

PARAPLEGIA
IN A MALE LOWLAND GORILLA
Gorilla gorilla
AT THE
NATIONAL ZOOLOGICAL PARK
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ON 15th June 1963, 'Nikumba', the male Lowland gorilla at the National Zoological Park was found paralyzed in both legs.

Nikumba arrived at the National Zoological Park on 24th February 1955 as an eighteen-month-old baby, along with a female gorilla, 'Moka' who was twenty-one months old. They have been kept together from the time of their arrival at the zoo.

Previous medical history had been uneventful. Faecal examinations at the time of their arrival revealed the presence of *balantidium coli* and *strongyloides*. Symptomatology was, as one might expect, with clinical parasitism such as diarrhoea, loss of weight and loss of appetite. Neither animal was ever lethargic or dull. Following a course of treatment with Carbazone (Eli Lilly, p-ureidobenzeneearsonic acid), the clinical symptoms disappeared.

On 13th June 1963 Nikumba showed symptoms of respiratory distress, including rapid abdominal breathing as well as a nasal discharge. He was also walking in a quadrupedal position with a hunched back and seemed dull and lethargic. His normal inclination toward play was completely absent, yet at the same time his food consumption had not been affected. Achrocidin syrup (Lederle Laboratories, tetracycline antihistamine analgesic compound) was prescribed and administered, at the rate of one tablespoon four times daily. The following morning, the animal remained in a sitting position and when forced to rise showed great difficulty in coming up to all-fours. He was putting his hands as far behind him as possible and using the weight of his torso and shoulder girdle to assist in raising the pelvis. There seemed to be no pain in his rising, simply a weakness and an inability to control the feet and legs properly.

On 15th June, the gorilla was unable to rise

to his feet from a sitting position. After making as thorough an examination as possible, it was determined that paraplegia was present, affecting the pelvic girdle and legs. Retention of urine and faeces was normal. No impairment of appetite was seen. Plans were finalized to conduct as complete a diagnostic exercise as possible, with the assistance of Dr Henry Feffer, an orthopaedic physician, and Dr Hugo Rizzoli, a prominent neuro-surgeon. Both specialists have private practices in the city of Washington, as well as appointments to the orthopaedic and neurosurgical staffs of local hospitals.

On 17th June, Nikumba was heavily tranquillized through the administration of 500 mg. Sparine (Wyeth, promazine hydrochloride) and 750 mg. Demerol hydrochloride (Winthrop Laboratories, brand of meperidine). These tranquillizers were injected intramuscularly using Cap-Chur gun equipment (Palmer Chemical and Equipment Co, Atlanta, USA). Thirty-five minutes following the injection, Nikumba was forcibly restrained in a sitting position with his back to the cage bars and his arms spread and raised to an angle of 45°. He was then given an intramuscular injection of 250 mg. Demerol, using a disposable syringe.

Physical examination revealed the temperature to be 98.3°F. The pulse rate was 120 and respiration was a regular twenty-four to the minute. Auscultation and percussion of the chest revealed no abnormalities. Pin prick testing showed a lack of sensitivity from the toes to the rim of the pelvis. Nikumba was in a good state of hydration and weighed 245 lb. Advantage was taken of the restraint to inject 0.1 c.c. of purified protein derivative intradermally into the right eyelid as a tuberculosis test.

The erect position of the gorilla did not permit palpation of the lumbar sacral union, so the arms were lowered and the head placed between the gorilla's knees, the arms secured to the bars of the cage with rope, and the head maintained in its position between the gorillas' knees by one of the keepers. An intramuscular injection of 200 mg. Demerol was administered. Repeated attempts to obtain spinal fluid were fruitless at the L2 and L3 level. Taking a sample from the *sterna magna* was discussed

but was not carried out owing to the possibility of effecting permanent damage. Three hours from the start of the tranquilization procedure, the gorilla was released and sat up bright and alert.

