Koedoe (13): *123-126* (1970)

A LASTING METHOD FOR THE MARKING AND IDENTIFICATION OF ELEPHANT

by

U. DE V. PIENAAR *

Since the handling of African elephants was made possible by the application of neuroleptic-narcotic drug mixtures (Harthoorn, Lock and Luck, 1961; Pienaar *et al*, 1966), the need for developing a permanent marking technique for facilitating long-term studies of growth, ageing, reproduction, behaviour, seasonal migrations, herd stability etc. became widely recognized amongst field research workers in Africa. A variety of marking systems have been applied, and these ranged from painting numbers on the body or ears, the application of plastic streamers or numbered discs to the ears or of plastic markers to the tails, the fitting of brightly coloured collars around the neck, the clipping of ears and drilling of numbers on the tusks (Pienaar *et al*, 1966; Hanks, 1969). None of the marking techniques applied to date proved really satisfactory in the field, and practically all had the serious disadvantage that they achieved, at best, only a temporary means of identification.

In view of the very sensitive nature of elephants' skin, hot branding has also been ruled out as a marking method (Pienaar *et al*, 1966) but, in view of the spectacular results achieved by Farrell and his co-workers (1966) with super-chilled branding instruments on domestic animals, it was decided to test this technique also on Kruger Park elephants. For this purpose a young 2–2½ year old bull calf was captured in the field and kept in a holding pen at our headquarters at Skukuza. After an initial period of adjustment to captivity the animal was immobilized in the boma on 13 March 1969, with a dart syringe containing 1.0 mgm Etorphine hydrochloride and 7.0 mgm Acetylpromazine. The ears were chosen as branding sites in view of their large size, relatively flat surface and the fact that a number would be visible both in frontal and lateral view, due to the elephants' habit of flapping its ears.

Both ears were thoroughly cleaned with water, and subsequently also wiped down with 95 % alcohol (rectified spirit). The branding instrument consisted of a large number 4 which had been constructed out of copper, and had dimensions of 25 cm high and 1.25 cm thick. The branding surface was 2.5 cm wide. The instrument was chilled to a temperature of *ca.* -70°C with a mixture of solid CO_2 (i.e. dry ice) and 95 % ethyl alcohol.

* *Nature Conservator, Kruger National Park, Skukuza*

A flat wooden board was placed behind the ear of the elephant and the branding instrument was applied to the cleaned anterior surface, using an estimated pressure of some 20–30 kg (Fig. 1). The initial time of application to the left ear was 2 minutes. The branding iron was then re-chilled and applied to the branded area, which had been previously outlined with a grease pencil, for another 2 minutes. The process was repeated for a third time so that a total branding time of 6 minutes was

Fig. 1. Application of super-chilled copper branding instrument to ear of young elephant.

achieved on this ear. After the third application there were signs of frost-bite developing on the posterior surface of the ear and the branding was discontinued. During the entire period the animal gave no indication of stress or pain and remained perfectly still.

The branding process was repeated on the right ear, but in this case only 2 × two-minute applications were made. The narcotic antidote was then administered and the animal was left in the boma for subsequent observation. After the lapse of one week the outlines of a number four could be distinctly seen on both ears. Some sloughing of the surface pigmented skin layer had also commenced. This process continued for some weeks until all the surface skin had sloughed off on the branding sites of both ears. In the case of the 4 minute application the sloughing of the skin proceeded in a very satisfactory manner without any undesirable side-reactions. On the left ear, however, there was a marked degree of ulceration and the depigmented scar took a long time to heal completely. A six-minute application of the chilled branding iron is obviously too long for an animal of this size, and damage is done to the deeper skin tissues.

It was noticed that some patches of pigmented skin remained in both branding sites, but this was probably due to the fact that a completely

