Much work remains to be done before the value of these methods can be assessed for the large scale control of game. For example transferred populations must be studied for their establishment, balance with predators, rates of increment, weight gains and possible interbreeding with subspecies.

Although the killing of animals under a system of controlled cropping and shooting for protective reasons must continue, it is hoped that methods of immobilizing and transporting animals will contribute materially to the preservation, proper use and study of wild life in Africa.

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Fig. 1.—Young male Uganda kob. Showing easy handleability under the influence of Succinylcholine. Semliki Valley, Uganda.

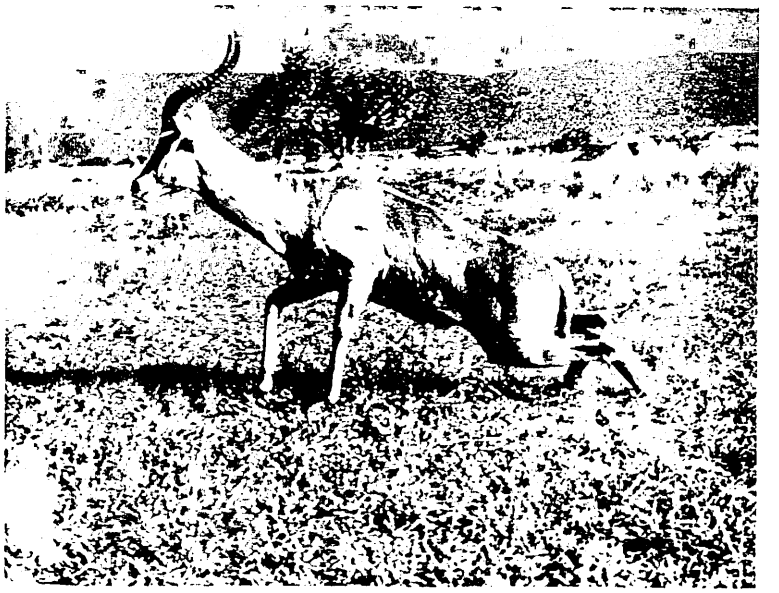

Fig. 2.—The kob gets to its feet. Note marker on ear.