



# National Zoological Park Annual Report

January 1, 1976 - December 31, 1976  
Smithsonian Institution



BOOK NO.

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# National Zoological Park Annual Report

January 1, 1976–December 31, 1976

Smithsonian Institution

City of Washington, 1976

Cover: Atlas lion (*Panthera leo leo*).

An aerial view of the Dr. William M. Mann Memorial Lion-Tiger Exhibit, completed in 1976.

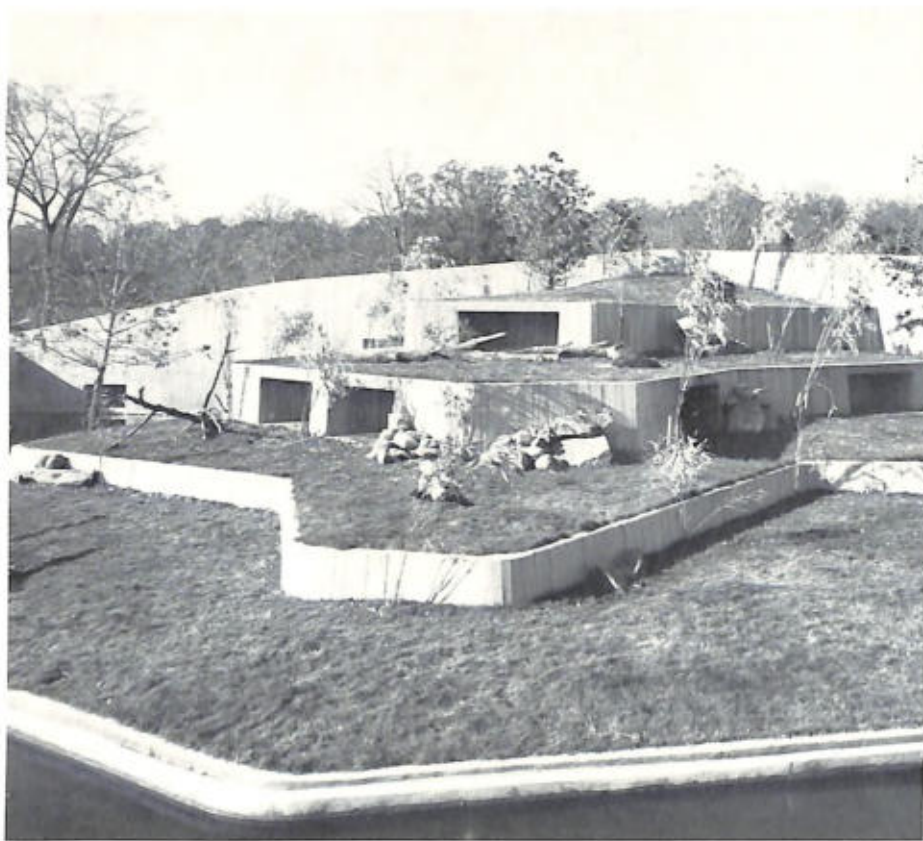
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**Range** India south of the Himalayan Mountains.

**Habitat** Tropical jungle.

**Natural Diet** Other mammals, such as sambar, barking deer, and wild pig; occasionally fish.

**Zoo Diet** Horsemeat, ox tails, occasionally chicken and rabbits.

**Reproduction** Three or four young.

**Social Structure** Travels alone, except during mating season or sometimes when feeding. Mothers and young travel together.

**Wild Status** Endangered.

## Staff (December 31, 1976)

<b>Directors of the National Zoological Park</b>	Dr. William Temple Hornaday	March 2, 1889-June 15, 1890	
	(Acting Superintendent)		
	Dr. Frank Baker	June 15, 1890-November 1, 1916	
	Mr. Ned Hollister	November 1, 1916-November 3, 1924	
	Dr. Alexander Wetmore	November 3, 1924-April 1, 1925	
	Dr. William Mann	May 13, 1925-October 31, 1956	
	Dr. Theodore H. Reed	March 12, 1958-	
<b>Offices</b>	Office of the Director	381-7221	Director Theodore H. Reed, D.V.M.  Deputy Director Edward Kohn  Executive Officer Vincent J. Doyle
	Office of Animal Management	381-7283	General Curator Jaren G. Horsley
	Office of Animal Health	381-7293	Veterinarian-in-Charge R. Mitchell Bush, D.V.M.
	Office of Pathology	381-7293	Pathologist-in-Charge Richard J. Montali, D.V.M.
	Office of Zoological Research	381-7249	Scientist-in-Charge John F. Eisenberg
	Conservation and Research Center	703-381-7301	Curator-in-Charge Christen M. Wemmer
	Office of Education Information	381-7235	Education Officer Judith White
	Office of Graphics and Exhibits	381-7251	Manager of Design Robert E. Mulcahy
	Office of Police and Safety	381-7218	Chief of Police and Safety Samuel L. Middleton, Jr.
	Office of Facilities Management	381-7273	Facilities Manager Emanuel Petrella
	Office of Construction Management	381-7254	Construction Manager Robert C. Engle
	Office of Management Services	381-7225	Administrative Officer Joe W. Reed
	Associate in Ecology Research Associates		S. Dillon Ripley  Jean Delacour Wolfgang P.J. Dittus Edwin Gould Theodore I. Grand Robert J. Hoage Edgardo Mondolfi Rasnayagam Rudran John C. Seidensticker James A. Sherburne Susan C. Wilson Bernard C. Zook
	Collaborator		Paul Leyhausen

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Friends of the National Zoo

President, 1973  
 President, 1974-1975  
 President, 1975-1976  
 Executive Director

Peter C. Andrews  
 Arthur W. Arundel  
 Stephen T. Hosmer  
 Sabin Robbins  
 Director  
 Deputy Director  
 Assistant Director for Conservation  
 Executive Officer  
 Secretary  
 Secretary

Office of the Director

Theodore H. Reed, D.V.M.  
 Edward Kohn  
 John Perry\*  
 Vincent J. Doyle  
 Margaret C. Baity  
 Martha H. Rogers

Office of Animal Management

Jaren G. Horsley  
 Harold J. Egoscue  
 Dale L. Marcellini  
 William A. Xanten, Jr.  
 Miles S. Roberts  
 Charles W. Pickett, Jr.  
 Michael L. Davenport  
 Judith A. Block  
 Sheryl Gilbert  
 John W. Mallen  
 Samuel W. Beeler  
 Caldwell Graham  
 Tony J. Olds  
 Herbert R. Stroman, Jr.  
 Robert R. MacLeod  
 Michael J. Johnson  
 Moses Benson, Jr.  
 George H. Adams  
 James A. Taylor  
 Charlotte A. Brown  
 Lynda M. Lambert

General Curator  
 Mammalogist  
 Research Curator, Herpetology  
 Curator, Mammals  
 Curator, Mammals  
 Curator, Birds  
 Curator, Reptiles  
 Registrar  
 Animal Specialist  
 Animal Technician  
 Animal Keeper Foreman  
 Animal Keeper Foreman  
 Animal Keeper Foreman  
 Animal Keeper Foreman  
 Administrative Officer  
 Training Coordinator  
 Commissary Manager  
 Procurement Assistant  
 Commissary Foreman  
 Secretary  
 Secretary

\*Retired, February 1976.

Office of Zoological Research

John F. Eisenburg  
 Devra G. Kleiman  
 Gerald G. Montgomery\*  
 Eugene S. Morton  
 Katherine S. Ralls  
 Carolyn A. Dorsey  
 Eugene Maliniak  
 Michael V. Deal  
 John S. Hough  
 Lawrence L. Newman  
 Gail T. Hill  
 Wyotta Holden\*\*  
 Betty S. Howser

Scientist-in-Charge  
 Reproduction Zoologist  
 Zoologist  
 Ornithologist  
 Intern  
 Biotechnician  
 Biotechnician  
 Keeper  
 Keeper  
 Keeper  
 Secretary  
 Administrative Assistant  
 Clerk

Visiting Scholars and Graduate Students

Wolfgang Dittus  
 Rasnayagam Rudran  
 John Seidensticker  
 Margaret A. O'Connell  
 Kenneth Green  
 Robert Hoage  
 William Principe

Research Associate  
 Research Associate  
 Research Associate  
 Smithsonian Pre-doctoral Fellow  
 Pre-doctoral Fellow  
 Pre-doctoral Fellow  
 Pre-doctoral Fellow

Susan Wilson	Pre-doctoral Research Associate
Charles Brady	Pre-doctoral Graduate Student
R. Penn Chu	Pre-doctoral Graduate Student
Todd Davis	Pre-doctoral Graduate Student
A. Lang Elliott	Pre-doctoral Graduate Student
Susan Farabaugh	Pre-doctoral Graduate Student
Rebecca Field	Pre-doctoral Graduate Student
Christine Schonewald	Pre-doctoral Graduate Student
Paul Woodward	Pre-doctoral Graduate Student
Douglas W. Mock	Post-doctoral Fellow
Galen B. Rathbun	Post-doctoral Fellow

\*Reassigned to Smithsonian Tropical Research Institute, January 1976.

\*\*Retired, October 1976.

**Office of Animal Health**

R. Mitchell Bush, D.V.M.	Veterinarian-in-Charge
Clinton W. Gray, D.V.M.	Senior Veterinarian
Philip K. Ensley, D.V.M.*	Veterinary Intern
Suzanne Kennedy, D.V.M.**	Veterinary Intern
Thomas G. Schneider	Biotechnician
Lena May Bush	Biotechnician
Randy W. Custer	Research Assistant
Johanna M. Smeller	Research Assistant
Robert Douglas, Jr.	Animal Keeper
Marilyn F. Keefe	Office Manager
Margaret F. Meredith	Clerk-Typist

\*1975-1976.

\*\*1976-1977.

**Office of Pathology**

Richard J. Montali, D.V.M.	Pathologist-in-Charge
Elizabeth Smith	Supervisor, Clinical Pathology Lab
Joan Zaremski	Medical Technologist
Russell Davenport	Histological Technologist
Leonard Harrell	Autopsy Technician
Joan Albert	Secretary

**Conservation and Research Center**

Christen M. Wemmer	Curator-in-Charge
Larry Collins	Conservation Project Officer
Guy A. Greenwell	Conservation Project Officer—Birds
Mary McComas	Administrative Assistant
Marleigh Hartman	Clerk-Stenographer
Leo Slaughter	Animal Operations Supervisor
Berkeley Pomeroy	Farm Operations Supervisor
Truen McDaniel	General Maintenance Supervisor

**Officer of Education and Information**

Judith White	Education Officer
Judith King	Program Assistant
Emily Rudin	Education Writer
Sybil Hamlet	Information Officer
Michael Morgan	Information Assistant
Mildred Haltiwanger	Secretary

**Office of Graphics and Exhibits**

Robert E. Mulcahy	Manager of Design
Joseph Falletta	Visual Information Specialist
Jordan Ross	Exhibits Specialist
Warren Cutler	Illustrator
Max Hirshfeld	Photographer
Virginia Mahoney	Exhibits Specialist
Roy LaRoche	Audio-Visual Specialist, OEC
Avanell Martin	Administrative Assistant
Peter Kibbee	Management Assistant

<b>Office of Police and Safety</b>	Samuel L. Middleton, Jr. Howard Maley Donald Grist Vincent McGoldrick Herbert Bell Stewart Lucas Ray Luckey, Jr. Robert Ruffin Anthony Kadlubowski Thomas B. Evans	Chief Lieutenant Sergeant Sergeant Sergeant Sergeant Sergeant Sergeant Sergeant Health and Safety Coordinator Health Technician
<b>Office of Facilities Management</b>	Emanuel Petrella Robert Hacker Michael O'Brien  Robert F. Ogilvie Robert T. Chesley Carl F. Jackson Samuel W. Gordon James E. Deal James E. Pearson	Facilities Manager Deputy Chief Facilities Maintenance and Repair Specialist General Foreman, Maintenance Unit Foreman, Transportation Unit Foreman, Services Unit Foreman, Grounds Unit Head, Property and Procurement Unit Employee Counselor and Development Coordinator Administrative Assistant
<b>Office of Construction Management</b>	Thelma Davis Robert C. Engle David Boothe Norman Melun Walter Dobbins Fred Barwick Betty Schaad	Construction Manager General Engineer Staff Architect Architect Contracting Officer Administrative Assistant
<b>Office of Management Services</b>	Joe Reed James Fitzpatrick Wilda M. Dooley Tabetha Gilmore	Administrative Officer Accounting Technician Management Services Assistant Secretary
<b>Friends of the National Zoo</b>	Permanent Staff Sabin Robbins Dennis Baker Terry Gercke	Executive Director Associate Director Secretary
<b>Education and Volunteer Services</b>	Susan Trencher Donna Schlegel Maggie Morton Mary Sawyer	Director Assistant to the Director Education Assistant Secretary
<b>Membership and Publications</b>	Monica Morgan Fran Bernstein Cathy Kanak	Director Assistant Director Membership Assistant
<b>Food Services Department</b>	Mike Gill Danny Daniels Jo Daniels	Manager Assistant Manager Assistant Manager
<b>Merchandising Department</b>	Claire Farnsworth Lisa DiGirolamo Wilma Platt	Shop Manager Assistant Manager Shop Assistant

**Trains, Parking, and  
Maintenance  
Department**

Renee Caldwell  
Lawrence Chesley  
Kevin Polen

**Business Office**

Norma Gay  
Cathy Ferguson  
Mary Massey

**Department Head  
Maintenance Supervisor  
Mechanic**

Accountant  
Bookkeeper  
Personnel Assistant



### From the Director . . .

The Bicentennial year of our nation was indeed one of activity and progress for the National Zoological Park. The main effort leading up to this celebration year had been the attempt to have the central part of the Zoo's construction completed, so that the Zoo - - at least in the main part - - would be open to receive the large crowds expected during the Bicentennial. The two previous years had been horrendous, with as much as a third of the Zoo completely disrupted by new construction and renovations to the old buildings. For the Bicentennial, we did manage to get the Lion-Tiger Exhibit open; the Monkey House had been previously renovated; the Elephant House yards and interior were improved; but unfortunately the renovation of the Bird House interior and the completion of the surrounding yards were still in progress during the Bicentennial summer. In general, we were all quite pleased to see the new look in the central area of the Zoo and the clean, bright, eager appearance of our displays. It will take several years for the plantings and trees to mature, so there is a young look about many parts of the Zoo; but time will improve this appearance.

Unfortunately, the giant pandas did not participate in the celebration by delivering a baby for the Bicentennial year. In the spring they attempted to mate, but regrettably the male is still too young.

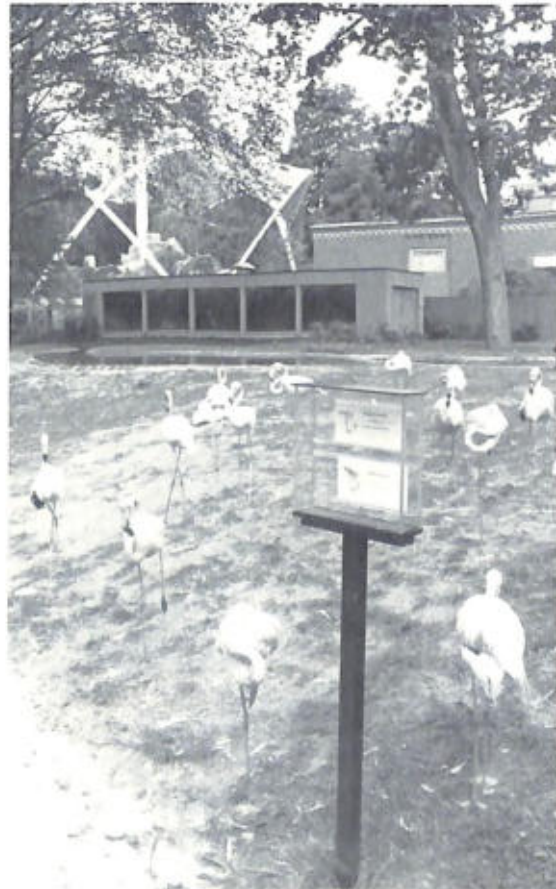
There have been no major changes in the Zoo's staff or organization.

What follows is the staff's account of this year's events.\* Any successes that the NZP has enjoyed and is enjoying, are due solely to the dedicated, hard-working, knowledgeable, competent staff in all areas. To them the achievements of this Zoo should be credited.



\*see "Status of the Collection" p. 53.

White Bengal tigers explore their outdoor moated enclosures.



## Building the Animal Collection . . .

### Accommodations

The National Zoo's emphasis on sustained breeding and maintenance of a healthy, representative collection continued in 1976. Of the total number of animals added to the collection during the year, two-thirds were born and raised at the Zoo. At the same time, exhibit construction and rebuilding were major preoccupations; accommodations had to be made for new animal acquisitions, and improvements in existing facilities were necessary for the benefit of the animals already in the collection and for more attractive and informative exhibits.

The most exciting new exhibit is the big cat complex, upon which work had begun in 1974 and which was opened to the public in May 1976. It is named the Dr. William M. Mann Memorial Lion-Tiger Exhibit, after one of the Zoo's most dynamic directors (1925-1956). By the end of the summer, it was filled to capacity with lions, tigers, leopards, clouded leopards, and jaguars. The facility has successfully met the twin challenges of gaining public acceptance and of being an easily managed animal complex.

The bird collection, which had been sent to the Conservation and Research Center at Front Royal, Va. in 1975 while the whole bird area was renovated, returned to new facilities in June 1976. The crane area was built with emphasis on barrier-free design and breeding potential, with viewing from only one side. Light mesh had to be installed across the viewing front to keep children from throwing stones at the birds. The yards are deep enough for the birds to feel secure; already both the sarus crane and Stanley's crane have produced young.

Each of the four new mesh-covered exhibits was constructed with dimensions sufficient to reduce stress. Each is suitable for a wide variety of hardy species such as gallinaceous and predatory birds.

Adjacent to the covered exhibits is the new flamingo exhibit. It allows year-round display, having a heated, glass-fronted house with pool and sand floor for winter viewing and entrances from the outside which the birds have been trained to use without assistance.

Other new outdoor areas include ratite yards and a set of off-exhibit yards designed for rearing young birds. In front of the Bird House are three waterfowl ponds. Each provides barrier-free viewing and natural nesting conditions.

Each enclosure was designed with a particular species in mind, and the plan for the building was designed to show relationships between species. For example, two adjacent enclosures were designed to contrast the Old World hornbills with the New World toucans as birds of convergent evolutionary development.

The Nocturnal Room in the Small Mammal House was renovated. Old, small metal cages were replaced with larger, interconnecting block cages to provide more space and to permit the combination of cages for larger or more active species. The room now has twelve small cages which may be combined to form four separate larger areas. New low-level blue lights simulate night during public visiting hours, while bright white lights approximate daylight during non-visiting hours.

In other areas of the Small Mammal House, enclosures were combined to make larger, more attractive exhibits and experimental mixed-species exhibits. Simulation of natural habitats, variable cage environments, and better exhibition potential were achieved through the use of natural materials and rockwork. Creative, colorful painting was used to project the natural vegetation background of the animals's wild habitats onto the walls of the cages.

A female ring-tailed mongoose, born at NZP in 1976, was the first captive birth of this species in the Western Hemisphere. / Kodiak bear. / Atlas lion. / Flamingos in their new outdoor yards.

A skillful keeper is an essential element in successful sustained breeding efforts and in competent management of additional facilities. Specialized training began in 1976 to update keepers' techniques and develop new skills.

## Mammals

The present mammal collection, managed by two curators, thirty-four keepers, and three keeper foremen, contains 435 animals of 114 species.

In its second year, the new Monkey House fostered the reproduction of eleven species, including representatives of all five families in the collection. Most notable were the births of a woolly monkey and an orangutan. The mother of the woolly monkey was an ex-pet, and while woolly monkey births themselves are unusual in captivity, it is extremely rare for a domesticated primate to mate and rear its young. The orangutan was born to captive-born parents. While the mother took excellent care of her first infant, the infant weakened and died of bacterial meningitis three days after birth.

Among the carnivores, one of the most interesting births was a ring-tailed mongoose, an unusual diurnal viverrid from Madagascar. The males have been in the collection since 1965, and a female was received on loan from the Bronx Zoo in 1974. Breeding took place almost every month of 1976, and the mongoose baby was born in September. It died, but its parents have bred again.

The red panda breeding project began in 1972. During 1976 seven cubs were born to three mothers, including one second-generation litter. For the first time at this Zoo, observers witnessed an actual breeding.

Mustelid reproduction in captivity is relatively unusual. The Zoo's pair of zorillas, which were captive-born in Canada in 1974, produced in 1976 the first second-generation litter in captivity, and perhaps the first of its species to be born in the U.S. The gestation period was about one month. The last of four litters has survived.

The white tiger breeding program continued in 1976 with the loan of the collection's yellow female to the Cincinnati Zoo. Breeding between the female and an unrelated white male, owned by the Cuneo Brothers Circus, produced five cubs, four white and one yellow. The cubs were successfully hand-reared in Cincinnati and returned to the Zoo in April.

Among the hoofed animals, births occurred in 17 of 20 species able to reproduce. Herds which produced four or more young were reindeer, Burmese brow-antlered deer, Reeves' muntjac, dorcas gazelle, and dik-dik. Four giraffes were born, but one was stillborn and two died from complications after birth. A program was begun for isolating and hand-rearing the Burmese brow-antlered fawns, to produce more easily managed animals. Thus far the plan has been successful. Two hand-reared fawns were accepted into the herd and are calm and friendly with the keepers.

The elephant population, usually quite static in zoos, given the animals' longevity and space limitations, changed radically in 1976. The male African forest elephant, Dzimbo, was lent to Lion Country Safari in Florida, when his temperament at the onset of maturity rendered him a safety hazard. Unfortunately, three months after the move, he died of unknown causes. One female Asian elephant, Shanti, died after many months of illness. She had been in the Zoo over 26 years. For the American Bicentennial, a year-old orphaned Asian elephant came to the Zoo as a gift from the children of Sri Lanka to the children of the U.S. The baby arrived on December 30 and will be presented officially early next year.

The greatest loss during the year was that of Smokey Bear, an American black bear, who had been the symbol of the nation's forest fire prevention program for 26 years. As a cinnamon-colored cub, it had been rescued from a severe forest fire in Lincoln National Park, New Mexico in 1950. From then until his retirement May 25, 1975, he had been the official Smokey Bear. After his retirement, a younger bear assumed the official title. Smokey died of old age in his sleep November 9, 1976. His body was flown to Capitan, New Mexico, where he was buried with appropriate ceremonies in Smokey Bear Historical State Park. The current Smokey Bear has endeared himself to visitors and staff, just as his predecessor had done.

In 1976, hopes were dashed for keeping the unusual red uakari. One of the collection's two females was exchanged for a male from another zoo in 1975. The new pair was compatible, but the female miscarried in January 1976 and died a month later of a kidney impaction. The exchanged female died at the other zoo of hemorrhagic enteritis before she could be returned to the National Zoo. The lone male was sent on to a third zoo.

The cheetah breeding project also temporarily halted. It began in 1974 with three pairs of cheetahs, one pair from the National Zoo and two on loan from other zoos. All had been in captivity at least five years, but none had ever reproduced. At the Zoo they were given a large, wooded enclosure. An elaborate series of hormone injections and encounters were arranged; breeding resulted but conception did not. By the end of 1976, four of the animals died of old age.

Efforts to breed the giant pandas in 1976 were an additional disappointment for the Animal Management staff. A plot of the female's estrous cycle during Summer 1975 indicated that behavioral estrus occurred twice within a period of two days. What appeared to be a good encounter between the male and female during the second estrus did not result in conception. It was assumed that perhaps the male was sexually inexperienced or immature, especially given the Chinese advice that successful panda copulations occur between the ages of six and seven years—and the Zoo's pandas were then only five. With the experience gained from 1975, and the suspicion that the second estrus is behaviorally more conducive to copulation, the female was observed during Summer 1976 for the signs of the first estrus. Staff awaited the second estrus to run the encounter with hopes that the animals would be more competent than they were in the previous year. The second estrus was never observed, so no encounter took place and no new pandas were born. Japanese breeders have stated that mature copulations are more apt to occur between the ages of seven and eight years, so perhaps breeding efforts next year will be more successful. What is now clear is that for the giant panda, every estrous cycle is different.

To help avoid taking animals from the wild, the Zoo continued to lend its animals to other zoos for breeding purposes. Important among such loans in 1976 was the shipment of the National Zoo-born Indian rhino to the Bronx Zoo, to be reared and bred with young, imported females. A female Nile hippo was given to the Singapore Zoo as a mate for its solitary male.

Species new to the collection included the markhor, the first in over 20 years, and the fennec fox. The most important arrival was that of one male and three female Atlas lions, lent by the National Zoo of Rabat in Morocco. The 30 animals of the Rabat stock are the last living members of the subspecies *Panthera leo leo*, extinct in the wild since the 1920's. In the 1950's some *Panthera leo senegalensis* stock were allowed to breed with *Panthera leo leo*, but it is uncertain to what extent crossbreeding occurred. Therefore, all the Rabat animals have recently been graded on their conformity to the *Panthera leo leo* type. The tasks facing the zoos in Washington and Rabat are to improve the remaining stock and to produce animals that most closely resemble the type, through carefully managed and controlled selective breeding.

## Reptiles and Amphibians

The National Zoo maintains 61 amphibian specimens of 18 species, and 397 reptile specimens of 94 species. These collections are managed by a team of one curator and four keepers.

In the Reptile House in 1976, cage redecoration continued and experimentation with live plants began. Besides these visual changes, the unit exhibited 14 new species of reptiles and amphibians.

One hundred sixteen animals were hatched or born. Of 12 species that reproduced, the red-footed tortoise and tegu lizard were bred and hatched for the first time at the Zoo. Second-generation captive reproduction occurred in the leopard gecko, giant day gecko, and mangrove pit viper. Animals were acquired either to enlarge breeding groups or to improve sex ratios. Such additions, along with intensive research on husbandry and reproductive behavior, significantly increased the breeding potential of the collection.

Research was conducted on corn snakes, geckos, and the Cuban crocodile. Growth parameters of corn snakes were studied with 40 hatchlings from 2 clutches. The gecko study focused on vocalization and field ecology. Crocodile observations continued from the previous year; first copulations were observed.

A notable death was that of the male Chinese alligator, on loan to the Rockefeller Wildlife Refuge in Louisiana as part of a cooperative breeding arrangement between the National Zoo, the Rockefeller Wildlife Refuge, and the Bronx Zoo. The alligator had entered the NZP collection in 1937. Death also claimed a female broad-nosed crocodile on a breeding loan to Busch Gardens in Tampa, Florida. This animal had been at the Park since 1933.

The most important acquisition was the purchase of three Aldabra tortoises, which joined the two non-breeding males and a female which had been in the collection for several years.

## Birds

In 1976, the bird collection at the National Zoo contained 1,014 specimens representing 236 species. The bird management staff, composed of one curator, two technicians, ten keepers, and one keeper foreman, was forced to deal this year with a population explosion generated by the record number of eggs laid in 1975. Eggs were acquired from resident birds; donated or purchased; and collected from the wild. Limitations were also imposed by construction and renovation of bird facilities, which precluded use of many rearing yards. For these reasons, the preceding year's aggressive approach to reproduction gave way to a more moderate program in 1976.

The following criteria were used to select species for propagation in the face of limited accommodations: (1) Was the species rare or endangered in the captive or wild state; (2) Would it be too expensive or difficult to obtain another specimen later; (3) Would it add to the representative character of the collection; and (4) What knowledge could be gained by rearing the bird? Given these criteria, the nene goose, lesser white-fronted goose, Laysan teal, sarus crane, and Stanley crane were selected because of their endangered status. Species reared to replace those in the collection included the ringed teal, radjah shelduck, and mandarin. Many species, such as the ruddy duck, were selected to gain more knowledge about their propagation. Species which had not previously laid eggs at the Zoo, such as the Coscoroba swan, Chilean pintail, rosybill, and ostrich, were also selected for this purpose. Several species of eggs which were laid were not incubated, including the Atlantic Canada goose, Lady Amherst pheasant, and Swinhoe's pheasant, since they were not needed in the collection and are readily available from other sources.

Natural incubation results were quite poor. Hatching ability was good, but the young were quickly destroyed by predators such as rats and indigenous black-crowned night herons. Larger, more aggressive species, such as cranes and swans, had better results. Young removed from their parents after hatching adjusted very poorly but survived. Based on these results, the long dispute over natural versus artificial rearing of birds at the Zoo has been resolved in favor of artificial rearing. For display value, however, several species will be allowed to rear their own young in the future.

Three pairs of nene produced 41 eggs, of which 24 hatched. The 22 goslings reared received concentrated attention. Their growth and development were studied and weights were monitored up to 60 days of age. The nenes were fed a special diet of chopped kale, vionate, and oyster-shell flour to promote healthy growth at a controlled rate. This diet eliminated all evidence of leg pyrosis, a common problem in the past.

Another accomplishment was hatching Laysan teal after several years of failure. The last successful hatching occurred in 1971. Since then, eggs have been incubated artificially each year without success. In 1976, it was decided to let the female keep her eggs. Presumably stolen by rats, the first clutch disappeared after 25 days of incubation. The second clutch was parent-incubated for the first two weeks and then hatched artificially.

The first hatching of a Coscoroba swan at the Zoo occurred when the parents were allowed to incubate one egg out of a clutch of four. Unfortunately, the survivor of the clutch died when a thunderstorm weakened its resistance.

The greatest challenge encountered was rearing North American ruddy ducks. Several experiments were tried. The most successful was natural propagation, after which 11 ruddy ducks reached 30 days of age. Other efforts were not so successful. Artificial propagation was attempted, with three rearing steps: first, with slightly older teal who were given dry feed in shallow water; second, with older ruddy ducks who were given live food in shallow water; and third, with other ruddy ducks who were given live food in a secluded area with a large, deeper pond. All three methods yielded poor results.

In an effort to propagate bald eagles, the first clutch of two eggs was removed and incubated artificially. One egg, despite having normal shell thickness, was yolkless. The other egg was infertile and at least 22 percent below normal shell thickness. Chemical analysis of this egg, performed by the Patuxent Research Center in Maryland, showed no organochlorides present at a level high enough to interfere with hatching. Recycling data were gathered, but the second clutch disappeared after several weeks of parental incubation.

