

Animal Keepers' Forum

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Dedicated to Professional Animal Care

JANUARY 1979

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SCOOPS and SCUTTLEBUTT

The charming cover illustration is by Herb Roberts of the Little Rock, Arkansas zoo. Thanks, Herb, for a very appropriate January cover!

Editors Note: We feel a need to clarify the time schedule of the AKF. The deadline for articles and news is the 20th of the month, then the typing and lay-out work is done, then to the printer for ten or more days, then mailing. Since the mailing is now second class, it may be delayed according to the volume at the post office. Therefore, the month's issue is presented in your mailbox near the end of the month. In the last two months, the printer moved, and we moved, which complicated procedures even more and delayed those issues. Apologies to all. We are working hard on getting it all together and tightening up the whole schedule. Thanks for your patience.

Papers from the 4th National Conference of the AAZK will be published throughout the year, starting with this issue. The theme of the conference was "Our Education for Their Survival".

The Little Rock, Arkansas, chapter of AAZK has just established a quarterly newsletter, The Kept. It is a very impressive publication. Congratulations on both your growth and your new venture!

IT'S ZOOSKI TIME AT METRO TORONTO ZOO

The Metro Toronto Zoo is again offering the ZooSki pass which allows the holder an unlimited number of visits to the Zoo through the cross-country skiing season. There is cross-country skiing at the Zoo every day, snow conditions permitting. All the pavilions are open so that skiers may stop off for a relaxing walk through warm flora and fauna filled environments.

The beginners trail passes through the Eurasian region of the Zoo, where skiers pass by Siberian tigers, Chinese leopards, camels, yak, Japanese macaques and other hardy cold weather loving animals. The intermediate and advanced intermediate trails pass through the African and Indo-Malayan regions as well as the Canadian Domain where there are fur seals, lions, cheetahs, moose and wood bison among others.

Cross-country ski equipment is available for rent. Lessons are available at the zoo also.

March 12-16, 1979 North American Moose Conference, Soldotna, Alaska
For further information contact: Dr. A.W. Granzmann
Alaska Department of Fish & Game
Box 1809
Soldotna, AK 9669

KIWIS EN ROUTE TO SAN DIEGO ZOO

Two female kiwis, the odd-looking national bird of New Zealand, were turned over to a U.S. Department of Agriculture quarantine station in Honolulu in the middle of December as a first step in their journey to a noteworthy exhibit at the San Diego Zoo.

There are only five kiwis -- all males -- in the entire United States. The new females will eventually join two male kiwis already at the San Diego Zoo with the intent of establishing a breeding group to provide mates for the other U.S. kiwis.

The kiwi is a nocturnal bird with thick, hair-like feathers, stubby wings and no tail. It has an extremely long beak, tipped with nostrils which it pokes into the ground to sniff out worms. The bird moves with a squat, Groucho Marx-like gait and can produce a startling whistle similar to its name.

The female kiwis will come to the San Diego Zoo as part of an exchange program with the Auckland Zoo in New Zealand. The kiwi is not an endangered species, but is strictly protected in its homeland. Besides the San Diego Zoo, the National Zoo in Washington, D.C. and the Brookfield Zoo in Chicago are the only American zoos to exhibit the bird.

WORLD'S OLDEST CAPTIVE GORILLA CELEBRATES 48th BIRTHDAY

Massa, the world's oldest captive gorilla, celebrated his 48th birthday on Thursday, December 28th. The Philadelphia Zoo planned many festivities in honor of the occasion.

Massa's enclosure was festooned with colorful balloons, streamers and a special "Happy Birthday Massa" banner.

An elaborate 5-tier birthday "cake" was prepared for Massa's party. It was made predominantly of Zoo Cake (the Zoo's vitamin-enriched grain and meat formula) and garnished with some of Massa's favorites--oranges, bananas, kale, apples and carrots. It was topped with a small real cake made of people food (a once-a-year departure from Massa's usual healthy diet).

To round out the festivities 25 members of the Merion School Chamber Choir led by Director Barbara Moore sang their special rendition of "Happy Birthday to You."

Massa, which means "big boss," is a lowland gorilla. He was born in the remote jungles of western Africa. His mother was slain while raiding village crops and he was subsequently raised by sympathetic natives. He was then sold to a sea captain who in turn sold him to Mrs. Gertrude Lintz, a devoted animal lover who specialized in rearing baby primates. Mrs. Lintz also owned Gargantua who became the famous circus gorilla. Massa and Gargantua were, in fact, playmates.

AAZK AWARDS

ANIMAL KEEPERS' FORUM

- Best Narrative Article - "Haddock and Hospitality" Tom Goldsberry
Best Technical and Scientific Article - "Rehabilitation of a Dusky Leaf Langur" B. Wayne Buchanan

Awards for Excellence in Zookeeping

- Herbert Malzacher, Zookeeper, Henry Vilas Zoo, Madison, Wisconsin
Michael D. Crocker, Asst. Senior Keeper, Dickerson Park Zoo, Springfield, Missouri
Sue Ellis, Former Bird Keeper, San Diego Zoo, now at Duke University
Saul Joseph, Reptile Keeper, Lincoln Park

Certificate of Merit for Zoo Keeper Education Award

- Baltimore Zoo for a nine month Keeper course developed by Mr. Robert Johnson, Ms. Susan Walker, and Dr. Michael K. Stoskopf

BEAN AWARDS

AAZPA

- Mammals - Walter Tucker, Melanie Bond
National Zoological Park
Captive 2nd Generation Birth of Orangutan
- Birds - Staff of World of Birds
New York Zoological Society
Breeding of Malayan Wreath
Billed Horn Bill
- Robert Smerge, William Amundson
Metro Zoo of Toronto
Renauldt's Ground Cuckoo
- Reptile - Thomas A. Huff
Reptile Breeding Foundation
Propagation of Insular
Forms of Eprelates
- Invertebrates - Milan Busching
Cincinnati Zoo
Royal Goliath Beetle
- Amphibians and Fish - No award

From the President's desk. . .

AAZK members who are planning to present papers at any of the AAZPA Regional Workshops next spring should contact the conference hosts at the earliest possible date. Indicate that you are an AAZK member.

Any AAZK Member who is planning or considering to attend an AAZPA Regional Workshop and would possibly like to act as an AAZK representative, please contact Ed Roberts or myself as soon as possible.

I encourage AAZK members to attend the AAZPA Regionals if possible, especially those people who feel they will not be able to attend in Portland, Oregon, next fall for the AAZK National Convention. Many animal keepers will be at these Regionals which offers the opportunity for AAZK members to discuss mutual concerns informally. Many outstanding presentations are also given during the course of these conferences. The spring will be here before you know it, so try to start making the necessary arrangements now!

The schedule for the AAZPA Regional Workshops follows:

March 4-6, Great Lakes, Detroit, MI
April 1-3, Southern, Knoxville, TN
April 10-12, Central, Wichita, KS
April 22-24, Western, Sacramento, CA
May 6-8, Northeastern, Erie, PA

The 1978 AAZK National Convention hosted by the Santa Fe Community College AAZK Chapter at Gainesville, Florida, was one of the most successful conventions to date. Interesting field trips, numerous presentations, and varied demonstrations and films highlighted the week's activities. Extensive business meetings were also conducted. I feel that we have made progress in firming up our administrative aspects, rectifying some of our problems, and initiating some new projects which could be beneficial to all animal keepers. We had an excellent turn-out by animal keepers throughout the country and everyone had an enjoyable, informative experience.

Next year's Convention dates have been established and they are September 24-27. (Administrative personnel, regional coordinators, and project chairpersons will start Board meetings at least one day prior to the actual Convention.) The Washington Park AAZK Chapter will be hosting the Convention in beautiful Portland, Oregon. Jonalyn Wilson, Convention Chairperson, and her staff have already begun setting up another outstanding conference. Start planning to attend now!

I am accepting bids for the 1980 Convention site. Points to consider by the host for a successful convention are nearby zoos or animal related institutions, hotel accommodations, including banquet hall, availability of suitable facilities or auditorium for presentations, Board meeting rooms, and transportation resources. Costs for the necessary facilities and services should also be evaluated. All bids will be given serious consideration and the Board of Directors will make the final decision.