A tentative diagnosis of a selective spotty viral infection of the spinal cord was made and a treatment regimen was established. The course of treatment included Medrol (Upjohn Laboratories, methyl-prednisolone) 48 mg. per day divided into four doses orally; chloromycetin succinate 1 gm. per day; Bejectol (Abbott Laboratories, injectable B complex vitamins) 3 c.c. per day. The antibiotics and Vitamin B complex were injected intramuscularly daily, using the projectile syringe.

Five days following the onset of paralysis, Nikumba had adjusted himself to his locomotion problem and was moving round his cage by raising his body with his arms and hands and sliding backwards; on the sixth day he had learnt to move himself by rolling. His appetite decreased but never disappeared completely and some food was taken daily. Seventy-two hours following the injection of PPD, the test proved negative. Three weeks following the onset of paralysis, the gorilla was able to flex his right leg. During this three-week period, Nikumba was observed passively exercising both legs, raising and lowering them with his hands and rotating the feet. His appetite improved, slowly but steadily. Antibiotics were discontinued on the fourteenth day but the cortisone and Vitamin B complex were maintained. On 21st July, Nikumba was able to flex both legs as he moved around the cage and a slow steady improvement was noted in his ability to flex and extend the legs, without using his hands as well as pedal rotation. To stimulate the use of his legs, an elevated tray was fastened to the cage bars so that it would be necessary for him to pull himself erect to eat. In the beginning this was purely an exercise for his arms, but his improvement was rapid and within a week he was able to stand erect and feed.

The administration of 100 units of ACTH solution (National Drug Co, corticotropin injection USP) twice a week was started in preparation for the cortisone withdrawal. The Medrol dosage was reduced to 36 mg. per day

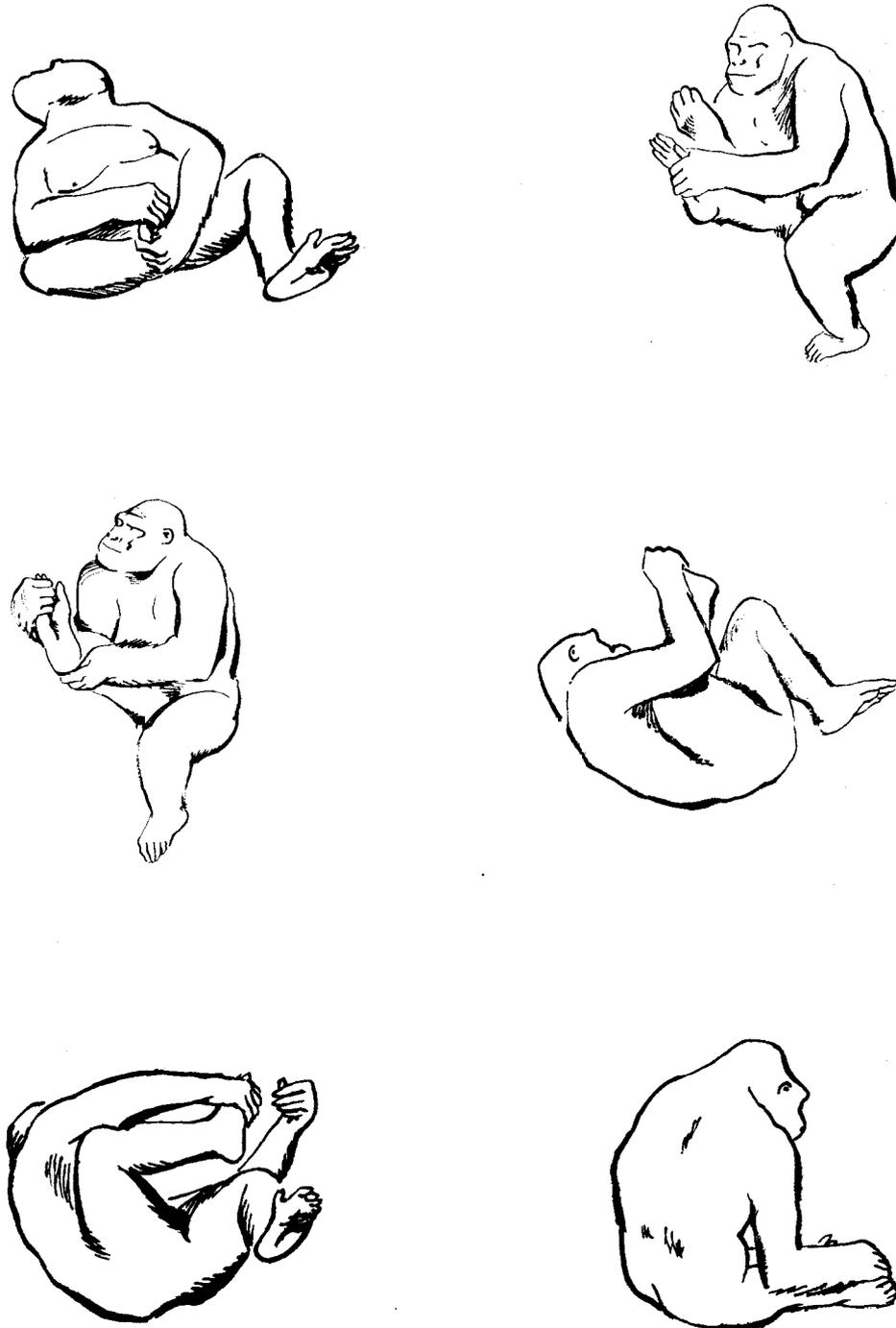
in two divided doses in the first week, and to 24 mg. per day for the second week in two doses per day. This rate of dosage reduction was continued and the use of Medrol was completely eliminated in four weeks.