In general, the incubation program was successful. Most species selected for propagation were reared. New additions to the collection by purchase or gift were few, due to extensive renovation. Six Caribbean flamingos were received on loan from the Buffalo Zoological Gardens. Recent research on captive propagation indicates that large flocks are essential for reproduction, so new facilities and additional animals should promote successful breeding. Another notable arrival was a pair of kookaburras. Years ago, the Zoo had more success than most in breeding this well-known Australian bird, but the group of kookaburras died in the 1960's. It is hoped that the new pair from the Bronx Zoo will produce offspring to build NZP's collection.

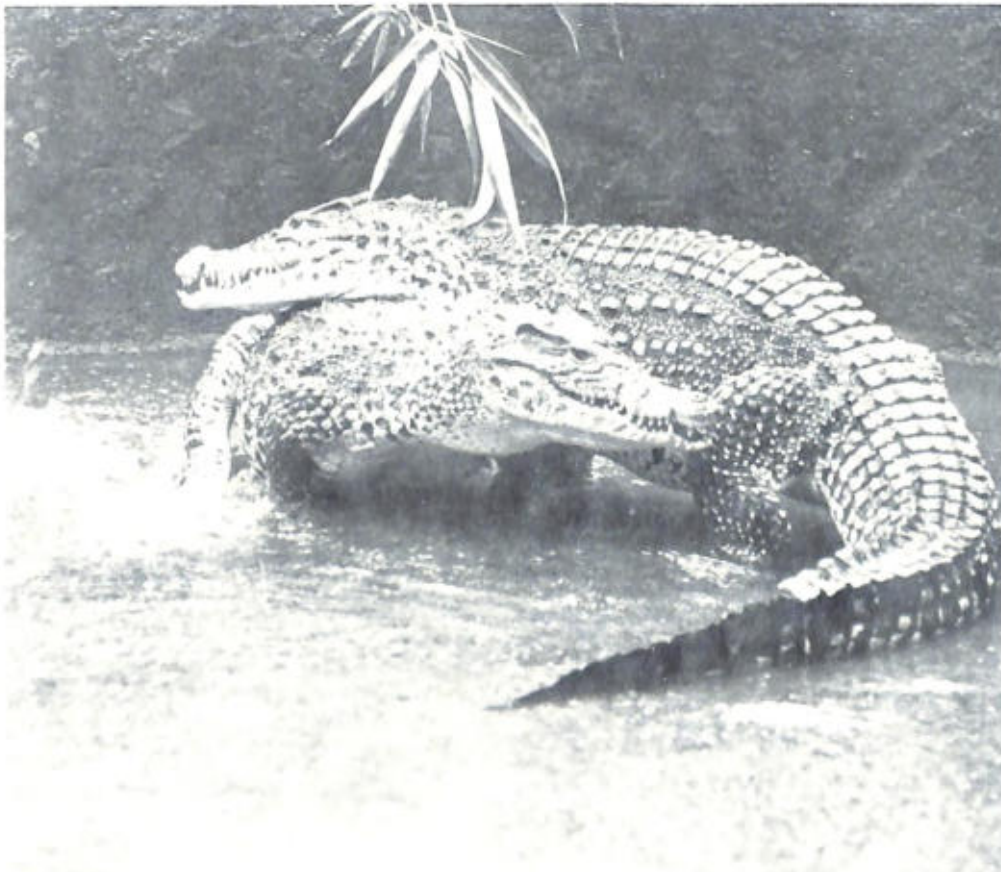
Deaths were primarily due to trauma (such as accidental, cagemate, self-induced, and predator); infectious diseases caused by bacterial organisms; and avian tuberculosis. All birds which had been relocated to the Conservation and Research Center at Front Royal because of construction at the Zoo, were screened with blood tests and, when necessary, laparoscopy. Species which had contracted tuberculosis in the past and those in high-incidence areas were removed from the collection. Deaths from avian tuberculosis during 1976 stand at 44, just under the 1975 figure of 46. During both 1975 and 1976, the

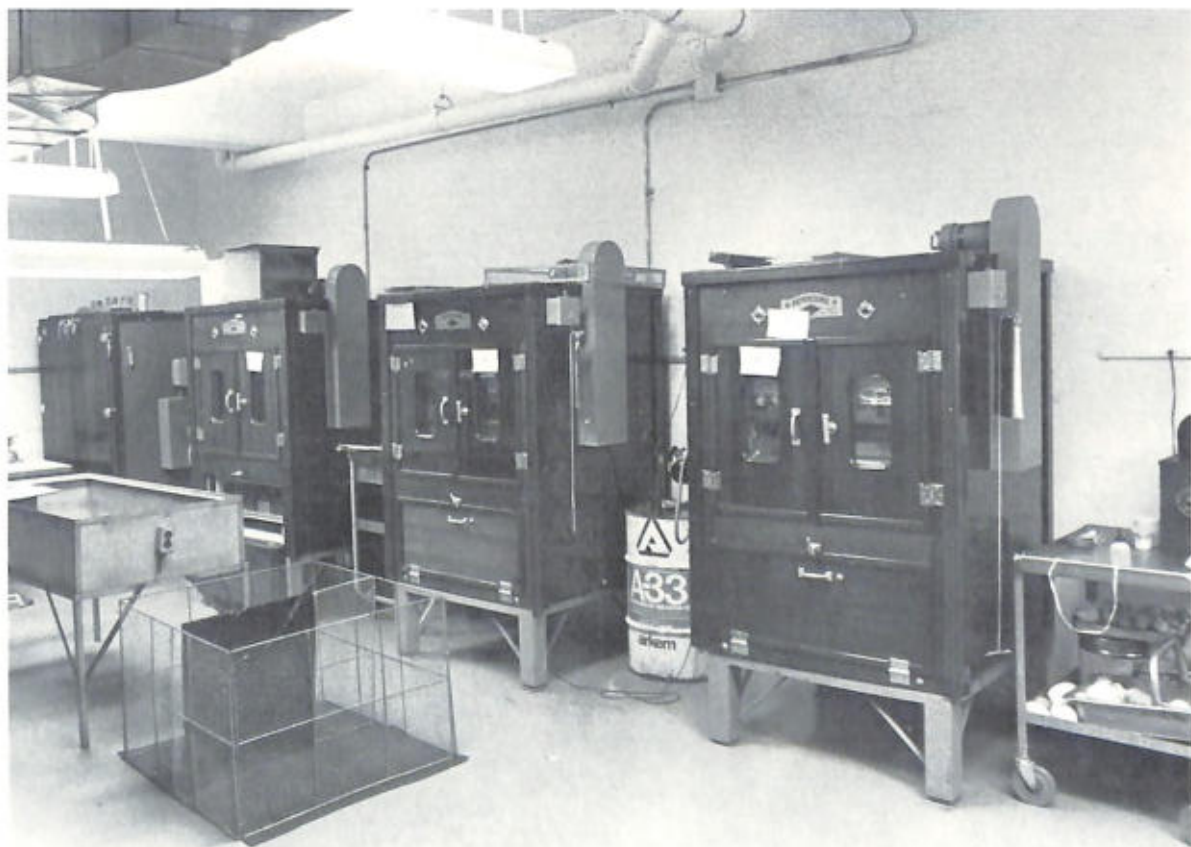
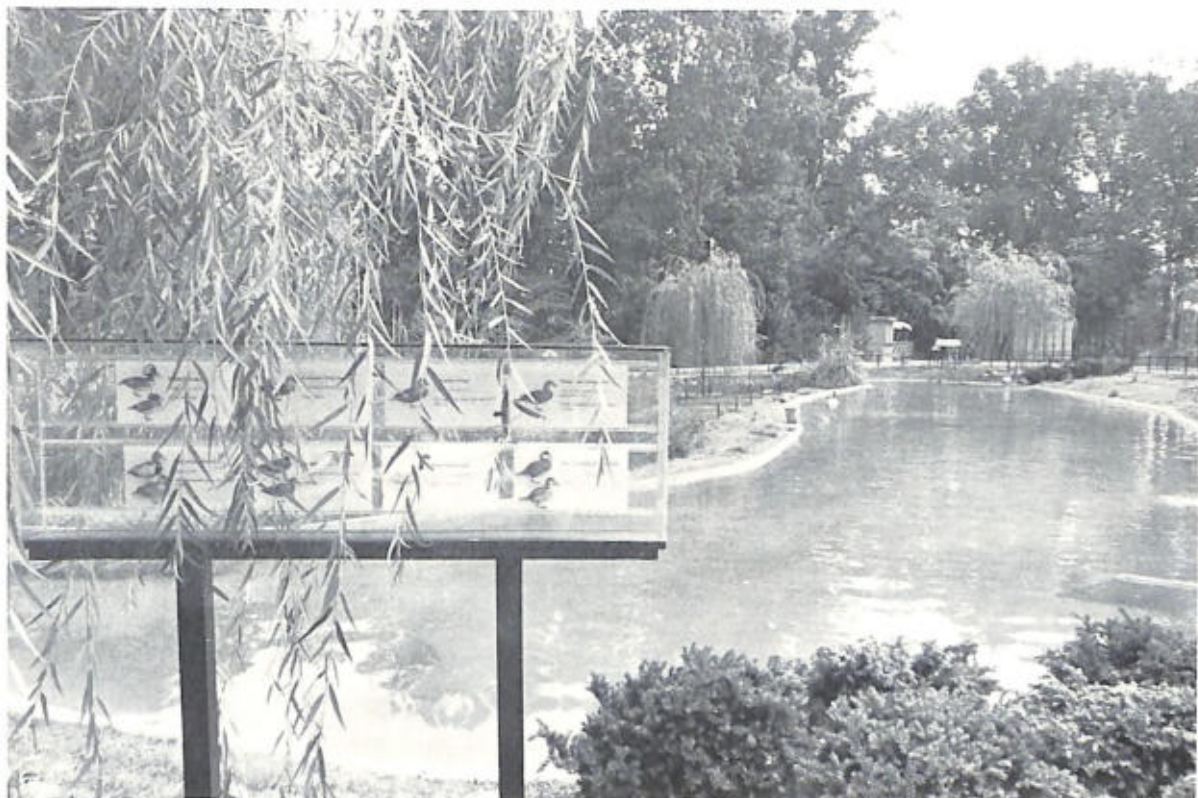
percentage of birds lost due to avian tuberculosis out of the total collection was low - - between three and four percent both years - - despite intensified surveillance in 1976. On the basis of these statistics and in view of the efforts to reduce the tuberculosis problem this year, it is expected that future deaths caused by this infection will be minimized.

At its annual meeting in October in Baltimore, the American Association of Zoological Parks and Aquariums awarded the National Zoo its Edward H. Bean Award for the hatching of a kiwi in 1975.

Incubators line a wall in the Bird House's incubation room, where eggs laid in the collection are taken from the nests for hatching. / Waterfowl ponds at the renovated Bird House.

Cuban crocodiles.







## Building the New Zoo . . .

The most immediate impression made on visitors to the National Zoo in 1976 was the extent of rebuilding activity. The first fruits of the ambitious Master Plan were realized in 1976 and projects were sped up to make new facilities available during the Bicentennial summer.

In addition to the Lion-Tiger Exhibit and the new Bird House facilities, opened in May and June 1976 respectively, elephant yards were expanded and the Elephant House was renovated and completed in June. Rhino, hippo, and giraffe yards were also renovated. Food service facilities were improved through complete renovation of the restaurant and expansion of a snack shop on the Panda House roof. Work continued on the new Education-Administration Building with its theatre, classrooms, and offices. Work began on a new bear exhibit and a General Services Building to house all of the Zoo's crafts shops. Designs were initiated on Beaver Valley, which will include exhibits of seals, sea lions, beavers, otters, wolves, and other animals.

On May 16, 1976, a 36-foot-high musical tower, called a glockenspiel - a bequest to the Zoo by the late Dr. Ivy A. Pelzman - was dedicated in memory of his wife, Katherine. This structure has an 8-foot-square clock face, four moving animals, 35 bronze bells, and a playing console. The dedication was the culmination of five years of planning, design, and construction. The I.T. Verdin Company of Ohio prepared the tower, clock, and animal figures; the bells were cast in the Netherlands. The three octaves of bells can be played either from a pre-recorded electronic tape or from the manual console. The "glock," as it is affectionately called, has proven immensely popular with visitors, chiming the time of day and playing a musical selection every hour and half-hour. During the summer, FONZ has sponsored live concerts every Saturday between 11:00 a.m. and noon.

The most complex and interesting of the new exhibits is the Lion-Tiger Exhibit, which received recognition from the General Services Administration as one of the outstanding examples of federally sponsored architecture. The enclosed area is 33,500 square feet. Each of three animal compartment wings has five dens. There are three outdoor viewing areas, with a total surface area of 21,250 square feet. Wet moats surround the viewing areas and contain 320,000 gallons of water. Tigers often use the moats, not only swimming in the water but also appearing to prefer to defecate there. As a result, standard pool filtration and circulation are insufficient to maintain good water quality. For future design guidance, such pools should be treated as sewage treatment projects with provisions for removal of sludge. The complex also has an electrical locking system. Although the idea is a good one, the system is expensive both to install and to operate. Problems with other conventional locking systems seem to be rapid rusting and corrosion. There seems to be no better method than the padlock, and so all future projects will have no other locking system.

Designers of the new bird facilities were concerned with creating exhibits which are both practical and attractive, while providing the birds with conditions conducive to breeding. The crane area and the four mesh-covered outdoor exhibits have recirculating and filtered water supplies and heated shelters. Two different screening approaches were used. In the crane area, nylon tennis shades have been installed to separate the birds visually from each other until the prepared plant screens thicken with growth. The covered outdoor exhibits were constructed with piano wire on the front side, the Zoo's first attempt to use such wire outdoors.

This glockenspiel, a 35-bell carillon, was bequeathed to the Zoo by the late Dr. Ivy A. Pelzman in May 1976.

Giraffes and giraffe-watchers inside the Elephant House.

Thanks to the expansion of their outdoor yards, elephants, giraffes, rhinos, and hippos can roam in spacious surroundings.

The outside yard at the flamingo exhibit contains a large oval pool with recirculated, filtered, and heated water. A soil-base nesting site was created which may be flooded and mounded with clay. Bamboo was used to provide screening and shade. It was also used at the waterfowl ponds, with willow and grass varieties, to provide shade and shelter on the islands separating the ponds. This separation of the ponds allows breeding pairs to defend a sufficiently large area with minimal aggression.

Inside the Bird House, all cages were restored, heating, ventilation, and air conditioning were installed, old skylights were removed, and the roof was repaired and sealed. The Indoor Flight Room has a new ceiling of wire mesh to allow for better natural light; new lighting in most cages provides sufficient intensity for plant growth. Live plants are used wherever possible.

At the Elephant House, large new outdoor yards were completed for the Indian rhino, African elephant, and Nile hippo. Inside the building, guard rails were replaced and moved closer to the exhibit fronts, allowing better visibility and more visitor space, and planter boxes were installed. Bars were removed from the Nile hippos' indoor pool and replaced with a metal observation deck constructed about two feet above the floor of the building to provide visitors with a better view of the pool. Bars which obstructed visibility were lowered at the pygmy hippo and giraffe enclosures. A standard 30-inch handrail was thought to be sufficient visitor protection along the outdoor elephant moats. The rail height had to be raised, however, when parents were observed holding their children over the rail to reach the extended elephant trunks.

Design problems of a more general nature included sewer clogging, resulting from accumulation of solid wastes in floor drains. Open trenches with specialized pumps and filter pipes have been proposed to alleviate this problem. Another concern is with structural designs requiring heavy concrete elements. These designs make facilities structurally less flexible, and are unnecessary unless the retaining structure is to house particularly large or heavy animals or equipment. Future construction will focus on structurally flexible retaining structures, in cases where the hazards of heavy loads are at a minimum.

Another finding that will guide future work at the Zoo is that relatively small investments in landscaping and walkway improvements yield benefits which more than justify their costs. For example, a spur off the bypass road located near the Monkey and Reptile Houses was most unsightly until 1976, when the 45-foot-wide area was torn out and a 30-foot-wide visitor walkway replaced it. While the new walkway eliminated all traces of the old cobblestone and gravel street, the landscaping around the walkway added a new aesthetic dimension to the area. Visitors continually comment on such small yet visually pleasing changes.

## Caring . . .

The scope of the Office of Animal Health (OAH) continues to be the delivery of complete health care to the animals of the National Zoological Park, located at both Rock Creek and the Conservation and Research Center (CRC) at Front Royal, Virginia. The Office is also committed to conducting clinically oriented research in the areas of exotic animal medicine and surgery. The teaching role of the Office, on both the pre- and postgraduate levels, is also being maintained. These activities within OAH have been accelerated due to increasing demands in all of the above aspects.

The general health of the collection at the National Zoo is good. There are continuing problems of internal parasite control due to the small paddock areas. The parasite problem is under control by routine parasite examinations, administration of appropriate medication, and continued surveillance of problem animals and areas. Minor nutritional changes are being made, in consultation with the curatorial staff of the Office of Animal Management, to insure adequate nutrition of all animals. Avian tuberculosis continued to be a problem in the bird collection.

There have been two minor outbreaks of disease in our hoofstock, the first being a bacterial infection, *Yersinia pseudotuberculosis*, which killed three newly arrived blesboks (*Damaliscus dorcas*). Yersinosis was also diagnosed in a dik-dik (*Madoqua kirki*), which was located in the same area. A report of this incident has been prepared for publication, documenting both clinical and pathological findings, and management manipulation which helped limit the disease. We are attempting to develop and evaluate an appropriate vaccine to protect susceptible species. A fungal disease due to *Absidia corymbifera* was diagnosed in reindeer calves and led to the death of two.

During our routine screening procedures and TB testing of newly arrived hoofstock, we found that our group of Bactrian camels (*Camelus bactrianus*) at CRC had positive skin tests for tuberculosis. Since then, we have been conducting an extensive evaluation of this problem, with the help of several investigators as well as new, sophisticated techniques. This evaluation has included culturing lymph nodes; repeated intradermal tuberculin tests with various test antigens; and lymphocyte transformation testing. One camel with a strongly positive skin test, a positive test on lymphocyte transformation, and a marked weight loss was euthanized; extensive necropsy and bacteriological examinations were negative for TB. This problem in Bactrian camels was presented at a symposium on tuberculosis at CRC. Our finding is that for some reason, many Bactrian camels show positive TB tests but are not infected with *Mycobacterium tuberculosis*. We are now aware that other herds of Bactrian camels have also had this problem with positive skin tests.

As the Master Plan is completed at Rock Creek, and as CRC grows to its full potential, the pace of animal health operations is sure to accelerate. With the influx of new animals, the Office will continue to maintain its quarantine and screening procedures to minimize the introduction of infectious disease into our existing collection. Plans have been submitted for a new quarantine facility and large animal holding facility near the Hospital Research Complex at the Zoo, to update our present facilities so that we may provide the necessary quarantine procedures and supportive care for large hoofstock. Also, several potential sites at CRC are being investigated for establishment of an on-site veterinary facility and a possible quarantine facility for animal arrivals there.

The work on avian tuberculosis accelerated during 1976, since the majority of the bird collection was moved to CRC while the bird facilities were renovated. While the birds were at CRC, extensive sanitation measures were taken at the Bird House to minimize exposure of returning birds. An extensive screening program was conducted on the birds at CRC prior to their returning to Rock Creek. Blood samples were obtained from all returning birds. If a bird had an elevated white count, it was classified as a possible TB suspect. Suspect birds of minimal value that are easily replaceable were euthanized.

Selected suspect birds had further screening tests, such as repeated blood sampling, radiographs, and/or laparoscopic examination to attempt ante-mortem diagnosis of avian TB. Through this extensive screening program, we hope to minimize the problem of avian tuberculosis in our returning birds. Other methods to control the disease have included attempts to produce a vaccine for it. At least seven to ten months are required to obtain the results of this research, due to the chronic nature of the disease, but results may enable us to protect birds further from avian TB.

The following is a list of selected medical and surgical events that occurred during 1976.

The breeding female Indian rhino (*Rhinoceros unicornis*) developed repeated rectal mucosal prolapses which were replaced on several occasions. On the third recurrence of the prolapse, a mucosal resection was required to correct the problem.

The breeding female bongo (*Boocercus eurycerus*), who had two previous normal calves, developed problems during her third pregnancy. A prolonged gestation with a dead fetus was diagnosed on rectal examination and amniocentesis. A caesarean section was required to remove the dead fetus. The female is doing well postsurgically and the evaluation of the uterus, via rectal examinations, is continuing. This is the second bongo at NZP that has required a caesarean section. In both cases, the fetus was dead.

The Zoo's first baby orangutan (*Pongo pygmaeus*) that was born to parents who were both captive-born died approximately three days after birth, due to an ascending umbilical infection. It is extremely difficult to separate new babies from great apes and then reintroduce them. For this reason, the normal neonatal examination is usually not performed. This examination includes a routine blood sample, disinfection of the navel, and prophylactic antibiotics. In light of the tragic event, the veterinarians are investigating methods by which we can perform this type of examination on newborn great apes and still keep the infant with its mother.

In this year's crop of giraffes (*Giraffa camelopardalis*), two of the three babies died due to secondary complications of suspected congenital problems. In the first calf, there was an extensive aneurysm of the umbilical artery, and in the second, a congenital blindness which impaired nursing and led to secondary infections.

Shanti, a female Asian elephant (*Elephas maximus*), has been monitored for the last two years for a progressive kidney disease. Extensive blood tests were performed to evaluate the progression of the disease. An attempt was made to treat her using antibiotic therapy. She was losing weight and, during a routine evaluation, a positive skin test for tuberculosis was found. This necessitated further study using specific skin test antigens. To facilitate the injection of antigens, she was lightly sedated with xylazine. The tests were performed and she appeared to be recovering as expected when, approximately two hours later, she died. The results of necropsy revealed no evidence of tuberculosis and confirmed the clinical diagnosis of extensive, progressive renal disease. A secondary complication was calcification of the lungs, probably due to uremia from the chronic renal problem.

Clinically related research in 1976 consisted of the continuation of previous projects, such as the following: (1) The Physiological and Hematological Changes in Exotic Animals During and After Physical Restraint, Chemical Immobilization, and General

Dr. R. Mitchell Bush, Veterinarian-in-Charge, uses a laparoscope during an operation. An instrument widely used in human medicine, the laparoscope is finding successful applications in the realm of animal health.

Dr. R. Mitchell Bush (left center), gives an intravenous injection in the leg of a sedated scimitar-horned oryx yearling, while keepers help. At right, a member of the animal health team records observations.



Anesthesia. [This study was funded by the Smithsonian Research Foundation]. (2) Blood Levels of Antibiotics in Exotic Specimens, Including Snakes, Birds and Large Mammals. (3) The Ante-mortem Diagnosis of Avian Tuberculosis in Birds and Marsupials and Specific Vaccine Production. (4) Establishing Normal Clinical Pathological Values in Selected Species. (5) Comparative Studies in Orthopedics, Ophthalmology, and Dentistry. (6) Physiological Studies in Reptiles, Including Blood Volumes, Red Blood Survival Time, and Uric Acid Metabolism. (7) Evaluation of Infertility in Selected Exotic Species, Such As the Cheetah and Gorilla.

New areas of clinical research investigated in 1976 include the use of the laparoscope, a sophisticated diagnostic and research instrument used extensively in obstetrics and gynecology in human medicine. The laparoscope offers many unique potentials in the field of exotic animal medicine and surgery. The need to immobilize and anesthetize essentially all species prior to even routine physical examination, makes routine laparoscopic examination, at the same time, a relatively simple procedure. We have used the laparoscope in the ante-mortem evaluation of avian tuberculosis and also for the routine sexing of selected avian species which exhibit no external sexual dimorphism. The laparoscope has also been used in the evaluation of the reproductive status of the Zoo's cheetahs (*Acinonyx jubatus*). At the time of evaluation of reproductive status, we are also able to evaluate the kidneys and liver by direct observation. Biopsy for pathological examination is also possible at this time. These examinations were performed through an incision of 10 mm in diameter. The instrument also has photographic capabilities which have allowed us to document photographically the changes observed in birds with avian tuberculosis; document the morphology of avian gonads as well as the reproductive organs of mammals; and perform selective studies on the appearance of both kidneys and liver. With the aid of the Office of Graphics and Exhibits, we have also attached the laparoscope to a closed-circuit color television and have produced videotapes during laparoscopic procedures. A diagnostic laparoscope procedure was used on Mohini, an old female white tiger (*Panthera tigris*), who has been suffering from chronic kidney disease. We examined her reproductive tract during a laparoscopic examination and found her ovaries to be essentially non-functional. The kidney biopsy obtained at that time helped in formulating a course of treatment which is being evaluated as to its possible role in helping her renal problem.

Another exciting area of clinical investigation is the use of artificial insemination of exotic animals. With the collaboration of Dr. Seager of the Baylor College of Medicine, we have been selectively electroejaculating animals at the Zoo and CRC, to evaluate their reproductive potential as well as to obtain normal baseline data on techniques of collecting semen and proper methods of storing it for future use. Along with Dr. Seager, we are also evaluating methods of studying female reproductive systems through the use of the laparoscope. Based on these preliminary studies, we believe it will soon be feasible to use artificial insemination in selective cases where natural breeding is impossible. It is hoped that through the use of frozen semen, it will also be possible to prevent inbreeding.

The teaching role of OAH has greatly expanded. Our internship program has been very successful in providing us with additional clinical coverage at both Rock Creek and CRC, while allowing the staff more time to conduct related clinical research. The volume of applications for our upcoming intership is overwhelming. Also upcoming is an opening for a second postdoctoral intern in 1977. The postdoctoral program is being revamped by lengthening the training to two years, so that a more enriched program is possible. We are now having to refuse students in schools of veterinary medicine who wish to spend time with us under our preceptor program. We are selecting only students who have completed their junior year, since these students would benefit most fully from the experience because they already have some basic medical training. With the present schedule, we have students with us almost continually throughout the year.

The Senior Veterinarian, Dr. Clinton W. Gray, has been presenting a series of seminars on "Exotic Animal Husbandry and Medicine" to junior and senior veterinary students at eight different schools, and to eleven groups of practicing veterinarians. In all, over 2,000 people have participated in the program and have expressed enthusiastic approval of the educational opportunity supported by the Smithsonian Institution/National Zoological Park. Scheduling for fall and winter presentations indicates a broader range of support by veterinary colleges in the U.S. and Canada. Cooperative biomedical research programs have been pursued in conjunction with Dr. U.S. Seal, a research biochemist at the University of Minnesota. In addition to enlarging the physiological norms information, a project in chemical contraception has been studied over the last three years. This animal management technique is completely reversible at the discretion of the curator and we have been able to prevent conception for periods of three or more years. Contraceptive implants are now functioning in animals of 12 different species in more than 20 zoos. An interesting offshoot of this project is the likelihood of its use in the control of the wild horse and burro populations of the western states, in conjunction with the College of Veterinary Medicine at Oregon State University.

Dr. Mitchell Bush, head of OAH, maintains a joint academic appointment to the Departments of Animal Health and Radiology at Johns Hopkins University Medical School. He is involved in teaching comparative and exotic animal medicine in both departments. He holds a visiting clinical professorship at the Vanderbilt University Hospital, and is a consultant to George Washington University Medical School, Largo Wildlife Preserve, and Lion Country Safari at Doswell, Virginia. Selected lectures are presented to the elective course of exotic animal medicine at the School of Veterinary Medicine of the University of Pennsylvania, and seminars are offered to allied medical groups such as dentists, radiologists, and anesthesiologists. This teaching role has a positive feedback, in that it stimulates an interest in exotics. Many of the allied health professionals have expressed a real interest in helping solve a number of our problems that relate to their specialties. This additional help has proved invaluable on many occasions.

The next few years hold much expectation and challenge for this Office. The continued growth of CRC will require additional effort to maintain proper health care. New construction at Rock Creek will allow new and greatly improved isolation and quarantine facilities and a large animal holding and treatment area close to the Hospital. The construction of a new Pathology Post-Mortem Building will allow the development of a larger, more flexible surgery suite and establishment of an intensive care unit within the existing hospital area.

As we continue to meet our three goals of health care, teaching, and research, additional support is anticipated. Computerization of our growing record system will enhance future progress by appropriately storing for fast retrieval the information and data being generated by our growth.



## Diagnostic Support . . .

The Office of Pathology (OP) continues to function with its major objective being the maintenance and improvement of the health of the Zoo's collection. To achieve this goal throughout 1976, the staff of OP included a pathologist, a histopathology technician, two medical technologists, an autopsy technician (part-time), and a secretary/office manager. Laboratory personnel function as a team which delivers diagnostic support through the Office of Animal Health (OAH) to the Zoo's collection.

In carrying out these objectives, other benefits - - including progress in teaching and research - - have been realized. These benefits have served both directly and indirectly to maintain the Zoo's high animal-health standards and have added measurably to the general fund of knowledge about zoo medicine.

Over the past year, the Clinical Pathology Laboratory has expanded its services, to meet the demands of an increasing workload associated with the development of the Conservation and Research Center (CRC) at Front Royal and the increase in professional personnel in OAH. The Clinical Pathology Lab accessioned 4,109 specimens, broken down as follows:

- Hematology: 2,088 (includes hematocrit, hemoglobin, red blood cell count, white blood cell count, total protein, indices, and differentials)
- Blood chemistries: SMA<sub>12</sub> (12 individual tests) - - 516
  - Electrolytes (Na, K, Chloride) - - 166
  - Miscellaneous (Creatinine, CPK, etc.) - - 260
- Fecal examination for parasite eggs: 1,010
- Parasite identification: 48
- Urinalysis: 168
- Cultures: 555 (bacterial and fungal)
- AFG (acid-fast) smears: 110
- Pregnancy tests: 131
- Miscellaneous: 76 (fluid analysis, guaiac, skin scrapings, etc.)

The histopathology laboratory handled a total of 1,074 cases, with preparation of 4,695 paraffin blocks, 5,627 routine hematoxylin and eosin stains, and 838 special stains.

There were 645 deaths in the collection, giving a mortality rate for 1976 of 18.8 percent, based on a total of 3,432 animals at risk in the collection.

Tables presenting the breakdown of deaths by major categories, the distribution of deaths throughout the year, and the causes of death are in the Appendix.

Highlighting the year's activities of OP was a symposium on Mycobacterial Infections of Zoo Animals, at CRC in October. The symposium was organized and chaired by Dr. Montali and sponsored by the Friends of the National Zoo. Tuberculosis - - its mechanisms, diagnosis and control - - was the focal point of the meeting, but other diseases were discussed, including leprosy-like conditions of animals; Johne's disease of ruminants; and other mycobacterioses, including those of reptiles and fish. Proceedings of the symposium are to be published by the Smithsonian Press as a monograph, expected to be available in late Fall 1977.