National Wildlife Week will be celebrated March 18-24, 1979, on the theme: "Conserve Our Wildlife"

In conjunction with Conventions, any AAZK member in good standing may submit topics for discussion, including proposed constitutional changes, for the Board meetings prior to the convention dates, preferable several months beforehand.

Dennis Grimm
President, American Association of Zoo Keepers

AAZK ACCESSORIES AVAILABLE -- TELL THE WORLD ABOUT AAZK

The official AAZK decal is available again through the Overton Park AAZK Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially your car's window! Cost is \$1.00 complete, prepaid.

Make checks payable to the "Memphis Chapter, AAZK" and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Avenue, Memphis Tennessee 38107.

The official AAZK T-shirts are now available through Carlton Bailie. They come in a variety of colors and all have the AAZK logo on them. For more information contact Carlton. His address is 11 Willway Ave., Richmond, VA 23226.

The Lincoln Park AAZK Chapter will be producing the "Keepers CARE" buttons again in the near future. Interested individuals should contact Pat Sammarco, Chapter President, Lincoln Park Zoo, 100 W. Webster Ave., Chicago, IL 60614 for details and availability.

COLORFUL SQUIRRELS MAKE DEBUT AT PHILADELPHIA ZOO

A pair of unusual Prevost's squirrels are making their public debut at the Philadelphia Zoo. The generic name, *Callosciurus*, which means "beautiful squirrels," is appropriate, since these squirrels are among the most brilliantly colored mammals.

Prevost's squirrels are quite large, with a head and body length of almost a foot, and a tail length of 10". Adults can weight up to a pound and a half. They are colorfully marked in burnt orange, pale cream, black and gray.

In the wild, in their native Asia, they feed on seeds, nuts, fruits and flowers. Their captive diet will consist of vitamin-enriched Zoo cake, carrots, kale, nuts and apples.

At the present time, the Philadelphia Zoo is the only Zoo in the United States to exhibit these interesting animals. According to the Zoo's Assistant Curator of Mammals Steve Viola, "These beautiful squirrels have been bred only a few times in captivity. We have high hopes of breeding our pair here in the Philadelphia Zoo."

METROPARKS ZOO TO EXHIBIT EXOTIC ANIMALS

by
Charles R. Voracek
Cleveland Metroparks Zoo
Cleveland, Ohio

With the completion of the interior habitats of five exhibits in the Metroparks Zoo's new Primate and Cat Building, new (to our zoo) animal species will be put on display each week over the next four week period.

Already moved to the Creatures of the Night section of the Primate and Cat Building are 13 Egyptian Fruit Bats. This species of fruit eating bats is found in caves, old graves, and temples in Egypt. They feed after dark on native fruit such as wild figs. In the Zoo display, the bats are provided with feed dishes containing bananas, grapes, oranges, apples, and a special jello-and-blended-meat mixture. The special lighting program has red neon light illuminating the bat display between 9:30 a.m. and 10 p.m. At the 10 p.m. hour, bright white neon lights are activated so that the bats react instinctively and roost during the period when no zoo visitors are in the building. Fruit bats normally have but one young born at a time after a gestation period of about 105 days. These are the first bats ever to be displayed at the Cleveland Metroparks Zoo. They were obtained from the Metro Toronto (Ontario, Canada) zoo on November 8, 1978. Longevity in captivity has been recorded at more than 20 years.

On exhibit in the alcove between the large cats (jaguars and leopards) and the chimpanzees are two species of animals belonging to the raccoon family. The extremely rare Lesser Panda is an endangered species native to Nepal, Bhutan, Sikkim, northern Assam, northern Burma, and the provinces of Yunnan and Szechuan in western China. This relative of the Giant Panda looks like a raccoon, but has a reddish color on the back down to the lower flanks; the underside and feet, as well as the back of the ears, are black. The tail is long and bushy, is reddish-brown, and has lighter colored rings. Soles of the feet are covered with hair; the purpose of this special adaptation is to reduce heat loss of the body on snow or ice-covered ground, and also reduces the danger of slipping on wet smooth tree branches which they frequent in their day-to-day activities.

The diet of the Lesser Panda in its native habitat consists of bamboo shoots, juicy grasses, roots, berries, and fruits, supplemented with young birds, bird eggs, small rodents, and insects.

The Lesser Panda is quiet shy and asocial in the wild. They may be seen in pairs, but more commonly this species lives alone. Vocal sounds range from shrill cries, repeated whistles, peeping, and bird-like chirping.

When excited Lesser Pandas secrete an anal gland musky liquid.

Mature females bear one to four young after a gestation period of about 130 days. Longevity of the Lesser Panda is about 13 years.

Adjacent to the Lesser Panda display are six Kinkajous or Honey Bears, which are found from southern Mexico to central South America. This relative of the raccoon is distinguished from all other members of the

Exotic Animals in Cleveland Zoo, *continued*

family by its prehensile tail. Soles of the feet are short and hair-covered. There is a membrane covering the digits of both front and hind feet. Upper side of the body is olive-brown, yellowish-brown, reddish-brown, or sandy colored, and usually has a bronze sheen. The middle of the back is darker and the underbelly varies in shade from yellow-brown to golden-yellow.

Kinkajous are nocturnal, sleeping in a tree hollow or network of leaves and vines by day and becoming active at dusk, foraging for its food which consists of fruit such as wild figs, guava, avocado, mango, bird eggs, an occasional young bird, nectar, insects, and the honey of wild bees.

Kinkajou births may occur at any time of the year; one (rarely two) young is born after a gestation period of from 112 to 118 days. Adult coloration is reached at about one year. Males mature at approximately 1 1/2 years; females in a little over 2 years.

The group of kinkajous displayed in the Metroparks Zoo is on breeding loan from the New England Primate Research Center.

Longevity has been recorded to more than 23 years in captivity. Some zoos have had successful breeding records with this species.

Soon to be put on display is a pair of ocelots, a small cat species which ranges from Mexico, through Central America and about two-thirds of South America. Because of the demand for the beautifully patterned fur, ocelots have been alarmingly decimated in its native habitat.

Usually hunting at night, the ocelot preys upon mice, rats, guinea pigs, pakas, agoutis, porcupines, hares, monkeys small deer, birds, lizards, and invertebrates. Occasionally domestic livestock and poultry are killed and eaten.

Ocelots are excellent climbers but most hunting is done on the ground. Female ocelots bear two to four young after a gestation period of about 70 days. Longevity has been recorded at over 17 years.

Also are display are a trio of Geoffroy's Cats. This small member of the feline group is about the size of a domestic house cat. Its native range is from southern Bolivia and Brazil's Mato Grosso to southern Argentina. It is a spotted cat with black spots regularly arranged on a fur which may range from silver-gray to brownish-yellow or brilliant ochre-yellow in color. Melanistic (black) specimens are common in zoos, and the Metroparks Zoo's male and one of the two females are black.

The Western Reserve Cat Club, Youngstown, Ohio, has purchased the male and one female for the zoo; the cost of the pair is \$600. The black female was obtained from the Gladys Porter Zoo of Brownsville, Texas; the black male and spotted female were acquired from the Sacramento, California Zoo.

Geoffroy's Cats are good climbers and swimmers. Local natives in South America call the animal a fishing cat and state that it readily enters water (unlike many other felines which have a disdain for an aquatic environment.)

THE SIXTH SENSE

By
Pam Chapman
Buffalo Zoological Garden

My first experiences with wild animals took place at the Santa Fe Teaching Zoo. Before then, I had no knowledge of their ways, so I was very influenced by whatever I was told about them.

One point that was stressed constantly was the ability wild animals have to harm people. I was told many gory stories of what animals had done to zoo keepers in the past. I was told that our monkeys at SFTZ reacted badly to women. As a result, I never had much interest in primates. If I had, it may have helped me get a job as a primate keeper at a zoo where I wanted to work very much.

Now that I am working at the Buffalo Zoological Garden, I have been in situations where animals have sensed the fears that have been built up in me over the past year at Santa Fe. This article is not to put down the program, because it may not effect others the way it did me. I just want to stress to other new keepers that fear of zoo animals is very detrimental.

