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Conditioning of a Greater One Horned Rhino (*Rhinoceros unicornis*) to Accept Foot Treatment Without Anesthetic

By

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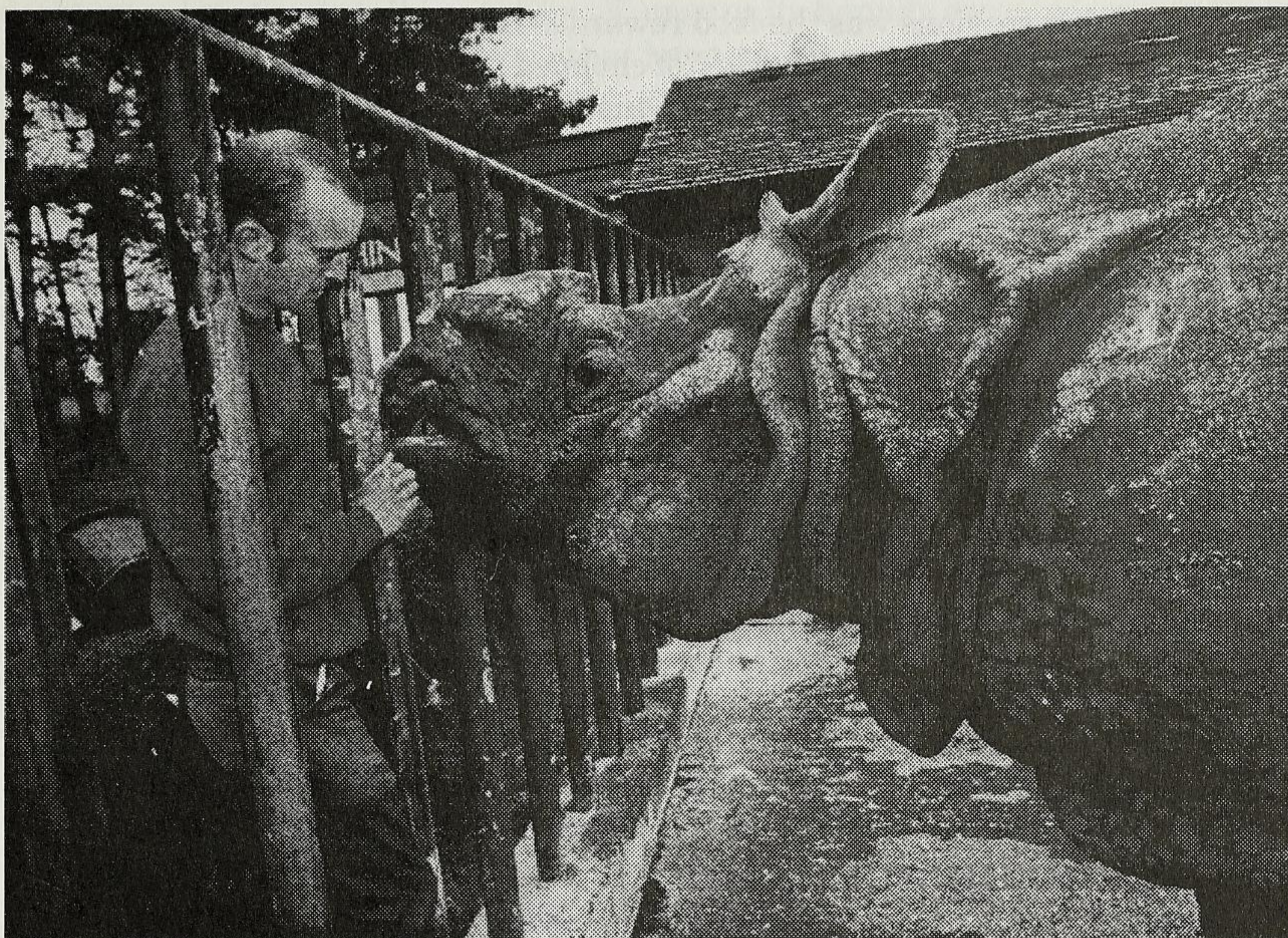
This is a paper which documents the problems and successes of conditioning the behavior of Kumar, a 24-year-old greater one-horned rhino to allow his persistent foot problems to be treated; with approximate guidelines as to how long each newly taught behavior took.