A clinical pathologist, working in a laboratory in the Office of Animal Health, conducts biochemical tests of bacterial cultures taken from the animal collection.

Expansion of the necropsy facilities began in the Fall 1976 and a new Pathology Building is due to be completed in Summer 1977. The facility will permit performance of necropsies on animals that range in size from hummingbirds to large hoofed mammals. It will include a large walk-in cooler with an overhead track, a large animal table, adequate laboratory and storage space, and a pathologic incinerator to dispose of potentially infectious material. This facility will alleviate many of the difficulties encountered in trying to manipulate large animals and will improve our biohazard containment.

OP completed a number of research projects which led to scientific publications that are listed in the Appendix. Other projects continue, including collaborative studies with OAH and investigators from other institutions. The major studies are those concerned with epidemiologic factors associated with the tuberculosis problem in the bird collection, and continuing projects based on the outbreak of yersinosis of the hoofstock during Winter 1976. We are studying the pathology of gentamicin toxicity in snakes. We also have a number of collaborative studies, including those on a viral inclusion disease of boa constrictors; cryptosporidiosis in snakes; and avian hematology. Numerous independent research projects are carried out by staff members, Armed Forces Institute of Pathology Fellows (AFIP), and other individuals in training.

University affiliations are maintained via Dr. Montali's appointments as assistant professor of comparative medicine and assistant professor of pathology at Johns Hopkins University School of Medicine, and as assistant clinical professor of pathology at George Washington University School of Medicine. The laboratory section of Comparative Pathology 295 at George Washington University was taught by OP staff in the necropsy facility at the Zoo.

Teaching resources continue to be generated by OP's diagnostic services. At present, teaching aids include a computerized pathologic data bank, photographs of pathologic entities of Zoo animals, histologic slide sets for the study of many important conditions, and tissues and other materials which are filed for future studies.

Planned programs and activities for the immediate future include a symposium on the comparative pathology of zoo animals, to be co-organized and co-sponsored by the Registry of Comparative Pathology and the National Zoological Park via this Office.

## Learning Through Research . . .

Diversity was the key word in describing National Zoo's research activities in 1976. Topics of study included ecology, reproduction, behavior, and nutrition, both in the field and in captivity for a wide variety of species. Results of these studies have been applied to the formulation of theories on communication and social bonding and to conservation, propagation, and management efforts. Research activity included field work on four continents, in such countries as Venezuela, Panama, and Sri Lanka.

The staff of 12 at the Office of Zoological Research (OZR) - - complemented by students, grant-assisted associates, volunteers, Smithsonian Fellows, and collaborators in universities and other research centers - - multiplied the benefits of the information thus acquired with the publication of more than 20 scientific papers; with lectures at academic and professional meetings; with teaching assignments; and with other public activities.

In the field, a major project continued in Venezuela, supported by funds from the Smithsonian International Environmental Sciences Program. The project's goal is to compare the fauna of two habitat types - - montane tropical rain forest and llanos - - with gallery rain forest. By trapping small and medium-sized mammals from the two areas, the identities of principal species and population densities may be determined. The two sites are also being used to study feeding habits and population densities of local howler monkeys (*Alouatta seniculus*), to determine the habitat's carrying capacity. Analysis of primate diversity and densities in the Neotropics indicated that predictable patterns of competition and coexistence among cebids and callitrichids are functions of the habitat and feeding strategies of the species. Studies of the crab-eating fox (*Cerdocyon thous*), during the wet season on the llanos, revealed that fox pairs forage together for small vertebrates and invertebrates (the bulk of their diet), but do not hunt cooperatively.

Another aspect of the Venezuelan research is a comparison of vocal repertoires of bird species in different habitats. Also being investigated are the thermal ecology of the South American pond turtle (*Podocremis vogli*), and the population dynamics and behavior of the caiman (*Caiman crocodilus*).

Other field studies included one in Maine, supported by the Maine Mammal Commission, on the maternal care and juvenile social behavior of harbor seals (*Phoca vitulina*). Recommendations on techniques for the care and management of captive harbor seals were possible as a result of this research. In Sri Lanka, one NZP research associate, supported by the National Science Foundation, continued a study on the social behavior and feeding ecology of the toque monkey (*Macaca sinica*). Eastern bluebirds (*Sialia sialis*) were studied to determine clutch size and reproductive success. Song wrens and white-breasted wood wrens had become extinct on Barro Colorado Island in Panama before researchers released seven of each species there in 1976. Relocation of the birds revealed that several pairs of song wrens have successfully reproduced. The project is being supported by Save Animals from Extinction and the World Wildlife Fund. Studies in Panama are also underway to understand the sources of natural selection acting upon vocal communication in congeneric wrens. A Zoo researcher also developed a new conceptual framework for understanding how the physical structure of sound relates to motivation and the information communicated by vocalizations in mammals and birds.

Field studies yield basic scientific understanding and critical information about the complex web of interactions between exotic animals and their natural habitats. Within the Zoo's collection, such information is quite valuable in improving breeding potential and animal health. Keepers, volunteers, and students join Zoo researchers in these efforts. The captive studies described below also enlisted the indispensable aid of many non-staff assistants.

In 1976, an edited videotape of the social and reproductive behavior of giant pandas (*Ailuropoda melanoleuca*) was prepared. Studies of the reproductive and social behavior

of golden lion marmosets (*Leontopithecus rosalia*) continued in 1976. Supported by the National Institute for Mental Health, the studies emphasize factors promoting the development of a successful pair bond. Of interest has been the discovery of a mid-pregnancy peak in sexual behavior in many lion marmoset pairs. Studies of golden lion marmosets have also been directed at the occurrence of food-sharing and food-stealing, behavioral development, and parental care; these were conducted by a FONZ-sponsored pre-doctoral student. The role and contexts of scent-marking and the function of the arch posture were also studied.

Studies of social behavior and communication in the bush dog (*Speothos venaticus*), maned wolf (*Chrysocyon brachyurus*), and crab-eating fox (*Cerdocyon thous*) are being supported by the Smithsonian Research Foundation and conducted at the Conservation and Research Center (CRC). Reproduction in all three species was successful; two litters of maned wolves have been born and reared, and a single female bush dog was hand-reared successfully. A major finding was that both bush dogs and crab-eating foxes appear able to bear two litters each year, although the majority of canids are monoestrous.

Both the canid and marmoset studies have contributed to a review of the characteristics of monogamy in mammals, and have initiated a broad-based comparison of the phenomenon of monogamy. As part of this work, a Smithsonian Fellow began a study of social behavior, communication, and parental care in the rufous elephant shrew (*Elephantulus rufescens*). An abandoned *E. rufescens* was successfully hand-reared in the research collection.

Manuscripts on the work of the late H.K. Buechner were prepared by an OZR intern. Dr. Buechner had studied the bongo (*Boocerus eurycerus*) and the Indian rhinoceros (*Rhinoceros unicornis*). Also completed in 1976 was the investigation by a pre-doctoral student into the temporal patterning of courtship behavior in the acouchi (*Myoprocta pratti*). This research resulted in better understanding of the motivation and function of courtship activities.

Studies of reproduction in the phyllostomatid bat (*Carollia perspicillata*) continued in 1976. Several techniques for marking bats were developed, which will be used in long-term studies of bat populations in Panama.

Nearing completion is a project designed to analyze the morphological characteristics of leaves from the trees on Barro Colorado Island. The ultimate goal of the project is to be able to trace the feeding habits and food preferences of Neotropical folivorous mammals from analysis of leaf fragments in feces.

A master's thesis on the effects of familiarity on the agonistic behavior of degus (*Octodon degus*) was completed in 1976. Student projects continued on rodent ontogeny and play in four rodent species, and on development, sex differences, and context of wolf (*Canis lupus*) vocalizations.

Zoo researchers added to the scientific community's storehouse of knowledge through a number of college lectures across the country, and through such organizational conferences as the Animal Behavior Society, Georgetown Family Center Symposium, Ornithologists Union, Wilson Ornithological Society, American Association of Zoological Parks and Aquariums, and a London symposium on breeding rare and endangered species.

Zoologists in Venezuela measure the length of a spectacled caiman, as part of an NZP study on the thermal ecology of caiman and South American pond turtles.

Basking in the Venezuelan sun, spectacled caiman and South American pond turtles crowd the edges of a pond where studies of these animals are being directed by NZP staff.





## New Horizons . . .

### Conservation and Research Center

The National Zoo acquired a most valuable resource in 1975 when it opened the Conservation and Research Center (CRC) in Front Royal, Virginia. The Center's capacity to provide sizable tracts of land and its potential as a research facility are just two aspects which make the property ideal for the maintenance of large breeding populations of exotic and endangered species. Long-range planning meetings at the end of each month continued in 1976, and formulation of a CRC master plan for programs, facilities, and resources should be completed by Summer 1977. At the same time, expansion of both operations and facilities has produced significant changes at CRC.

New outdoor animal compounds were constructed in King Pasture and near the south entrance. Three paddocks covering approximately 65 acres were completed in King Pasture in October to accommodate large hoofstock. Seven new muntjac enclosures covering approximately four acres were completed in March. Construction of an observation tower inside the muntjac enclosures was also completed this year. The tower contains a storage area, sleeping quarters, and an observation area, and is completely enclosed, insulated, and heated for year-round use.

Since the U.S. Department of Agriculture had left many usable structures on the property, most new indoor facilities have been created by remodeling old ones. H-shaped Building 4-9 was at one time a horse barn. Conversion of this structure into small mammal and bird facilities took almost four months for the contractor to complete, but the final product is of first-class quality. The east wing of Building 4 was renovated to provide connecting indoor and outdoor cages to house binturongs and tree kangaroos. The east wing of Building 9 now has 24 cages inside and outside to accommodate marmosets and birds. A formidable undertaking was the conversion of the old granary to a commissary, fully equipped for food preparation and storage as well as for raising rodents and rabbits for carnivorous species at the Center. The central location of the building is ideal as a distribution point. New facilities in the wings of the structure include walk-in freezers, coolers, and food-processing equipment. The central link is furnished with an office, locker and shower rooms, and a drive-through section for loading the food truck in cold weather.

Partial remodeling of Greenhill, Waller, and Meade Barns continues each year. Renovations are necessary in order to upgrade these converted cattle barns to a standard required for exotic hoofstock. The upgrading of facilities in a manner that is appropriate for each hoofed species is made possible by knowledge, acquired yearly, about the husbandry of these species under seminatural conditions. Provisions were also made in the barns this year for winter housing as well as for holding pregnant and sick animals.

Animal management responsibilities were expanded with the arrivals of several new species at CRC. In December 1976 there were 81 specimens in residence, representing 12 mammal species. The first group of Reeves' muntjac were received in March and installed in their new enclosures. The first wisent, a European relative of the American bison, was received in King Pasture as a gift from the Brookfield Zoo in November. Also in November was the arrival of a group of binturongs. Golden lion marmosets arrived in September.

Breeding and herd enlargement efforts for hoofstock continued in 1976. One onager colt was born, but it died from cold weather and lack of maternal feeding. One Eld's deer was born, but another member of the group died, yielding no net gain. Natural rearing of Grant's zebras, scimitar-horned oryx, and Père David's deer has been more successful.

Animal barns and a commissary, converted from an old granary, are a few of the buildings that serve the growing facility at the Zoo's Conservation and Research Center near Front Royal, Virginia.

A keeper observes a pair of scimitar-horned oryx in the field from a four-wheel-drive vehicle.

Efforts to enlarge the herd of Bactrian camels at CRC resulted in disappointing and embarrassing findings in 1976. In December 1974, the herd consisted of one male and eight females. Four months later, a male calf was born and was presumed to have been conceived by the lone adult male, Humphrey. Humphrey went through all the breeding motions and actually bred with the infant's mother twice in the following six months.

Blood samples obtained from each of the females in successive months indicated that a couple of them might have been pregnant, but no offspring were ever produced. By this time, two additional males had been added to the collection, but were kept separated from the herd. Jimmy arrived in January 1975 as a loan from the Cleveland Zoo, and Tex, on loan from San Antonio, Texas, arrived in May 1976. Suspicious veterinarians electroejaculated all three of the adult males in the latter half of 1976. At the same time, a routine physical examination revealed that Humphrey was lacking testicles, and a sperm count revealed that Jimmy was producing no live sperm. The third male had a normal sperm count and was placed in the herd, but he displayed abnormal behavior patterns with no breeding activity and suffered a 600-pound weight loss. The removal of Tex from the herd and administration of a good diet restored his strength. All three males are now in the herd but no offspring have been produced.

Most of the Zoo's bird collection was housed at CRC from Fall 1975 through late 1976. While propagation during this temporary transfer was not a major objective, some experimental rearing projects were conducted which assessed the potential of CRC as a future bird-rearing facility. During 1976, 23 common rheas were hatched and reared. Those which did not survive (about 50 percent of the eggs laid), were lost due to unfavorable response to artificial uncubation, body deformities, and other problems. Those that survived artificial incubation were returned to the rhea group in the oryx paddock when they were old enough to fend for themselves. The relative success of the common rhea breeding effort prompted the decision to acquire a group of the endangered Darwin's rheas from the San Diego Zoo, and the 2.6 specimens arrived in October.

The Center operated in 1976 with a full-time staff of 20, distributed among the administration, maintenance, animal, and farming units. Eleven of the 20 lived at the Center. Three additional full-year residents were grant-supported researchers, and five individuals with temporary appointments were seasonally employed. The Center also profited from the services of five volunteers over the year.

Several measures were taken during the year to provide additional protection for both employees and resident animals. The Center was able to supply its volunteer fire department with a new brush-fire truck this year, and also acquired a combination pumper-tanker for fighting building fires. This latest addition has a pumping capacity of 750 gallons per minute and a storage capacity of 100 gallons. The pumper-tanker is now being readied for use and should be completed by the end of 1977. The two pieces of equipment update the fire-fighting capability of the Center appreciably.

Considerable contributions to security at the Center were also made by the fencing crew. To protect the collection from the possible hazards of development on the Leach Property - - an area on the south end, surrounded by government land and especially inviting to poachers - - 6,000 feet of fencing were erected around the Leach Property's perimeter. Three interior gates were constructed at appropriate sites in the central area of the Center. The gates serve as additional impediments to uninvited guests who might enter the property via the south entrance during off-hours.

The farm unit at CRC grossed 109 tons of grass hay and 20 tons of alfalfa in 1976. The loss of a record cutting of alfalfa was attributed to the ground's heaving because of recurrent freezing and thawing. However, enough hay has been produced yearly at CRC to meet the Zoo's demands at both Rock Creek and Front Royal.

Knowledge of the captive husbandry of most wild animals is in a rudimentary state and requires refinement through research. The following three ongoing research projects at the Center are examples of efforts being made to understand the biology and ecology of several species, to sustain and enlarge these animals' populations most successfully.

A comparative study on the communication systems and social organization of three species of South American canids is in progress in Building 4-9. It is hoped that the research on maned wolves, crab-eating foxes, and bush dogs, which is being funded by a grant from the Smithsonian Research Foundation, will elucidate the reproductive biology of each species.

A project dealing with the nutrition and range management of Père David's deer is being undertaken as a master's degree dissertation at Virginia Polytechnic Institute. Accurate estimates of the seasonal carrying capacity of the 35-acre Père David's deer paddock will permit the population to be maintained at a stocking level commensurate with sustained forage production, and thereby prevent soil erosion and maintain adequate cover.

A three-year study on the social structure and communication of Père David's deer is being undertaken by two members of the CRC staff. The documentation of seasonal changes in social organization and the elucidation of the role of communication in forming social relationships should provide information for assessing the effects of sex ratio and age structure on herd productivity.

During Summer 1976, four student interns assisted ongoing research projects. Two of the students, supported by FONZ and the Smithsonian respectively, participated in OZR projects being carried out at the Center: one on clutch size and reproductive success in the resident population of eastern bluebirds, and one on the foraging distance and social behavior of radio-collared resident turkey vultures. One of the students accompanied the OZR ornithologist on a field trip to Panama. Two other FONZ research trainees participated in the study of social behavior of Pere David's deer by assisting in field observations and data processing on a daily basis. Their participation also made it possible to conduct a 24-hour watch, which provided a basic time budget for observing herdmaster behavior.

The Center not only was characterized by vigorous internal activity during 1976; it also had opportunities to serve both the scientific community and the public. Four scientific conferences highlighted the use of the Conference Center. In February the Smithsonian Council met to discuss research funding in the Institution. This was followed by three symposia in the spring and summer, sponsored by several National Zoo scientists. An April symposium was held on the behavior and neurophysiology of lizards, while the biology of arboreal folivores and golden marmosets were the topics of two symposia in May and August, respectively. The Conference Center was also used by the Smithsonian Associates as a base for two summer weekend field trips.

People from the Front Royal area were invited to obtain passes for the first visitor day on September 11, 1976. Nearly 400 visitors turned out for truck tours of the grounds; a lecture and slide show presenting a summary of CRC's purpose, programs, and future plans; taped recordings of vocalizations of South American canids; and videotaped encounters of courtship between maned wolves, made last December. The cafeteria was the site of refreshments and offered a chance for visitors to socialize with employees. Vernon, the Center's pet vulture, entertained unsuspecting visitors by untying their shoelaces.

Paralleling the expansion of CRC's role in the breeding and research efforts of the National Zoo, is the desire to enhance fully the care endangered species so desperately need. Progress in this direction is being made through cooperative planning by CRC and other Zoo offices to carry out a most urgent mission.



Care For Them  
By Not Feeding



Care For Them  
By Not Feeding



## Providing an Educational Experience . . .

### For the General Visitor

As new animal exhibits were constructed, the task of providing accompanying information for the Zoo visitor continued to be an important priority of the Office of Education and Information (OEI). Approximately 40 new identification (ID) labels were researched, written, and translated into Spanish to complete the new labeling system. A set of "visual keys" (including photos, drawings, and written material) was completed for the renovated Elephant House and yards.

Planning and research began for graphics and information in two new animal exhibit areas: the renovated Bird House and the new enclosures for polar bears and for other bears. Several innovative approaches were proposed for the Bird House, including special kinds of bird labels, a flight exhibit, and a Visitor Information Center. A small area located inside the Bird House, the Center will be a place where visitors can find in-depth information about the collection, or, perhaps, be stimulated to view the birds more carefully with an educated eye. Besides books, the Center will contain collections of skeletal materials, feathers, nests, eggs, and sound recordings. In 1976 the materials for the Center were collected and the design of interpretive materials was begun. Due to some construction plan changes, those materials were then reassigned to the Resource Room,\* until the Center in the Bird House was completed.

In addition to labels and "visual keys," plans for the new bear exhibits included an interpretive exhibit and photo mural in the underwater viewing area.

### Exhibit Evaluation

An extensive visitor survey, conducted by Philip G. Kuehl of Westat, Inc. in Rockville, Maryland, was completed and given to the Director in 1976. In addition, Diana Kwong, a student from Scripps College interning with OEI (through the American University's American Studies program), completed a study of visitor behavior in the new Lion-Tiger Exhibit in Fall 1976. By "tracking" and interviewing, she evaluated how visitors used the area, where they walked, what signs they read, etc. Her findings gave us more insight into the kinds of information visitors seek.

### Printed Material: Guidebook, Brochures

The Zoo's new guidebook, *ZooBook*, was written by OEI and was on sale to the public by Christmas 1976. It was recommended in the *Washington Post's* Christmas book list. Copies of the book were sent to associates in zoos throughout the world.

New brochures printed in 1976 included one on tigers and another on lions, to accompany the new Lion-Tiger Exhibit, and the general Zoo brochure. A "no-feed" animal trading card was inserted in the general brochure, to educate visitors about the Zoo's no-feed policy. A special booklet, *Lion Fact Sheet*, was written for the National Zoological Park in Rabat, Morocco, as an expression of thanks for the Atlas lions.

A prototype of a general visitor self-guided tour for the proposed Crowned Crane Trail was produced and tried out, while awaiting completion of the trail. (See also School Groups, self-guide).

\* A vacant room (previously planned as FONZ offices) in the new Education-Administration Building was designated as the site for the Resource Room - a library of books and materials about the animals in the collection, open to family visitors and teachers.

Skeletons, nests, skins, and other materials were assembled by staff of the Office of Education in 1976 for Zoolab, a resource learning center in the Education-Administration Building. Zoolab is scheduled to open to the public in 1977.

Two of the cards distributed to the public in 1976 as part of the Zoo's "No-Feed" campaign.

With the help of Hatti Ettinger, a volunteer experienced in publication, a three-year report of the Zoo's activities was assembled and edited. Printing was undertaken by SI Press.

### Audio-visual

Two prize-winning films were completed by OEI in conjunction with the Smithsonian's Motion Picture Unit (Office of Exhibits Central). *The Big Cats and How They Came to Be*, a film supported by the Excess Currency Program and animated by artists at Film Polski in Warsaw, received a CINE Golden Eagle award in 1976. Subsequently, the film was invited to be shown at the International Week for Education and Teaching Films in Berlin; at the CINE showcase in Kabul, Afghanistan; at the Sixth International Film Festival of India in New Dehli; and at the Egyptian International Scientific Film Festival in Rio de Janeiro, Brazil. *Tiger*, the other film, won the first-place audio-visual award at the American Association of Zoological Parks and Aquariums' annual convention in Fall 1976.

Planning began on a second animated film to be done in collaboration with the Motion Picture Unit and Film Polski. Speciation was chosen as the film's theme.

The script for the *New Zoo* slide show was revised for the Bicentennial summer. Major recataloguing of OEI's slides, integrating them into the system used by Smithsonian Photo Services, was undertaken. Over 3,000 original slides were identified, indexed, and sent to Photo Services, and duplicates were returned to OEI's files.

The black-and-white photo collection continued to expand. Photo assistance was rendered to publishers, teachers, individual writers, and other zoos, although the photo-caption project was not continued. The response indicated that although newspapers were appreciative of the material (a black-and-white 8 x 10 photo plus an informative caption), not enough photos were published to warrant the appreciable effort required by OEI to send them out.

### School Programs

One accomplishment of 1976, achieved after careful and tedious negotiations, was a clearer definition of roles and working relationships between OEI and the Office of Volunteer and Educational Services of the Friends of the National Zoo. These clarifications paved the way for many successful future collaborative projects.

A new approach to guide training was tried out in Fall 1976. It called for collaborative teaching by the Zoo's curatorial, research, and education staffs, as well as by trained FONZ guides and staff. One result was a consensus of all involved on what the content and format of future training should be. It should stress general zoology concepts, teaching skills, and a practical rather than lecture-based approach.

A goal shared by OEI and FONZ for several years was to offer some in-depth Zoo programs for District of Columbia school children. Such programs should complement the school curriculum and assist the teacher as much as possible.

In Fall 1976, OEI and FONZ began research on a pilot program with the D.C. schools. Contacts were made with D.C. school administrators, and visits were made to schools to talk with principals and teachers. The District Schools' Region II was selected to begin the pilot program. Simultaneously, OEI began the recruiting process to hire a new OEI staff member for the program.

## **Public Information and Assistance**

Answering public and press requests continued to be a time-consuming task for the Office's information officers. Phone calls seeking information come in on the estimated average of one every five minutes. Hundreds of letters were answered, queries from both adults and children. Meeting the needs of the press, often on short notice, continued to be a time-consuming priority.

*Tiger Talk*, the employees' newsletter, continued to be a weekly publication, distributed to over 450 staff and associates of the Zoo.

Special events included a number of functions to celebrate completion of the new Master Plan exhibits. The William M. Mann Memorial Lion-Tiger Exhibit was officially opened in May 1976, with the debut of the Atlas lions honored the following September. The Zoo's new glockenspiel, a bequest of the late Dr. Ivy A. Pelzman, was dedicated in May 1976. Subsequently, concerts were held throughout the year. Besides the annual FONZ and Smithsonian Associates Zoo Nights, some special functions were scheduled at the Zoo for the Harvard and Yale Clubs.



## **On Exhibits . . .**

### **Presenting the Printed Word**

The Office of Graphics and Exhibits (OGE) acts as co-planner, designer, and producer of all visual communications material and media for visitors and other special or scientific audiences. This Office works directly with every other office in the National Zoological Park and at the Conservation and Research Center at Front Royal, Va. More direct contact with other offices has been facilitated this year by a new work-order system which significantly reduces paperwork, and by a reorganized Office staff.

### **Master Graphics Trail System**

This year saw the completion of the plans for the Trail System - - a myriad of technical drawing packages prepared for bidding - - and the completion of prototype pre-cast elements of the totem, map stand, settee, and benches. All artwork was prepared and the complex color separations were completed. The work advertised for contract bidding included all service symbols, animal symbols, trail markers, service symbol panels, animal location panels, complete ten-color service maps, service symbols for waste receptacles, inter-office information labeling, and traffic signs.

Prototypes were installed in non-public areas to check durability and visibility and to correct visual proportions. Once all elements were approved by this Office and the Office of the Director, contracts were issued and production began. June 1977 was the target date for completion of the Master Graphics program. Twenty-seven separate contracts were issued by OGE and the Office of Construction Management, for completion by the proposed date.

### **Labels**

Over half of the labels in the Park were completed this year, designed and produced by this Office. In the new Lion-Tiger Exhibit, ID labels for all species and 48 visual keys were completed. The latter require research for illustrations, photography, copy layout, design, and production. The same extensive preparations were necessary to produce ID labels and indoor and outdoor visual keys at the renovated Elephant House. In 1976, this Office met the labeling needs of the hoofstock areas, great apes, and Small Mammal House. It also installed over 1,800 emergency signs.

### **William M. Mann Lion-Tiger Exhibit**

The Dr. William M. Mann Memorial Lion-Tiger Exhibit required many man-hours from this Office for the design, planning, and construction of three major pictorial exhibits comparing the social behavior, hunting activity, and habitats of lions and tigers. The lobby of the exhibit also required a memorial display about Dr. Mann, his years as Zoo director, and his achievements before and after. The theatre was designed and programmed for multimedia presentations. Remote-control and projection systems make possible showings of *How the Big Cats Came to Be*. A visitor may view the film merely by pressing the button on the exterior wall sign. Special seating in the theatre was selected and installed to provide comfort and yet allow free entrance and exit without disturbing other visitors.

The theater at the Lion-Tiger Exhibit, designed by OGE, opened in 1976.

Zoo Book is a largely pictorial account of the daily activities at the National Zoo. Designed by OGE, it was published by Smithsonian Press in 1976.

## **Bird House**

Since the Bird House renovation was completed this year, this Office began planning strategies for exhibit and graphic requirements. Interior and exterior Bird House labels were the first items to be produced, and visual keys to be made in 1977 were developed. Modular cases were designed for the Bird Information Center and produced by the Office of Exhibits Central, as well as a series of special skeletal presentation cases for the Office of Education and Information. The remaining phases were planned for the Visitor Information Center and an exhibit on flight; design and production will take place in 1977.

## **Elephant House**

The renovation of the Elephant House interior was a collaborative effort between the Office of Construction Management and OGE. Accomplishments include redesigned animal enclosures, visitor spaces, and label cases. Provisions were made for the handicapped to view the exhibits more closely. The architectural details that were saved were highlighted and cleaned, so the origins of the architecture and its period are still represented. Natural plants were installed to enhance the atmosphere of the indoor exhibits.

## **Visitor Center**

The Visitor Center and projection unit were designed and constructed for a spring opening. The audio-visual system consisted of a three-screen multimedia show to tell the visitor about the Zoo and its future plans. The Center also has a circular information desk, serviced daily and on weekends by FONZ volunteers who answer questions and hand out the transitional brochure that will be used until the new graphics system opens in 1977.

## **Zoobook**

One of the major highlights of 1976 was the planning, design, organization, and production of *Zoobook*. It was an immediate success and sales are climbing. *Zoobook* was written by the Office of Education and Information and is a pictorial story of the NZP and what it is all about. The book already has won two design awards from the National Art Directors Club of Washington, D.C. and the "Print 76" show in Chicago, the largest national design show in the U.S.

## **Audio-visual**

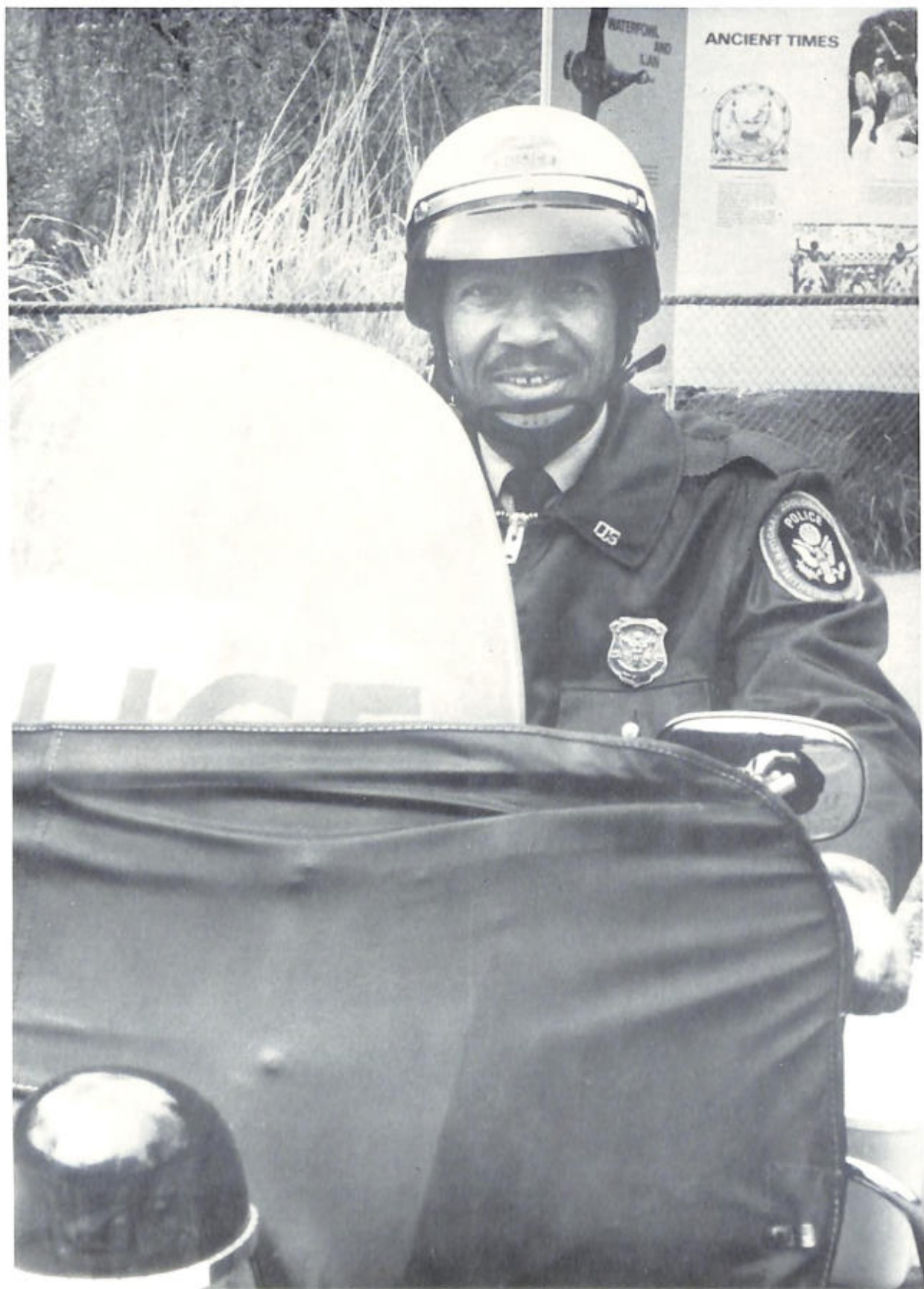
Our audio-visual support is expanding as more new facilities open; visitors will have more opportunity to learn from visual and tactile presentations. Experiments began this year with colored videotapes dealing with exotic animal medicine and immobilization techniques, in partnership with Dr. Clinton Gray. OGE hopes to develop a series of tapes for Dr. Gray to use in veterinary schools and as a video loan library.