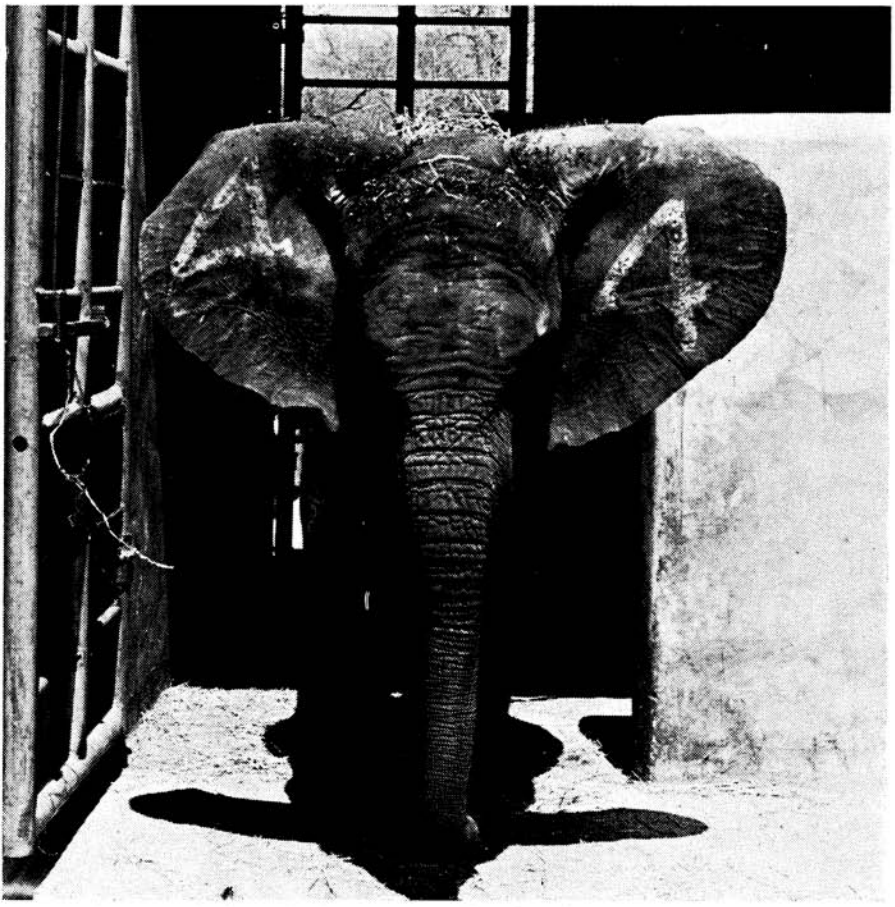

Fig. 2. Young elephant bull seven months after freeze-branding on both ears.

flat surface is almost impossible to achieve on the ears of these animals. The final result, however, was very pleasing indeed and the procedure appears highly promising as a lasting method of identification. The branded area of skin was depigmented to a remarkable degree and the numbers were very clearly legible even at a long distance. The animal was kept in the boma to check on reinvasion of the branded sites by melanocytes, but after the lapse of 7 months there was still no evidence of such a re-pigmentation (Fig. 2), and the animal was released near Skukuza in November 1969.

Stimulated by the very promising results achieved with the young animal, a fully grown adult bull was subsequently immobilized near Tshokwane, and branded on the right ear with the same branding instrument. In this case the numbered instrument was applied for a total of four two-minute intervals. (It seems feasible that with liquid nitrogen as the chilling medium the application time can be reduced considerably.) At the time of writing this animal has not yet been re-sighted and it is not possible to report on the results.

On the strength of our single successful experiment we can already advocate the technique as a more lasting and obvious method of identification for African elephants than any of the older techniques.

REFERENCES

FARRELL, R. K., L. M. KOGER and L. D. WINDWARD. 1966. Freeze Branding of Cattle, Dogs and Cats for identification. *J. Am. Vet. Med. Ass.* 149: 745–752.

*FARRELL, R. K., G. A. LAISNER and T. S. RUSSELL. 1969. An International Freeze-Mark Animal Identification System. *J. Am. Vet. Med. Ass.* 154: 1561–1572.

HANKS, J. 1969. Techniques for Marking Large African Mammals. *Puku* (5): 65–86.

HARTHOORN, A. M., J. A. LOCK and C. P. LUCK. 1961. The handling and marking of wild African elephants (*Loxodonta africana*) with the use of the drug immobilizing technique: a preliminary report. *Brit. Vet. Journ.* 117 : 89–91.

*HARTHOORN, A. M. and C. P. LUCK. 1962. The handling and marking of wild African elephants (*Loxodonta africana*) with the drug immobilizing technique: second preliminary report. *Brit. Vet. Journ.* 118: 526–530.

*HOOVEN, N. W. 1968. Freeze Branding for Animal Identification. *J. Dai. Sci.* 51: 146–152.

*MACPHERSON, J. W. and P. PENNER. 1967. Animal Identification. Liquid Nitrogen Branding of Cattle. *Canad. J. Comp. Med.* & *Vet. Sci.* 31: 271–274.

PIENAAR, U. DE V., J. W. VAN NIEKERK, E. YOUNG, P. VAN WYK and N. FAIRALL. 1966. The use of Oripavine Hydrochloride (M-99) in the drug-immobilization and marking of Wild African elephant (*Loxodonta africana*) in the Kruger National Park. *Koedoe* (9): 108–124.

*Not quoted in text.