

Annual Report of the Board of Regents

of the

SMITHSONIAN

INSTITUTION



PUBLICATION 4613

Showing the Operations, Expenditures, and Condition of the

Institution for the Year Ended June 30

1964

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Report on the National Zoological Park

SIR: I have the honor to submit the following report on the activities of the National Zoological Park for the fiscal year ended June 30, 1964:

BIRTHS

One of the most beautiful animals in the Zoo is Mohini of Rewa, the so-called white tiger. With her cream-colored coat, striped with varying hues of gray to black, her ice-blue eyes, her great size and majestic mien, she has been an extremely popular exhibit since her arrival in 1960. Her mate, Samson, is a normal-colored tiger but comes from the same strain and hence carries the genes for whiteness. Mated to a white female, he could be expected to sire white cubs.

On January 6, 1964, three young were born to the pair; one white, the other two orange. Through the courtesy of Metromedia, a closed-circuit television was installed, and the actual birth of the cubs was witnessed by members of the Zoo staff on a monitor placed in the vestibule of the lion house. Until the cubs were 6 weeks old the lion house was closed to the public. Zoo visitors could, however, watch the little family on either one of two television screens. Mohini proved to be an exceptional mother; she took the greatest care of her cubs, and all three, now weaned, are thriving. When they were first put on exhibition they were so popular that it was necessary to put a sign on the cage asking visitors to move on and let others enjoy the scene; some people actually arrived in the morning and spent the entire day standing in front of the cage until the building closed in the evening. A film of the birth, combined with a film made at the palace of the Maharajah of Rewa in India, was shown on a half-hour nationwide television program.

For many years, the National Zoological Park was famous for its success in breeding pygmy hippopotamuses. Then the old male died, and it was several years before a replacement for him could be secured. In 1960 President William V. S. Tubman of Liberia donated a male pygmy hippo, which has now sired seven offspring, three of them within the past year. Two Nile hippopotamuses were also born at the National Zoo this year.

On September 9, 1961, the first gorilla to be bred and born at the National Zoological Park arrived, the offspring of Moka and

Nikumba, lowland gorillas. The baby was named Tomoka and was successfully reared by the wife of Keeper Bernard M. Gallagher. Moka's first pregnancy was carefully watched, and the birth of the baby was eagerly anticipated. After her pregnancy, like some human mothers, she began to put on weight, and although her diet was carefully supervised she continued to gain. This, and the fact that the male gorilla suffered an attack of paralysis in June 1963 (see p. 143), account for her second baby, Leonard, arriving as something of a surprise package on January 10, 1964. Leonard, like his brother, is being raised in Keeper Gallagher's home and gives every evidence of being a normal, healthy young gorilla.

Four more calves were born to the Dorcas gazelles, increasing the number of these graceful little animals to a herd of eight. The original pair were gifts from President Habib Bourguiba of Tunisia in 1960.

Other interesting additions were two hybrids between a male cotton-top marmoset (*Saguinus oedipus*) and a female red-handed tamarin (*S. midas*), born on February 19. The babies closely resemble their mother, lacking the white pompadour of the cottontop.

Following the procedure of previous years, all births and hatchings are listed below, whether or not the young were successfully reared. In many instances, the record of animals having bred in captivity is of interest.