### **Conference Support**

Conferences held at the Zoo and the Conservation and Research Center also received audio-visual and graphic support. Personnel and equipment were furnished to record proceedings and to show films and slides. Letters, brochures, and information packets were prepared to advertise the conferences and assist conferees during the proceedings. Graphic support in the design and production of conference papers and post-conference publications was also rendered.

### **SI Museum Programs**

The head of OGE has held classes on zoo graphics for several Smithsonian museum programs. These classes have included talks on the conceptual background of the Master Graphics program, as well as workshop tours of our facilities for "hands-on" experience in the production of signs, labels, and other visual aids.



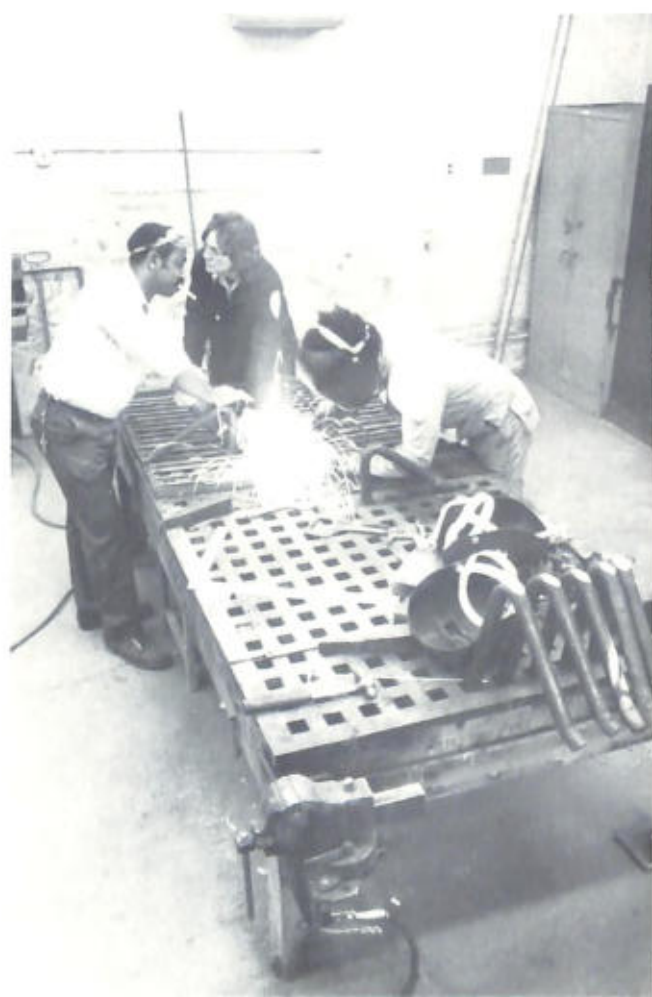
## Safeguarding Animals, Public, and Employees . . .

The National Zoo offers free admission to over three million visitors annually, with parking for 1,000 cars. More than 2,000 animals are on exhibit. The Zoo also provides employment for over 300 people. Insuring health and safety at such a public place is no small task.

The most serious problem encountered in 1976 was vandalism in the Bird House area, involving ripping cages and injuring birds. Increased police patrols, along with adjustment of facilities, reduced the number of incidents. The 30-officer police force and three civilians, supplemented by police aides in summer, also investigated 5 assaults on visitors by other visitors, 36 vehicle accidents, 31 thefts from parked vehicles, and 24 robberies. Comparison of these figures to crime statistics for neighborhoods just outside Zoo gates indicates that the number of incidents is far below the norm. However, since the objective of the police is to have no criminal activity at all, high-visibility patrols and an all-employee uniform policy are being tried to minimize future incidents.

The Office of Police and Safety was on hand for three animal escapes during the year. The most serious was the near-escape of a bear from its enclosure, after a large tree blown over in a storm gave the bear a means of escape. Officer Moore and Aide Anderson were presented with Superior Performance awards for preventing the actual escape.

Significant progress in the Health and Safety division was made in 1976 with the first contracting for pre-employment physical exams and new services to employees, such as the swine influenza vaccines. A paramedic program to administer these services was begun in the latter half of the year.



## Keeping the Zoo Open . . .

With 127 full-time employees, facilities management is the largest of all Zoo activities. Exhibits and grounds must be clean and safe; all equipment must be maintained in good working order.

Despite the many construction projects in 1976, the Zoo grounds were cleaner than ever before. Special thanks for this service go to 13 special youngsters from the Webster School for Handicapped Children in the District of Columbia, as well as to the full-time staff of the Office of Facilities Management (OFM).

Besides having the imperative to keep all animal and public facilities open and safe, the OFM staff was responsible for revamping the Zoo's communication and security systems. The new systems permit more efficient communication in an emergency.

Special work to accommodate animals was performed in nearly all exhibit buildings - - holding pens and exercise bars were built, cages were remodeled, fencing was repaired or installed, and a variety of facilities were converted or remodeled for new purposes. Improvements expended 6,637 manhours and \$28,184 in materials.

The Zoo's most difficult operating problem in 1976 was the sharp increase in the cost of electric power and natural gas. Efforts to reduce consumption included temperature control, selective shut-off of lights and motors, and use of small vehicles such as scooters. Essential equipment purchases were deferred to meet the costs of utility bills.

## Managing the Money . . .

Federal appropriations and approval of work-force changes for 1976 were actually voted on as Fiscal Year 1977 Congressional appropriations. The facts and figures which follow represent 1976 Zoo spending of funds appropriated in two fiscal years, 1976 and 1977. This financial information has been prepared by the Office of Management Services.

The National Zoo's budget increased only slightly in 1976. The total increase of \$350,900 appropriated in 1977 included \$267,500 for pay raises of current employees and \$59,000 for utility-rate increases. Thus, only \$24,400 was available for keeping up with other forms of inflation and for funding new positions.

Four new positions were added in 1976. Two utility system repairers were appointed to maintain the complex new mechanical systems of the new exhibits. Two additional animal keepers were necessary to tend new and expanded exhibits.

## Financial Facts . . .

### Funding:

#### Federal Appropriations

1. Total Salaries and Operating Expenses		\$ 6,255,461
<b>By Activity:</b>	<b>Percent of Total:</b>	
Buildings and Grounds	39%	\$ 2,439,630
Animal Management	25%	1,563,865
Administration	8%	500,437
Police and Safety	8%	500,437
Conservation and Research Center	7%	437,882
Animal Health and Pathology	4%	250,218
Research	4%	250,218
Graphics and Exhibits	3%	187,664
Education	2%	125,110
2. Construction		\$10,097,736

#### Private Funds

Total		\$ 486,600*
<b>By Activity:</b>	<b>Percent of Total:</b>	
Research	67%	\$ 328,615
Animal Acquisition	16%	76,055
Animal Care	8%	38,405
Events/Operations	9%	43,525

\* Does not include National Zoological Park/Friends of the National Zoo Parking Commission Fund of approximately \$375,000.

The total of \$486,600 in private funds represents contributions from a wide variety of sources:

Discretionary Fund: small dollar donations from individuals.

Smithsonian Institution Funding: includes a Special Events Fund.

Conservation and Research Fund: rents and other miscellaneous charges to residents of the CRC at Front Royal, Va.

Education Building Fund: charges for rental of theatre and classrooms to outside groups and individuals.

Endowment Funds: income generated by endowments from individuals.

Zerbee Fund

Barstow Fund

Bertha M. Ruef Fund

Zoo Animal Conditions Fund

Chrysler Corporation Animal Acquisition Fund: income generated from sales of Zoo animals and donations.

Save the Tiger Fund: income from sale of tiger picture.

Noble Fund: from Noble Foundation for support of studies conducted by visiting scholars at CRC.

H.K. Buechner Fund: formerly the Uganda Kob Fund, from charges for various scientific tests administered for outside institutions at NZP, and from film rental.

Grants to the Office of Zoological Research:

National Science Foundation

IESP Smithsonian

National Institute of Mental Health

Smithsonian Research Foundation

SAFE International

World Wildlife Fund

U.S. Marine Mammal Commission

Friends of the National Zoo: allocations for a variety of uses, mostly in support of education and scientific programs.

### Visitor Information:

I. Total visitors in 364 open days	2,150,000
Percent of total who came in April-August	50%
Percent of total who came on Saturday or Sunday	50%
Percent of total who arrived by car	50%
Percent of total who arrived by bus in January-May	25%
Percent of total who arrived by bus in other months	6%



## Support from Friends . . .

Now in its nineteenth year, the Friends of the National Zoo is a fully effective service organization and has a permanent year-round staff of 20. During peak summer months, an additional 150 people are required to carry out the organization's diversified programs. FONZ now recruits and trains some 50 volunteers each year as Park tour guides for more than 30,000 area school children. Over 250 volunteers participate in animal observations and pregnancy watches to assist Zoo personnel.

While the Friends' principal efforts are directed toward aiding Zoo operations and toward the education of Zoo visitors, FONZ promotes an understanding of Zoo activities and objectives through outside channels as well. To expand further the educational impact of the FONZ-produced film *Zoo* (available through school and library systems nationwide), a film kit call "Zoo Box" was developed and tested for local and possibly national distribution. It includes background information on the National Zoo, plus project activities focusing on primates, large mammals, birds, turtles, and classification. The specific activities have been designed for multi-purpose use in the classroom, at the Zoo, or independently of the film.

Highlights of the year, in terms of FONZ special programs, were the two ZooNights. ZooNights offered members a chance to take behind-the-scenes tours, observe special exhibits and demonstrations, hear the new glockenspiel in concert, and enjoy other special events. Other exciting activities included organized trips to see wildlife, in places as near as the Philadelphia Zoo and as far as Africa.

In 1976 FONZ budgeted \$97,226 for education programs and research. The largest segment of these funds was given in support of the school tour program. The second largest allocation was for the Zoo's research projects and symposia.

Support for research and conservation programs at the Zoo has done much to benefit endangered wildlife around the world. FONZ provided partial or complete support, totalling \$30,000, for three scientific symposia on arboreal folivores, marmosets, and mycobacterial infections. FONZ contributed to the costs of publications of the proceedings from the first two symposia, and to the costs of organization and operation of the third. The mycobacterial conference resulted in new and consistent tuberculosis diagnostic techniques, just at the time when tuberculosis in zoos was becoming a serious problem.

FONZ financial support also went to Dr. Clinton Gray, allowing him to make a substantial contribution to the scientific community and to endangered exotic animal collections through exotic veterinary medicine.

Other financial assistance in 1976 was granted to six students from four universities as FONZ research trainees, each assigned to a Zoo or CRC research project. The variety of projects, which included behavioral studies on marmosets, Pere David's deer, bluebirds, and geckos, gave the students an opportunity to learn research skills and contribute to conservation efforts at the Zoo.

As recently as 1973, there were fewer than 2,000 FONZ members. Thanks to successful recruiting campaigns, membership in 1976 had soared to over 18,000 adults and children. All are dedicated zoo-lovers and hard-working supporters of the National Zoo. FONZ now ranks among the three largest zoological societies in the U.S. Income derived from membership in 1976, a total of \$81,314, represented the fourth highest source of FONZ revenue.

"Zoo Night," annually sponsored by FONZ, features behind-the-scenes tours, special exhibits, and other events.

During 1976, the gross income of FONZ rose to \$1,799,575, a 20 percent increase over 1975. The rise in revenue has been attributed to the successes of the Mane Gift Shop and the Park's improved food services. These businesses were diversified over the year, causing their recent popularity and the resulting boost in sales. Net profits for 1976 amounted to \$119,315, a 22 percent decrease from the previous year. This was attributed to considerable increases in allocations for educational programs and research support. However, a 35 percent increase in FONZ' net worth, as well as the success of the various FONZ operations at the Zoo, reflect the favorable financial state of the organization at present and the prospect of a bright future.

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**National Zoological Park  
Status of the Collection 31 December 1976**

	Amphibians	Reptiles	Birds	Mammals	Total*
Orders	2	3	19	12	36
Families	11	23	55	44	133
Species	18	94	236	134	482
Specimens	61	397	1,014	740	2,212

**Changes in the Collection 1976**

	OAM Amphibians	OAM Reptiles	OAM Birds	CRC Mammals	OAM Mammals	OZR Mammals	Total
Status 31 Dec. 1975*	50	403	1,313	43	430	227	2,466
Born/Hatched**	0	116	261	33	153	78	641
Other acquisition	43	107	71	20	45	39	325
Total In	93	626	1,645	96	628	344	3,432
Died	18	79	326	15	111	70	619
Other disposition	14	150	302	0	82	49	597
Adjustment	0	0	3	0	0	1	4
Status 31 Dec. 1976*	61	397	1,014	81	435	224	2,212
Loans to NZP	4	18	34	30	21	1	108

\* includes loans from NZP

\*\* includes stillbirths

**Amphibian and Reptile Collection 31 December 1976**  
**National Zoological Park**  
**Office of Animal Management**

TOTALS: (Only specimens owned by the National Zoological Park are included.)

	Amphibians	Reptiles	Total
ORDERS:	2	3	5
FAMILIES:	11	23	34
SPECIES:	18	94	112
SPECIMENS:	61	397	458

LEGEND: 1.1.1 = males, females, undetermined sex  
-1.1 = specimens on loan from National Zoological Park  
+1.1 = specimens on loan to National Zoological Park  
\* = not conceived at National Zoological Park

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
CAUDATA:						
4 species — 11 specimens						
AMBYSTOMIDAE						
<i>Ambystoma tigrinum</i>						
Tiger salamander	0	0	0.0.2	0.0.1	0	0.0.1
AMPHIUMIDAE						
<i>Amphiuma means</i>						
Amphiuma	0.0.2	0	0	0	0	0.0.2
CRYPTOBRANCHIDAE						
<i>Andrias davidianus</i>						
Chinese giant salamander	0.0.1	0	0	0	0	0.0.1
SALAMANDRIDAE						
<i>Notophthalmus viridescens</i>						
Red spotted newt	0	0	0.0.8	0.0.1	0	0.0.7
SIRENIDAE						
<i>Siren lacertina</i>						
Greater siren	0.0.1	0	0	0.0.1	0	0
SALIENTIA:						
14 species — 50 specimens						
BUFONIDAE						
<i>Bufo alvarius</i>						
Colorado River toad	0.0.3	0	0	0	0	0.0.3
<i>Bufo cognatus</i>						
Great Plains toad	0.0.2	0	0	0.0.1	0.0.1	0.0.0
<i>Bufo marinus</i>						
Marine toad	0.0.1	0	0	0	0	0.0.1
DISCOGLOSSIDAE						
<i>Bombina bombina</i>						
Fire-bellied toad	0.0.2	0	0.0.19 +0.0.4	0.0.6	0.0.13	0.0.2 +0.0.4
HYLIDAE						
<i>Hyla septentrionalis</i>						
Cuban tree frog	0.0.4	0	0.0.1	0.0.1	0	0.0.4
<i>Hyla vasta</i>						
Giant tree frog	0	0	0.0.3	0.0.1	0	0.0.2
<i>Litoria caerulea</i>						
White's tree frog	0.0.1+0.0.1	0	0	0.0.1	+0.0.1	0
<i>Pachymedusa dacnicolor</i>						
Mexican tree frog	4.0	0	0	0	0	4.0
<i>Phrynohyas venulosa</i>						
Marbled tree frog	0	0	0.0.2	0.0.1	-0.0.1	-0.0.1
LEPTODACTYLIDAE						
<i>Ceratophrys calcarata</i>						
Colombian horned frog	0	0	0.0.6	0.0.1	0	0.0.5
<i>Leptodactylus pentadactylus</i>						
Smokey jungle frog	2.0	0	0	0	0	2.0
PELOBATIDAE						
<i>Megophrys nasuta</i>						
Asian horned frog	0	0	0.0.2	0	0	0.0.2
PIPIDAE						
<i>Pipa pipa</i>						
Surinam toad	0.3	0	0	0	0	0.3
<i>Xenopus laevis</i>						
African clawed frog	0.0.16	0	0	0	0	0.0.16
RHACOPHORIDAE						
<i>Hyperolius sp.</i>						
African reed frog	0.0.3	0	0	0.0.3	0	0
RANIDAE						
<i>Pyxicephalus adspersa</i>						
African bullfrog	0.0.2	0	0	0	0	0.0.2
<i>Rana catesbeiana</i>						
American bullfrog	0.0.3	0	0	0	0	0.0.3

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
CHELONIA:						
24 species — 105 specimens						
CHELIDAE						
<i>Chelys fimbriata</i>						
Mata mata turtle	3.2.1	0	0	0.1	-2.0	1.1.1-2.0
<i>Platemys platycephala</i>						
Twist-neck turtle	2.1+0.1-1.0	0	0	0	0	2.1+0.1-1.0
CHELYDRIDAE						
<i>Macrolemys temmincki</i>						
Alligator snapping turtle	1.0-1.1	0	0	0		1.0-1.1
EMYDIDAE						
<i>Chrysemys concinna</i>						
River cooter	0.0.1	0	0	0	0	0.0.1
<i>Chrysemys floridana</i>						
Cooter	0.1	0	1.0	0.1	0	1.0
<i>Chrysemys picta</i>						
Eastern painted turtle	2.3.1	0	0	0.0.1		2.3
<i>Chrysemys rubriventris</i>						
Red-bellied turtle	0.2	0.0.8	1.2	0.0.5	0	2.2.4
<i>Chrysemys scripta</i>						
Red-eared turtle	3.2	0.0.1	0.0.1	0.0.1		3.2.1
<i>Clemmys guttata</i>						
Spotted turtle	0.3.1	0	1.0	0	0	1.3.1
<i>Clemmys insculpta</i>						
Wood turtle	2.3	0	0	0	0	2.3
<i>Graptemys flavimaculata</i>						
Yellow-blotched sawback turtle	1.1	0	0	0	0	1.1
<i>Graptemys pseudogeographica</i>						
False map turtle	2.2	0	0	0	0	2.2
<i>Terrapene carolina triunguis</i>						
Three-toed box turtle	1.3	0	1.0	0	0	2.3
KINOSTERNIDAE						
<i>Kinosternon leucostomum</i>						
White-lipped mud turtle	1.2.2	0	0	0	1.2.2	0
<i>Staurotypus salvini</i>						
Central American mud turtle	1.1	0	0	0	0	1.1
PELOMEDUSIDAE						
<i>Pelomedusa subrufa</i>						
African helmeted turtle	1.3.7	0	0	0	1.3.1-0.0.1	0.0.5-0.0.1
<i>Podocnemis dumeriliana</i>						
South American side- necked turtle	0	0	0.0.2	0	0	0.0.2
<i>Podocnemis expansa</i>						
Arrau turtle	0.0.1	0	0	0.0.1	0	0
<i>Podocnemis unifilis</i>						
Amazon spotted turtle	1.3	0	0.0.1+1.1	0	0	1.3.1+1.1
PLATYSTERNIDAE						
<i>Platysternon megacephalum</i>						
Big-headed turtle	0.0.1	0	0	0	0.0.1	0
TESTUDINIDAE						
<i>Geochelone carbonaria</i>						
Red-footed tortoise	0.0.10	0.0.1	0	0.2	-0.0.2	2.4.1-0.0.2
<i>Geochelone elegans</i>						
Starred tortoise	0.0.2	0	0	0	0	0.0.2
<i>Geochelone elephantopus</i>						
Galapagos tortoise	1.0-0.3	0	0	0	0	1.0-0.3
<i>Geochelone gigantea</i>						
Aldabra tortoise	2.1	0	1.2	0	0	3.3
<i>Geochelone pardalis</i>						
Leopard tortoise	0.0.2	0	2.2.2	0.0.1	0	2.2.3

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Kinixys belliana</i> Bell's hinged-back tortoise	0.0.2	0	0	0.0.1	0.0.1	0
<i>Kinixys homeana</i> Home's hinged-back tortoise	1.0	0	0	0	1.0	0
<i>Malacochersus tornieri</i> Pancake tortoise	1.6	0	1.1	0.2	0	2.5
TRIONYCHIDAE						
<i>Trionyx triunguis</i> African softshell turtle	1.0	0	0	0	0	1.0
CROCODYLIA: 6 species — 11 specimens						
ALLIGATORIDAE						
<i>Alligator sinensis</i> Chinese alligator	-1.1	0	0	-1.0	0	-0.1
<i>Melanosuchus niger</i> Black caiman	0.0.3	0	0	0.0.1	-0.0.2	-0.0.2
<i>Paleosuchus trigonatus</i> Smooth-fronted caiman	4.1.1	0	0	0	1.0	3.1.1
CROCODYLIDAE						
<i>Crocodylus cataphractus</i> Slender-snouted crocodile	-0.1	0	0	0	0	-0.1
<i>Crocodylus moreletii</i> Morelet's crocodile	-1.0	0	0	0	0	-1.0
<i>Crocodylus rhombifer</i> Cuban crocodile	+1.3	0	0	0	0	+1.3
<i>Osteolaemus tetraspis</i> Broad-nosed crocodile	-1.1	0	0	-0.1		-1.0
SQUAMATA: 64 species — 281 specimens						
SAURIA						
AGAMIDAE						
<i>Amphibolurus barbatus</i> Bearded lizard	1.0	0	0	0	0	1.0
<i>Physignathus cocincinus</i> Water dragon	1.1	0	0.0.3	0.0.1	0	1.1.2
ANGUIDAE						
<i>Ophisaurus apodus</i> European glass lizard	0.0.5	0	0	0.0.1	0	0.0.4
<i>Ophisaurus ventralis</i> Eastern glass lizard	0	0	0.0.3	0	0	0.0.3
CORDYLIDAE						
<i>Cordylus giganteus</i> Sungazer lizard	0.0.1	0	0	0	0.0.1	0
<i>Gerrhosaurus validus</i> Plated lizard	0.0.5	0	0	0	0	0.0.5
GEKKONIDAE						
<i>Cyrtodactylus pulchellus</i> Malayan bent-toed gecko	0	0	0.0.4	0.0.2	0	0.0.2
<i>Eublepharis macularis</i> Leopard gecko	2.3.10	0.0.4	0	0.1	0.0.1	2.2.13
<i>Gekko gekko</i> Tokay gecko	2.2.19	0.0.3	0.0.7	0.0.5	0.0.17	2.3.6
<i>Gonatodes annularis</i> Gecko	0.0.2	0	0	0.0.1	0.0.1	0
<i>Hemidactylus brookii</i> Gecko	0.0.1	0	0	0	0.0.1	0
<i>Phelsuma madagascariensis</i> Giant day gecko	3.4+0.1	0.0.5	0.0.4+0.1	0.1.4	+0.2	3.3.5

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Ptychozoon lionotum</i> Gliding gecko	2.4	0	1.0	0.4	0	3.0
<i>Ptychozoon sp.</i> Gliding gecko	0	0	0.0.3	0	0.0.3	0
<i>Thecadactylus rapicaudus</i> Turnip-tailed gecko	1.1	0	0	0	0	1.1
HELODERMATIDAE						
<i>Heloderma horridum</i> Mexican beaded lizard	0.0.1	0	0	0	0	0.0.1
<i>Heloderma suspectum</i> Gila monster	1.1	0	0	0	0	1.1
IGUANIDAE						
<i>Anolis equestris</i> Cuban anole	0	0.0.2*	1.1.5	0.0.4	0	1.1.3
<i>Anolis garmani</i> Jamaican anole	3.3	0	0	0.1	0	3.2
<i>Anolis grahami</i> Jamaican anole	0.0.7	0	0	0	0.0.7	0
<i>Anolis lineatopus</i> Bush lizard	0.0.2	0	0	0	0.0.2	0
<i>Anolis sagrei</i> Brown anole	0	0	3.5	1.2	0.1	2.2
<i>Basiliscus basiliscus</i> Common basilisk lizard	0	0	1.1	0	0	1.1
<i>Basiliscus plumifrons</i> Green basilisk lizard	1.0	0	0	0	0	1.0
<i>Brachylophus fasciatus</i> Fiji Island iguana	0.2	0	0	0	0	0.2
<i>Crotaphytus wislizenii</i> Leopard lizard	0	0	0.0.1	0.0.1	0	0
<i>Cyclura stejnegeri</i> Rock iguana	0.0.2	0	0	0	0.0.2	0
<i>Iguana iguana</i> Common iguana	0.0.3	0	0	0	0.0.3	0
<i>Sceloporus clarki</i> Clark's spiny lizard	1.1	0	0	1.0	0	0.1
<i>Tropidurus torquatus</i> Spiny tree lizard	0.0.6	0	0.0.5	0.0.4	0.0.2	0.0.5
LACERTIDAE						
<i>Lacerta lepida</i> Jeweled lizard	5.2	0	0	0.1	3.0	2.1
SCINCIDAE						
<i>Corucia zebrata</i> Prehensile-tailed skink	0.0.4	0	0	0	0	0.0.4
<i>Egernia cunninghami</i> Cunningham's skink	0.0.3	0	0	0	0	0.0.3
<i>Tiliqua gigas</i> Blue-tongued skink	0.0.6	0	0	0	0	0.0.6
<i>Tiliqua scincoides</i> Australian blue-tongued skink	0.0.1	0	0	0	0	0.0.1
TEIIDAE						
<i>Ameiva undulata</i> Ameiva lizard	0.0.1	0	0	0.0.1	0	0
<i>Tupinambis teguixin</i> Black tegu lizard	3.2.1	0.0.3	0	0	0	3.2.4
VARANIDAE						
<i>Varanus dumerili</i> Dumeril's monitor	2.2	0	0	0.1	0	2.1
<i>Varanus exanthematicus</i> Savanna monitor	1.1-0.0.1	0	0	0	0.0.1	1.1

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Varanus niloticus</i> Nile monitor	0.0.1	0	0	0	0	0.0.1
<i>Varanus prasinus</i> Green tree monitor	1.2	0	0	0	0	1.2
<i>Varanus salvadorii</i> Salvador's monitor	0.0.1	0	0	0	0	0.0.1
<i>Varanus salvator</i> Malayan water monitor	1.0.1+1.1	0	+0.1	+0.1	+1.1	1.0.1
SERPENTES						
BOIDAE						
<i>Boa constrictor</i> Boa constrictor	1.2.1	0	0.1.7+1.0	0	0.0.8	1.3+1.0
<i>Corallus canina</i> Emerald tree boa	0	0	+1.2	0	0	+1.2
<i>Corallus enydris cooki</i> Cook's tree boa	0.0.4	0	0	0	0.0.1	0.0.3
<i>Epicrates cenchria</i> Rainbow boa	1.0	0	0.3	0	-1.0	0.3-1.0
<i>Epicrates striatus</i> Haitian boa	0.0.2	0	0	0	0	0.0.2
<i>Epicrates subflavus</i> Jamaican boa	-1.0	0	0	0	0	-1.0
<i>Eunectes notaeus</i> Yellow anaconda	0.3+0.1	0	0.1	0	+0.1	0.4
<i>Python curtus</i> Blood python	0.0.5	0	0	0	0.0.1	0.0.4
<i>Python molurus bivittatus</i> Burmese python	2.5.2-0.0.9	0.0.27	2.0.1	-0.0.2	1.0.29-0.2	3.3.2-0.0.9
<i>Python molurus molurus</i> Indian python	+3.2	0.0.16	0	0	0.0.11	0.0.5+3.2
<i>Python regius</i> Ball python	0	0	0.0.1	0	0.0.1	0
<i>Python reticulatus</i> Reticulated python	0.0.4+0.0.1	0	0.0.2	0.0.2	0.0.2+0.0.1	1.0.1
COLUBRIDAE						
<i>Alsophis cantherigeras</i> Gray racer	0.0.1	0	0	0	0.0.1	0
<i>Boaedon fuliginosus</i> African house snake	1.1.3	0.0.4	0.0.1	0	0.0.8	1.1
<i>Boiga dendrophila</i> Mangrove snake	0	0	0.1.2+2.0	0	0.0.2	0.1+2.0
<i>Coluber constrictor</i> Black racer	1.2.3	0	0	0.0.1	0.0.1-0.0.1	1.2-0.0.1
<i>Dinodon rufozonatum</i> Banded red snake	1.0	0	0	0	1.0	0
<i>Drymarchon corais</i> Indigo snake	1.1	0	0	0	0	1.1
<i>Elaphe carinata</i> Keeled rat snake	-0.0.1	0	0	0	-0.0.1	0
<i>Elaphe guttata</i> Corn snake	2.3.9	0.0.40	0	1.1.6	0.0.1 -0.0.27	1.2.15 -0.0.27
<i>Elaphe obsoleta obsoleta</i> Black ratsnake	2.1	0	0.0.1	0	0.0.1	2.1
<i>Elaphe taeniura</i> Beauty snake	1.1.1	0	0.1	0.0.1	0	1.2
<i>Gonyosoma oxycephala</i> Red-tailed ratsnake	0.1.1	0	0	0.0.1	0.1	0
<i>Lampropeltis calligaster</i> Mole snake	2.1.2	0	0.0.1	0.0.1	0.0.1	2.1.1
<i>Lampropeltis getulus</i> Florida king snake	0	0	0.0.1	0	0.0.1	0

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Lampropeltis triangulum</i> Eastern milksnake	1.0.1-0.0.1	0	0.1	0	0.0.2	1.1
<i>Natrix sipedon</i> Northern water snake	0	0	0.0.1	0	0.0.1	0
<i>Oxybelis fulgidus</i> Green vine snake	1.1	0	0	1.0	0.1	0
<i>Pituophis melanoleucus</i> <i>melanoleucus</i> Pine snake	-0.0.1	0	0	0	-0.0.1	0
<i>Pituophis melanoleucus sayi</i> Bullsnake	-0.0.1	0	0	0	0	-0.0.1
<i>Rhamphiophis oxyrhynchus</i> Rufous-beaked snake	0.0.2	0	0.0.1	0.0.1	0	0.0.2
<i>Telescopus semiannulatus</i> African tiger snake	0	0	0.3	0	0	0.3
<i>Thamnophis terrestris elegans</i> Coast garter snake	1.1.3	0	0	0	1.1.3	0
<b>ELAPIDAE</b>						
<i>Naja naja</i> Indian cobra	1.4	0	0	0.2	0	1.2
<i>Ophiophagus hannah</i> King cobra	1.0	0	0	0	0	1.0
<b>VIPERIDAE</b>						
<i>Agkistrodon contortrix</i> Copperhead	0.0.5	0	0.0.1	0	0.0.2	0.0.4
<i>Agkistrodon piscivorus</i> Cottonmouth	0.0.6	0	0.0.1	0	0.0.4	0.0.3
<i>Bitis arietans</i> Puff adder	1.4	0	0	0	0	1.4
<i>Crotalus durissus</i> South American rattlesnake	2.2	0	0	0	0	2.2
<i>Crotalus horridus</i> Timber rattlesnake	1.1.2	0	0	0	0.0.2	1.1
<i>Trimeresurus popeorum</i> Pope's pit viper	1.4	0	0.2	0	0.1	1.5
<i>Trimeresurus</i> <i>purpureomaculatus</i> Mangrove pit viper	2.2.1	0.0.2	1.1	0.0.3	-1.1	2.2-1.1

### Amphibian and Reptile Loans to the National Zoological Park, Office of Animal Management (on hand December 31, 1976)

- 0.0.4 Fire-bellied toad, *Bombina bombina*, from Philadelphia Zoological Garden, Philadelphia, Pennsylvania.
- 0.1 Twist-neck turtle, *Platemys platycephala*, from Philadelphia Zoological Garden, Philadelphia, Pennsylvania.
- 1.1 Amazon spotted turtle, *Podocnemis unifilis*, from Philadelphia Zoological Garden, Philadelphia, Pennsylvania.
- 1.3 Cuban crocodile, *Crocodylus rhombifer*, from Wade Ferrel, Toronto, Ontario, Canada.
- 1.0 Boa constrictor, *Boa constrictor*, from Knoxville Zoological Park, Knoxville, Tennessee.
- 1.2 Emerald tree boa, *Corallus canina*, from Sheffield Edwards, Leesburg, Virginia.
- 3.2 Indian python, *Python molurus molurus*, from Louis Walsh, Bethesda, Maryland.
- 2.0 Mangrove snake, *Boiga dendrophila*, from Knoxville Zoological Park, Knoxville, Tennessee.