While at Whipsnade, where Kumar has been since 1973, the solution to his foot problems has been to anesthetize him and remove a six-inch long and two-inch thick chunk of his back central toenails with an electric saw. At the same time, the accumulations of dead skin between his nails and on the soles of his feet were also removed. These particular foot problems affect a number of male greater one-horned rhinos in European and North American zoos. The foot problem was caused by excessive growth of the toenails on the back feet. The prolonged stresses caused by these excessively long nails led to infections on the pads of his back feet and between his toes - and his reluctance to put weight on the infected foot.

To deal with these problems Kumar had been anesthetized up to four times a year. In September 1995, Bardia, a six-year-old son of Kumar, died under anesthesia while undergoing foot treatment. This tragedy, combined with Kumar's advancing age, necessitated finding an alternative solution to dealing with his foot problems.

During the day Kumar is kept in a concrete yard with housing. The front yard is surrounded by vertical bars set in concrete at 10-inch (25.4 cm) intervals. At night Kumar has access to a large grass paddock. The rhinos at Whipsnade are fed concentrates and hay twice daily, at 0830 hrs. and 1700 hrs., as well as fruit and vegetables when available. Kumar's training sessions take place between 1200 hrs. and 1300 hrs. five days a week. They gradually increased in duration from five to 40 minutes in length.

It has taken approximately 12 months of hard work and patience to achieve a successful footcare program. Hopefully this program will continue and prevent another tragedy such as Bardia's death from occurring at Whipsnade in the future.



Author Jim Gregory with Kumar at Whipsnade Zoo. Patient conditioning has allowed the staff to do foot work on the rhino without the use of anesthesia. (photos provided by the authors)

The Beginning - Jan. - April 1996

This initial period was a testing ground for assessing effective training methods and setting realistic achievement targets.

Our first goal was acclimating Kumar to keepers being present in the area between his bars and the stand-off barrier - an area of about one meter (3 ft.). We achieved this in a couple of days as Kumar has always accepted keepers in this area, especially if they had food and he would readily take food offered to him by hand.

After Kumar had become comfortable with us working near him, we started working on forging a link between Kumar receiving fruit/vegetables and good behavior. Initially, every time Kumar targeted to the trainer's hand a whistle would be blown and Kumar would be fed. The whistle was used as it could provide a consistent sound regardless of which trainer was working Kumar rather than relying on the peculiarities of different keepers' voices.

Originally we had assumed that the main motivation for Kumar to participate

in these training sessions was the food rewards. However, after three weeks, it became clear that although the bucket of chopped fruit/vegetables undoubtedly constituted a major initial incentive for his involvement in training sessions, Kumar's willingness to work for purely verbal praise led to the whistle being replaced by a repertoire of encouraging phrases.

At this stage Kumar would only receive a food reward when he had targeted to the trainer's hand. This allowed us to maneuver Kumar into three positions against the bars of the enclosure which gave us access to both sides of his body and enabled us to safely reach his back feet by leaning through the bars. If Kumar failed to achieve the position near enough to the bars, he would be returned to the previous position and asked to target again. Only when he achieved the requested position would he be fed.

Once Kumar had targeted correctly his ears would be rigorously handled and held to desensitize them for any future hand injections or venipuncture procedures. The ears were chosen upon advice from the vet.

A Helping Hand

On 29 January things started to get moving - literally. Through consultation with other keepers and experimentation, we found that by scratching the web of skin at the top of his back leg underneath the flap, Kumar would lift and extend his scratched leg backwards - exposing the sole of his foot. To reinforce this behavior, every time his foot was raised he would be rewarded with fruit/vegetable by one keeper and showered with praise by the other keeper. Kumar would then be turned around and the same process was repeated on the other leg.

Between mid-March and early April we introduced the verbal command "foot". This command was given while his leg was being scratched. In a bid to bypass the scratching, we began to work on just giving the verbal command with no physical contact. At no point did he show any inclination to cooperate to purely verbal commands and often became frustrated during these sessions. By mid-April the combination of scratching then slapping his leg and then calling for his foot was successfully reintroduced to persuade Kumar to lift his back feet. By the end of March Kumar was lifting his back feet on a daily basis in his training sessions, but we still had the problem of supporting his foot once it was raised to allow us to treat the infections.