MAMMALS

<i>Common name</i>	<i>Number</i>	<i>Common name</i>	<i>Number</i>
Rat kangaroo -----	1	Leopard -----	**3
Vampire bat -----	2	Lion -----	3
Ring-tailed lemur -----	1	Bengal tiger -----	3
Squirrel monkey -----	1	Sea-lion -----	2
Black spider monkey -----	2	Rock hyrax -----	2
Hybrid marmoset -----	2	Grant's zebra -----	3
Rhesus monkey -----	1	Brazilian tapir -----	*1
Barbary ape -----	2, *1	Collared peccary -----	5
Sooty mangabey -----	1	Nile hippopotamus -----	2
Chimpanzee -----	1	Pygmy hippopotamus -----	3
Lowland gorilla -----	1	Llama -----	4
Two-toed sloth -----	1	White fallow deer -----	2
Prairie-dogs -----	6	Axis deer -----	4
Egyptian spiny mouse -----	10	Red deer -----	2
Patagonian cavy -----	4, *2	Sika deer -----	1
Hairy-rumped agouti -----	3	White-tailed deer -----	1
Timber wolf -----	1	Reindeer -----	3, *1
Hybrid fox -----	1	Caribou × reindeer -----	1
European brown bear -----	3	Cape buffalo -----	1
Hybrid bear -----	1	Brindled gnu -----	2
Grizzly bear -----	1	Dorcas gazelle -----	4
Neumann's genet -----	**1	African pygmy goat -----	1
Bobcat -----	1	Aoudad -----	1
Black leopard -----	2	Big-horn sheep -----	1

*Stillborn.

**Second litter destroyed by mother.

BIRDS

Black-crowned night heron	3	Mallard duck	110
Crested screamer	1	Peafowl	1
Black swan	4	Nanday parrot	3
Wood duck	54	Formosan red-billed pie	2

REPTILES

Snapping turtle	21	Tokay gecko	1
Box turtle	7	African spiny lizard	2
Eastern box turtle	6	Pilot black snake	9
Red-lined turtle	1	Tessellated snake	1
Red-bellied turtle	1	Cantil	26
Red-eared turtle	1		