**Amphibian and Reptile Loans from the National Zoological Park,  
Office of Animal Management (as of December 31, 1976)**

- 0.0.1 Marbled tree frog, *Phrynohyas venulosa*, to Michael Davenport, National Zoological Park, Washington, D.C.
- 2.0 Mata mata turtle, *Chelys fimbriata*, to Knoxville Zoological Park, Knoxville, Tennessee.
- 1.0 Twist-neck turtle, *Platemys platycephala*, to Philadelphia Zoological Garden, Philadelphia, Pennsylvania.
- 1.1 Alligator snapping turtle, *Macroclemys temmincki*, to Knoxville Zoological Park, Knoxville, Tennessee.
- 0.0.1 African helmeted turtle, *Pelomedusa subrufa*, to Michael Johnson, National Zoological Park, Washington, D.C.
- 0.0.2 Red-footed tortoise, *Geochelone carbonaria*, to Steven Graham, Salisbury Zoological Gardens, Salisbury, Maryland.
- 0.3 Galapagos tortoise, *Geochelone elephantopus*, to Honolulu Zoo, Honolulu, Hawaii.
- 0.1 Chinese alligator, *Alligator sinensis*, to New York Zoological Park, New York, New York.
- 0.0.2 Black caiman, *Melanosuchus niger*, to Oklahoma City Zoo, Oklahoma City, Oklahoma.
- 0.1 Slender-snouted crocodile, *Crocodylus cataphractus*, to Crandon Park Zoo, Miami, Florida.
- 1.0 Morelet's crocodile, *Crocodylus moreletii*, to Atlanta Zoological Park, Atlanta, Georgia.
- 1.0 Broad-nosed crocodile, *Osteolaemus tetraspis*, to Busch Gardens, Tampa, Florida.
- 1.0 Rainbow boa, *Epicrates cenchria*, to Craig Philips, National Aquarium, Washington, D.C.
- 1.0 Jamaican boa, *Epicrates subflavus*, to Jacksonville Zoological Park, Jacksonville, Florida.
- 0.0.1 Burmese python, *Python molurus bivittatus*, to Dr. David Brownstein, Johns Hopkins Medical Institution, Baltimore, Maryland.
- 0.0.1 Burmese python, *P.m. bivittatus*, to Len Jones, Patuxent Wildlife Research Center, Laurel, Maryland.
- 0.0.2 Burmese python, *P.m. bivittatus*, to Wesley Knollenburg, Ames, Iowa.
- 0.2 Burmese python, *P.m. bivittatus*, to Knoxville Zoological Park, Knoxville, Tennessee.
- 0.0.1 Burmese python, *P.m. bivittatus*, to John Pepper, Bethesda, Maryland.
- 0.0.1 Burmese python, *P.m. bivittatus*, to Randy Smith, Gaithersburg, Maryland.
- 0.0.1 Black racer (albino), *Coluber constrictor*, to Zoological Society of Cincinnati, Cincinnati, Ohio.
- 0.0.18 Corn snake, *Elaphe guttata*, to Harry Green, Dept. of Psychology, University of Tennessee, Knoxville, Tennessee.
- 0.0.2 Corn snake, *E. guttata*, to Brenda Hall, National Zoological Park, Washington, D.C.
- 0.0.6 Corn snake, *E. guttata*, to Victor Nicholas, Fairfax, Virginia.
- 0.0.1 Bullsnake, *Pituophis melanoleucus*, to Bill Xanten, National Zoological Park, Washington, D.C.
- 1.1 Mangrove pit viper, *Trimeresurus purpureomaculatus*, to Philadelphia Zoological Garden, Philadelphia, Pennsylvania.

**Bird Collection 31 December 1976**  
**National Zoological Park**  
**Office of Animal Management**

TOTALS: (Only specimens owned by the National Zoological Park are included.)  
ORDERS: 19  
FAMILIES: 55  
SPECIES: 236  
SPECIMENS: 1,014

LEGEND: 1.1.1 = males, females, undetermined sex  
-1.1 = specimens on loan from National Zoological Park  
+1.1 = specimens on loan to National Zoological Park  
(1) = stillbirth; not included in adjacent figure  
\* = not conceived at National Zoological Park

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
STRUTHIONIFORMES: 1 species — 2 specimens							
STRUTHIONIDAE							
<i>Struthio camelus</i> Ostrich	1.1	0.0.2	0	0.0.2	0	0	1.1
RHEIFORMES: 1 species — 24 specimens							
RHEIDAE							
<i>Rhea americana</i> Common rhea	0.0.6	0.0.34	0	0.0.7	0.0.9	0	1.3.20
<i>Pterocnemia pennata</i> Darwin's rhea	0	0	+2.4	+0.2	0	0	0.0+2.2
CASUARIIFORMES: 2 species — 5 specimens							
CASUARIIDAE							
<i>Casuarus bicarunculatus</i> Double-wattled cassowary	1.2	0	0	0	0	0	1.2
DROMICEIDAE							
<i>Dromiceius novaehollandiae</i> Emu	1.1.2	0	0	1.1	0	0	0.0.2
APTERYGIFORMES: 1 species — 3 specimens							
APTERYGIDAE							
<i>Apteryx australis mantelli</i> North Island brown kiwi	1.0.1-1.0	0	0	0	0	0	1.0.1-1.0
TINAMIFORMES: 2 species — 4 specimens							
TINAMIDAE							
<i>Nothoprocta pentlandii</i> Andean tinamou	0.0.2	0	0	0.0.1	0	0	0.0.1
<i>Eudromia e. elegans</i> Crested tinamou	0	0	2.2	1.0	0	0	1.2
PELECANIFORMES: 2 species — 4 specimens							
PELECANIDAE							
<i>Pelecanus onocrotalus</i> Old World white pelican	1.1	0	0	0	0	0	1.1
<i>Pelecanus erythrorhynchos</i> American white pelican	0.0.2	0	0	0	0	0	0.0.2
PHALACROCORACIDAE							
<i>Phalacrocorax bougainvillii</i> Guanay cormorant	0.0.1	0	0	0	0	0.0.1	0
CICONIIFORMES: 9 species — 28 specimens							
ARDEIDAE							
<i>Nycticorax nycticorax</i> Black-crowned night heron	0.0.3	0	0	0	0	0	0.0.3
<i>Tigrisoma l. lineatum</i> Amazon tiger bittern	0	0	+1.1	0	0	0	0.0+1.1
CICONIIDAE							
<i>Ciconia nigra</i> Black stork	1.0	0	0	0	-1.0	0	0.0-1.0
THRESKIORNITHIDAE							
<i>Threskiornis aethiopica</i> Sacred ibis	1.1.2	0	0	1.1	0	0	0.0.2
<i>Threskiornis melanocephala</i> Black-headed ibis	0.1	0	0	0	0.1	0	0

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Eudocimus ruber</i> Scarlet ibis	2.3.2	0	0	0.0.1	0	0	2.3.1
<i>Plegadis chihi</i> White-faced glossy ibis	0.0.5	0	0	0	0	0	0.0.5
<i>Ajaia ajaja</i> Roseate spoonbill	1.1	0	0	0	0	0	1.1
PHOENICOPTERIDAE							
<i>Phoenicopterus ruber chilensis</i> Chilean flamingo	3.2	0	0	1.0	0	0	2.2
<i>Phoenicopterus r. ruber</i> Caribbean flamingo	4.1	0	+0.0.6	1.0	0	0	3.1+0.0.6
<i>Phoenicopterus ruber roseus</i> European flamingo	1.1+0.1	0	0	1.0+0.1	0	0	0.1
ANSERIFORMES:							
76 species — 486 specimens							
ANATIDAE							
DENDROCYGNINI							
<i>Dendrocygna viduata</i> White-faced whistling duck	2.2	0	0	0.1	0	1.0	1.1
<i>Dendrocygna autumnalis discolor</i> Southern red-billed whistling duck	2.3	0	0	0	0	0	2.3
ANSERINI							
<i>Coscoroba coscoroba</i> Coscoroba swan	1.1	0	0	0	0	0	1.1
<i>Cygnus atratus</i> Black swan	3.3.3	0.0.2	0	1.0.3	0.1	1.1	1.3
<i>Cygnus melanocoryphus</i> Black-necked swan	2.4	0.0.11	0	0.0.9	0	1.1	2.4
<i>Cygnus c. columbianus</i> Whistling swan	2.1	0	1.1	0	0	0	3.2
<i>Anser albifrons frontalis</i> Pacific white-fronted goose	1.1	0	0	0	0	0	1.1
<i>Anser erythropus</i> Lesser white-fronted goose	2.1	1.0	1.0	0	0	0	4.1
<i>Anser fabalis brachyrhynchus</i> Pink-footed goose	0.1	0	0	0	0	0	0.1
<i>Anser c. caerulescens</i> Lesser snow goose, white phase	1.1	0	0	0	0	0	1.1
<i>Anser rossii</i> Ross's goose	2.3	0	0	0.1	0	0	2.2
<i>Anser indicus</i> Bar-headed goose	2.2	0	0	0	0	0	2.2
<i>Anser indicus x Anser albifrons</i> Bar-headed goose x White-fronted goose, hybrid	0.1	0	0	0.1	0	0	0
<i>Branta sandvicensis</i> Hawaiian goose or Nene	15.12	0.0.24	0	0.0.4	-19.15	0	7.6-19.15
<i>Branta canadensis</i> Common Canada goose	1.1	0	0	0	1.1	0	0
<i>Branta c. canadensis</i> Atlantic Canada goose	4.2	0	0	1.0	1.1	1.1	0.1
<i>Branta canadensis maxima</i> Giant Canada goose	2.3	0	0	0	-1.2	0	1.1-1.2

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Branta canadensis</i>							
<i>occidentalis</i>							
Dusky Canada goose	1.2	0	0	0.1	1.1	0	0
<i>Branta canadensis hutchinsii</i>							
Richardson's Canada goose	1.1	0	0	0	0	0	1.1
<i>Branta ruficollis</i>							
Red-breasted goose	1.1	0	4.4	1.0	0	0	4.5
<i>Branta bernicla hrota</i>							
Atlantic brant	1.0	0	0	0	0	0	1.0
<i>Branta bernicla orientalis</i>							
Pacific or black brant	2.2	0	0	1.0	0	0	1.2
TADORNINI							
<i>Cereopsis novaehollandiae</i>							
<i>Cereopsis</i> or Cape Barren goose							
	1.1	0	0	1.0	0	0	0.1
<i>Chloephaga poliocephala</i>							
Ashy-headed goose	2.0+0.1	0	0	0	0	0	2.0+0.1
<i>Chloephaga picta picta</i>							
Lesser Magellan goose	-1.0	0	-1.0	0	0	0	1.0
<i>Neochen jubatus</i>							
Orinoco goose	0.1	0	0	0	0	0	0.1
<i>Tadorna variegata</i>							
Paradise shelduck	0.1	0	1.0	0.1	0	0	1.0
<i>Tadorna variegata x</i> <i>Tadorna cana</i>							
Paradise shelduck x Cape shelduck, hybrid							
	1.1	0	0	0	1.1	0	0
<i>Tadorna cana</i>							
Cape shelduck	3.3	0	0	1.0	0.1	0	2.2
<i>Tadorna ferruginea</i>							
Ruddy shelduck	2.2	0	0	0	0	0	2.2
<i>Tadorna r. radjah</i>							
Moluccan radjah shelduck							
	8.10	0.0.2	0	0.0.2	1.1	0	7.9
<i>Tadorna tadorna</i>							
European shelduck	6.2	0	0	1.1	0	0	5.1
<i>Lophonetta s. specularioides</i>							
Patagonian crested duck	2.1	0.0.4	0	0.0.4	0	0	2.1
ANATINI							
<i>Anas platyrhynchos wyvilliana</i>							
Hawaiian duck							
	33.15	0.0.5	0	0.0.6	0.0.12	0.0.22	10.3
<i>Anas platyrhynchos</i> <i>laysanensis</i>							
Laysan teal	2.2	0.0.5	0	0.0.1	0	0	4.4
<i>Anas rubripes</i>							
North American black duck							
	1.0	0	0	0	0	0	1.0
<i>Anas p. poecilorhyncha</i>							
Indian spotbill	9.10	0.0.3	0	0.0.2	1.0	0.0.2	8.9
<i>Anas luzonica</i>							
Philippine duck	0.2	0	1.0	0	0	0	1.2
<i>Anas u. undulata</i>							
South African yellowbill	6.5	2.0.5	0	2.0.5	0	0.1	4.6
<i>Anas gibberifrons gracilis</i>							
Australian gray teal	14.14	0.0.35	0	0.0.8	1.1	0.0.15	22.16
<i>Anas castanea</i>							
Chestnut teal	1.1	0	0	0	0	1.1	0
<i>Anas f. flavirostris</i>							
Chilean teal	1.1	0	0	0	0	0	1.1
<i>Anas flavirostris oxyptera</i>							
Sharp-winged teal	0.1	0	0	0	0	0	0.1

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Anas crecca carolinensis</i>							
American green-winged teal	0.1	0	1.1	1.0	0	0.1	0.1
<i>Anas s. strepera</i>							
Gadwall	3.6	0	0	1.0	0	0	2.6
<i>Anas penelope</i>							
European wigeon	1.0	0	0	0	0	0	1.0
<i>Anas americana</i>							
American wigeon	3.1	0	0	0	0	1.0	2.1
<i>Anas georgica spinicauda</i>							
Chilean pintail	1.2	0.0.9	0	0.0.6	0	0.1	1.4
<i>Anas a. acuta</i>							
Northern pintail	3.5	0	0	1.1	0	0	2.4
<i>Anas erythrorhyncha</i>							
Red-billed pintail	1.2	0	0	0	0	0	1.2
<i>Anas angustirostris</i>							
Marbled teal	0.1	0	0	0	0	0	0.1
<i>Anas capensis</i>							
Cape teal	1.1	0	0	0.1	0	0	1.0
<i>Anas discors</i>							
Blue-winged teal	8.13	0.0.2	0	0.0.1	0.0.1	0.0.5	6.10
<i>Anas cyanoptera septentrionalium</i>							
Northern cinnamon teal	10.12	0.0.7	0	0.0.8	0	3.2	7.9
<i>Anas falcata x Anas penelope</i>							
Falcated teal x European wigeon, hybrid	2.0	0	0	0	0	1.0	1.0
<i>Anas leucophrys</i>							
Ringed teal	19.7	1.1.2	0	2.0.2	1.0	2.0	15.8
<b>SOMATERIINI</b>							
<i>Somateria millissima</i>							
American eider	1.1	0	0	0	0	0	1.1
<i>Somateria mollissima v-nigra</i>							
Pacific eider	4.3	0	0	3.1	0	0	0.2
<b>AYTHYINI</b>							
<i>Netta rufina</i>							
Red-crested pochard	4.2	0	0	0.1	0	0	4.1
<i>Netta peposaca</i>							
Rosybill	2.1	1.1	0	0	0	0	3.2
<i>Aythya valisineria</i>							
Canvasback	2.1	0	0	1.0	0	0	1.1
<i>Aythya americana</i>							
Redhead	6.3	0.0.2	0	0.0.1	0	0	6.4
<i>Aythya a. australis</i>							
Australian white-eye	1.1	0	0	0	0	0	1.1
<i>Aythya nyroca</i>							
Ferruginous white-eye	2.1	0	1.1	1.0	0	1.1	1.1
<i>Aythya collaris</i>							
Red-necked duck	4.2	0	0	2.1	0	0	2.1
<i>Aythya fuligula</i>							
Tufted duck	3.1	0	0	0	0	0	3.1
<i>Aythya novae-seelandiae</i>							
New Zealand scaup	1.1	0	0	0	0	0	1.1
<i>Aythya affinis</i>							
Lesser scaup	1.4	0	0	0.1	0	0	1.3
<i>Aythya m. marila</i>							
European or Greater scaup	2.2	0	0	1.0	0	1.0	0.2
<b>CAIRININI</b>							
<i>Amazonetta b. brasiliensis</i>							
Lesser Brazilian teal	2.1	0	0	1.1	0	0	1.0
<i>Amazonetta brasiliensis ipecutiri</i>							
Greater Brazilian teal	5.6	0	0	0.2	0	0.1	5.3

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Chenonetta jubata</i> Australian wood duck	1.1	0	0	0	0	0	1.1
<i>Aix sponsa</i> North American wood duck	21.30	0.0.14	0	0.0.9	8.11	1.1.1	12.17.5
<i>Aix galericulata</i> Mandarin	23.19	0.0.4	0	0.0.2	8.6	2.6	13.9
<i>Sarkidiornis m. melanotos</i> Old World comb duck	1.1	0	0	0	0	0	1.1
<i>Cairina scutulata</i> White-winged wood duck	0.1+2.2	0	0	0	0	0	0.1+2.2
<i>Plectropterus gambensis</i> <i>niger</i> Black spur-winged goose	+0.1	0	0	0	+1.0	0	0
MERGINI							
<i>Melanitta fusca deglandi</i> White-winged scoter	0.2	0	0	0	0	0	0.2
<i>Bucephala clangula americana</i> American goldeneye	2.2	0	0	0	0	0.1	2.1
<i>Bucephala islandica</i> Barrow's goldeneye	5.2	0	0	0	0	0.1	5.1
<i>Mergus cucullatus</i> Hooded merganser	1.1	0	1.2	1.0	0	0	1.3
<i>Mergus merganser americanus</i> American merganser	3.8	0	0	1.0	0	0	2.8
OXYURINI							
<i>Oxyura j. jamaicensis</i> North American ruddy duck	7.9	0.0.44	0	0.0.28	0	0.0.9	8.8.5
FALCONIFORMES: 13 species – 22 specimens							
CATHARTIDAE							
<i>Coragyps atratus</i> Black vulture	0.0.1	0	0	0	0	0	0.0.1
<i>Sarcorhamphus papa</i> King vulture	0.0.2	0	0	0	0	0	0.0.2
ACCIPITRIDAE							
<i>Haliaeetus leucogaster</i> White-bellied sea eagle	-0.0.1	0	+0.0.1 -0.0.1	0	0	0	0.0.1+0.0.1
<i>Haliaeetus leucocephalus</i> Bald or American eagle	1.2-0.0.1	0	0	0	-0.1	0	1.1-0.1.1
<i>Spilornis cheela</i> Crested serpent eagle	0.0.1	0	0.0.1	0	0	0	0.0.2
<i>Heterospizias meridionalis</i> Savannah hawk	0.0.1	0	0	0	0	0	0.0.1
<i>Parabuteo unicinctus harrisi</i> Harris's hawk	0.1+1.0	0	0	0	-0.1	0	-0.1+0.1
<i>Buteo magnirostris</i> Roadside hawk	0.0.1	0	0	0	0	0	0.0.1
<i>Aquila heliaca</i> Imperial eagle	1.0+0.1	0	0	0	0	0	1.0+0.1
<i>Aquila chrysaetos canadensis</i> American golden eagle	0.2-0.1	0	1.0	0	0.1	0	1.1-0.1
<i>Lophaetus occipitalis</i> Long-crested hawk eagle	0.0.1	0	0	0	0	0	0.0.1
SAGITTARIIDAE							
<i>Sagittarius serpentarius</i> Secretary bird	0.0.2	0	0	0	0	0	0.0.2

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<b>FALCONIDAE</b>							
<i>Polyborus plancus</i> Common caracara	0.0.3	0	0	0.0.1	0	0	0.0.2
<i>Micrastur semitorquatus</i> Collared forest falcon	0.1	0	0	0	0	0.1	0
<b>GALLIFORMES:</b> 18 species – 102 specimens							
<b>MEGAPODIIDAE</b>							
<i>Alectura lathami</i> Brush turkey	3.1	0	0	0	-2.0	0	1.1-2.0
<b>CRACIDAE</b>							
<i>Crax globulosa</i> Wattled currawong	1.1	0.0.1	0	0.0.1	0	0	1.1
<i>Aburria pipile cumanensis</i> White-headed piping guan	1.1.1-0.0.2	0	0	0	-0.0.1	0	1.1-0.0.3
<b>PHASIANIDAE</b>							
<i>Lophortyx californicus</i> California quail	3.3	0.0.19	0	0.0.15	0	0	6.4
<i>Francolinus francolinus</i> Chinese francolin	1.0	0	0	1.0	0	0	0
<i>Coturnix chinensis</i> Blue-breasted quail	10.9	0	0	6.9	0	4.0	0
<i>Arborophila brunneopectus</i> Bare-throated tree partridge	0.0.3	0	0	0.0.2	0	0	0.0.1
<i>Rollulus roulroul</i> Crested green wood partridge	17.11.2	0	0	10.5.2	2.0	0	5.6
<i>Lophophorus impeyanus</i> Impeyan pheasant	0.1	0	0	0	0	0.1	0
<i>Gallus lafayetteii</i> Ceylon junglefowl	2.6	0.0.1	0	2.6.1	0	0	0
<i>Lophura leucomelana hamiltoni</i> White-crested kalij pheasant	2.3	0	0	2.3	0	0	0
<i>Lophura swinhoei</i> Swinhoe's pheasant	2.12	0	0	0	1.9	0	1.3
<i>Crossoptilon crossoptilon</i> White eared pheasant	1.1	0	0	0	0	0	1.1
<i>Symaticus humiae</i> Hume's bar-tailed pheasant	3.2	0	0	1.0	1.1	0	1.1
<i>Chrysolophus pictus</i> Golden pheasant	4.7	0.0.1	0	1.2	0	0.0.3	2.3
<i>Chrysolophus amherstiae</i> Lady Amherst pheasant	8.6	0	0	0	7.5	0	1.1
<i>Lophura e. erythrothalma</i> Malay crestless fire back pheasant	0	0	1.2	0	0	0	1.2
<i>Polyplectron germaini</i> Germain's peacock pheasant	1.0	0	0	0	-1.0	0	-1.0
<i>Argusianus argus grayi</i> Bornean great argus pheasant	2.5.6	0	0	0.0.1	0	0	2.5.5
<i>Pavo cristatus</i> Indian blue peafowl	12.12.7	0	0	0	9.9	1.1.7	3.1
<i>Pavo m. muticus</i> Javanese green peafowl	1.1	0	0	0	0	0	1.1

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
NUMIDIDAE							
<i>Acryllium vulturinum</i> Vulturine guineafowl	2.2.37	0	0	0.0.10	0	0	2.2.27
MELEAGRIDIDAE							
<i>Meleagris gallopavo</i> <i>sylvestris</i> Wild turkey	3.2	0	0	0	0	3.2	0
<i>Meleagris ocellata</i> Ocellated turkey	1.1+1.1	0.0.1	0	0.1.1	0	0	1.0+1.1
GRUIFORMES: 19 species – 56 specimens							
TURNICIDAE							
GRUIDAE							
<i>Grus canadensis canadensis</i> Lesser sandhill crane	0.0.2	0	0	0	0	0	0.0.2
<i>Grus canadensis tabida</i> Greater sandhill crane	1.0+0.1	0	3.3	0	0	0	4.3+0.1
<i>Grus canadensis pratensis</i> Florida sandhill crane	0.0.1	0	3.3	0	0	0	3.3.1
<i>Grus antigone</i> Sarus crane	2.3.4	0.0.3	+0.1	0.0.2	1.0	0	2.1.6+0.1
<i>Anthropoides virgo</i> Demoiselle crane	1.1	0	0	0	0	0	1.1
<i>Anthropoides paradisea</i> Blue or Stanley's crane	2.3	0.0.1	0	0	0.1	0	2.2.1
<i>Balearica regulorum</i> <i>gibbericeps</i> Eastern crowned crane	1.2.1-0.1	0	0.0.1	-0.1	0	0	1.2.2
PSOPHIIDAE							
<i>Psophia leucoptera</i> White-winged trumpeter	0.0.1	0	0	0	0	0	0.0.1
RALLIDAE							
<i>Rallus longirostris</i> Clapper rail	0.0.1	0	0	0.0.1	0	0	0
<i>Aramides cajanea</i> Gray-necked wood rail	0.0.3	0	0	0.0.2	0	0	0.0.1
<i>Limnocolax flavirostra</i> African black crane	0.0.2	0	0	0.0.1	0	0	0.0.1
<i>Coturnicops noveboracensis</i> Yellow rail	1.1	0	0	0	0	0	1.1
<i>Gallinula chloropus</i> Common gallinule	0.0.1	0	0	0	0	0	0.0.1
<i>Gallinula comeri</i> Gough Island gallinule	0	0	0.0.2	0	0	0	0.0.2
<i>Porphyrio melanotus</i> Pukeko	0.1	0	0	0	0	0	0.1
<i>Fulica americana</i> North American coot	0.0.2	0	0	0	0	0	0.0.2
<i>Fulica gigantea</i> Giant Peruvian coot	1.0	0	0	0	0	0	1.0
EURYPYGIDAE							
<i>Eurypyga helias</i> Sunbittern	1.1.2	0	0	0	0	0	1.1.2
CARIAMIDAE							
<i>Cariama cristata</i> Crested seriema	1.1	0	0	0	0	0	1.1
OTIDIDAE							
<i>Ardeotis kori</i> Kori bustard	0.1	0	0	0	0	0	0.1

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Afrotis atra afroides</i> White-quilled black bustard	+0.1	0	0	+0.1	0	0	0
CHARADRIIFORMES: 12 species — 41 specimens							
RECURVIROSTRIDAE							
<i>Recurvirostra americana</i> American avocet	0.0.3	0	0	0.0.1	0	0	0.0.2
<i>Himantopus mexicanus</i> Black-necked stilt	0.0.3	0	0	0.0.1	0	0	0.0.2
CHARADRIIDAE							
<i>Hoplopterus spinosus</i> Spur-winged plover	0.0.3+0.0.2	0	0	0.0.1 +0.0.2	0	0	0.0.2
SCOLOPACIDAE							
<i>Catoptrophorus</i> <i>semipalmatus</i> Willet	0.0.3	0	0	0	0	0	0.0.3
<i>Calidris canutus</i> Knot	0.0.2	0	0	0	0	0	0.0.2
<i>Limnodromus griseus</i> Short-billed dowitcher	0.0.1	0	0	0.0.1	0	0	0
<i>Arenaria interpres</i> Ruddy turnstone	0.0.1	0	0	0	0	0	0.0.1
GLAREOLIDAE							
<i>Glareola pratincola</i> Pratincole	+0.0.1	0	0	0	0	0	+0.0.1
LARIDAE							
<i>Larus heermanni</i> Heermann's gull	0.1	0	0	0	0	0	0.1
<i>Larus atricilla</i> Laughing gull	0.0.9	0	0	0	0	0	0.0.9
<i>Larus novaehollandiae</i> Silver gull	3.3.4	0.0.3	0	0.0.2	0	0	3.3.5
<i>Larus atricilla</i> x <i>Larus</i> <i>novaehollandiae</i> Laughing gull x Silver gull, hybrid	0.0.2	0	0	0	0	0	0.0.2
<i>Chlidonias leucoptera</i> White-winged black tern	0.0.1	0	0	0	0	0	0.0.1
<i>Larosterna inca</i> Inca tern	1.1.4	0	0	0.0.1	0	0	1.1.3
COLUMBIFORMES: 12 species — 83 specimens							
COLUMBIDAE							
<i>Treron phoenicoptera</i> Yellow-legged green pigeon	0.0.1	0	0	0.0.1	0	0	0
<i>Ptilinopus occipitalis</i> Yellow-breasted fruit dove	1.1	0	0	0.1	0	0	1.0
<i>Ducula aenea</i> Green imperial pigeon	0.0.3	0	0	0	0	0	0.0.3
<i>Columba eucocephala</i> White-crowned pigeon	1.0	0	0	1.0	0	0	0.0
<i>Columba fasciata</i> Band-tailed pigeon	1.2	0	0	0	0	0	1.2
<i>Zenaidura macroura</i> Mourning dove	0.0.4	0	0	0.0.1	0	0	0.0.3
<i>Nesopelia galapagoensis</i> Galapagos dove	1.0	0	0	0	0	0	1.0