Snow Time

With snow on the ground during a lot of January and February and bitterly cold daytime temperatures, Kumar would spend a lot of time sleeping indoors underneath his heater. At the beginning of the training sessions on 13 Feb. we found Kumar lying indoors with his head pointing away from the only entrance/exit to his indoor quarters. With his head away from the door, it allows keepers to leave safely if Kumar gets up suddenly. Two keepers then entered Kumar's

enclosure constantly talking to him. Kumar quite happily accepted our presence as we had been led to believe by other keepers. As one keeper stroked his rear leg with a soft brush and kept an eye on his head movement (which we used as the best indicator of his intention to get to his feet), the other keeper would examine the infections on his feet, wash them in an antiseptic solution and then start to file his toenails using a 30cm (11.8 inch) elephant rasp.

Between mid-February and the beginning of April, Kumar was lying in the appropriate position to allow filing only six times. In these six sessions we achieved more material results than we had done in the other 57 days of training.

Spring in His Step April - July

After the initial frustrations of his earlier training, Kumar progressed by leaps and bounds in these three months.

Due to the restricted opportunities we had had to file Kumar's overgrown toenails (only six times when he had been lying indoors), we began working on ways of filing his feet while he was standing up. The first method we tried was filing his foot with the rasp while he was standing in his front yard, but this never worked successfully as the grating sound of the rasp against the concrete caused Kumar to continuously move his foot.

On 18 April we started working on methods of raising Kumar's foot off the concrete floor in his front yard to allow filing. We started by cutting a 5cm (2 inch) thick piece of wood to the approximate width and length of Kumar's foot. This block of wood was placed underneath his feet every time they were raised. Once the foot had been lifted, the wood was kept pressed against the sole until his foot was returned to the floor and he was standing on the wooden block. Using the block allowed us to lift his foot off the concrete floor, provide a steady platform upon which to file, and allowed us to gain greater access to the underside of his toenail. At this stage any time that Kumar has his leg raised or his foot was on the wood block he would receive a food reward and verbal praise. Two weeks after the wooden block was introduced Kumar was still refusing to put any weight on the block and would move his feet off the block as soon as he stood on it.

On 12 May we tried again, this time we covered the wooden block in cotton wool and secured it with masking tape. Within days of making this change, using the same reward system as before, Kumar was standing on the block and allowing us to file his nails on a daily basis.

Originally the duration of the filing was largely erratic as Kumar would move his foot after a short period of time on the block. In order to control his foot movement once on the block we introduced the verbal command "hold". By giving this command and holding the nail still as we filed, Kumar would leave his foot on the board until we had finished filing up to a maximum of five minutes per foot. By the end of May filing his overgrown toenails became a daily activity whether Kumar was standing or lying down.

Now that Kumar was lifting his feet on a daily basis, we could assess the extent of the problems on his back feet, i.e. the lateral tears in his pads and the necrotic tissue growth behind and between the toenails. Although Kumar would lift his feet it was too short a time to allow us to apply any treatment onto the soles of his feet. So on 9 May we started working on supporting Kumar's legs once they had been raised. As soon as Kumar had lifted his foot, one keeper would slide through the bars and support Kumar's raised leg between his hands approximately 50cm (20 inches) of the ground. Initially it was a physical impossibility to support his foot once it was raised, but as he became used to having his feet handled he would transfer his weight to the other feet which allowed the keeper to bring his foot up to a more easily observable height. With the end of June approaching Kumar's back feet could be raised and supported at each training session. This allowed us to give his soles a daily antiseptic rinse and apply antiseptic cream to the most infected areas.

While Kumar's foot was being supported, the second keeper would reward Kumar with fruit/vegetables as well as praise until his foot was lowered. If Kumar appeared to become agitated or restless by suddenly raising his head or ignoring his food during the training session, a quiet word from the keeper feeding Kumar allowed the second keeper to release his leg and leave the enclosure.

To assess the effectiveness of various foot treatments the vet started visiting Kumar regularly and inspecting the condition of his soles of his back feet once raised. This was one of the most satisfying achievements of his training. Due to the many times Kumar had undergone "knock-downs" he had always been wary of the presence of any vet near to him. Now after seven months of work, Kumar would remain stationary as the vet examined, felt and prodded the sole of his raised foot.