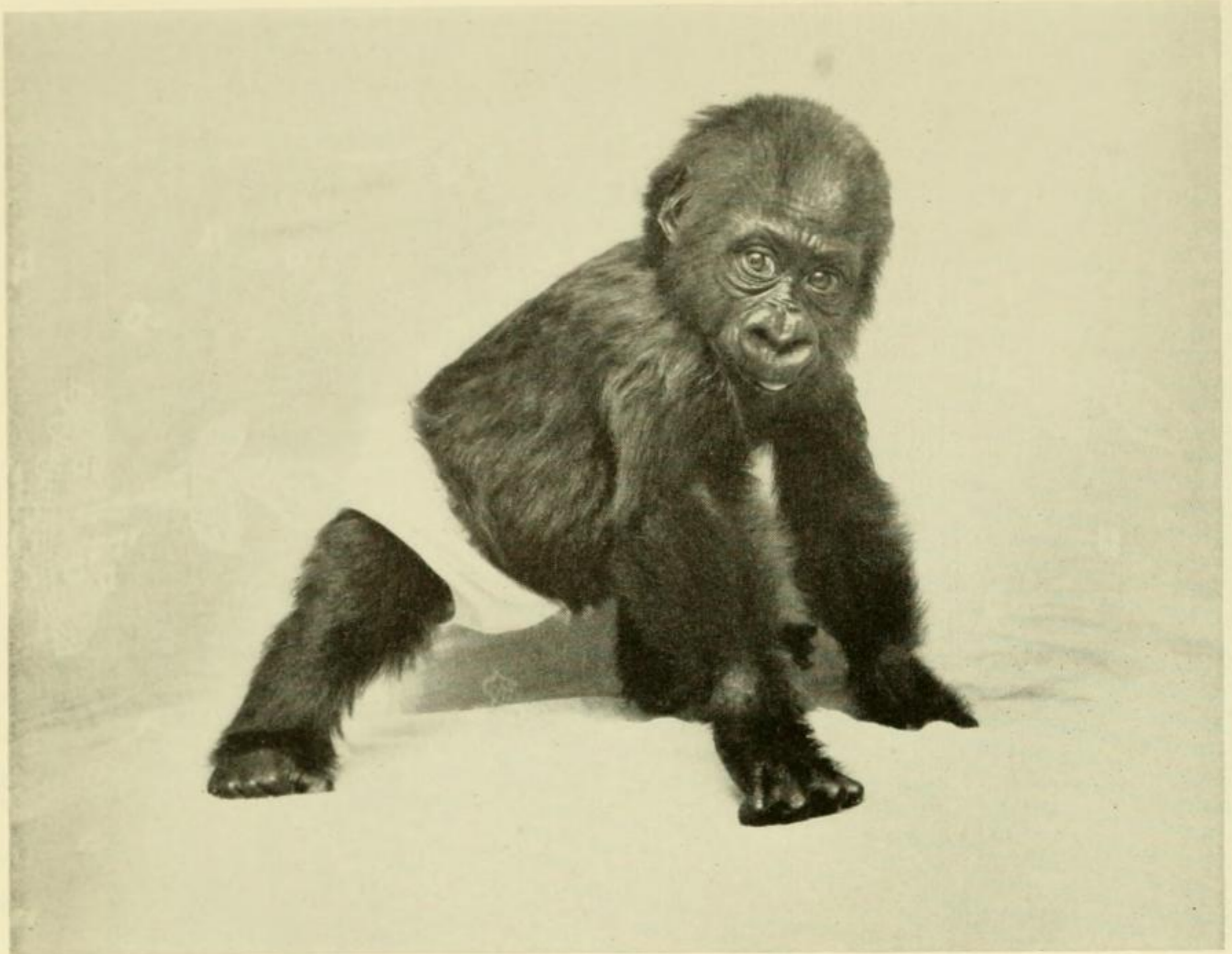
FISHES

Red swordtails	40
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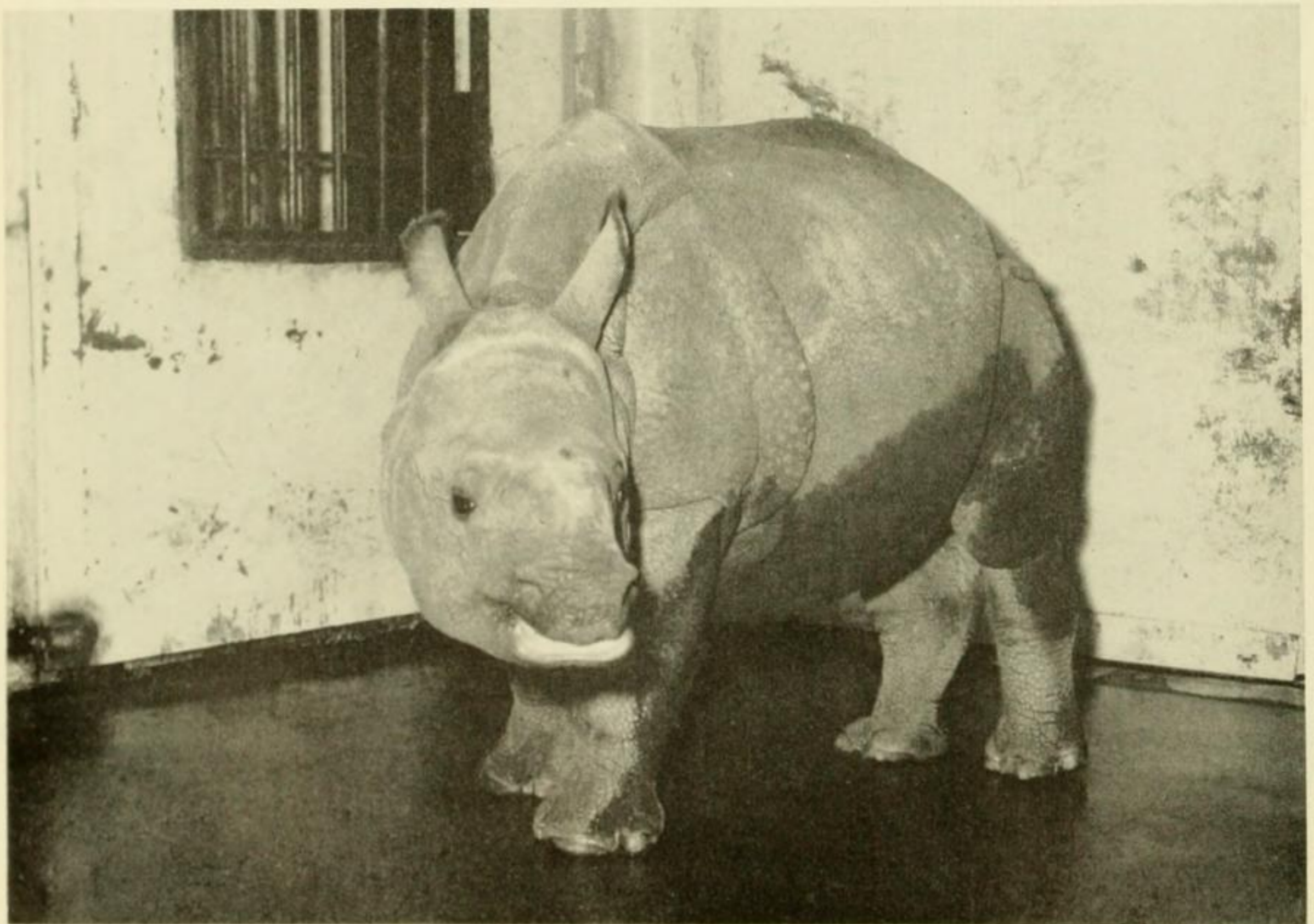
GIFTS