Knowing an animal's behavior will help to decrease fear of them. Once the fears are overcome, one can deal with the animals on a more sincere and conscious level; duties can be carried out to their fullest. What one can learn will then be more meaningful and more useful in bettering the zoo world.

Knowing when to go in with an animal and when not to is very important. I am learning this valuable information and in the process I feel that by dealing with the animals on a day-to-day basis, I am developing a sixth sense about them.

Some keepers at the Buffalo Zoo have this sixth sense when dealing with our animals and others don't. The poorest keepers seem to be those who don't have this special sense and also seem to have fears which hamper them in their duties. The few who are excellent keepers, in my opinion, have helped me the most in handling risky situations. For example, when I have to go into a Golden Eagle cage when they have an egg or when I have to clean a Bighorn Sheep moat when the male is very aggressive.

I feel this knowledge will make me a better keeper and I hope this message will help others to realize that fear of animals in a zoo atmosphere can be overcome by developing this sixth sense.

*reprinted from the Santa Fe Association of Zoo Keepers Newsletter,
Santa Fe Community College, Teaching Zoo, Gainesville, Fla.*

Exotic Animals in Cleveland Zoo, *continued*

It is generally found in rocky terrain with scattered shrubs and trees. It avoids dense forests and open grasslands. Small prey animals include rats, mice, guinea pigs, birds, and agoutis. Geoffroy's Cats are usually wary of human settlements and only occasionally take poultry.

The usual litter is two or three young with just one litter per year. Longevity in captivity has been over 11 years.

BLOATING IN AN EASTERN COLLARED LIZARD
Crotaphytus collaris collaris

by
Mike Coker
Senior Animal Keeper, Topeka Zoo

At 1600 hours on 11 December 1978, our young male collared lizard was discovered to be severely bloated. He had eaten two crickets earlier in the day. The lizard was found lying in a shallow pool of water. The lizard exhibited the following clinical signs: tail twitching, dorsal rotation of the eyes, eyelids nearly closed, gaping, dyspnea with the respirations being slow and deep. Further examination revealed that a clear fluid was bubbling from the esophagus and that the abdomen was greatly distended with gas. The cloaca was partially everted and a small amount of white watery material was exuding from the cloaca. Palpitation of the colon revealed that it was apparently impacted with fecal material. It was felt that the lizard may have been dehydrated.

The gaseous distention of the abdomen was relieved by manually restraining the lizard and intubating the esophagus with a short piece of .047 inch diameter teflon tubing. A relatively large amount of semi-dry fecal material was expressed from the colon. The lizard was then returned to its exhibit. The heat lamps in the exhibit were turned off for the night to help decrease the severity of bloat in case the bloat recurred.

The initial behavior of the lizard when returned to its exhibit was to open its mouth, stretch its limbs and twitch its tail. At 1700 hours, the lizard appeared to be alert, its mouth was open slightly and it had moved approximately six inches. The lizard was observed several times throughout the evening. The lizard remained in a prone position on a rock throughout the night. The temperature stayed between 70° and 78° F in the exhibit.

By 1000 hours on 12 December 1978, the lizard was moving around. The heat lamps were turned on and the lizard crawled immediately to a hot spot in the exhibit. It was observed moving about in the exhibit the rest of the day. Its appetite later returned and no problem defecating has been noticed.

PHILADELPHIA ZOO HAS NEW DIRECTOR OF EDUCATION

The Philadelphia Zoo is pleased to announce the appointment of Harold A. Bair as Director of Education. Mr. Bair's responsibilities will include the administration of the Zoo's rapidly developing educational programs, many of which will be funded by a recent \$100,000 grant from the J. N. Pew, Jr. Charitable Trust.

Mr. Bair comes to the Zoo with a most interesting variety of teaching assignments to his credit. He has taught public school children in Philadelphia. He has also taught former headhunters in the Borneo jungle as a member of the Peace Corps.

DRAMATIC PEST CONTROL ACHIEVED

BY TAMPA THEME PARK: THE DARK CONTINENT

by
Alan Caruba

In January, a three-day school in the fundamentals of pest control technology in zoological gardens and amusement attractions was held in Tampa, Florida under the direction of Dr. Austin M. Frishman, professor of biology at the State University of New York in Farmingdale. The location of the school was directly related to a dramatic story of pest control achieved at Busch Gardens vast theme park, The Dark Continent. Indeed, the school featured two half-day trips to The Dark Continent.

Shortly before the school, sponsored by Southern Mill Creek Products Company of Tampa, conducted its sessions, I was in Tampa and interviewed Dennis Sullivan, Busch Gardens' Pest Control Coordinator. I took an extensive behind-the-scene tour of the 300-acre park and the result was astonishing.

The most noticeable fact is that there is virtually no evidence of the most common insect pests one expects to find in a theme park featuring more than 800 head of big game and some 2,500 exotic birds. In the entire tour, only a single cockroach was spotted. The more than 2,00 baits and traps to deal with the rat and mouse population gave clear evidence of their success, however, as inspections, conducted every other day, indicated several kills. Some dozen rodenticides featuring meat or fish flavors in addition to "Trap Stick", a glue-like compound keeps the rodent population at bay.

It was hard to believe that little more than three years earlier, The Dark Continent and, in particular, its bird area, was "literally overrun" with roaches according to Sullivan and his associate Lloyd De France who, with three technicians, are responsible not only for the park, but the management offices and the 100-acre adjacent Anheuser-Busch brewery.

Fortunately for Sullivan who was recruited in 1975 to tackle the problem of pest control after a branch of a national pest control firm was unable to cope, a new pesticide, Ficam-W, was just being introduced to the United States following extensive testing and approval by the Environmental Protection Agency. Produced by Fisons, Inc., headquartered in Bedford, Massachusetts, the pesticide comes from the chemical group called carbamates. It was a technological breakthrough in several ways. First, it is a wettable powder that mixes with water and sprayed on various surfaces. Older pesticides are oil-based and volatilize rapidly when exposed to the air. Around animals, such pesticides not only pose a physical threat, but their odors render them virtually useless in situations where everything from rare birds to elephants demonstrate their sensitivity to such odors. Ficam-W is odorless.

"If you were to take Dursban (an organic phosphate pesticide) and spray it in our elephant barn, you'd have a stampede," says Sullivan. He similarly ruled out Diazinon and Baygon for the same reason. Moreover, the use of chlorinated hydrocarbons has been virtually banned by the EPA. The best known example of this chemical group is DDT. So sensitive to the animal's health are the keepers and Sullivan's staff, they

discontinued the use of Chlordane, a chlorinated hydrocarbon, which was being used to control fire ants in the cheetah pen area where it is hoped these animals will mate.

"At this time," said Sullivan, "we use Ficam-W almost exclusively for routine spraying" and the product has proved equally popular with the office staff because, like the animals, they don't care for smelly pesticides either. The animal's safety, of course, takes first priority and, naturally, the pest control staff are the first suspects if an animal should die. In the three years of its extensive use throughout the park, no animal has been lost as the result, nor has any died from any aspect of the staff's work.

This is in part due to the fact that testing has demonstrated that animals easily metabolize Ficam-W when they come in contact with it without any injurious side effects.

There's plenty of opportunity to come in contact because Ficam-W is sprayed around the cages, inside the cages, on the walls and on the ceilings of the facilities throughout the huge park which also includes several food service areas. Unlike repellent pesticides which drive unwanted insect pests further and further into areas difficult get out, the invisible powder of Ficam-W adheres to the surface, the cockroach or fleas crawl over it, and die within ten to fifteen minutes.

In undisturbed areas, Ficam-W will go on killing with a residual power that will last as long as twenty days and more.

The dedication of Sullivan's staff and the cooperation they receive from the animal keepers and other employees of The Dark Continent permits them to keep one step ahead of the constant threat of infestation. They are literally on call 24-hours a day and it is not unusual for them to do a late night inspection with a flashlight to determine where any concentrations of roaches might be occurring. They next day, they come back and spray.

The Dark Continent is a constant challenge because the animals on the veldt-like area are fed twice a day and food is often available overnight when insects are most active. The constant sanitation of the zoo creates damp areas for breeding and Tampa, itself, is "the tropics" with warm, sunny weather. Still, Sullivan and his staff have been able to achieve "manageable levels" of control under these circumstances and The Dark Continent has become a model for other zoological parks as the result.