Nine weeks from the onset of paralysis, Nikumba started walking and was able to take two steps before returning to a sitting position. When he started walking, his knees were flexed and his weight was put on the outer edges of his feet, with the toes curled inwards. He had regained his original weight (estimated at 275 lb.) and his locomotor progress continued at a slow and steady rate. Eight months after the onset of paralysis, Nikumba's toes were straight and he was walking flat on his feet. He was able to stand erect, take eight or nine steps, beat his chest and go through the series of motions and activities common to a male gorilla.

One of the most interesting things that occurred during the treatment period was Nikumba's reaction to the use of Cap-Chur gun equipment. One could approach the cage with empty hands and Nikumba would come up to the bars, wishing to hold hands and would grasp one's arm and show every evidence of affection. As soon as the equipment was produced, Nikumba would retreat to the far corner of the cage or climb to the top of the shift cage. He became fairly nervous and would swing from the horizontal bars in the cage to try and escape the administration of the medication. Immediately following the injection, Nikumba would realize that the treatment had been completed and would then come forward to the bars and display his normal friendliness.

Nikumba's recovery has been observed with a great deal of interest, not only because he is an excellent specimen of a male Lowland gorilla, but also because he is a potent sire. A brief review of the breeding history of Nikumba and Moka, the adult female gorilla, indicates that their first mating occurred on 16th February 1960, and the first baby, 'Tomoka' was born on 9th September 1961 (Carmichael, Kraus and Reed, 1962). The last observed mating took place on 24th and 25th April 1963. 'Leonard', a second male, was born on 10th January 1964. Unfortunately it was necessary for both these babies to be hand-

Fig. 1. Six days after the onset of paralysis in his legs, the National Zoological Park gorilla learned to move himself round his cage by rolling, using one of his legs as a lever.



reared since Moka had no milk following either birth. Needless to say, the entire zoo staff is anxiously awaiting Moka's return to a regular menstrual cycle to observe whether Nikumba's ability to mate has been impaired by his paralytic attack.

REFERENCE

Carmichael, L., Kraus, M. B., and Reed, T. H. (1962): The Washington National Zoological Park gorilla infant, Tomoka. *Inter. Zoo Yearbook*, 3, 88-93.