More than a year ago the Government of Assam, India, offered the National Zoological Park a female rhinoceros as a mate for Tarun, the male rhino that came to the Zoo in May 1960. An adult female was secured from the Kazirangi Game Reserve, and negotiations began to transport her from India to Washington. Then it was discovered that "Deepali" was pregnant, and all plans for her trip to the United States were held in abeyance until her calf was born. In April 1963 she produced a female calf, subsequently named Rajkumari, and it was necessary to wait until the young one was weaned. In October Associate Director J. Lear Grimmer and Mrs. Grimmer went to India to arrange transportation for the huge animal. They found, to their delight, that the Indian Government was including the baby in the generous gift to the United States. Crates were built under Mr. Grimmer's supervision, and both animals were brought to the zoo in Calcutta. No commercial airline could handle the shipment (Deepali, crated, weighed 4,000 pounds). Fortunately a number of planes from the American Air Force were in India at the time, participating in joint Indo-Anglo-American air exercises, and through the good offices of the then Vice President, Lyndon B. Johnson, who was a Regent of the Smithsonian Institution, and Air Force Chief of Staff Curtis LeMay, it was possible to load both animals on a C-130 transport. The animals arrived December 17, and were unloaded at the elephant house at dusk. Only 11 days later Deepali succumbed to an acute attack of gastroenteritis. This was a tragic loss for the Zoo, but Rajkumari (the name means "princess") has adapted nicely to the Zoo regime, is eating well, gaining weight, and of course is the most valuable single acquisition made by the Zoo during the past year.

On February 12 the director left for Indonesia with gifts of whis-



Leonard, second lowland gorilla bred and born at the National Zoological Park, at 6 months of age.



Rajkumari, young female Indian one-horned rhinoceros (*Rhinoceros unicornis*). National Zoological Park.

ting swans, ducks, and geese from Attorney General Robert Kennedy to President Sukarno of Indonesia. While there he accepted a most generous gift from the Government of Indonesia of a pair of the giant monitor lizards found on a few small islands in Indonesia and known as Komodo dragons. The male was nearly 9 feet long and weighed approximately 200 pounds; the female was about half that size. Again, the Zoo was most unfortunate, as the big male, a truly impressive specimen, died of systematic amebiasis on June 1, after only 12 weeks and 4 days on exhibition at the Park. The female has the same infestation with amebae, and every effort is being made to cure her, as she is the only one of this species in the United States at the present time.