"Pest control has a direct affect on how many guests return through the gates," noted Sullivan. In 1978, more than 2.7 million visitors had enjoyed the park by Thanksgiving and the popularity of The Dark Continent is growing annually. "If we have roaches running up the walls or rats dashing across the sidewalks, we're not going to make a big hit with the folks. We get in early in the morning and make things nice for them."

The result is a delightful day at the multi-faced theme park and one which is pest-free.

Ed. Note: Alan Caruba is a professional writer and photo-journalist who has written extensively on the subject of pest control for many publication. This is an exclusive to the Animal Keepers' Forum.

INTERNATIONAL COORDINATOR REPORT

by
Tom Goldsberry
Washington Park Zoo, Portland, Oregon

Working from the list of nine Eastern European zoos visited in 1977 by Marvin Jones (AKF, Jan.-Nov., 1978), I surveyed the nine regarding keeper training, average age of keepers, and the number of women keepers. The five replies I received are as follows:

Cologne:

Three years apprenticeship
Average keeper age, thirty-one
Eight women keepers

Schonbrunn, Vienna:

Three years apprenticeship including practical zoo work and trade school attendance.

Vychodocheska Zahrada, Czechoslovakia:

Required education for new keepers, one of the following:

1. Two years agricultural husbandry.
2. Four years agricultural technical high school.
3. Four years veterinary technical high school.
4. Four years animal keeper's school.

Average age of keepers:

Men-Twenty-nine
Women-Thirty-two

Thirty-two men keepers; thirteen women keepers.

Moscow:

"...we have no keeper training schools in Moscow. Our keepers are mostly very young, sometime they come to work at the zoo after having graduated from secondary (grammar) school. They get all their training at the zoo when they begin working. There are very many women keepers. Some of our keepers are very old, as they have worked at the zoo for a very long time, and of course, they are very devoted people..."

Berlin:

Three year apprenticeship. "...it is impossible to describe all the subjects stressed during apprenticeship."

Average age of keepers: Thirty-three
Eight women keepers.

CAPTIVE BREEDING CONFERENCE

The 3rd World Conference on Breeding Endangered Species in Captivity, sponsored by the Fauna Preservation Society, will be hosted by the Zoological Society of San Diego. The first two conferences were held abroad; this is the first time it will convene in the United States. It will be held 12-16 November 1979 in San Diego at the Town & Country Hotel. Further details will be provided as the conference program is firmed up, but you may want to mark the dates on your 1979 calendar now.

INTRODUCTION TO THE INTERNATIONAL CRANE FOUNDATION

by
Chris LaRue, Aviculturist
International Crane Foundation, Baraboo, Wis.

The family Gruidae contains 15 species of cranes of which 7 are endangered. The International Crane Foundation (ICF) is dedicated to the saving of these cranes through its varied programs and research projects. Located on a beautiful 65 acre former Arabian horse ranch near Baraboo, Wisconsin, ICF is the world center for the study and preservation of cranes. ICF facilities currently house 120 individuals of 14 species. The only species of crane not represented at ICF is the rare Black-Necked Crane of Tibet.

Work at ICF is aimed at five major goals: (1) Research - both in the field and at the foundation headquarters covering a wide variety of subjects dealing with crane survival. (2) Habitat conservation - to save cranes and other wildlife through preservation of the world's wetlands. (3) Breeding - in captivity to insure the existence of a species bank of threatened cranes as wild populations decline. (4) Restocking - after suitable habitat in their former range has been preserved, captive hatched birds can be introduced to these areas to create new populations. (5) Public education - to inform people of the plight of wild cranes and their disappearing habitat.

Much of the breeding success at ICF has been a result of artificial insemination. All eggs layed are immediately collected and artificially incubated. This stimulates the birds to lay many more eggs than normal and increases the number of offspring produced by each pair annually. Spacious and private quarters, proper diets, and good management techniques have contributed greatly to the breeding records of ICF.

ICF is a non-profit organization funded solely through memberships and contributions. The facilities are open to the public through tours by appointment only. A visit to ICF is an educational experience with the unique opportunity to see more kinds of cranes in a few minutes than most people see in a lifetime.

chapter

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news

PHYSICAL EXAMS FOR GREAT APES

by
Tim O'Brien, Keeper
Audubon Park Zoo

For approximately five years annual physicals have been done on the primates at the Audubon Park Zoo in New Orleans, La. I would like to discuss our most recent gorilla and orangutan physicals and show that these procedures can be performed at any zoo with a little planning, personnel and equipment. At the present time we have a pair of lowland gorillas and a pair of orangutans.

At each of the physicals, at least one veterinarian, one veterinary assistant, three keepers and three senior staff members were present. This large number of people aided in the speed with which we completed the physicals. In both cases, the time from darting to putting the animal back in the cage did not exceed one hour. I feel the teamwork of the staff was the key to our quick and efficient job. While the keepers were transferring and weighing one animal, the veterinarian was cleaning the teeth and drawing blood on the other, thus speeding the process considerably.

All were weighed and temperatures were taken on the gorillas. Weights are taken so accurate drug and medication doses can be made, so records can be kept to watch for excessive gains or losses and to get an idea of the animals' food energy requirements. Temperatures are elevated when the animals are down with Ketamine so normal body temperature can not be determined. These values can be used as a comparison with later physicals and possibly used as an indicator of problems when the animal is down. They were TB tested under the right eyelid. These tests should always be given on the same eye so no matter which animal is being checked it is always the same. The eyelid is a good area to test because it is hairless and can be checked easily without restraining the animal. The veterinarian also examined the eyes, ears, throat, and tonsils. From the eye examinations, one of the primates was found to have a scratched cornea and early diagnosis allowed for quick treatment. The nails were examined and clipped where necessary. The females were given plevic examinations and the males' testes were checked. This proved advantageous in the case of the male orangutan as his hair around the genital area was heavily matted and had to be clipped. This may have hampered his breeding attempts.

For the first time, all had EKG's done. The procedure was performed by an EKG technician and each took five minutes or less to complete. No problems occurred during this procedure, but it was necessary to shave the male orangutan to connect the EKG clips. These electrocardiograms can be used to tell the condition of the heart and lungs and the general electrical condition of the body. The veterinarian also checked their hearts with a stethoscope.

On each occasion the animals were darted in their indoor night houses with CO₂ dart pistol or rifle. The immobilizing drug was Ketamine and atrophine was also administered to reduce salivation. The gorillas took 13 to 21 minutes to go down and had to be supplemented with Ketamine during the procedure. This was probably due to under-estimating the amount needed as they had both gained weight since the last physical. The orangutans went down in 3 to 7 minutes and stayed down during the whole procedure.

Physicals for Great Apes, continued

All were given a thorough dental examination and their teeth were cleaned. This proved to be a very important part of the physical examinations as they all had plaque on their teeth and the male gorilla had a cavity which will probably require root canal work.

While their teeth were being cleaned, blood samples were taken and antibiotic was administered. The antibiotic, Flocillan, was administered to prevent any infection from dart wounds. Blood samples were taken and analyzed for Complete Blood Count (CBC) and SMAC/20. CBC test show the amount of different types of white blood cells, such as neutrophylls, lymphocytes, esinophylls, monocytes, and basophylls in the blood. These amount, if in abnormal numbers, may indicate infection or parasites. SMAC/20 is twenty test which measure the amount of glucose, cholesterol, triglycerides, uric acid, phosphorous, electrolytes, calcium and total protein, to name a few. Imbalances in some of these test can indicate diabetes, bleeding ulcers, atherosclerosis, hypothyroidism, gout, bone diseases, hepatitis, cirrhosis, heart disease, lung disease, hyperparathyroidism, and bacterial infections.

I feel these physicals are a very important part of our animal health program. Combined with balanced diets, clean enclosures, and monthly fecal examination, these physicals give us a particularly good preventative medicine program. It seems to be paying off well as we have had no deaths and few illnesses in the primate section this year. These physicals exposed a potentially hazardous problem in the male gorilla with the cavity and it can now be corrected before serious damage is done and we can re-evaluate our procedures to prevent any future occurrences of this type.