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Streptopelia roseogriseus</i>							
<i>decaocto</i>							
Ring-necked dove	0.0.7	0	0	0.0.3	0	0	0.0.4
<i>Geotrygon versicolor</i>							
Crested quail dove	0	0	0.0.6	0	0	0	0.0.6
<i>Streptopelia chinensis</i>							
Chinese necklace dove	25.25 <sup>†</sup>	0	0	0	0	0	25.25 <sup>†</sup>
<i>Geopelia cuneata</i>							
Diamond dove	0.2	0	0	0.2	0	0	0
<i>Scardafella inca</i>							
Inca dove	0.0.2	0	0	0.0.2	0	0	0
<i>Chalcophaps indica</i>							
Emerald dove	0.1	0	0	0	0	0	0.1
<i>Caloenas nicobarica</i>							
Nicobar pigeon	2.2.3	0	0	0.0.2	1.0.1	0	1.2
<i>Goura cristata</i>							
Common crowned pigeon	3.1	0	0	0	0	0	3.1
<i>Lophophaps p. plumifera</i>							
Plumed pigeon	0	0.0.1	0.0.4	0.0.1	0	0	0.0.4
PSITTACIFORMES:							
18 species — 43 specimens							
PSITTACIDAE							
<i>Eos bornea</i>							
Red lory	1.1.1	0	0	0	0.0.1	0	1.1
<i>Trichoglossus ornatus</i>							
Ornate lorikeet	1.1	0	0	1.0	0	0	0.1
<i>Trichoglossus haematodus rubritorquis</i>							
Red-collared lorikeet	1.1	0	0	0	0	0	1.1
<i>Cacatua galerita triton</i>							
Sulphur-crested cockatoo	0.1	0	0	0	0	0	0.1
<i>Cacatua moluccensis</i>							
Salmon-crested cockatoo	1.1	0	1.1	0	0	0	2.2
<i>Cacatua tenuirostris</i>							
Long-billed corella	0.1+1.0	0	0	0	0	0	0.1+1.0
<i>Polytelis alexandrae</i>							
Princess parrot	3.1.1-0.1	0	0	0	0		3.1.1-0.1
<i>Neophema pulchella</i>							
Turquoise parrot	5.1	0	0	2.0	3.1	0	0
<i>Psittacus erithacus</i>							
African gray parrot	0.0.2	0	0	0.0.2	0	0	0
<i>Agapornis roseicollis</i>							
Peach-faced lovebird	0.0.3	0	0	0.0.2	0.0.1	0	0
<i>Loriculus vernalis</i>							
Vernal hanging parakeet	0.0.1	0	0	0	0	0	0.0.1
<i>Psittacula krameri</i>							
Rose-ringed parakeet	1.0	0	0	0	0	0	1.0
<i>Psittacula cyanocephala</i>							
Plum-headed parakeet	1.0.1	0		0.0.1	1.0	0	0
<i>Ara ararauna</i>							
Blue and yellow macaw	1.3	0	0	0	-1.1	0	0.2-1.1
<i>Ara militaris</i>							
Military macaw	1.1	0	0	0	0	0	1.1
<i>Ara macao</i>							
Scarlet macaw	2.2-0.1	0	0	0	-1.1	0	1.1-1.2
<i>Ara chloroptera</i>							
Green-winged macaw	1.1	0	0	0.1	1.0	0	0
<i>Aratinga jandaya</i>							
Jandaya conure	1.1	0	0	0	0	0	1.1
<i>Aratinga canicularis</i>							
Orange-fronted conure	1.1	0	0	0	1.1	0	0

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Forpus cyanopygius</i> Mexican parrotlet	0.1	0	0	0	0	0	0.1
<i>Brotogeris versicolorus</i> Canary-winged parakeet	0.0.8	0	0	0.0.2	0.0.6	0	0
<i>Brotogeris sanctithomae</i> Tui parakeet	1.0	0	0	1.0	0	0	0
<i>Pionites melanocephala</i> Black-headed caique	1.3	0.0.4	0	0	0.2.1	0	1.1.3
<i>Pionites leucogaster</i> White-bellied caique	0.0.1	0	0	0	0.0.1	0	0
<i>Pionus menstruus</i> Blue-headed parrot	0.0.1	0	0	0	0	0	0.0.1
<i>Amazona leucocephala</i> <i>caymanensis</i> Grand Cayman white- fronted Amazon parrot	1.1-0.1	0	0	0	0	0	1.1-0.1
<i>Amazona ochrocephala</i> Yellow-headed Amazon parrot	0.0.3	0	0	0	0.0.3	0	0
<i>Amazona guildingii</i> St. Vincent Amazon parrot	-0.1	0	0	0	0	0	-0.1
CUCULIFORMES: 2 species — 3 specimens							
CUCULIDAE							
<i>Geococcyx californianus</i> Roadrunner	1.1	0.0.2	0	1.1.2	0	0	0
MUSOPHAGIDAE							
<i>Tauraco livingstoni schalowi</i> Schalow's turaco	2.0	0	0.1	0	1.0	0	1.1
<i>Tauraco leucotis</i> White-cheeked turaco	1.1	0	0	0	0	1.0	0.1
STRIGIFORMES: 9 species — 20 specimens							
TYTONIDAE							
<i>Tyto alba</i> Barn owl	1.1.4	0	0	0.0.1		0	2.2.1
STRIGIDAE							
<i>Otus asio</i> Screech owl	1.1	0	1.2	0	-1.2	1.1	-1.2
<i>Bubo virginianus</i> Great horned owl	0.0.1	0	0	0	0		0.0.1
<i>Ketupa ketupa</i> Malay fishing owl	0.1	0	0	0	0	0	0.1
<i>Nyctea scandiaca</i> Snowy owl	1.1	0	0	0.1	0	0	1.0
<i>Micrathene whitneyi</i> Elf owl	1.1.1	0		1.0.1	0	0	0.1
<i>Speotyto cunicularia</i> Burrowing owl	7.2.2	0	0	0	2.3-1.1	0	2.2-1.1
<i>Strix leptogrammica</i> Nepal brown wood owl	0.1	0	0	0	0	0	0.1
<i>Rhinoptynx clamator</i> Striped owl	0	0	0.0.1	0	0	0	0.0.1
CAPRIMULGIFORMES: 0 species — 0 specimen							
PODARGIDAE							
<i>Podargus strigoides</i> Tawny frogmouth	0.0.1+0.1.1	0	0	0.0.1	0	0	+0.1.1
CORACIIFORMES: 1 species — 2 specimens							

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<b>ALCEDINIDAE</b>							
<i>Dacelo gigas</i>							
Laughing kookaburra	0	0	+1.1	0	0	0	+1.1
<b>BUCEROTIDAE</b>							
<i>Buceros hydrocorax</i>							
Rufous hornbill	+0.2	0	0	+0.1	0	0	+0.1
<i>Buceros rhinoceros</i>							
Rhinoceros hornbill	1.1	0	0	0.1	1.0	0	0
<i>Bucorvus abyssinicus</i>							
Abyssinian ground hornbill	1.1	0	0	0	0	0	1.1
<b>PICIFORMES:</b>							
3 species — 5 specimens							
<b>RAMPHASTIDAE</b>							
<i>Pteroglossus beauharnaesii</i>							
Curl-crested aracari	1.1	0	0	0	0	0	1.1
<i>Ramphastos sulfuratus</i>							
Keel-billed toucan	0.0.1	0	0.0.1	0.0.1	0	0	0.0.1
<i>Ramphastos culminatus</i>							
Yellow-ridged toucan	0	0	0.1	0.1	0	0	0
<i>Ramphastos toco</i>							
Toco toucan	1.1	0	0	0	0	0	1.1
<b>PASSERIFORMES:</b>							
41 species — 81 specimens							
<b>EURLAIMIDAE</b>							
<i>Calyptomena viridis</i>							
Lesser green broadbill	0.1	0	0	0	0	0	0.1
<b>DENDROCOLAPTIDAE</b>							
<b>COTINGIDAE</b>							
<i>Rupicola peruviana</i>							
Peruvian cock-of-the-rock	0.1+1.0	0	0	0	0	0	0.1+1.0
<b>PIPRIDAE</b>							
<i>Chiroxiphia linearis</i>							
Long-tailed blue-backed manakin	1.0	0	0	0	0	0	1.0
<b>PITTIDAE</b>							
<i>Pitta caerulea</i>							
Giant pitta	1.0	0	0	1.0	0		0
<b>ORIOOLIDAE</b>							
<i>Oriolus oriolus</i>							
European golden oriole	0.1	0	0	0	0.1	0	0
<i>Oriolus chinensis</i>							
Black-naped oriole	1.0	0	0	1.0	0	0	0
<b>CORVIDAE</b>							
<i>Cyanocitta cristata</i>							
Blue jay	0.0.1	0	0	0	0	0	0.0.1
<i>Cyanocorax affinis</i>							
Black-chested jay	1.0	0	0	0	0	0	1.0
<i>Cyanocorax yncas</i>							
Green jay	0.0.1	0	0	0	0	0	0.0.1
<i>Cyanocorax sanblasiensis</i>							
San Blas jay	0.1	0	0	0	0	0	0.1
<i>Garrulus lanceolatus</i>							
Black-throated jay	1.0	0	0	0	0	0	1.0
<i>Urocissa erythrorhyncha</i>							
Red-billed blue magpie	0.0.5	0	0	0	0	0	0.0.5
<i>Pica pica</i>							
Black-billed magpie	0.0.4	0	0	0	0	0	0.0.4
<i>Pica nuttalli</i>							
Yellow-billed magpie	0.0.1	0	0	0.0.1	0	0	0

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Corvus albus</i> Pied crow	0.0.1	0	0	0	0	0	0.0.1
<i>Corvus cryptoleucus</i> White-necked raven	0.0.1	0	0	0	-0.0.1	0	-0.0.1
PTILONORHYNCHIDAE							
<i>Ptilonorhynchus violaceus</i> Satin bowerbird	1.1	0	0	0	0	0	1.1
PARADISAEIDAE							
<i>Paradisaea raggiana</i> Red-plumed bird-of-paradise	0.1	0	0	0	0	0	0.1
TIMALIIDAE							
<i>Garrulax leucolophus</i> White-crested laughing thrush	0.0.3	0	0	0.0.1	0	0	0.0.2
<i>Leiothrix argenteauris</i> Silver-eared mesia	0.1	0	0	0	0.1	0	0
<i>Leiothrix lutea</i> Pekin robin	0.0.5	0	0	0.0.5	0	0	0
<i>Turdoides jardinei</i> Arrow-marked babbler	0.0.1	0	0	0	0	0	0.0.1
<i>Picathartes gymnocephalus</i> White-necked rock-fowl	0.0.2	0	0	0.0.2	0	0	0
TROGLODYTIDAE							
<i>Salpinctes obsoletus</i> Rock wren	3.1	0	0	0	0	3.1	0
<i>Thryomanes bewickii</i> Bewick's wren	0.0.1	0	0	0	0	0.0.1	0
<i>Troglodytes aedon</i> House wren	0.0.1	0	0	0	0	0.0.1	0
MIMIDAE							
<i>Mimus polyglottos</i> Mockingbird	0.0.1	0	0.0.1	0	-0.0.2	0	-0.0.2
<i>Ramphocinclus brachyurus</i> White-breasted thrasher	0	0	1.1	0	0	0	1.1
<i>Zoothera citrina</i> Orange-headed ground thrush	0.1	0	0	0.1	0	0	0
TURDIDAE							
<i>Turdus migratorius</i> American robin	0.0.1	0	0	0	0	0	0.0.1
ARTAMIDAE							
<i>Artamus personatus</i> x <i>Artamus superciliosus</i> Masked wood-swallow x White-browed wood-swallow, hybrid	0.1	0	0	0	0.1	0	0
LANIIDAE							
<i>Laniarius atro-cooccineus</i> Crimson-breasted shrike	0.0.1	0	0	0	0	0	0.0.1
STURNIDAE							
<i>Onychognathus morio</i> Red-winged starling	1.0	0	0	0	0	0	1.0
<i>Lamprotornis corruscus</i> Black-bellied glossy starling	0.0.1	0	0	0	0	0	0.0.1
<i>Lamprotornis caudatus</i> Long-tailed glossy starling	1.1	0	0	0	0	0	1.1
<i>Cosmopsarus regius</i> Golden-breasted starling	0.0.4	0	0	0	0	0	0.0.4

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Spreo superbus</i>							
Superb starling	+0.0.2	0	0	0	0	0	+0.0.2
<i>Leucopsar rothschildi</i>							
Rothschild's mynah	8.6-1.1	0	0	0.2	0	0	8.4-1.1
<i>Acridotheres cristatellus</i>							
Crested mynah	0.0.1	0	0	0.0.1	0	0	0
<i>Gracula r. religiosa</i>							
Northern hill mynah	0	0	0.0.2	0	0	0	0.0.2
<i>Buphaga erythrorhyncha</i>							
Red-billed oxpecker	0.0.1	0	0	0.0.1	0	0	0
MELIPHAGIDAE							
<i>Melithreptus lunatus</i>							
White-naped honeyeater	0.0.2	0	0	0.0.1	0	0	0.0.1
NECTARINIIDAE							
ZOSTEROPIDAE							
<i>Zosterops senegalensis</i>							
<i>kikuyuensis</i>							
Kikuyu white-eye	1.1	0.0.1	0	0.0.1	0	0	1.1
COEREBIDAE							
<i>Cyanerpes caeruleus</i>							
Yellow-legged honeycreeper	1.0	0	0	1.0	0	0	0
<i>Cyanerpes cyaneus</i>							
Red-legged honeycreeper	2.3	0	0	0.2	0	1.0	1.1
PARULIDAE							
PLOCEIDAE							
<i>Euplectes afra</i>							
Napoleon weaver	3.1	0	0	1.0	0	0	2.1
<i>Euplectes orix</i>							
Red bishop	3.1	0	0	0.1	0	0	3.0
<i>Ploceus luteolus</i>							
Masked weaver	1.0	0	0	0	1.0	0	0
<i>Steganura paradisea</i>							
Paradise whydah	0.0.4	0	0	0.0.1	0	0.0.1	0.0.2
<i>Vidua fischeri</i>							
Fischer's straw-tailed whydah	0.1	0	0	0	0.1	0	0
<i>Lonchura malacca</i>							
Tri-colored nun	0.0.3	0	0	0.0.1	0.0.1	0.0.1	0
<i>Lonchura punctulata</i>							
Nutmeg finch	0.0.2	0	0	0.0.1	0.0.1	0	0
<i>Lonchura domestica</i>							
Bengalese finch	0.0.1	0	0	0	0.0.1	0	0
<i>Amadina fasciata</i>							
Cut-throat finch	2.0	0	0	0	2.0	0	0
<i>Estrilda amandava</i>							
Strawberry finch	0.1	0	0	0	0	0.1	0
<i>Estrilda astrild</i>							
Common waxbill	0.0.1	0	0	0.0.1	0	0	0
<i>Lagonistricta senegala</i>							
Red-billed fire finch	0.1	0	0	0	0	0.1	0
<i>Poephila castanotis</i>							
Zebra finch	2.0	0	0	0	0	2.0	0
<i>Poephila acuticauda</i>							
Long-tailed finch	1.0	0	0	0	0	0.1	0
<i>Passer luteus</i>							
Gold song sparrow	0.0.3	0	0	0	0.0.2	0.0.1	0
ICTERIDAE							
<i>Quiscalus quiscula</i>							
Common grackle	2.0	0	0	0	0	0	2.0

	Status 31 Dec. 75	Hatched	Received	Died	Sent Out	Other	Status 31 Dec. 76
<i>Agelaius phoeniceus</i> Red-winged blackbird	1.0	0	0	0	0	1.0	0.0
<i>Icterus galbula</i> Northern oriole	2.0	0	0	0	0	0	2.0
<i>Xanthocephalus xanthocephalus</i> Yellow-headed blackbird	2.0	0	0	0	0	0	2.0
<b>THRAUPIDAE</b>							
<i>Thraupis episcopus</i> Blue-gray tanager	0.0.1	0	0	0.0.1	0	0	0
<i>Ramphocelus bresilius</i> Brazilian scarlet tanager	1.0	0	0	1.0	0	0	0
<b>FRINGILLIDAE</b>							
<i>Paroaria coronata</i> Red-crested cardinal	1.1.1		0	0.0.1	0	0	1.1
<i>Cardinalis phoeniceus</i> Vermilion cardinal	1.0	0	0	0	0	0	1.0
<i>Richmondia cardinalis</i> Cardinal	1.0	0	0	0	0	0	1.0
<i>Passerina leclancherii</i> Rainbow bunting	0.1	0	0	0.1	0	0	0
<i>Fringilla coelebs</i> Chaffinch	0.0.1	0	0	0	0.0.1	0	0
<i>Serinus mozambicus</i> Green singing finch	0.0.1	0	0	0	0.0.1	0	0
<i>Lophospingus pusillus</i> Black-crested finch	0.0.1	0	0	0	0	0.0.1	0
<i>Coryphospingus cucullatus</i> Red-crested finch	0.0.1	0	0	0	0	0	0.0.1
<i>Rhodospingus cruentus</i> Crimson finch	1.1	0	0	0.1	0	0	1.0
<i>Saltator maximus</i> Buff-throated saltator	0	0	0.0.1	0	0	0	0.0.1

### Bird Loans to the National Zoological Park, Office of Animal Management (on hand December 31, 1976)

- 2.2 Darwin's Rhea, *Pterocnemia pennata*, from San Diego Zoological Gardens, San Diego, California.
- 1.1 Amazonian tiger bittern, *Tigrisoma l. lineatum*, from New York Zoological Park, Bronx, New York.
- 0.0.6 Caribbean flamingo, *Phoenicopterus ruber ruber*, from Buffalo Zoological Gardens, Buffalo, New York.
- 0.1 Ashy-headed goose, *Chloephaga poliocephala*, from Los Angeles Zoo, Los Angeles, California.
- 2.2 White-winged wood duck, *Cairina scutulata*, from The Wildfowl Trust, Slimbridge, England.
- 1.0 White-bellied sea eagle, *Haliaeetus leucogaster*, from Los Angeles Zoo, Los Angeles, California.
- 0.1 Harris' hawk, *Parabuteo unicinctus*, from New York Zoological Park, Bronx, New York.
- 0.1 Imperial eagle, *Aquila heliaca*, from St. Louis Zoological Park, St. Louis, Missouri.
- 1.1 Ocellated turkey, *Meleagris ocellata*, from Salisbury Zoo, Salisbury, Maryland.
- 0.1 Greater sandhill crane, *Grus canadensis tabida*, from Patuxent Wildlife Research Center, Laurel, Maryland.
- 0.1 Sarus crane, *Grus antigone*, from Chicago Zoological Park, Brookfield, Illinois.
- 0.0.1 Pratincole, *Glaucopis pratincola*, from New York Zoological Park, Bronx, New York.
- 1.0 Slender-billed corella, *Cacatua tenuirostris*, from Los Angeles Zoo, Los Angeles, California.
- 1.1 Tawny frogmouth, *Podargus strigoides*, from New York Zoological Park, Bronx, New York.
- 1.1 Laughing kookāburra, *Dacelo gigas*, from New York Zoological Park, Bronx, New York.
- 0.1 Rufous hornbill, *Buceros hydrocorax*, from Los Angeles Zoo, Los Angeles, California.
- 1.0 Peruvian cock-of-the-rock, *Rupicola peruviana*, from New York Zoological Park, Bronx, New York.
- 0.0.2 Superb starling, *Spreo superbus*, from Denver Zoological Gardens, Denver, Colorado.

**Bird Loans from the National Zoological Park,  
Office of Animal Management (as of December 31, 1976)**

- 1.0 North Island brown kiwi, *Apteryx australis mantelli*, to Chicago Zoological Park, Brookfield, Illinois.
- 2.2 Nene (Hawaiian goose), *Branta sandvicensis*, to Buffalo Zoological Gardens, Buffalo, New York.
- 2.2 Nene (Hawaiian goose), *Branta sandvicensis*, to Louisiana Purchase Gardens and Zoo, Monroe, Louisiana.
- 2.1 Nene (Hawaiian goose), *Branta sandvicensis*, to Robert Elgas, Big Timber, Montana.
- 1.1 Nene (Hawaiian goose), *Branta sandvicensis*, to Fort Wayne Children's Zoological Gardens, Fort Wayne, Indiana.
- 2.0 Nene (Hawaiian goose), *Branta sandvicensis*, to San Francisco Zoological Gardens, San Francisco, California.
- 2.2 Nene (Hawaiian goose), *Branta sandvicensis*, to Zoological Society of Cincinnati, Cincinnati, Ohio.
- 2.3 Nene (Hawaiian goose), *Branta sandvicensis*, to S. Dillon Ripley, Paddling Ponds, Litchfield, Connecticut.
- 2.2 Nene (Hawaiian goose), *Branta sandvicensis*, to Los Angeles Zoo, Los Angeles, California.
- 2.2 Nene (Hawaiian goose), *Branta sandvicensis*, to San Diego Zoological Gardens, San Diego, California.
- 1.1 Nene (Hawaiian goose), *Branta sandvicensis*, to Prof. Ernest C. Weaver, West Linn, Oregon.
- 1.1 Nene (Hawaiian goose), *Branta sandvicensis*, to Great Plains Zoo, Sioux Falls, South Dakota.
- 0.0.1 Bald eagle, *Haliaeetus leucocephalus*, to Patuxent Wildlife Research Center, Laurel, Maryland.
- 0.1 Bald eagle, *Haliaeetus leucocephalus*, to Philadelphia Zoological Gardens, Philadelphia, Pennsylvania.
- 0.1 Harris' Hawk, *Parabuteo unicinctus*, to Alva Nye, McLean, Virginia.
- 0.1 Golden eagle, *Aquila chrysaetos canadensis*, to Baltimore Zoo, Baltimore, Maryland.
- 2.0 Brush turkey, *Alectura lathamii*, to Walt Disney World, Orlando, Florida.
- 0.0.1 White-headed piping guan, *Aburria pipile cumanensis*, to Walt Disney World, Orlando, Florida.
- 0.0.2 White-headed piping guan, *Aburria pipile cumanensis*, to Los Angeles Zoo, Los Angeles, California.
- 1.0 Germain's peacock pheasant, *Polyplectron germaini*, to Jackson Zoological Park, Jackson, Mississippi.
- 0.1 Princess parrot, *Polytelis alexandrae*, to San Diego Zoological Gardens, San Diego, California.
- 0.2 Blue and yellow macaw, *Ara ararauna*, to Salisbury Zoological Garden, Salisbury, Maryland.
- 1.1 Scarlet macaw, *Ara macao*, to Salisbury Zoological Garden, Salisbury, Maryland.
- 0.1 Scarlet macaw, *Ara macao*, to Baltimore Zoo, Baltimore, Maryland.
- 0.1 Grand Cayman white-fronted Amazon parrot, *Amazona leucocephala caymanensis*, to Dr. Thomas Nichols, San Antonio, Texas.
- 0.1 St. Vincent's Amazon parrot, *Amazona guildingii*, to Houston Zoological Gardens, Houston, Texas.
- 0.0.3 Screech owl, *Otus asio*, to Michael Johnson, National Zoological Park, Washington, D.C.
- 1.1 Burrowing owl, *Speotyto cunicularia*, to Salisbury Zoological Garden, Salisbury, Maryland.
- 0.0.1 White-necked raven, *Corvus cryptoleucus*, to Department of the Interior, National Park Service, Washington, D.C.
- 0.0.2 Mockingbird, *Mimus polyglottos*, to National Gallery of Art, Washington, D.C.
- 0.0.2 Rothschild's mynah, *Leucospa rothschildi*, to Denver Zoological Gardens, Denver, Colorado.

**Mammal Collection 31 December 1976**  
**National Zoological Park**  
**Office of Animal Management**

TOTALS: (Only specimens owned by the National Zoological Park are included.)  
ORDERS: 11  
FAMILIES: 38  
SPECIES: 114  
SPECIMENS: 435

LEGEND: 1.1.1 = males, females, undetermined sex  
-1.1 = specimens on loan from National Zoological Park  
+1.1 = specimens on loan to National Zoological Park  
(1) = stillbirth; not included in adjacent figure  
\* = not conceived at National Zoological Park

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<b>MONOTREMATA:</b>						
1 species — 3 specimens						
<b>TACHYGLOSSIDAE</b>						
<i>Tachyglossus aculeatus</i> Short-nosed echidna	0.0.3	0	0	0	0	0.0.3
<b>MARSUPIALIA:</b>						
9 species — 36 specimens						
<b>DASYURIDAE</b>						
<i>Dasyurus albopunctatus</i> New Guinea dasyure	1.0	0	0	1.0	0	0
<i>Sarcophilus harrisii</i> Tasmanian devil	0	0	+1.0	0	0	+1.0
<b>PHALANGERIDAE</b>						
<i>Trichosurus vulpecula</i> Brush-tailed possum	0.2	0	1.0	0	0.1	1.1
<i>Petaurus breviceps</i> Sugar glider	4.3	1.1	0	0	1.0	4.4
<b>PHASCOLOMIDAE</b>						
<i>Vombatus ursinus</i> Common wombat	1.1	0	0	0	0	1.1
<b>MACROPODIDAE</b>						
<i>Potorous apicalis</i> Southern potoroo	1.0+0.1	0.0.1	2.2	1.1	0.1	2.0.1+0.1
<i>Dendrolagus matschiei</i> Matschie's tree kangaroo	3.6	3	+0.1	1.0	0	2.6.3+0.1
<i>Macropus parma</i> White-fronted wallaby	1.0	0	0	0	0	1.0
<i>Megaleia rufa</i> Red kangaroo	1.5	1.2.1	0	1.0.1	0	1.7
<b>INSECTIVORA:</b>						
2 species — 5 specimens						
<b>TENRECIDAE</b>						
<i>Setifer setosus</i> Large Madagascar hedgehog tenrec	0	0	1.2	0	0	1.2
<b>MACROSCOLIDIDAE</b>						
<i>Elephantulus rufescens</i> Elephant shrew	1.1	0.0.2	0.2	0.3.2	1.0	0
<b>TUPAIIDAE</b>						
<i>Tupaia glis</i> Common tree shrew	1.1	0	0	0	0	1.1
<b>PRIMATES:</b>						
25 species — 96 specimens						
<b>LORISIDAE</b>						
<i>Nycticebus coucang</i> Slow loris	1.2	0	0	0.2	0	1.0
<i>Perodicticus potto</i> Potto	1.1	0	0	0	0	1.1
<i>Galago crassicaudatus</i> Thick-tailed bushbaby	+1.1-1.2	1.0	1.1	0	1.0+1.1	1.1-1.2
<i>Galago senegalensis</i> Senegal bushbaby	1.2	0	0	0.2	0	1.0
<b>CEBIDAE</b>						
<i>Aotus trivirgatus</i> Douroucouli	1.1	0	0	0.1	0	1.0
<i>Cacajao rubicundus</i> Red uakari	0.1+1.0-0.1	0		0.1-0.1	0	+1.0
<i>Alouatta villosa</i> Mantled howler monkey	1.1	0	0	0	0	1.1

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Cebus capucinus</i> White-throated capuchin	+1.0	0	0	+1.0	0	0
<i>Saimiri sciureus</i> Common squirrel monkey	2.3	0	0	0.1	0	2.2
<i>Ateles fusciceps</i> Brown-headed spider monkey	4.4	0.1	0	1.0	0	3.5
<i>Lagothrix lagotricha</i> Woolly monkey	2.1+0.1	0.1	0	0	0	2.2+0.1
CALLITRICHIDAE						
<i>Callithrix geoffroyi</i> White-fronted marmoset	1.1	(2)	0	(2)	0	1.1
<i>Leontideus r. rosalia</i> Golden lion marmoset	4.4	3.3(2)	0	1.0(2)	2.2	4.5
<i>Saquinus geoffroyi</i> Geoffroy's tamarin	1.1	0	0	1.0	0	0.1
<i>Saquinus nigricollis</i> Black and red tamarin	3.1	0	0	0	0	3.1
CERCOPITHECIDAE						
<i>Cercocebus albigena</i> Grey-cheeked mangabey	1.0	0	0	0	0	1.0
<i>Cercopithecus diana diana</i> Diana monkey	+1.0	0	+1.0	0	0	+1.1
<i>Cercopithecus d. roloway</i> Roloway monkey	+1.1	0	0	0	0	+1.1
<i>Macaca nigra</i> Black (or Celebes) ape	1.3-0.2	1.0	0	1.0	0	1.3-0.2
<i>Macaca silenus</i> Lion-tailed macaque	1.3-1.0	0	0	0	0	1.3-1.0
<i>Macaca sylvanus</i> Barbary ape	3.5	1.1(1)	1.0	2.0(1)	0	3.6
<i>Colobus guereza</i> Colobus monkey	2.4	1.0	0	0	0	3.4
<i>Presbytis senex senex</i> Purple-faced langur	1.1	0	0	0	0	1.1
PONGIDAE						
<i>Hylobates concolor</i> Black gibbon	2.2	0	+0.2	0	0	2.2+0.2
<i>Hylobates hoolock male</i> <i>X H. agilis female</i> Hybrid gibbon	0.1	0	0	0	0	0.1
<i>Hylobates syndactylus</i> Siamang	1.1	0	0	0	0	1.1
<i>Gorilla g. gorilla</i> Lowland gorilla	2.1-1.0	0	0	0	0	2.1-1.0
<i>Pan troglodytes</i> Chimpanzee	1.0	0	0	0	0	1.0
<i>Pongo pygmaeus</i> Orangutan	2.2-4.3	0.1	0	0.1-1.0	0	2.2-3.3
EDENTATA:						
3 species — 8 specimens						
MYRMECOPHAGIDAE						
<i>Myrmecophaga tridactyla</i> Giant anteater	1.0+0.1	0	0	1.0	+0.1	0
<i>Tamandua tetradactyla</i> Tamandua	-0.1	0	0	0	0	-0.1
BRADYPODIDAE						
<i>Choloepus didactylus</i> Two-toed sloth	1.2	0	0	0	0	1.2
DASYPODIDAE						
<i>ChaetophRACTUS villosus</i> Hairy armadillo	0	0	0.4	0	0	0.4