Space does not permit listing all gifts received in the course of the year, but the following are of interest:

- Allan, Karen, Fairfax County, Va., brush-tailed porcupine.
 Amis, Mrs. Esther V., Washington, D.C., Patas monkey.
 Birch, Mrs. H. M., Bethesda, Md., lesser hill mynah.
 Chester Zoo, Chester, England, 2 axolotls (white phase).
 Cochran, Dr. Doris, Washington, D.C., 5 tropical American turtles of 2 species.
 Collette, Mrs. B. B., Alexandria, Va., sooty mangabey.
 DesPres, Mrs. Helen, Monrovia, Liberia, Maxwell's duiker.
 Dietlein, Lt. Donald R., Alameda, Calif., Galápagos tortoise, sulphur-breasted toucan.
 Godet, Dr. René, Dakar, Senegal, lungfish.
 Greenhall, Arthur, Washington, D.C., 4 spear-nosed bats, 8 vampire bats.
 Greeson's Flying Squirrel Ranch, Arlington, Va., southern fox squirrel.
 Harding, Grayson E., New York, N.Y., kura kura turtle, Amazon spotted turtle, red-faced turtle, chicken turtle, southern soft-shelled turtle, diamond-back terrapin.
 Harris, Lester E., Takoma Park, Md., 6 timber rattlesnakes, 10 fer-de-lance.
 Houston, Robert, Arlington, Va., Swan Island iguana.
 Keegan, Lt. Col. Hugh L., U.S. Army Medical Command, Japan, 5 rat snakes of 4 species, Dinodon, 2 many-banded kraits, 2 palm vipers, 3 Ryukyu green snakes, Japanese water snake, Japanese pit viper, 4 habus of 3 species, 3 Erabu sea snakes.
 Kennedy, Robert F., McLean, Va., 2 Geoffroy's marmosets.
 Klikna, Mrs. Vincent, Falls Church, Va., 5 chinchillas.
 Kuntz, Dr. R. E., Washington, D.C., 2 axolotls.
 Marcus, Dr. Leonard, Washington, D.C., 3 Pacific tree frogs, caiman lizard.
 Maryland Game Department, through David J. Smith, Annapolis, Md., bald eagle.
 McKittrick, F. A., Ithaca, N.Y., capybara.
 Miller, Robert Fox, Jr., Washington, D.C., 5 South American sucker catfish (*Plecostomus*).
 Norfolk, John E., Upper Marlboro, Md., boa constrictor.
 Ripley, Dr. S. Dillon, Washington, D.C., 2 rosy-billed pochards.
 Rivero, Vincentes Carlos, Caracas, Venezuela, rainbow boa.
 Stair, Gary, Washington, D.C., antelope ground squirrel.
 Sweeney, Philip Niles, Washington, D.C., striped sand snake.

REPORT OF THE VETERINARIAN

Nikumba, the adult male gorilla, whose paraplegia was mentioned in last year's Report, made an essentially complete recovery in 8 months. A tentative diagnosis was made of a selective spotty viral infection of the spinal cord. Nikumba was treated daily for approximately 3 months. Chloromycetin succinate and Bejectal, a vitamin-B complex, were injected intramuscularly, by the use of the projectile syringe and the Cap-Chur gun. Methylprednisolone was given orally in Coca Cola syrup. The most noteworthy progress was seen approximately 21½ months after the onset of the paralytic attack when Nikumba was able to stand erect and take two or three steps before returning to a sitting position. His progress since that time has been slow and steady; he has regained his original weight and is moving in a normal manner.

One of the most interesting things that occurred during the treatment period was the gorilla's reaction to the use of the Cap-Chur gun equipment. One could enter the room with empty hands and Nikumba would come to the bars with a desire to hold your arm or your hand, and displayed every evidence of affection. As soon as the equipment was produced, however, Nikumba would retreat to a far corner of the cage or climb to the top of the shift cage. He became very nervous and would swing from the horizontal bars in the cage to 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.