What I have presented may sound like a very complicated procedure but it can be a simple operation if handled properly. The main worry for most zoos seems to be the process of knocking down the animal. While this is a dangerous process, when handled properly it can be done with a great deal of success. Well-trained personnel experienced with the use of the drugs and a veterinarian present are essential. Ketamine is a safe drug and when used properly will produce good results.

An essential part of the operation is the planning stage. If necessary, all the people involved can sit down beforehand and discuss who will do what and when. All the operations I have described can be completed in 30 to 40 minutes on one animal with planning and teamwork. The staff need not be numerous. One veterinarian, one veterinary technician and three to four zoo staff members are enough. As long as each person knows their part, things should proceed smoothly.

Elaborate facilities are not essential, our physicals were done on a table in the primate house kitchen. As for frequency, our policy is that if the animal is in good health and a permanent resident we do physicals only once a year. Equipment needed includes teeth cleaning tools, EKG machine, Ketamine, atropine, Flocillan, dart guns and darting equipment, TB test equipment and syringes, syringes for drawing blood and giving injections, vials for blood samples, hair clippers, scale and various veterinary supplies such as cotton, alcohol, etc. Resuscitation and emergency equipment should also be ready because while it is a fairly safe procedure you can never be sure. It is essential to have all these things ready and present before you start the operation.

Physicals for Great Apes, continued

As for the cost, the general examination costs nothing except veterinary costs. Dental tools are free after the initial purchase. EKG machines can be borrowed or possibly rented. The largest cost is probably for analyzing the blood. All in all, the cost is not as high as might be expected.

The need for primate physicals is obvious. I have tried to show that any zoo can perform them if then have trained personnel, correct equipment and planning. Trained personnel and a competent veterinarian are the most important ingredients. Add to this the correct equipment, gathered beforehand, and all that is left is planning. It is essential to budget your time because the amount of time the animal will stay down is limited. Clipping toenails, taking temperatures, drawing blood and examining eyes, ears, and throat can all be done at once, thus saving a lot of time. The key is to combine activities and plan each step beforehand.

So remember, good personnel, proper equipment and planning are what you need. Try it. You may be surprised by the results.

Species	Sex	Wt	Age	Temp	Total Ketamine	Initial Dose Ket	Atropine	Flocillan
Gorilla	M	194#	8	101.7	7 cc	5 cc	2 cc	8 cc
Gorilla	F	128½#	9	101.8	6.75 cc	4.75 cc	2 cc	6 cc
Orangutan	M	194#	16	--	6.5 cc	6.5 cc	3 cc	6 cc
Orangutan	F	81#	15	--	4.25 cc	4.25 cc	2 cc	4 cc

	Down Time	Time to Go Down
M Gorilla	53 min	13 min
F Gorilla	38 min	21 min
M Orangutan	68 min	7 min
F Orangutan	71 min	3 min

This paper was presented at the 4th National Conference of the American Association of Zoo Keepers.

ENDANGERED SPECIES SCIENTIFIC AUTHORITY (ESSA)

The Endangered Species Scientific Authority is composed of representatives from seven federal agencies. The ESSA was established by Executive order to insure the scientific soundness of governmental decisions concerning trade in endangered species of animals and plants. It consists of seven members: the Secretary of the Interior, the Secretary of Agriculture, the Secretary of the Army, the Chairman of the Council of Economic Advisors, the Administrator of EPA, the Administrator of the National Oceanic and Atmospheric Administration, and a state representative, as appointed by the President after consideration of the recommendation from the Governor of the affected state. This committee reviews all aspects of legislation involving plants and animals. The Committee is responsible to the Endangered Species Program, Division of U.S. Fish and Wildlife Service, Dept. of the Interior, Washington, D.C. 20240.

THE UNKNOWN ZOO, A DESIGN FOR CONSERVATION

by
Steve A. Clevenger

Conservation, Research, Education and Recreation - of these four generally recognized functions of the modern zoo, one has a dual importance for zookeepers. Conservation is not only a vital concern for those species which face the possibility of extinction in the wild, but also for the survival of the zoo itself. For if we, as zoos, do not make an active attempt to reproduce captively the rare, endangered and uncommon animals today, many of our cages and lots will be empty in the immediate future.

In the spring of 1975, the Oklahoma City Zoo took steps towards contributing to the concept of the self-sustaining zoo. Ten to twelve acres were set aside off the zoo grounds and an initial construction effort produced nine cages. From that beginning the "unknown zoo" has grown each successive year. It presently consists of 30 cages in 18 separate facilities, and right now we are working with 96 specimens of 26 species. The entire area is surrounded by a 6 foot stockade and chain link fence. A three foot chain link barrier at the base of the perimeter fence is an effective deterrent against entry by feral dogs.

Within these walls is an area based on a single concept - the removal of as many outside stress factors as possible. This is accomplished in several ways: First, public access to the area is limited. Only keepers of the area are allowed to approach the cages unescorted. Second, maintenance and husbandry time and presence is decreased as much as possible. Generally, each cage is approached and/or entered a maximum of two times daily. Cages are designed to be as maintenance-free as possible. Third, winterizing the cages by several means eliminates the twice-a-year moving stress encountered in a temperate climate. Fourth, Spacing the cages at appropriate distances allows for visual and at least partial olfactory isolation from adjoining cages.

Fifteen of the existing 18 cages are unique. Of modular design, each 4'x8' or 4'x12' cage section was prefabricated at our maintenance compound. The modules were then carried to the cage sites and erected on previously-built foundations. In this way each small (8'x16'x8') cage was erected in less than one working day with the larger (16'x16'x12') cages taking from two to three days. A large 36'x42'x12' chain link facility was constructed for breeding psittacine birds and already existant facilities were modified for use in the breeding area. These facilities house our breeding groups of 1/3 Snow Leopards, Red Kangaroos, Sable and Addax Antelope.

Each prefabricated cage sits on a foundation of railroad ties and a predator barrier of 1"x2" welded wire is buried 18" deep around each foundation. The basic cage is covered by an 8' half-roof of translucent fiberglass and the northern quarter of each cage is covered with sheet metal. This serves as a wind barrier from our predominantly northwestern winter winds. Each cage is heated by a minimum of 2-250W radiant heat lamps, which are thermostatically-controlled from the outside of each cage. Each fall the east and west sides and top of each cage are covered. 4'x8' frames of 2"x2" lumber covered with translucent fiberglass are bolted to each 4'x8' panel. This creates a beneficial, heat-holding "greenhouse effect". The south end of each cage is left uncovered throughout the winter to provide ventilation.

The Unknown Zoo, continued

Cage design, that is placement of perches and nest boxes, is done with two things in mind. First, ease of maintenance - perches are not placed where they will be fouled with feces, and "dead ends" which cannot be reached with rake or shovel are not created. This makes cleaning easier and faster, thus reducing the time we spend in each cage. Second, cage props are used basically to satisfy the animals' biological needs and to provide necessary avenues for escape should aggression problems arise. These cages are not set up as exhibits.

After three years of learning and varying degrees of hard work, 1978 was to be the first year when we were rewarded for our persistence. The twelfth of March we found one egg in the nest we had built for our 3 unsexed Egyptian Vultures. Both parents remained at or on the nest, sharing incubation duties. Ten days later a second egg was laid and thirty-two days after that the first egg hatched. The incubation period was 42 days. The youngster was initially white and downy and the parents became extremely protective of the nest area as they raised the chick themselves. By day #58, the chick was entirely dark and almost as large as the parents.

During this time period we had separated the male and one female from our group of 1/2 Geoffroy's Cats. The less dominant female had shown an obvious abdominal weight gain and had begun pulling hair from the posterior half of her body. She became extremely secretive the second week in March and for 3 weeks we listened at each nest box door for kittens. After having observed the female on her way back into the nest box the afternoon of 20 April, we checked the upper nest box and found two kittens. Their eyes were open but they were still crawling about, so we rather sheepishly estimated their age at 2-3 weeks. Both kittens are females, the melanistic one resembles her father. By the fifty-sixth day, both youngsters had already attained adult size.