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Zaedyus pichi caurinus</i> Pichi	-0.1	0	0	-0.1	0	0
RODENTIA: 12 species — 53 specimens						
SCIURIDAE						
<i>Ammospermophilus leucurus</i> <i>leucurus</i> Antelope ground squirrel	0	0	2.2	0.1	1.0	1.1
<i>Cynomys ludovicianus</i> Black-tailed prairie dog	-2.4	0	0	-0.3	2.1	0
<i>Cynomys parvidens</i> Utah prairie dog	3.5?	2.0	0	0	4?	2.0.4?
CRICETIDAE						
<i>Neotoma floridana</i> Eastern woodrat	1.1	0	0	0	1.1	0
<i>Tylomys nudicaudatus</i> Peter's climbing rat	1.0	0	0	0	0	1.0
<i>Microtus ochrogaster</i> Prairie vole	1.2	0	0	0.1	0	1.1
MURIDAE						
<i>Acomys sp.</i> Spiny mouse	7.6	0.0.35	0	2.0.3	9.6.2	15.10.1
<i>Pseudomys australis</i> Eastern mouse	2.0	0	2.2	2.0	1.2	1.0
HYSTRICIDAE						
<i>Atherurus africanus</i> Brush-tailed porcupine	1.0	0	0	0	0	1.0
<i>Hystrix cristata</i> Crested porcupine	0.2	0	1.0	0	0	1.2
DASYPROCTIDAE						
<i>Cuniculus paca</i> Paca	1.1	0	0	1.0	0	0.1
<i>Myoprocta pratti</i> Acouchi	1.0	0.0(2)	0.1	0.1(2)	0	1.0
CAPROMYIDAE						
<i>Capromys pilorides</i> Desmarest's (or Cuban) hutia	1.1	0	0	0	0	1.1
OCTODONTIDAE						
<i>Octodon degus</i> Degu	3.3	1.1.2(2)	0	0.2(2)	0.0.1	5.2
CARNIVORA: 35 species — 101 specimens						
CANIDAE						
<i>Canis lupus</i> Grey wolf	-2.1	0	0	0	0	-2.1
<i>Fennecus zerda</i> Fennec fox	0	0	1.1	1.0	0	0.1
<i>Nyctereutes procyonoides</i> Raccoon dog	3.4	1.5	0	0	2.4	2.5
<i>Vulpes macrotis nevadensis</i> Kit fox	0	0	1.1	0	0	1.1
URSIDAE						
<i>Helarctos malayanus</i> Sun bear	1.2	0	0	0	0	1.2
<i>Melursus ursinus</i> Sloth bear	1.2	0	0	0	0	1.2
<i>Tremarctos ornatus</i> Spectacled bear	0.1+1.0-1.0	0	0.1	0	0	0.2+1.0-1.0
<i>Ursus arctos arctos</i> European brown bear	1.1	1.0	0	1.0	0	1.1

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Ursus arctos middendorffi</i> Kodiak bear	2.3	0	0	0	1.1	1.2
<i>Ursus americanus</i> Black bear	2.1	0	0	1.0	0	1.1
<i>Ursus maritimus</i> Polar bear	1.2	1.1	0	1.1	0	1.2
PROCYONIDAE						
<i>Potos flavus</i> Kinkajou	1.2	0	0	0	1.2	0
AILUROPODIDAE						
<i>Ailurus fulgens</i> Red panda	4.6	5.2	0.1+0.1	2.2	0.1	7.6+0.1
<i>Ailuropoda melanoleuca</i> Giant panda	1.1	0	0	0	0	1.1
MUSTELIDAE						
<i>Eira barbara</i> Tayra	0.1	0	0	0.1	0	0
<i>Galictis vittata</i> Allemand's grison	1.1	0	0	0	0	1.1
<i>Ictonyx striatus</i> Zorilla	1.1	0.2.6	0	0.0.6	0	1.3
<i>Martes flavigula</i> Yellow-throated marten	-1.0	0	0	0	0	-1.0
<i>Martes pennanti pennanti</i> Fisher	0	0	1.1	0	0	1.1
<i>Mellivora capensis</i> Ratel	1.0	0	0	0	0	1.0
<i>Melogale moschata</i> Chinese ferret badger	0.1	0	0	0	0	0.1
VIVERRIDAE						
<i>Genetta tigrina</i> Blotched genet	1.1	0	0	0	0	1.1
<i>Arctictis binturong</i> Binturong	2.2	3.2	0	2.2	1.1	2.1
<i>Paradoxurus hermaphroditus</i> Common palm civet	1.1	0	0.1	0	0	1.2
<i>Fossa fossa</i> Malagasy civet (fanaloka)	2.0	0	0	0	0	2.0
<i>Gilidia elegans</i> Ring-tailed mongoose	2.0	1.0	1.0+0.1	1.0	0	3.0+0.1
<i>Atilax paludinosus</i> Marsh mongoose	1.0	0	0	0	0	1.0
<i>Suricata suricatta</i> Slender-tailed meerkat	3.1	0	0	0	0	3.1
HYAENIDAE						
<i>Crocuta crocuta</i> Spotted hyena	1.1	0	0	0	0	1.1
FELIDAE						
<i>Felis bengalensis</i> Leopard cat	1.1	2.0	0	0	0	3.1
<i>Felis colocolo</i> Pampas cat	-1.0	0	0	0	0	-1.0
<i>Felis geoffroyi</i> Geoffroy's cat	1.1	0	0	0	0	1.1
<i>Felis manul</i> Pallas' cat	1.1	0	0	0	0	1.1
<i>Neofelis nebulosa</i> Clouded leopard	0	0	1.0+1.0	0	0	1.0+1.0
<i>Panthera leo</i> Lion	0	0	+1.2	0	+1.2	0

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<i>Panthera leo leo</i> Atlas lion	0	0	+1.3	0	0	+1.3
<i>Panthera onca</i> Jaguar	1.1+1.1	0	0	0	+1.1	1.1
<i>Panthera pardus</i> Leopard, black	-1.0	0	-1.0	0	0	1.0
<i>Panthera tigris</i> Bengal tiger	-1.2	-0.1	-1.2	0	0	1.2-0.1
<i>Panthera tigris</i> Bengal tiger, white	-1.4	0	-1.4	0	0	1.4
<i>Acinonyx jubatus</i> Cheetah	1.1+1.2	0	0	1.1+1.0	0	+0.2
PROBOSCIDEA: 2 species — 3 specimens						
ELEPHANTIDAE						
<i>Elephas maximus indicus</i> Indian elephant	0.2	0	0	0.1	0	0.1
<i>Elephas maximus maximus</i> Ceylon elephant	0	0	0.1	0	0	0.1
<i>Loxodonta africana</i> <i>knochenhaueri</i> African bush elephant	0.1	0	0	0	0	0.1
<i>Loxodonta africana cyclotis</i> African forest elephant	1.0	0	0	-1.0	-1.0	0
PERISSODACTYLA: 5 species — 10 specimens						
EQUIDAE						
<i>Equus burchelli</i> Common zebra	1.1	0	0	0.1	0	1.0
TAPIRIDAE						
<i>Tapirus terrestris</i> South American tapir	1.1	0	0	0	0	1.1
RHINOCEROTIDAE						
<i>Ceratotherium simum cottoni</i> Northern white rhinoceros	-0.1	0	0	0	0	-0.1
<i>Diceros bicornis</i> Black rhinoceros	1.2	0	0	0	0	1.2
<i>Rhinoceros unicornis</i> Great Indian rhinoceros	2.1	0	0	0	0	1.1-1.0
ARTIODACTYLA: 19 species — 119 specimens						
HIPPOPOTAMIDAE						
<i>Choeropsis liberiensis</i> Pygmy hippopotamus	2.6-1.0	0.1	0	0	1.0	1.7-1.0
<i>Hippopotamus amphibius</i> Hippopotamus	1.1	0.1	0	0	0.1	1.1
CERVIDAE						
<i>Muntiacus reevesi</i> Reeves' muntjac	4.8+0.1-1.0	4.4	-1.0	3.1	2.6+0.1	4.5
<i>Cervus axis</i> Axis deer	1.0	0	0	0	1.0	0
<i>Cervus eldi thamin</i> Burmese brow- antlered deer	2.7	2.0.1(1)	0	0.1.1(1)	0	4.6
<i>Elaphurus davidianus</i> Père David's deer	2.3	0.1	0	1.0	0	1.4
<i>Mazama americana temama</i> Red brocket	1.1	0.1	0	0	0	1.2
<i>Rangifer tarandus</i> Reindeer	2.7	2.3	0	1.2	1.0	2.8

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<b>GIRAFFIDAE</b>						
<i>Giraffa camelopardalis</i>						
<i>tippelskirchi</i>						
Masai giraffe	1.5	2.1(1)	0	1.1(1)	0.1	2.4
<b>BOVIDAE</b>						
<i>Syncerus caffer</i>						
African buffalo	1.1	0	0	0	1.1	0
<i>Tragelaphus eurycerus</i>						
Bongo	1.2-0.1	(0.1)	0	(0.1)	0	1.2-0.1
<i>Tragelaphus strepsiceros</i>						
Greater kudu	1.3	1.2	0	1.1-0.1	0.1-0.2	1.1-0.1
<i>Cephalophus sylvicultor</i>						
Yellow-backed duiker	2.1	1.0	0	0	0	3.1
<i>Connochaetes taurinus</i>						
<i>albojubatus</i>						
White-bearded wildebeest	4.6	1.0	0	0	3.3	2.3
<i>Damaliscus dorcas phillipsi</i>						
Blesbok	0.3	0	1.0	1.2	0	0.1
<i>Hippotragus niger</i>						
Sable antelope	2.3-0.2	2.0	0	2.0	1.0	1.3-0.2
<i>Oryx dammah</i>						
Scimitar-horned oryx	3.2-2.2	2.0	0	0	2.0-1.0	2.2-3.2
<i>Gazella dama</i>						
Dama gazelle	0	0	1.0	0	0	1.0
<i>Gazella dorcas</i>						
Dorcas gazelle	4.11-2.6	4.0	1.0	3.0	1.2	5.9-2.6
<i>Madoqua kirki</i>						
Dik dik	2.6	1.3.1	0	0.4.1	0	3.5
<i>Capra falconeri</i>						
<i>cashmiriensis</i>						
Markhor	0	0	1.1	0	0	1.1
<i>Capra hircus</i>						
African pygmy goat	0	0	+0.1	0	0	+0.1

### Mammal Loans to National Zoological Park, Office of Animal Management (on hand December 31, 1976)

- 1.0 Tasmanian devil, *Sarcophilus harrisi*, from Chicago Zoological Park, Brookfield, Illinois.
- 0.1 Southern potoroo, *Potorous apicalis*, from Utica Zoological Park, Utica, New York.
- 0.1 Matschie's tree kangaroo, *Dendrolagus matschiei*, from New York Zoological Park, New York.
- 1.0 Red uakari, *Cacajao rubicundus*, from Milwaukee County Zoological Park, Milwaukee, Wisconsin.
- 0.1 Woolly monkey, *Lagothrix sp.*, from Mrs. Susan Halpern, 16 West Street, Succasunna, New Jersey.
- 2.2 Diana monkey, *Cercopithecus diana*, from Dr. Gordon L. Smith, R.R. #1, New Harmony, Indiana.
- 0.1 Black gibbon, *Hylobates concolor*, from Los Angeles Zoo, Los Angeles, California.
- 0.1 Black gibbon, *Hylobates concolor*, from San Francisco Zoological Gardens, San Francisco, California.
- 1.0 Spectacled bear, *Tremarctos ornatus*, from Baltimore Zoo, Baltimore, Maryland.
- 0.1 Ring-tailed mongoose, *Galidia elegans*, from New York Zoological Park, Bronx, New York.
- 1.0 Clouded leopard, *Neofelis nebulosa*, from Rare Feline Breeding Compound, Center Hill, Florida.
- 1.3 Atlas lion, *Panthera leo leo*, from Parque Zoologique National, Rabat, Morocco.
- 0.1 Cheetah, *Acinonyx jubatus*, from Baltimore Zoo, Baltimore, Maryland.
- 0.1 Cheetah, *Acinonyx jubatus*, from Cheyenne Mountain Zoological Park, Colorado Springs, Colorado.
- 0.1 Pygmy goat, *Capra hircus*, from Baltimore Zoo, Baltimore, Maryland.

**Mammal Loans from National Zoological Park,  
Office of Animal Management (as of December 31, 1976)**

- 1.2 Thick-tailed bushbaby, *Galago crassicaudatus*, to Seneca Park Zoo, Rochester, New York.
- 0.1 Black ape, *Macaca nigra*, to Houston Zoological Gardens, Houston, Texas.
- 0.1 Black ape, *Macaca nigra*, to Lincoln Park Zoo, Chicago, Illinois.
- 1.0 Lion-tailed macaque, *Macaca silenus*, to Randolph Park Zoo, Tucson, Arizona.
- 1.0 Lowland gorilla, *Gorilla g. gorilla*, to New York Zoological Park, Bronx, New York.
- 1.0 Orangutan, *Pongo pygmaeus*, to Cheyenne Mountain Zoo, Colorado Springs, Colorado.
- 1.0 Orangutan, *Pongo pygmaeus*, to Topeka Zoological Park, Topeka, Kansas.
- 0.1 Orangutan, *Pongo pygmaeus*, to Kansas City Zoo, Kansas City, Missouri.
- 1.0 Orangutan, *Pongo pygmaeus*, to Seneca Park Zoo, Rochester, New York.
- 0.1 Orangutan, *Pongo pygmaeus*, to Forth Worth Zoological Park, Fort Worth, Texas.
- 0.1 Orangutan, *Pongo pygmaeus*, to Woodland Park Zoo, Seattle, Washington.
- 0.1 Tamandua, *Tamandua tetradactyla*, to Houston Zoological Gardens, Houston, Texas.
- 2.1 Grey Wolf, *Canis lupus*, to French Creek Game Farm, French Creek, West Virginia.
- 1.0 Spectacled bear, *Tremarctos ornatus*, to Baltimore Zoo, Baltimore, Maryland.
- 1.0 Yellow-throated marten, *Martes flavigula*, to Chicago Zoological Park, Brookfield, Illinois.
- 1.0 Pampas cat, *Felis colocolo*, to Rotterdam Zoo, Rotterdam, Netherlands.
- 0.1 Bengal tiger, *Panthera tigris*, to Zoological Society of Cincinnati, Cincinnati, Ohio.
- 1.1 California sea lion, *Zalophus californianus*, to Zoological Society of Cincinnati, Cincinnati, Ohio.
- 0.1 Northern white rhinoceros, *Ceratotherium simum cottoni*, to San Diego Wild Animal Park, San Pasqual, California.
- 1.0 Great Indian rhinoceros, *Rhinoceros unicornis*, to New York Zoological Park, Bronx, New York.
- 1.0 Pygmy hippopotamus, *Cheoropsis liberiensis*, to Zoological Society of Cincinnati, Cincinnati, Ohio.
- 0.1 Bongo, *Tragelaphus euryceros*, to Gladys Porter Zoo, Brownsville, Texas.
- 0.1 Greater kudu, *Tragelaphus strepsiceros*, to Kings Dominion, Doswell, Virginia.
- 0.2 Sable antelope, *Hippotragus niger*, to New York Zoological Society, Saint Catherine's Island, Georgia.
- 2.1 Scimitar-horned oryx, *Oryx dammah*, to San Diego Wild Animal Park, San Pasqual, California.
- 0.1 Scimitar-horned oryx, *Oryx dammah*, to Kings Dominion, Doswell, Virginia.
- 1.0 Scimitar-horned oryx, *Oryx dammah*, to Kings Island, Kings Mills, Ohio.
- 2.6 Dorcas gazelle, *Gazella dorcas*, to Rare Animals Survival Center, Ocala, Florida.

**Mammal Collection 31 December 1976**  
**National Zoological Park**  
**Office of Zoological Research**

TOTALS: (Only specimens owned by the National Zoological Park are included.)

ORDERS: 6

FAMILIES: 13

SPECIES: 20

SPECIMENS: 224

LEGEND: 1.1.1 = males, females, undetermined sex  
-1.1 = specimens on loan from National Zoological Park  
+1.1 = specimens on loan to National Zoological Park  
(1) = stillbirth; not included in adjacent figure  
\* = not conceived at National Zoological Park

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<b>MARSUPIALIA:</b>						
0 Species — 0 specimens						
<b>DASYURIDAE</b>						
<i>Sarcophilus harrisii</i> Tasmanian devil	+1.1	0	0	+0.1	+1.0	0
<b>INSECTIVORA:</b>						
4 species — 29 specimens						
<b>SOLENOTODONTIDAE</b>						
<i>Solenodon paradoxus</i> Haitian solenodon	+1.0	0	0	+1.0	0	0
<b>TENRECIDAE</b>						
<i>Microgale talazaci</i> Tenrec	1.3	0	0	1.2	0	0.1
<b>MACROSCOLIDIDAE</b>						
<i>Elephantulus rufescens</i> Elephant shrew	0	1.0.1	11.14	1.1.1	0	11.13
<i>Petrodromus tetradactylus</i> Four-toed elephant shrew	0	0	2.5	1.2	0	1.3
<i>Rhynchocyon chrysopygus</i> Elephant shrew	0	0	0.1	0.1	0	0
<b>CHIROPTERA:</b>						
2 species — 26 specimens						
<b>PHYLLOSTOMATIDAE</b>						
<i>Carollia castanea</i> Short-tailed bat	1.0	0	0	0	0	1.0
<i>Carollia perspicillata</i> Short-tailed bat	9.9	8.7	0	7.4	0	10.12
<i>Glossophaga soricina</i> Long-tailed bat	2.1	• 0	0	0	0	2.1
<b>PRIMATES:</b>						
1 species — 16 specimens						
<b>CALLITRICHIDAE</b>						
<i>Leontideus r. rosalia</i> Golden lion marmoset	7.6+1.0	2.4.2	0	1.4	0	8.6.2+1.0
<b>EDENTATA:</b>						
1 species — 4 specimens						
<b>BRADYPODIDAE</b>						
<i>Choloepus didactylus</i> Two-toed sloth	1.3	0	0	0	0	1.3
<b>DASYPODIDAE</b>						
<i>Cabassous centralis</i> Naked-tailed armadillo	1.1	0	0	1.1	0	0
<b>RODENTIA:</b>						
10 species — 149 specimens						
<b>CRICETIDAE</b>						
<i>Tylomys nudicaudus</i> Peters' climbing rat	13.5	4.0.2	0	7.3.2	2.2	7.2
<i>Scotinomys teguina</i> Alston's brown mouse	5.4	0	0	0.1	-5.3	-5.3
<b>MURIDAE</b>						
<i>Rhodomys pumilio</i> Four-striped rat	0	0.0.2	2.2	0	0	2.2.2
<b>ERETHIZONTIDAE</b>						
<i>Coendou prehensilis</i> Prehensile-tailed porcupine	2.1	0	0	1.0	0	1.1
<b>CAVIDAE</b>						
<i>Dolichotis salinicola</i> Mara	3.4	1.1	0	1.2	0	3.3

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
<b>DASYPROCTIDAE</b>						
<i>Myoprocta pratti</i> Acouchi	12.10	0	0	1.0	6.7	5.3
<b>CHINCHILLIDAE</b>						
<i>Chinchilla laniger</i> Chinchilla	0.2	0	0	0	0	0.2
<i>Lagidium peruanum</i> Mountain viscacha	0.1	0.0.1	0	0.1.1	0	0
<b>CAPROMYIDAE</b>						
<i>Capromys pilorides</i> Desmarest's hutia	2.3	0	0.2	0.1	0	2.4
<i>Plagiodontia aedium</i> Cuvier's hutia	4.4	0.1	0	0	1.1	3.4
<b>OCTODONTIDAE</b>						
<i>Octodon degus</i> Degu	51.36	15.20	0	7.4	15.14	42.38
<i>Octodontomys gliroides</i> Boris	7.11	1.1.4	0	2.4.4	-0.1	6.7-0.1
<i>Spalacopus cyanus</i> Cururo	1.0	0	0	0	-1.0	-1.0
<b>CARNIVORA:</b>						
0 species — 0 specimens						
<b>VIVERRIDAE</b>						
<i>Galidia elegans</i> Ring-tailed mongoose	1.0+0.1	0	0	0	1.0+0.1	0

**Mammal Loans to Office of Zoological Research,  
National Zoological Park (on hand December 31, 1976)**

1.0 Golden lion marmoset, *Leontideus r. rosalia*, from Monkey Jungle, Goulds, Florida.

**Mammal Loans From Office of Zoological Research,  
National Zoological Park (as of December 31, 1976)**

5.3 Alston's brown mouse, *Scotinomys teguina*, to Dr. Ed Buchler, Department of Zoology,  
University of Maryland.

0.1 Boris, *Octodontomys gliroides*, to Dr. Charles Woods, Department of Zoology, University of  
Vermont.

1.0 Cururo, *Spalacopus cyanus*, to Dr. Charles Woods, Department of Zoology, University of  
Vermont.

**Mammal Collection 31 December 1976**  
**National Zoological Park**  
**Conservation and Research Center**

TOTALS: (Only specimens owned by the National Zoological Park are included.)

ORDERS:	4
FAMILIES:	7
SPECIES:	12
SPECIMENS:	81

LEGEND: 1.1.1 = males, females, undetermined sex  
-1.1 = specimens on loan **from** National Zoological Park  
+1.1 = specimens on loan **to** National Zoological Park  
(1) = stillbirth; not included in adjacent figure  
\* = not conceived at National Zoological Park

	Status 31 Dec. 75	Born (Stillborn)	Other Acquisition	Died (Stillborn)	Other Disposition	Status 31 Dec. 76
PRIMATES:						
1 species — 4 specimens						
CALLITRICHIDAE						
<i>Leontideus r. rosalia</i>						
Golden lion marmoset	0	0	2.2	0	0	2.2
CARNIVORA:						
4 species — 25 specimens						
CANIDAE						
<i>Cerdocyon thous</i>						
Crab-eating fox	2.3	5.7	0	1.1	0	6.9
<i>Chrysocyon brachyurus</i>						
Maned wolf	2.2	0.0.2	0	1.0.1	0	1.2.1
<i>Speothos venaticus</i>						
Bush dog	1.1+1.0	2.3	+2.1	2.3	+1.0	1.1+2.1
VIVERRIDAE						
<i>Arctictis binturong</i>						
Binturong	0	0	2.2+0.1	0	0	2.2+0.1
PERISSODACTYLA:						
1 species — 10 specimens						
EQUIDAE						
<i>Equus burchelli</i>						
Common zebra	2.6	0.3	0	0.1	0	2.8
<i>Equus hemionus onager</i>						
Persian onager	+2.2	0	+1.1	0	0	+3.3
ARTIODACTYLA:						
6 species — 42 specimens						
CAMELIDAE						
<i>Camelus bactrianus</i>						
Bactrian camel	1.1+2.7	0	+1.1	+0.1	0	1.1+3.7
CERVIDAE						
<i>Cervus eldi thamin</i>						
Burmese brow- antlered deer	2.1	0.0.1	0	0	0	2.1.1
<i>Muntiacus reevesi</i>						
Reeves' muntjac	0	0.1.2	5.6+0.1	1.0.1	0	4.7+1.0.1
<i>Elaphurus davidianus</i>						
Pere David's deer	6.7+2.7	1.2	0	2.1	0	5.8+2.7
BOVIDAE						
<i>Bison bonansus bonansus</i>						
Wisent	0	0	1.0	0	0	1.0
<i>Oryx dammah</i>						
Scimitar-horned oryx	1.5	3.1	0	0	0	4.6

### Mammal Loans to Conservation and Research Center, National Zoological Park (on hand December 31, 1976)

- 1.1 Bush dog, *Speothos venaticus*, from Frankfurt Zoo, Frankfurt, West Germany.
- 1.0 Bush dog, *Speothos venaticus*, from Los Angeles Zoo, Los Angeles, California.
- 0.1 Binturong, *Arctictis binturong*, from Buffalo Zoological Gardens, Buffalo, New York.
- 1.1 Persian onager, *Equus hemionus onager*, from Los Angeles Zoo, Los Angeles, California.
- 1.1 Persian onager, *Equus hemionus onager*, from San Diego Zoo, San Diego, California.
- 1.1 Persian onager, *Equus hemionus onager*, from Baltimore Zoo, Baltimore, Maryland.
- 1.7 Bactrian camel, *Camelus bactrianus*, from Minnesota Zoological Gardens, Apple Valley, Minnesota.
- 1.0 Bactrian camel, *Camelus bactrianus*, from Cleveland Zoological Park, Cleveland, Ohio.
- 1.0 Bactrian camel, *Camelus bactrianus*, from San Antonio Zoological Gardens, San Antonio, Texas.
- 0.1 Reeves' muntjac, *Muntiacus reevesi*, from Mr. S. Dillon Ripley, Litchfield, Connecticut.
- 2.7 Pere David's deer, *Elaphurus davidianus*, from New York Zoological Park, Bronx, New York.

**Table 1**  
**National Zoological Park**  
**Office of Animal Pathology**  
**Mortality - 1976**

Categories of Death	Reptiles & Amphibians	Birds	Mammals
Congenital	0	0	1
Familial	0	0	0
Perinatal	4	53	54
Infectious	6	69	12
Protozoan	0	0	1
Parasitism	3	6	2
Toxicities	0	0	0
Physical Agents	1	3	0
Stress	5	4	12
Trauma	1	47	12
Circulatory	2	1	3
Immunologic	0	8	3
Metabolic	3	2	1
Nutritional	20	14	2
Peritoneum	1	2	1
Integument	2	0	0
Musculoskeletal	0	1	1
Respiratory	2	7	14
Cardiovascular	0	10	2
Digestive	6	14	7
Urinary	3	2	10
Reproductive	1	3	2
Endocrine	0	0	0
Sensory (eye, ear)	0	0	0
Central Nervous	0	0	1
Hemic	0	0	0
Tumors	3	1	3
Euthanasia	4	46	14
Iatrogenic	0	2	2
Not evident	5	25	17
Undetermined, autolyzed	12	20	8
Undetermined, no carcass	<u>14</u>	<u>10</u>	<u>17</u>
	98	350	197

**Table 2**  
**Mortality by Month and Stay, 1976**

**Amphibians and Reptiles**

Order or Family	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Caudata	3	0	0	0	0	1	0	0	0	0	1	1	0	0	0	3	0
Chelonia	16	0	1	1	2	0	3	2	0	1	2	2	2	0	3	13	0
Crocodylia	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0
Salientia	15	0	0	1	2	0	2	5	0	2	1	1	1	0	3	12	0
Sauria	39	3	3	5	3	3	1	6	1	5	5	1	3	0	10	29	0
Serpentes	23	2	1	1	1	5	0	2	2	1	2	3	3	0	2	21	0
<b>TOTAL</b>	<b>98</b>	<b>6</b>	<b>5</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>6</b>	<b>15</b>	<b>4</b>	<b>9</b>	<b>11</b>	<b>8</b>	<b>9</b>	<b>0</b>	<b>18</b>	<b>80</b>	<b>0</b>

**Birds**

	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Anseriformes	155	7	4	6	14	32	30	23	15	5	12	5	2	0	80	75	0
Caprimulgiformes	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Casuariiformes	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0
Charadriiformes	8	0	0	0	0	1	1	0	2	1	0	1	2	0	0	8	0
Ciconiiformes	7	1	0	0	1	1	0	0	2	0	0	1	1	0	0	7	0
Columbiformes	15	2	0	0	0	1	2	2	0	0	4	1	3	0	1	14	0
Coraciiformes	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0
Cuculiformes	4	0	0	0	0	0	0	0	3	0	0	1	0	0	2	2	0
Falconiformes	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Galliformes	84	3	5	4	9	6	9	12	1	1	7	4	23	0	16	68	0
Gruiformes	8	1	1	0	1	1	1	1	0	0	0	0	2	0	1	7	0
Passeriformes	31	5	2	2	3	2	1	0	1	1	11	1	2	0	0	31	0
Piciformes	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
Psittaciformes	12	3	3	2	0	0	0	2	2	0	0	0	0	0	0	12	0
Rheiformes	9	0	0	0	0	0	0	4	2	1	0	2	0	0	3	6	0
Strigiformes	4	1	0	0	1	0	0	0	0	0	0	1	1	0	0	4	0
Struthioniformes	3	0	1	0	2	0	0	0	0	0	0	0	0	0	3	0	0
Tinamiformes	2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	0
<b>TOTAL</b>	<b>350</b>	<b>24</b>	<b>16</b>	<b>15</b>	<b>31</b>	<b>46</b>	<b>44</b>	<b>44</b>	<b>31</b>	<b>10</b>	<b>35</b>	<b>17</b>	<b>37</b>	<b>0</b>	<b>108</b>	<b>242</b>	<b>0</b>

**Mammals**

	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Ailuropodidae	3	0	0	0	0	0	1	0	2	0	0	0	0	0	1	2	0
Bovidae	18	3	0	4	2	2	1	0	1	1	0	2	2	0	6	12	0
Camelidae	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Canidae	10	0	1	0	0	0	0	0	1	0	2	5	1	0	7	3	0
Cervidae	16	2	0	3	2	0	2	3	1	0	2	1	0	0	6	9	1
Chiroptera	9	0	0	0	1	0	1	0	1	2	1	3	0	0	3	6	0
Edentata	3	1	0	0	0	1	0	0	0	1	0	0	0	0	0	3	0
Equidae	2	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3	0
Felidae	3	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0
Giraffidae	3	0	0	0	0	0	0	0	1	2	0	0	0	0	3	0	0
Insectivora	16	1	0	1	0	1	2	4	3	1	1	2	0	0	8	8	0
Marsupialia	7	1	1	1	1	0	0	1	0	0	1	1	0	0	1	6	0
Mustelidae	7	1	1	3	0	2	0	0	0	0	0	0	0	0	6	1	0
Primates	26	4	2	2	2	3	4	2	0	0	2	2	3	0	12	14	0
Proboscidea	2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0
Procyonidae	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Rodentia	62	4	7	3	7	3	1	4	5	3	8	6	11	0	20	42	0
Ursidae	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Viverridae	5	1	0	0	0	0	2	0	0	2	0	0	0	0	4	1	0
<b>TOTAL</b>	<b>197</b>	<b>21</b>	<b>12</b>	<b>17</b>	<b>16</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>16</b>	<b>13</b>	<b>18</b>	<b>24</b>	<b>19</b>	<b>0</b>	<b>80</b>	<b>116</b>	<b>1</b>