His recovery has been observed with a great deal of interest because he is not only an excellent specimen of the male lowland gorilla but also a proven sire. The first baby, Tomoka, was born on September 9, 1961. Leonard, a second male, was born on January 10, 1964. The last observed mating of the parent gorillas took place on April 24 and 25, 1963, approximately 2 months before the onset of the paraplegia of the breeding male. It has been necessary for both babies to be raised by the wife of a keeper, since Moka had no milk following either birth. The entire staff is anxiously awaiting Moka's return to a regular menstrual cycle to observe Nikumba's ability to mate following his paralysis.

On December 16, 1963, Deepali, an adult Indian rhinoceros and her baby were received by air from India. Eleven days following the arrival symptoms of an intestinal colic were noted in the adult at 1 p.m., and death occurred at 9 o'clock that evening. An immediate autopsy was performed and the cause of death was found to be a per-acute hemorrhagic gastroenteritis. Approximately 4 liters of free blood were found in the stomach and the anterior portion of the small

intestine. This problem was further complicated by the presence of a large number of fringed and diphylobothrium tapeworms and intestinal flukes, as well as numerous strongyloides. Treatment was instituted immediately to relieve the parasitic infestation of the baby rhino, Rajkumari, with excellent results, and her growth has been quite satisfactory.

On March 4, 1964, the director of the National Zoological Park returned from Djakarta, Indonesia, with a pair of Komodo dragons (*Varanus komodoensis*). The male dragon was 8 feet 11 inches long and weighed approximately 200 pounds. The smaller female was 6 feet long and weighed 75 pounds. The first fecal samples harvested following their arrival revealed a heavy infestation of protozoa with ameboid-like nuclei. On May 21 the large dragon became affected with severe gastric cramps which were relieved by the injection of atropine sulfate, but it died the next day. An intensive autopsy was performed, and the cause of death was established as intestinal and extraintestinal amebiasis. Histopathological sections were made from tissues harvested during the autopsy. Outstanding degeneration was noted in the liver, in which no functional tissue could be found; it consisted entirely of a mass of ameboid-like cysts. This has been reported only once in literature and much more extensive studies are being conducted by the veterinary division in cooperation with the Parasitology Department of George Washington University Medical School and the staff of the Armed Forces Institute of Pathology to determine the incidence of such liver cyst occurrence in our available lizards.

With the assistance of Dr. Thomas Sappington, an internal medicine specialist in Washington, a research program is being developed in the incidence and extent of tissue damage caused by amebae in lizards. This will include a study of the blood picture, parasite history, and possible liver damage caused by amebiasis in the monitor lizard.

A 6-day treatment of the female Komodo dragon consisted of retention enemas of 200 cc. of physiological saline, containing 650 mg. of diodoquin, and intramuscular injections of 500 mg. of tetracycline. In the meantime, tests were being conducted on *Varanus salvator* to determine the lizard's tolerance of 0.0325 mg. of intramuscular emetine hydrochloride as an effort to arrest the extraintestinal amebiasis. This test continued for 6 days with no apparent side effects. After establishing the safety of the drug, the Komodo dragon then received the same dosage. The results were a marked reduction in the number of amebae and flagellates in the stool.

Studies are continuing in the hope of finding a more satisfactory parasiticide for use in various species of mammals, birds, and reptiles. Ambutochloride has been used in canines, as well as reptiles; thiaben-

dazole has been used in equines, rhinoceroses, tapirs, and several monkeys; and a research product, called Alcopar, which contains the bephenium ion, shows a great deal of promise in selected species of animals. To generalize, thiabendazole has been the first product we have used in the zebras that has been so thorough that routine worming has become unnecessary; and the use of Alcopar in the large cats has caused a reduction in the egg count of both ascarid and hookworm.

Bird losses on the shipment arriving from India on December 16 were high, owing primarily to travel trauma. Among 69 waterfowl and pheasants quarantined at Clifton, N.J., 8 undiagnosed deaths occurred. Psittacine birds are required to be quarantined for a period of 90 days under the direction of the U.S. Public Health Service, and 101 birds were placed in a closed quarantine area. Quarantine procedure consists of 45 days on tetracycline-treated seeds, and a further 45-day period of observation. Of the quarantined birds, 48 died and were sent to the Communicable Disease Center. Psittacosis virus was isolated in some of the birds.