A pair of Hyacinthine Macaw had intensified their courtship activity during the second week in March and both birds were inside the nest box on the 16th of March. Only the male was observed outside for the next 32 days. On the 19th of April the female left the nest to eat, with dark, wet breast feathers and a tail sharply upturned from the limited confines of the nest box. Chick noises were heard from the nest the next afternoon and by the end of June, the two young birds could occasionally be glimpsed in the nest, smaller though perfect replicas of their parents. At five months, the youngsters are almost adult size.

The middle of June brought still another birth. Of our three snow leopard females, two have given birth and one has recently matured sexually. She has been placed on the regular introduction schedule. We have 1/3 snow leopards and the male is unrelated to the Oklahoma City born females. The male is regularly (at approximately two week intervals) introduced to each female by means of the chain link tunnels and doors between the cages. We have had three litters in the area since 1975.

The ornate hawk eagle *Spizaetus ornatus* is a medium-sized South American raptor which is uncommon, though not threatened both in the wild and in captivity. So far as we have been able to determine, the species has not reproduced captively. We are presently working with three pairs, two of which have laid fertile eggs. We have initiated nest building

The Unknown Zoo, continued

in both these paris by offering freshly-cut green, leafy branch tips to the birds by hanging them from existing perches in the cages. The 12th of July, 1978, our three year quest for a sucessful hatching was realized, though the artificially-hatched youngster lived only six days. Courtship and nest-building activity continues to occur and a successful hatching/rearing appears to be somewhere in the not too distant future.

Several other species have shown varying degrees of reproductive potential within the breeding area. These include a pair of spectacled owls which have laid and hatched eggs. The hatching occurred during the teeth of the 1977 winter and the youngsters unfortunately were lost. A group of 1/2 Vulturine Guineafowl have lain approximately 20 eggs this year, mainly in the early spring. All have thus far proved infertile. Our pairs of Thick-billed Parrots, Vulture-headed Parrots and Red-fronted Macaws have shown varying degrees of courtship behavior and interest in the nest. We recently obtained a male Batalwur Eagle and our pair (both of which are over 9 years old) now reside in one of the breeding cages.

These eighteen facilities are only the beginning. Within the existing perimeter fence, construction will soon begin on an indoor/outdoor breeding enclosure for our 4/2 Short-nosed Echidnas. Large open enclosure are also planned for 1/2 maned wolves, 1/3 cheetahs and a pair of Double-wattled Cassowaries.

The concept of the off-exhibit breeding of rare animals is important to the zoo in another sense - breeding or rare, endangered or uncommon species will not only increase captive populations of these animals for work in breeding multiple captive generations. It will also provide an additional source of revenue for the zoo at a time when self-sufficiency may be the only way in which the zoo will be able to survive as a public institution. In this sense, the zoo does not have to have the facilities or revenue of a San Diego Wild Animal Park or a Front Royal, Virginia, or even the somewhat modest facilies we are working with in Oklahoma City. By working with one, two or a handful of species, institutions of any size can contribute significantly to the survival of species which do not deserve the fate of extinction. The fate of the animals and fate of the zoo is in our hands.

This paper was presented at the 4th National Conference of the American Association of Zoo Keepers.

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Send changes of address to

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National Zoological Park
Washington, D.C. 20008

Thanks

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

CURATOR/MANAGER... aggressive, knowledgeable and experienced person sought for challenging, semi-administrative position. Responsible for wildlife rehabilitation and public education center. Duties include defining procedures and techniques for animal care, directing the center's employees, acting as liaison with other professionals in the animal care field, specifying purchases and aiding in planning of new and renovated facilities. Salary: \$14,641 - \$16,142, plus benefits. Apply with full resume and references to: R.D. Gooch, Superintendent of Conservation, Forest Preserve District of DuPage County, 881 West St. Charles Road, Lombard, IL 60148.

CURATOR... responsible for animal collection and should be experienced in the handling and care of a variety of wildlife. Must be able to organize and direct employees and work well with other people. Degree and experience required. Salary: \$11,968 - \$15,917. Send resume to or contact: R.L. Blakely, Director, Sedgwick County Zoo, 5555 Zoo Boulevard, Wichita, KS 67212. (316) 942-2212.

CURATOR/BIRDS... responsible professional work developing complete avian program in an expanding and progressive zoological park. Must be skilled in artificial incubation, supervision, exhibit design and avian husbandry. Requirements: B.S. in related field, three years of supervisory experience in a recognized zoological park and references. Salary: \$12,546 - \$17,688. Send resume to: Dale Stastny, Personnel Director, Audubon Park and Zoological Garden, P.O. Box 4327, New Orleans, LA 70178.

CURATOR/MAMMALS ... responsible for overall operation of major mammal collection. Applicant should have experience in handling and care of a variety of wildlife and ability to organize and direct others. B.S. in Zoology, Biology, or related field and supervisory experience in zoo required. Salary: \$13,00 - \$14,500. Send resume by 31 January 1979 to: Director, Memphis Zoo and Aquarium, 2000 Galloway, Memphis, TN 38112.

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COMING EVENTS

February 4-8, 1979 School for Professional Management Development for Zoo and Aquarium Personnel, Wilson Lodge, Oglebay Park, Wheeling, West Virginia. To enroll or for further information, Contact:

Elvie Turner, Jr. Director
Fort Worth Zoological Park
2727 Zoological Park Drive
Fort Worth, TX 76110

February 13-17, 1979 Association of Interpretive Naturalists Workshop to be held at the Thunderbird Hotel, Bloomington, Minnesota. The theme is to be Interpretation - The North Country Approach. For information contact:

Jack Mauritz, AIN Workshop Chairman,
Hennepin County Park Reserve District
Box 296
Maple Plain, MN 55359

INFORMATION FOR CONTRIBUTORS

ANIMAL KEEPERS FORUM publishes original papers, and news items of interest to the Animal Keeping Profession. Non-members are welcome to submit articles.

Articles should be typed or hand printed. All illustrations, graphs, tables, should be clearly marked when accompanying an article for publication. All illustrations, graphs and tables should be in final form and should fit in a page size of no more than 6"x10". AKF will not redesign illustrations or graphs.

Articles longer than three pages will be separated into monthly installments at the discretion of the Editorial Staff. Cite literature use in text and in final bibliography. Avoid footnotes.

Articles sent to Animal Keepers Forum will be reviewed for publication. No commitments to authors is made, but AKF will make every effort to print the article as soon as possible. All articles will be published in future issues of AKF for that calendar year.

Telephoned contributions on late-breaking news or last minute insertions is acceptable. However, phone-in contributions of long articles will not be accepted.

DEADLINE FOR EACH EDITION OF AKF IS THE 20th OF THE PRECEDING MONTH.

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Associate (part-time keepers, Students, docents)\$10.00 annually
Contributing\$50.00 and up annually

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Send name and address and a check or money order to:

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**American Association
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Animal Keepers' Forum



Dedicated to Professional Animal Care

FEBRUARY 1979

Editor-in-Chief: Ron Kaufman, Topeka Zoological Park
Executive Editor: Mike Coker, Topeka Zoological Park
Managing Editor: Lois Bogia, Topeka Zoological Park
Art Consultant: Elaine Shea

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CA, NV, AZ, UT, HA

The February cover illustration is by Mike Crocker of the Dickerson Park Zoo in Springfield, Mo. Notice the AAZK shoulder patch. Nice touch! Mike and an excellent drawing of two keepers measuring a Burmese python. Thanks!

FIRE AT THE OMAHA ZOO

The Omaha zoo staff reported that the Animal Nursery, a double-wide trailer, was completely destroyed by fire. No monetary damage has been estimated. Because of a problem with frozen pipes, a propane heater was in use and was tipped due to high winds.

The staff helped get all the animals out, but many were lost--a zoo-born Margay, one month old; a young female gorilla; several raptors and a macaw. A young orang was injured with smoke inhalation, but is recovering.

A new building has been planned for the same area. Plans are to break ground in March for the larger nursery.

FIRE AT THE KANSAS CITY ZOO

Betsy Burke, Curator of Reptiles and Birds, reported that the Administration/Concessions building was lost to fire. Damage was set at \$250,000. Animal records and financial records were saved, but were damaged. Two glass lizards were lost in the fire.

Two keepers reported the fire. There were no injuries to zoo personnel, but one fireman was injured in a gas explosion. Heavy snow made it hazardous to fight the fire. The cause was faulty electrical wiring.