The only change we made to his regime in this period was the withdrawal of fruit/vegetables from Kumar's morning feed. The fruit/vegetable supply for the Indian rhinos at Whipsnade is irregular and a pattern soon emerged whereby Kumar's willingness to work in his training sessions was far greater when he had received no fruit or vegetables with his morning concentrates.

Problems

Although we would carefully regulate our activities during Kumar's training sessions, we had less control over external factors. The first of these problems was a predictable one: the onset of oestrus of the female rhino in the adjacent pen. For a period of approximately five days every two months Kumar would become very agitated and very little if any training was done.

The second problem was far more unpredictable: the action of surrounding visitors. Kumar's training takes place at lunchtime, due to the need for two staff members to be available. As a result, especially in the summer months, his training sessions coincides with a large visitor presence around his enclosure.

The actions of visitors, such as shouting and putting children onto the stand-off fence during the training sessions, caused the most violent reactions during Kumar's training. This was illustrated on 30 March and then on 1 July when Kumar became agitated by the shouts of nearby visitors and spun around towards the keeper working behind him. On both occasions neither keeper was hurt and Kumar reimmersed himself into his routine, but both incidents highlighted the omnipresent threat that training a Indian rhino with its speed and bulk could carry.

Ideally we should train Kumar either when the public are excluded, first thing in the morning, in an off-exhibit area or in a crush, but unfortunately none of these are a viable option at Whipsnade.

We have always asked for the public's cooperation through a brief explanation of his training at the start of the session and the use of explanatory signs during the session, but these are only preventative measures and could never be regarded as a total remedy to the problem.

Cutting it Fine July - December

This period was very much one of consolidating the behaviors that Kumar had already learned. We reached a point in August when the vet informed us that the optimum length of Kumar's toenails on his back feet had been reached. The nail length was then recorded and intermittent, rather than daily, filings were carried out to maintain them at this length. The one new piece of equipment we introduced to his training was a hoofknife. This allowed us to cut away the pieces of dead skin between his toenails and on the soles of his back feet. While Kumar was learning to accept the hoofknife we were learning to use it. Inevitably the hoofknife drew blood on a couple of occasions; Kumar would flinch and move his raised leg, but after a few soothing words would present his foot again for treatment.

Tools of the Trade

At the end of November we were using a number of tools in Kumar's training: an elephant rasp, a cotton wool-covered block, antiseptic wash and cream, a hoofknife, explanatory visitor signs and a daily diary. The diary has been completed every day since day one and had been one of the most instrumental components of his training. By keeping a daily record we could soon see correlations developing between Kumar's behavior during training sessions and the prevailing weather conditions, visitor numbers and food rewards. As it was a daily diary, it allowed us to record the gradual increments in Kumar's progress towards the intended behavior, and gave us rough guidelines as to how long to persevere with training methods before modifying or rejecting them.

On days when we had achieved relatively little progress for no apparent reason, the diary often showed that the trainers had been ill and Kumar's unwillingness to work had been due to the lack of enthusiasm on the trainers' part rather than the rhino's.

Conclusion

Watching, recording and encouraging Kumar's progress has provided us with the most satisfying aspect of our zoo careers to date. Both Kumar and his keepers have benefited from the last 11 months of training. The increase in time spent with Kumar and closer contact with him has been a big advantage for the keepers involved. For Kumar the condition of his feet has improved immeasurably since his training began.

These sessions have also proved to be the most successful form of enrichment we have used on Kumar. With the exception of two sessions early in the year, Kumar has always participated in the training even though he has the choice to leave at any time.

In the future we hope to condition Kumar to accept regular blood sampling procedures and most importantly of all teach him to lie down on command.

Acknowledgements

Training an Indian rhino isn't a one/two person job and wouldn't have been possible without the support of the Asian Region, especially Joy Lear, at Whipsnade as well as the involvement of the Veterinary and Elephant Departments. Thanks also to Susan and Gretchen from Wildlife Safari who taught me how to teach.

Bowling for Rhinos T-Shirt Available

Once again, talented Janie Coleman, Dallas Zoo staff graphic artist, has designed our 1997 Bowling for Rhinos T-shirt. This new black and teal design on a white T-shirt features four different species of rhinos to represent the sanctuaries that Bowling for Rhinos funding supports. These T-shirts are selling for \$12.50 each. For further information contact Ann Stevens at the Dallas Zoo (214) 670-6798 or Fax (214) 670-6717.