Every effort is being made to improve the effectiveness of the veterinary division in the care of animal health in the Park. X-ray equipment purchased early in the year has been invaluable in the correction of several fractures. Equipment and supplies have been obtained to institute a system of bacteriological culturing in both living animals and autopsy specimens in an effort to establish the cause of death more definitely, and diagnose illnesses and infections in the living animals more rapidly.

The veterinary division has been fortunate in having the cooperation and assistance of various specialists in the fields of clinical investigation and medicine. Among these men were Dr. Henry Feffer, orthopedist; Dr. Hugo Rizzoli, neurosurgeon; Dr. A. G. Karlsen of the Mayo Clinic in Rochester, Minn.; Dr. F. R. Lucas, director of the Livestock Sanitary Laboratory in Centerville, Md.; Dr. Anthony Morris of the National Institutes of Health, Bethesda, Md.; and Dr. Leonard Marcus and staff, of the Armed Forces Institute of Pathology. Dr. Clarence Hartman, Dr. William McCarten, and Miss Bessie Sonnenberg, parasitologists on the staff of George Washington Medical School, connected with the Tropical Disease Program, have given assistance in the diagnosis of and identification of the parasites that we have encountered in the Zoo, and their advice on treatment has been most helpful.

A Brahminy kite (*Haliastur indus*) collected for the National Zoological Park by the National Geographic Society-Smithsonian Institution Expedition to the East Indies, received September 28, 1937, died on April 18, 1964. This bird had been in the collection 26 years 5 months 21 days.

Following are autopsy statistics for the mortality which occurred at the National Zoological Park during the last fiscal year, and a table of comparison with the past 6 years:

TABLE 1.—Autopsy statistics, 1958-64

Cause	Mortality, fiscal year 1964			Total mortality past 7 years
	Reptiles ¹	Birds	Mammals	
No autopsy for sundry reasons ² -----	126	27	17	1958----550
Attrition (within 14 days after arrival) ..	1	26	20	1959----472
Systemic diseases ³ -----	39	36	19	1960----532
Infectious diseases ⁴ -----	-----	5	1	1961----517
Parasites-----	9	3	1	1962----584
Injuries, accidents-----	19	74	41	1963----636
Euthanasia-----	-----	2	6	-----
Miscellaneous (stillborn, old age, shock)-----	7	-----	18	-----
Undetermined-----	36	57	29	-----
Total -----	237	230	152	1964----619

¹ Included with reptile deaths are amphibians, fishes, and insects.

² Reasons include preserving of intact specimen for museum and research, progressed decomposition, insufficient remains in case of predators, etc.

³ Systemic diseases include acute and chronic diseases of lung, liver, kidney and heart, and intestinal ailments other than parasite involvement, as well as CNS disorders.

⁴ Infectious diseases include TB, viremia, toxoplasmosis, etc.

RESEARCH

The National Zoological Park is expanding its scope in the field of animal behavioral studies to programs designed to develop a greater knowledge of animal husbandry as it applies to worldwide conservation efforts.

All possible efforts and means must immediately be turned to the task of preserving representative fauna from all parts of the world. International and national organizations of zoos and wildlife conservators do consonantly strive to preserve those species which are threatened in the countries of habitat. To foster and breed such species is a task well within the capabilities of the zoos and conservation societies of the world. It remains only to know enough about these vanishing animals to recreate at least minimum niches which may result in reversal and establishment of breeding units. To this end the National Zoological Park is participating and cooperating in the following projects:

Group relationships and social niches of the Barbary ape, *Macaca sylvanus*; investigators, Dr. R. K. Lahiri, Director Alipore Zoo, Calcutta, India, and Dr. Charles Southwick, Director, School of Biomedicine, Johns Hopkins University.

Social behavior of titi monkeys, *Callicebus*; investigator, Dr. Martin Moynihan, Canal Zone Biological Area, Balboa, Panama.