A new building is being planned, but construction will not begin for at least a year.

FIRE AT KINGS ISLAND

Bob Reece, the Director of the Lion Country Safari at Kings Mills, Ohio, reported that the Hoofstock Barn was lost to fire. The damage is estimated at \$80,000.

Thirteen animals had been housed in the barn. Five zebras were saved, three scimitar were saved and one was lost. 1.1 Hart was lost and 1.1 Addax was killed. Total animal loss is set at \$12,000 - \$15,000.

The fire was electrical in origin. A Security Guard smelled smoke and investigated.

The Regional Coordinator position for the state of New York is vacant. Anyone interested should contact
Tom Goldsberry
Washington Park Zoo
Portland, OR 97221

BIRTHS HATCHINGS

SILVER-BACKED SAKI BORN

A female Silver-backed Saki *Pithecia monachus* was born at the Oklahoma City Zoo on 29 November 1978. This animal was born in the Primate Building but was transferred to the Nursery on the following day when it was determined that she was not being cared for by the mother. The Saki weighed 121 grams upon entrance into the Nursery and is progressing well, weighing 221 grams on 10 January 1979. This was the first live birth recorded for this species at the Oklahoma City Zoo.

19th ELEPHANT BORN AT WASHINGTON PARK ZOO

On 19 May 1978, Portlands' 19th elephant was born to Me Tu, the second elephant born at Portland. Exact time of birth was unknown, but the calf was on its feet and nursing when discovered by the night keeper after midnight.

Exact birth weight and present weight are unknown due to the mother's reluctance to part with the calf. Estimated birth weight is 180 lb. (81 kg) and present weight is estimated at 700 lbs. (318 kg).

The male calf was named Khun Chorn, the Thai words for "mister elephant."

At eight months, fecal samples verify that he is ingesting and digesting some solid food.

Zoo staff is delighted to see a normal healthy calf after the two unfortunate congenitally defective calves born to Hanako.

Khun Chorn will spend a year with Me Tu at which time he will be weaned and chain-broke.

For those of you planning to attend the AAZK '79 convention in Portland next September, we hope to have number 20 on exhibit (due as early as June).

HUMBOLDT PENGUIN HATCHED AT WASHINGTON PARK ZOO

Thirteen Humboldt penguins reside in the Washington Park Zoo Penguin-arium, Portland, Oregon. On November 28, 1978, a pair laid one egg and a second one four days thereafter. Of the several nest sites provided for the colony, the pair selected a rock cave filled with sand. Both parents incubated the eggs and on January 12, 1979, a grey, downy chick was first noticed. The other egg has not hatched. Rarely have both parents left the nest to feed at the same time; hence the chick is not visible daily. This is the first successful hatching of a chick since the colony was formed.

P.S. I just found out, on January 17, 1979, the chick died of yet undetermined causes. We hope for better luck next time.

Bear Biology Association Newsletter is available from C.J. Martinka, Treasurer, BBA, Glacier National Park, West Glacier, MT 59936

A Note from the President

As we enter 1979, I am optimistic that we will be able to correct some of our administrative problems and initiate the projects we discussed at Gainsville during the next year. In January, we switch over to a mailing service for distribution of the AKF which should rectify, in the near future, the mailing errors we experienced last year. We will also be trying to procure additional funds for operating costs in various areas to delay any increase in annual dues. I feel we are off to a good start in many of our long term projects already. We'll be attempting to solidify the local chapter system and stabilize the administrative and regional coordinator personnel, both of which had a considerable turnover in the past, resulting in decreased efficiency.

I feel we have made progress in some areas, but still have some persistent problems to deal with. AAZK is a young organization that is still feeling growing pains.

AAZK is slowly developing into a more professional association, but we still have a long way to go before we can reach a level which I feel we should be capable of attaining.

AAZK is a voluntary organization which must rely on member support and involvement to sustain its functions and to increase its overall input into the professional zoo field. Consequently, every AAZK member has the opportunity to maintain a viable organization dedicated to improving the status of all animal keepers.

I urge all members to try to assist the association in some aspect, either on a local or national level.

I'm looking forward to a productive year in 1979, and another great convention in Portland, Oregon in the fall.

Sincerely,



Dennis Grimm
AAZK President

NEED FOR OIL BLINDS GOVERNMENT TO PLIGHT OF BIRD

The Indian government consented to allow hunting parties of Arab noblemen to hunt the Houbara bustard, a favorite of falcon hunters. Environmentalists told the government that the bird is endangered and has become extinct in neighboring Pakistan.

The Houbara bustard is an awkward migratory bird which squirts a gummy liquid. It is not protected by law as the Great Indian Bustard, which is considered a native bird.

India is short on energy sources and the Arab noblemen are from countries that sell oil. The government protested, but then allowed the hunting parties.

SOME STATISTICS ON LION BIRTHS IN CAPTIVITY

by
Rick Heithaus
Kings Island, Kings Mills, Ohio

The following data on lion births in captivity is presented to enlighten others in the field of large felines. It can be used in a comparison with similar data dealing with lions in the wild. The data was collected primarily over the past two years at Wild Animal Safari, Kings Island Park, Cincinnati, Ohio. Below is a table showing the data on the age of the mother when the young were born, the number and sex of the cubs in each litter, the month in which they were born, and the length of the gestation period (when it was known) for the 26 litters.

Name of Mother	Mother's Age	Sex of Cubs	Month Born	Gestation (days)
Bonnie	3.4	1.2	Sept.	107
Pepsi	4	0.2	Dec.	108
Claudine	5	2.3	Aug.	108
Mama	4	1.1	May	-
Stumpy	4	1.1	May	-
Frog	6	1.1	Sept.	-
Donna	6	2.2	Aug.	109
Maggie	4	1.1	Sept.	108
Nema	5	2.1	Aug.	107
Peaches	7	1.1	Oct.	-
	8.8	2.0	Sept.	-
Babe	4	0.2	June	-
	5.2	1.1	Aug.	112
Taunti	4	- (2)	June	-
	4.7	1.2	Jan.	-
	5	1.1	June	109
Sheba	4	- (3)	April	-
	4.8	2.0	Dec	-
	5.2	2.0	June	109
Brenda	4	2.1	Aug.	-
	4.4	1.0	Dec	-
	4.11	1.2	July	107
Miss	4.6	- (3)	Dec.	-
	7.2	1.2	Aug.	107
Cheetah	4	1.0	June	-
	5.1	1.1	July	109

Statistics on Lion Births, continued

We can see from the table that the mean gestation period for the twelve cases known was 108.33 days with a range of 107 days to 112 days. This suggests that this group of females fell within the upper end of the range usually given in literature as 98 days to 114 days with a mean of 106 days. However, Cooper (1942) found that the mean gestation period of 51 litters born in the wild was even higher at 109.7 days with a maximum carrying time of 119 days. From these three means, it seems that our lions have a gestation period closer to that of wild lions than to zoo lions. This could be due to the more natural surroundings in which they are kept in our Park rather than a smaller, enclosed area of a zoo.

Twenty-six litters are listed producing 62 cubs for a mean of 2.42 cubs per litter. The range is 1 cub to 5 cubs per litter. Of the 55 cubs sexed, the sex ratio was 28 males to 27 females. This indicates that the sexes are born close to a 1.1 ratio, but that the males may be favored in the total population. A larger sample size is needed to draw any firm conclusion.

Multiple births accounted for 92.3% of the litters, while single births accounted for the remaining 7.7%. The peak time period for births is June through September with 70% of the litters being born during this time period. The three individual months with the greatest number of litters born are August (6), June (5), and December and September (4). The month in which a litter was born could have been influenced by certain routines of the keeper.

The table that follows shows the sex make-up in litters of the same size. The expectant percentages of the possibilities for the sexes assumes a equal chance of a male or female being born.

Litter Size	Sex	No. of litters	Expectant Percentage	Actual Percentage
One Cub	1.0	2	50%	100%
2 Litters	0.1	0	50	0
Two Cubs	1.1	8	50	61.6
13 Litters	2.0	2	25	15.4
	0.2	3	25	23.1
Three Cubs	3.0	0	12.5	0
6 Litters	0.3	0	12.5	0
	1.2	4	37.5	67
	2.1	2	37.5	33

The above expected percentages assume that an equal chance exists for a male birth as for a female, although these statistics show the male may be favored. This holds true for litters of one cub, but not for the other two litter sizes shown above. A larger sample size is needed to come to any firm conclusion. New litters are on the way to increase my sample size and to add to the above statistics so perhaps I may observe some more definite trends over a longer period of time.