**Table 1**  
**National Zoological Park**  
**Office of Animal Pathology**  
**Mortality - 1976**

Categories of Death	Reptiles & Amphibians	Birds	Mammals
Congenital	0	0	1
Familial	0	0	0
Perinatal	4	53	54
Infectious	6	69	12
Protozoan	0	0	1
Parasitism	3	6	2
Toxicities	0	0	0
Physical Agents	1	3	0
Stress	5	4	12
Trauma	1	47	12
Circulatory	2	1	3
Immunologic	0	8	3
Metabolic	3	2	1
Nutritional	20	14	2
Peritoneum	1	2	1
Integument	2	0	0
Musculoskeletal	0	1	1
Respiratory	2	7	14
Cardiovascular	0	10	2
Digestive	6	14	7
Urinary	3	2	10
Reproductive	1	3	2
Endocrine	0	0	0
Sensory (eye, ear)	0	0	0
Central Nervous	0	0	1
Hemic	0	0	0
Tumors	3	1	3
Euthanasia	4	46	14
Iatrogenic	0	2	2
Not evident	5	25	17
Undetermined, autolyzed	12	20	8
Undetermined, no carcass	<u>14</u>	<u>10</u>	<u>17</u>
	98	350	197

**Table 2**  
**Mortality by Month and Stay, 1976**

**Amphibians and Reptiles**

Order or Family	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Caudata	3	0	0	0	0	1	0	0	0	0	1	1	0	0	0	3	0
Chelonia	16	0	1	1	2	0	3	2	0	1	2	2	2	0	3	13	0
Crocodylia	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0
Salientia	15	0	0	1	2	0	2	5	0	2	1	1	1	0	3	12	0
Sauria	39	3	3	5	3	3	1	6	1	5	5	1	3	0	10	29	0
Serpentes	23	2	1	1	1	5	0	2	2	1	2	3	3	0	2	21	0
<b>TOTAL</b>	<b>98</b>	<b>6</b>	<b>5</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>6</b>	<b>15</b>	<b>4</b>	<b>9</b>	<b>11</b>	<b>8</b>	<b>9</b>	<b>0</b>	<b>18</b>	<b>80</b>	<b>0</b>

**Birds**

	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Anseriformes	155	7	4	6	14	32	30	23	15	5	12	5	2	0	80	75	0
Caprimulgiformes	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Casuariiformes	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0
Charadriiformes	8	0	0	0	0	1	1	0	2	1	0	1	2	0	0	8	0
Ciconiiformes	7	1	0	0	1	1	0	0	2	0	0	1	1	0	0	7	0
Columbiformes	15	2	0	0	0	1	2	2	0	0	4	1	3	0	1	14	0
Coraciiformes	2	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0
Cuculiformes	4	0	0	0	0	0	0	0	3	0	0	1	0	0	2	2	0
Falconiformes	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Galliformes	84	3	5	4	9	6	9	12	1	1	7	4	23	0	16	68	0
Gruiformes	8	1	1	0	1	1	1	1	0	0	0	0	2	0	1	7	0
Passeriformes	31	5	2	2	3	2	1	0	1	1	11	1	2	0	0	31	0
Piciformes	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
Psittaciformes	12	3	3	2	0	0	0	2	2	0	0	0	0	0	0	12	0
Rheiformes	9	0	0	0	0	0	0	4	2	1	0	2	0	0	3	6	0
Strigiformes	4	1	0	0	1	0	0	0	0	0	0	1	1	0	0	4	0
Struthioniformes	3	0	1	0	2	0	0	0	0	0	0	0	0	0	3	0	0
Tinamiformes	2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	0
<b>TOTAL</b>	<b>350</b>	<b>24</b>	<b>16</b>	<b>15</b>	<b>31</b>	<b>46</b>	<b>44</b>	<b>44</b>	<b>31</b>	<b>10</b>	<b>35</b>	<b>17</b>	<b>37</b>	<b>0</b>	<b>108</b>	<b>242</b>	<b>0</b>

**Mammals**

	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Ailuropodidae	3	0	0	0	0	0	1	0	2	0	0	0	0	0	1	2	0
Bovidae	18	3	0	4	2	2	1	0	1	1	0	2	2	0	6	12	0
Camelidae	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Canidae	10	0	1	0	0	0	0	0	1	0	2	5	1	0	7	3	0
Cervidae	16	2	0	3	2	0	2	3	1	0	2	1	0	0	6	9	1
Chiroptera	9	0	0	0	1	0	1	0	1	2	1	3	0	0	3	6	0
Edentata	3	1	0	0	0	1	0	0	0	1	0	0	0	0	0	3	0
Equidae	2	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0
Felidae	3	0	0	0	0	1	0	0	0	0	0	1	1	0	0	3	0
Giraffidae	3	0	0	0	0	0	0	0	1	2	0	0	0	0	3	0	0
Insectivora	16	1	0	1	0	1	2	4	3	1	1	2	0	0	8	8	0
Marsupialia	7	1	1	1	1	0	0	1	0	0	1	1	0	0	1	6	0
Mustelidae	7	1	1	3	0	2	0	0	0	0	0	0	0	0	6	1	0
Primates	26	4	2	2	2	3	4	2	0	0	2	2	3	0	12	14	0
Proboscidea	2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0
Procyonidae	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Rodentia	62	4	7	3	7	3	1	4	5	3	8	6	11	0	20	42	0
Ursidae	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Viverridae	5	1	0	0	0	0	2	0	0	2	0	0	0	0	4	1	0
<b>TOTAL</b>	<b>197</b>	<b>21</b>	<b>12</b>	<b>17</b>	<b>16</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>16</b>	<b>13</b>	<b>18</b>	<b>24</b>	<b>19</b>	<b>0</b>	<b>80</b>	<b>116</b>	<b>1</b>

**Table 2**  
**Mortality by Month and Stay, 1976**

**Amphibians and Reptiles**

Order or Family	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Caudata	3	0	0	0	0	1	0	0	0	0	1	1	0	0	0	3	0
Chelonia	16	0	1	1	2	0	3	2	0	1	2	2	2	0	3	13	0
Crocodylia	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0
Salientia	15	0	0	1	2	0	2	5	0	2	1	1	1	0	3	12	0
Sauria	39	3	3	5	3	3	1	6	1	5	5	1	3	0	10	29	0
Serpentes	23	2	1	1	1	5	0	2	2	1	2	3	3	0	2	21	0
<b>TOTAL</b>	<b>98</b>	<b>6</b>	<b>5</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>6</b>	<b>15</b>	<b>4</b>	<b>9</b>	<b>11</b>	<b>8</b>	<b>9</b>	<b>0</b>	<b>18</b>	<b>80</b>	<b>0</b>

Birds	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Anseriformes	155	7	4	6	14	32	30	23	15	5	12	5	2	0	80	75	0
Caprimulgiformes	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Casuariiformes	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0
Charadriiformes	8	0	0	0	0	1	1	0	2	1	0	1	2	0	0	8	0
Ciconiiformes	7	1	0	0	1	1	0	0	2	0	0	1	1	0	0	7	0
Columbiformes	15	2	0	0	0	1	2	2	0	0	4	1	3	0	1	14	0
Coraciiformes	2	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0
Cuculiformes	4	0	0	0	0	0	0	0	3	0	0	1	0	0	2	2	0
Falconiformes	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Galliformes	84	3	5	4	9	6	9	12	1	1	7	4	23	0	16	68	0
Gruiformes	8	1	1	0	1	1	1	1	0	0	0	0	2	0	1	7	0
Passeriformes	31	5	2	2	3	2	1	0	1	1	11	1	2	0	0	31	0
Piciformes	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
Psittaciformes	11	3	3	2	0	0	0	2	2	0	0	0	0	0	0	12	0
Rheiformes	9	0	0	0	0	0	0	4	2	1	0	2	0	0	3	6	0
Strigiformes	4	1	0	0	1	0	0	0	0	0	0	1	1	0	0	4	0
Struthioniformes	3	0	1	0	2	0	0	0	0	0	0	0	0	0	3	0	0
Tinamiformes	2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	0
<b>TOTAL</b>	<b>350</b>	<b>24</b>	<b>16</b>	<b>15</b>	<b>31</b>	<b>46</b>	<b>44</b>	<b>44</b>	<b>31</b>	<b>10</b>	<b>35</b>	<b>17</b>	<b>37</b>	<b>0</b>	<b>108</b>	<b>242</b>	<b>0</b>

Mammals	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Month of Death Unk	Stay Less Than 30 days	Stay More Than 30 days	Stay Unknown
Ailuropodidae	3	0	0	0	0	0	1	0	2	0	0	0	0	0	1	2	0
Bovidae	18	3	0	4	2	2	1	0	1	1	0	2	2	0	6	12	0
Camelidae	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Canidae	10	0	1	0	0	0	0	0	1	0	2	5	1	0	7	3	0
Cervidae	16	2	0	3	2	0	2	3	1	0	2	1	0	0	6	9	1
Chiroptera	9	0	0	0	1	0	1	0	1	2	1	3	0	0	3	6	0
Edentata	3	1	0	0	0	1	0	0	0	1	0	0	0	0	0	3	0
Equidae	2	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0
Felidae	3	0	0	0	0	1	0	0	0	0	0	1	1	0	0	3	0
Giraffidae	3	0	0	0	0	0	0	0	1	2	0	0	0	0	3	0	0
Insectivora	16	1	0	1	0	1	2	4	3	1	1	2	0	0	8	8	0
Marsupialia	7	1	1	1	1	0	0	1	0	0	1	1	0	0	1	6	0
Mustelidae	7	1	1	3	0	2	0	0	0	0	0	0	0	0	6	1	0
Primates	26	4	2	2	2	3	4	2	0	0	2	2	3	0	12	14	0
Proboscidea	2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0
Procyonidae	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Rodentia	62	4	7	3	7	3	1	4	5	3	8	6	11	0	20	42	0
Ursidae	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Viverridae	5	1	0	0	0	0	2	0	0	2	0	0	0	0	4	1	0
<b>TOTAL</b>	<b>197</b>	<b>21</b>	<b>12</b>	<b>17</b>	<b>16</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>16</b>	<b>13</b>	<b>18</b>	<b>24</b>	<b>19</b>	<b>0</b>	<b>80</b>	<b>116</b>	<b>1</b>

## Mortality by Month, Static Collection, 1976\*

### Amphibians and Reptiles

Order and Family	# Deaths	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Caudata	3	0	0	0	0	1	0	0	0	0	1	1	0
Chelonia	13	0	1	1	1	0	2	2	0	1	2	1	2
Crocodylia	2	1	0	0	0	0	0	0	1	0	0	0	0
Salientia	12	0	0	1	1	0	1	5	0	2	1	0	1
Sauria	29	3	3	5	2	2	0	1	1	3	5	1	3
Serpentes	21	2	1	1	0	5	0	1	2	1	2	3	3
<b>TOTAL</b>	<b>80</b>	<b>6</b>	<b>5</b>	<b>8</b>	<b>4</b>	<b>8</b>	<b>3</b>	<b>9</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>6</b>	<b>9</b>

### Birds

Anseriformes	75	5	3	4	7	19	7	6	4	1	12	5	2
Caprimulgiformes	1	0	0	0	0	0	0	0	1	0	0	0	0
Casuariiformes	2	1	0	0	0	0	0	0	0	1	0	0	0
Charadriiformes	8	0	0	0	0	1	1	0	2	1	0	1	2
Cinconiiformes	7	1	0	0	1	1	0	0	2	0	0	1	1
Columbiformes	14	2	0	0	0	1	2	2	0	0	4	1	2
Coraciiformes	1	0	0	1	0	0	0	0	0	0	0	0	0
Cuculiformes	2	0	0	0	0	0	0	0	1	0	0	1	0
Falconiformes	1	0	0	0	0	0	0	0	0	1	0	0	0
Galliformes	68	3	5	3	9	5	2	4	1	2	7	4	23
Gruiformes	7	1	1	0	1	1	1	0	0	0	0	0	2
Passeriformes	31	5	2	2	3	2	1	0	1	1	11	1	2
Piciformes	1	0	0	0	0	0	0	0	1	0	0	0	0
Psittaciformes	12	3	3	2	0	0	0	2	2	0	0	0	0
Rheiformes	6	0	0	0	0	0	0	1	2	1	0	2	0
Strigiformes	4	1	0	0	1	0	0	0	0	0	0	1	1
Tinamiformes	2	0	0	0	0	1	0	0	0	0	0	0	1
<b>TOTAL</b>	<b>242</b>	<b>22</b>	<b>14</b>	<b>12</b>	<b>22</b>	<b>31</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>7</b>	<b>34</b>	<b>17</b>	<b>36</b>

### Mammals

Ailuropodidae	2	0	0	0	0	0	0	0	2	0	0	0	0
Bovidae	12	3	0	3	1	1	0	0	1	1	0	1	1
Camelidae	1	0	0	0	0	0	0	0	0	0	1	0	0
Canidae	3	0	0	0	0	0	0	0	1	0	1	1	0
Cervidae	9	1	0	3	0	0	2	1	0	0	1	1	0
Chiroptera	6	0	0	0	1	0	0	0	1	1	1	2	0
Edentata	3	1	0	0	0	1	0	0	0	1	0	0	0
Equidae	2	0	0	0	1	0	0	0	0	0	0	1	0
Felidae	3	0	0	0	0	1	0	0	0	0	0	1	1
Insectivora	8	1	0	1	0	0	0	1	1	1	1	2	0
Marsupialia	6	1	1	0	1	0	0	1	0	0	1	1	0
Mustelidae	1	1	0	0	0	0	0	0	0	0	0	0	0
Primates	14	1	1	1	0	2	0	1	0	1	2	2	3
Proboscidea	2	0	0	0	0	0	0	0	0	1	0	0	1
Procyonidae	1	0	0	0	0	0	0	0	1	0	0	0	0
Rodentia	42	3	5	3	2	2	1	4	3	2	4	4	8
Viverridae	1	0	0	0	0	0	0	0	0	1	0	0	0
<b>TOTAL</b>	<b>116</b>	<b>12</b>	<b>7</b>	<b>11</b>	<b>6</b>	<b>7</b>	<b>3</b>	<b>8</b>	<b>10</b>	<b>9</b>	<b>12</b>	<b>16</b>	<b>24</b>

\* Excludes dead animals accessioned less than 30 days.

**Table 3**  
**Cause of Death by Order/Family, 1976**

**Amphibians & Reptiles**

No. Affected	Diagnosis
	CAUDATA
1	Integument, skin necrosis
1	Not evident
<u>1</u>	Undetermined, no carcass
3	
	CHELONIA
1	Circulator, anasarca
1	Digestive, enterocolitis
1	Digestive, hepatitis, necrotic
1	Euthanasia, ulcerative, shell disease
1	Metabolic, metastatic calcification
1	Peritoneum, peritonitis
1	Reproductive, eggbound
6	Undetermined, autolyzed
<u>3</u>	Undetermined, no carcass
16	
	CROCODYLIA
1	Metabolic, gout
<u>1</u>	Stress, exposure, cold
2	
	SALIENTIA
1	Not evident
5	Nutritional, inanition
1	Respiratory, pneumonia
1	Stress
1	Trauma, undetermined
1	Tumor, leukemia
2	Undetermined, autolyzed
<u>3</u>	Undetermined, no carcass
15	
	SAURIA
1	Circulatory, dehydration
2	Digestive, gastrolithiasis
1	Infectious, bacterial, sepsis
1	Infectious, viral, herpetic-like, disseminated
3	Not evident
10	Nutritional, inanition
1	Parasitism, intestinal, helminths
1	Parasitism, microfilaria
1	Parasitism, multiple
1	Perinatal, inanition
3	Perinatal, not evident
1	Physical agent, drowning
1	Respiratory, pneumonia
2	Stress, multiple factors
1	Tumor, bile duct adenocarcinoma
3	Undetermined, autolyzed
4	Undetermined, no carcass
1	Urinary, nephritis
<u>1</u>	Urinary, nephrosis
39	

No. Affected	Diagnosis
	SERPENTES
2	Digestive, colitis, necrotic, bacterial
1	Euthanasia, failure to feed
1	Euthanasia, scoliosis
1	Euthanasia, neuropathy
1	Infectious, bacterial, <i>Aeromonas hydrophila</i>
1	Infectious, bacterial, sepsis, <i>Pseudomonas aeruginosa</i>
1	Infectious, protozoan, <i>Cryptosporidia sp.</i>
1	Infectious, viral suspect
1	Metabolic, metastatic calcification
5	Nutritional, inanition
2	Stress
1	Tumor, leukemia, lymphocytic
1	Undetermined, autolyzed
3	Undetermined, no carcass
1	Urinary, glomerulosclerosis
23	

## Birds

No. Affected	Diagnosis
	ANSERIFORMES
1	Digestive, enteritis
1	Digestive, enteritis, acute
1	Digestive, gizzard, foreign body
1	Digestive, hepatic necrosis
1	Digestive, impaction
1	Digestive, intestinal, hemorrhage
1	Digestive, proventriculus, rupture
10	Euthanasia, cull
1	Euthanasia, eye infection
1	Iatrogenic, pulmonary hemorrhage
4	Immunologic, amyloidosis
1	Infectious, bacterial, <i>E. coli</i>
2	Infectious, bacterial, endocarditis, <i>Staphylococcus aureus</i>
3	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Infectious, bacterial, pneumonia
1	Infectious, bacterial, sepsis
3	Infectious, bacterial, sepsis, <i>Streptococcus sp.</i>
2	Infectious, bacterial, septicemia, <i>Streptococcus sp.</i>
4	Infectious, bacterial, <i>Streptococcus sp.</i>
1	Infectious, fungal, aspergillosis
1	Infectious, fungal, <i>Aspergillus flavus</i>
4	Infectious, fungal, <i>Aspergillus fumigatus</i>
3	Infectious, fungal, <i>Aspergillus sp.</i>
1	Infectious, no agent
1	Musculoskeletal, torticollis
10	Not evident
7	Nutritional, inanition
4	Perinatal, autolyzed
6	Perinatal, drowning
1	Perinatal, gout
1	Perinatal, intestinal hemorrhage
1	Perinatal, nephrosis, urate
6	Perinatal, not evident
1	Perinatal, pharyngeal obstruction
1	Perinatal, pulmonary hemorrhage
2	Perinatal, retained yolk sac
1	Perinatal, sepsis
10	Perinatal, stress
1	Perinatal, trauma
1	Perinatal, trauma, restraint
1	Perinatal, undetermined
1	Physical agent, drowning
1	Physical agent, oil

No. Affected	Diagnosis
1	Reproductive, egg bound
1	Reproductive, impacted egg
1	Respiratory, bronchitis
1	Respiratory, pneumonia
2	Respiratory, pneumonitis
1	Respiratory, pulmonary edema
1	Stress
2	Trauma, accidental
11	Trauma, predator
2	Trauma, predator, presumptive
2	Trauma, predator, suspect
1	Trauma, self
5	Trauma, undetermined
5	Trauma, vandalism
4	Undetermined, autolyzed
8	Undetermined, no carcass
155	
	CAPRIMULGIFORMES
1	Infectious, bacterial, <i>Mycobacterium avium</i>
1	
	CASUARIIFORMES
1	Cardiovascular, myocarditis
1	Circulatory, congestive heart failure
2	
	CHARADRIIFORMES
1	Digestive, esophageal hemorrhage
1	Euthanasia, CNS disturbance
1	Euthanasia, TB suspect
1	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Not evident
1	Nutritional, inanition
1	Trauma, vandalism
1	Undetermined, autolyzed
8	
	CICONIIFORMES
1	Cardiovascular, myocarditis, acute
1	Not evident
1	Trauma, self
1	Trauma, undetermined
2	Trauma, vandalism
1	Urinary, nephrosis
7	
	COLUMBIFORMES
1	Cardiovascular, myocarditis
3	Euthanasia, tuberculosis
5	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Not evident
1	Nutritional, inanition
1	Perinatal, not evident
1	Trauma, cagemate
1	Trauma, undetermined
1	Undetermined, autolyzed
15	
	CORACIIFORMES
2	Cardiovascular, atherosclerosis
2	
	CUCULIFORMES
1	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Peritoneum, peritonitis, bacterial
2	Perinatal, undetermined
4	

No. Affected	Diagnosis
	FALCONIFORMES
<u>1</u>	Cardiovascular, aortic, aneurysm, ruptured
1	
	GALLIFORMES
1	Cardiovascular, endocarditis
1	Euthanasia
2	Euthanasia, cull
1	Euthanasia, splayed legs
16	Euthanasia, TB suspect
3	Immunologic, amyloidosis
11	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Infectious, bacterial, sepsis, suspect
1	Infectious, fungal, <i>Candida sp.</i>
1	Metabolic, gout
7	Not evident
2	Nutritional, inanition
1	Parasitism, cestodes, liver
1	Parasitism, <i>Heterakis isolanche</i>
1	Parasitism, <i>Heterakis sp.</i>
1	Parasitism, trematode, kidney
4	Perinatal, autolyzed
4	Perinatal, sepsis, presumed
1	Peritoneum, peritonitis, acute
1	Reproductive, eggbound
1	Reproductive, necrotic ova
1	Respiratory, sinusitis
1	Respiratory, sinusitis, suspect
1	Stress, restraint
1	Stress, transit
2	Trauma, accidental
4	Trauma, cagemate
1	Trauma, cagemate, presumptive
1	Tumor, mesothelioma
8	Undetermined, autolyzed
<u>2</u>	Undetermined, no carcass
84	
	GRUIFORMES
1	Euthanasia, tuberculosis
1	Iatrogenic, anesthetic
4	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Perinatal, undetermined
<u>1</u>	Undetermined, autolyzed
8	
	PASSERIFORMES
1	Cardiovascular, myocardial infarction
1	Cardiovascular, myocarditis
1	Digestive, hemorrhage
1	Digestive, hepatitis
2	Euthanasia
3	Euthanasia, TB suspect
1	Euthanasia, tuberculosis
1	Immunologic, amyloidosis
9	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Infectious, fungal, <i>Aspergillus sp.</i>
3	Nutritional, inanition
1	Parasitism, cestodiasis
1	Physical agent, gangrenous leg
1	Trauma, accidental
1	Trauma, self
<u>3</u>	Undetermined, autolyzed
31	
	PICIFORMES
1	Digestive, hemachromatosis
<u>1</u>	Not evident
2	

No. Affected	Diagnosis
<b>PSITTACIFORMES</b>	
4	Infectious, bacterial, <i>Mycobacterium avium</i>
1	Infectious, bacterial, sepsis, gram positive cocci
1	Infectious, fungal, <i>Aspergillus fumigatus</i>
1	Metabolic, gout
2	Not evident
1	Parasitism, ascarids
1	Trauma, cagemate
<u>1</u>	Undetermined, autolyzed
14	
<b>RHEIFORMES</b>	
1	Cardiovascular, myocarditis
2	Digestive, gizzard, impaction
1	Digestive, grass, impaction
1	Euthanasia, perosis
1	Infectious, bacterial, pseudomonas sepsis
1	Not evident
1	Stress, post-operative shock
<u>1</u>	Trauma, self
9	
<b>STRIGIFORMES</b>	
1	Euthanasia, limb deformity
1	Infectious, bacterial, <i>Salmonella typhimurium</i>
1	Not evident
<u>1</u>	Urinary, nephrosis
4	
<b>STRUTHIONIFORMES</b>	
1	Perinatal, cloacitis
<u>2</u>	Perinatal, not evident
3	
<b>TINAMIFORMES</b>	
1	Trauma, self
<u>1</u>	Undetermined, autolyzed
2	

## Mammals

No. Affected	Diagnosis
<b>AILUROPODIDAE</b>	
1	Perinatal, not evident
<u>2</u>	Respiratory, aspiration
3	
<b>BOVIDAE</b>	
1	Circulatory, ischemic, shock
1	Euthanasia, hoof deformity
1	Iatrogenic, anesthetic
1	Infectious, bacterial, sepsis, <i>Streptococcus</i>
4	Infectious, bacterial, <i>Yersinia pseudotuberculosis</i>
1	Perinatal, gram-negative bacterial sepsis
1	Perinatal, inanition
2	Perinatal, not evident
1	Perinatal, prolonged gestation
1	Perinatal, stress
1	Perinatal, undetermined
2	Stress, multiple factors
<u>1</u>	Stress, shipping
18	
<b>CAMELIDAE</b>	
<u>1</u>	Euthanasia, TB reactor
1	

No. Affected	Diagnosis
<b>CANIDAE</b>	
2	Infectious, agent unknown
1	Neonatal, undetermined
1	Parasitism, <i>Angiostrongylus sp.</i>
1	Perinatal, hypoxia
1	Perinatal, pneumonia, interstitial
2	Perinatal, undetermined, no carcass
1	Urinary, renal tubular necrosis
1	Urinary, urolithiasis
<u>10</u>	
<b>CERVIDAE</b>	
1	Digestive, hemorrhage
1	Digestive, hepatitis
1	Euthanasia, mandibular hypoplasia
1	Euthanasia, senescence
1	Infectious, fungal, <i>Absidia sp.</i>
1	Infectious, fungal, phycomycosis
1	Perinatal, aborted
1	Perinatal, autolyzed
1	Perinatal, mucormycosis
2	Perinatal, not evident
1	Perinatal, stress, multiple
1	Respiratory, pneumonia, aspiration
1	Respiratory, pneumonia, post-surgical
1	Tumor, lymphocarcoma
1	Undetermined, no carcass
<u>16</u>	
<b>CHIROPTERA</b>	
2	Not evident
1	Perinatal, stillborn
2	Stress, accidental
2	Undetermined, autolyzed
1	Undetermined, no carcass
1	Urinary, nephritis
<u>9</u>	
<b>EDENTATA</b>	
1	Infectious, bacterial, <i>Yersinia pseudotuberculosis</i> , presumptive
1	Not evident
1	Protozoan, toxoplasmosis
<u>3</u>	
<b>EQUIDAE</b>	
1	Infectious, bacterial, clostridium tetni
1	Not evident
<u>2</u>	
<b>FELIDAE</b>	
1	Respiratory, emphysema
1	Urinary, glomerulosclerosis
1	Urinary, renal calculi
<u>3</u>	
<b>GIRAFFIDAE</b>	
1	Perinatal, abortion
1	Perinatal, sepsis
1	Perinatal, umbilical artery aneurysms
<u>3</u>	
<b>INSECTIVORA</b>	
1	Digestive, gastric impact
4	Not evident
1	Parasitism, helminthiasis
1	Perinatal, aborted
1	Respiratory, pneumonia, interstitial
3	Stress, shipment
1	Stress, transit

No. Affected	Diagnosis
1	Trauma, maternal
2	Undetermined, no carcass
<u>1</u>	Urinary, nephrosis
16	
	MARSUPIALIA
1	Digestive, gastric ulcers, hemorrhagic
1	Infectious, bacteria, <i>Mycobacterium avium</i>
1	Not evident
1	Perinatal, not evident
1	Respiratory, pulmonary, hemorrhages
1	Trauma, accidental
<u>1</u>	Tumor, liver, hepatocellular carcinoma
7	
	MUSTELIDAE
1	Stress, multiple factors
2	Trauma, maternal
<u>4</u>	Undetermined, no carcass
7	
	PRIMATES
2	Cardiovascular, congestive heart failure
1	Central nervous, meningitis coliform
1	Circulatory, congestive heart failure
1	Circulatory, multiple factors
1	Digestive, enteritis, hemorrhagic
3	Perinatal, aborted
1	Perinatal, amniotic fluid aspiration
2	Perinatal, maternal trauma
1	Perinatal, pulmonary hemorrhage
3	Perinatal, stillborn
2	Perinatal, trauma, maternal
1	Peritoneum, peritonitis, fibrinopurulent, organizing
4	Trauma, cagemate
1	Undetermined, no carcass
1	Urinary, nephrosis
<u>1</u>	Urinary, pyelitis, bacterial
26	
	PROBOSCIDEA
1	Undetermined, no carcass
<u>1</u>	Urinary, nephrosclerosis
2	
	PROCYONIDAE
<u>1</u>	Stress
1	
	RODENTIA
1	Congenital, cardiopulmonary
1	Digestive, cecal torsion
1	Digestive, incisors, malocclusion
8	Euthanasia
1	Euthanasia, trauma, cagemate
1	Iatrogenic, anesthetic
3	Immunologic, amyloidosis
1	Metabolic, endocrinopathy
1	Musculoskeletal, maxilla, osteomyelitis
8	Not evident
1	Nutritional, inanition
1	Nutritional, runt
2	Perinatal, abortion
2	Perinatal, maceration
1	Perinatal, not evident
1	Perinatal, stillborn
2	Perinatal, undetermined
2	Perinatal, undetermined, no carcass
1	Perinatal, unknown

No. Affected	Diagnosis
1	Reproductive, metritis
1	Reproductive, metritis, suppurative
1	Respiratory, bronchopneumonia
1	Respiratory, bronchopneumonia, bacterial
1	Respiratory, bronchopneumonia, <i>Pseudomonas sp.</i>
1	Respiratory, pneumonia
1	Respiratory, pneumonia, bacterial
1	Respiratory, pneumonia, pyogranulomatous
1	Respiratory, pulmonary edema
1	Stress, multiple factors
2	Trauma, cagemate
1	Trauma, predator, suspect
1	Tumor, liver, hepatocellular carcinoma
1	Undetermined, autolyzed
7	Undetermined, no carcass
<u>1</u>	Urinary, glomerulosclerosis, severe
62	
	URSIDAE
1	Perinatal
1	Perinatal, pneumonia
<u>1</u>	Trauma, maternal
3	
	VIVERRIDAE
1	Euthanasia, chronic, pulmonary disease
1	Perinatal, autolyzed
1	Perinatal, eventrated
<u>2</u>	Perinatal, stress
5	

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