YOU ARE WHAT YOU SWEEP

by
Jill Grade

The following is a letter I recently wrote to a friend of mine concerning my views on his attitude towards animal keepers--then I realized that what I was expressing on a personal level may be relevant to keepers and curators throughout the profession.

After my recent visit to your compound, I was quite impressed with the facilities you have for your collection. It must be nice to own a place that was built for the specimens in residence. It makes it so much easier to keep them properly, and I envy your employees the physical environment in which they work. But I do not envy the fact that they work for you, your attitude toward your employees is as antiquated as a zoo which attempts to keep penguins in a bear moat exhibit. Not that penguins can not live, and even do well, in an exhibit meant for bears--but it puts them in a compromising situation in which the tenacity of the penguins (and their keepers) is the only positive force involved. Thus the employees are faced with extreme difficulties--to do well under adverse conditions; to attempt to work as professionals, with pride and expertise in their fields, for an employer who believes they are no better than that which they sweep or shovel out of cages. What was it you said?..that they give you their opinions on how they feel specific situations should be handled, as token involvement with their work, but that underneath all they really want is to be told what to do by someone who knows better; and further, that all animal keepers fall into this category. If this is the attitude with which your keepers were approached when you were a curator at the zoo, it is no wonder they had so little respect for you! Why is it that you insist keepers are no more than easily replaced janitors just because they do not have management qualities? You consider a keeper who does not know the origin and Latin nomenclature of each species with which he works to be a non-professional. But where would you be if that same keeper had not told you that, while you were doing your paperwork, one of the Siamang looked "alittle down", and was therefore examined and medicated before illness could overtake it? And what good does it do you to know the origin and scientific name of two Hyacinthine Macaws, when a keeper is the only person who has observed them enough to know they are not a breeding pair? Examples such as these could go on forever--my point is that it is the keepers, not the curators, who are working in close with the animals on a day-to-day basis; and if a zoo keeper is a professional, by keeper standards, he will look listen and learn every time a cage is swept, scrubbed, shoveled, raked or hosed, until his personal knowledge of the animals in that cage becomes so comprehensive that it could be considered invaluable by a curator if only it were utilized rather than scoffed at. Your attitude, and the attitudes of others like you in zoos throughout the world, is one of the reasons we keepers are having such a hard time becoming professionals. Zoo officials brag and publicize the fact that their zoo exhibits are modern, natural habitats in which endangered species breed. They are paid to take expeditions into the wild to capture and observe animals, and they send their curators (expenses paid) to AAZPA conventions to keep them abreast of new developments in the zoological field. But zoo keepers, in spite of the progress being made in zoos, are still often regarded as managerie caretakers, capable only of leaning on shovels; and yet are expected to have a BA in Biology before we are hired to shovel manure at a wage one-third that of a ditch-digger. But even with attitudes such as yours prevalent in many zoos, keepers are working towards becoming more scientifically knowledgable; we are taking pride in our work and are

You Are What You Sweep, continued.

despite what you may think, dedicated to professional animal care. In light of the efforts being made by many keepers towards educating themselves and each other (as is seen in the work done by AAZK), I can only say that I wish people like yourself would try to farther our efforts rather than foil them--how can you expect someone to rise to a professional level when you keep knocking them down with your stinking attitude. I'm sure you've been shooting holes in every point I've made here. If so, just keep in mind that there are many keepers who feel the way I do. If you want respect you've got to deal it out; and if you don't care whether or not your employees (or keepers) respect you, then you're in the wrong business. Professional animal care in zoos, or any business dealing with large animal collections, requires mutual respect between curators and keepers of the part each plays in the efficient management of their institution. All personnel must work as a team, egos aside, for the benefit of the animals with which we are so concerned. Such comradery may sound impractical to a businessman like yourself, and in truth is somewhat idealistic on my part in view of the fact that even on a grand scale keepers and curators are having a hard time relating to one another--AAZPA and AAZK are still mainly working as separate entities--but since we are all working toward the preservation of wildlife, I think its high time we started working together. Our task is difficult enough without inside turmoils.

I guess I've said all I really can on this subject, and you've heard it all before--somewhat soapboxish if I do say so myself. Sorry if I've bored you with it--even sorrier if you've found it amusing. You know by now that I feel deeply about the part I play, as a keeper, in the zoo field. I just can't help taking it as a personal affront when you put down the efforts of people like myself. I hope you take what I've said here to heart this time.

Sincerely,
Jill

Animal Keepers' Forum is a medium for open discussion. The views of the author are not necessarily those of the AKF or AAZK.

PHILADELPHIA ZOO GIVES ZOO MEMBERSHIPS TO NEW YEAR BABIES

The Philadelphia Zoo is pleased to accept as its youngest members, six babies born in the Delaware Valley shortly after the beginning of the New Year.

According to the Zoo's Director of Marketing and Development John H. Cassidy, Jr., "We believe that membership in the Philadelphia Zoo is one of our city's most cherished traditions. We feel that our gift to these youngsters creates an exciting blend of the old and the new--the first-born babies in the brand New Year joining together with the oldest and best-loved zoo in America."

Bat Research News is available from Dr. M.B. Fenton, Editor, Dept. of Biology, Carleton University, Ottawa, Ontario K1S 5B6 Canada

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chapter

Santa Fe Chapter
Santa Fe Teaching Zoo
Santa Fe Community College
3000 N.W. 83rd Street
Gainesville, Fla. 32602

President....Jeff Stafford
Vice Pres....Dee Nelson
Sec/Treas....Dee Hontscharik
Program Director...Steve Stivers
Project Director...Tory Brodahl

news

The chapter reports that they are putting together educational kits for local school children. If anyone is interested in the kits or has suggestions as to what might be included in them, please contact Tory Brodahl at the above address.

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NEW GORILLA TO ARRIVE AT THE SAN DIEGO ZOO

Bouba, a 30-year-old female and the lone lowland gorilla at the San Diego Zoo, will soon be getting a playmate -- and perhaps a boyfriend -- with a little help from Ray Kroc and the San Diego Padres.

Zoo officials flew to Colorado Springs to pick up Abraham, a 375-pound (160 kg) male lowland gorilla, to mate with Bouba through a breeding loan arrangement with the Cheyenne Mountain Zoological Park. "Abe" will fly back in the San Diego Padres team plane, courtesy of Ray Kroc.

ATTENTION: POLAR BEAR KEEPERS

Those zoos and aquariums keeping polar bears will be interested to note that some work has been in progress covering the discoloration of the hair coats of this species. An algae has been cultured from the hollow space in the guard hairs of polar bears in the San Diego and Fresno Zoos which had caused a greenish cast to their hair.

While publication of these findings is forth coming, it would be helpful to hear from institutions who have experienced similar problems. Any information about the occurrence of such discoloration should be sent to Dr. Phil Robinson, P.O. Box 551, San Diego, Ca. 92112. The results of these responses will be compiled and made available to the zoo profession.

The most pertinent information should describe (1) occurrence (2) distribution on body (3) seasonality, if any (4) numbers of animals affected (5) treatment, if any (6) results of any treatment. For those institutions who have this problem currently, arrangements can be made to examine hairs from affected animals to determine causative factors and suggest remedies.

INFORMATION REQUESTS

I am seeking information on the captive propagation of any subspecies of the Kestrel *Falco sparverius*. Any information or data related to diet, breeding enclosure and nestbox requirements, tolerance to disturbances, incubation and hand-rearing, and release of offspring would be greatly appreciated. Please send reply to

Richard J. Devereaux
3530 SW 24th Avenue Box 86
Gainesville, Florida 32601

I am doing research on the African Crested Porcupine *Hystrix cristata*, and would appreciate any information AKF readers could send to me.

Denise Cunningham
200 East 31st St 2
Baltimore, MD
21218

Denise Bartenfelder is gathering information for a keeper education manual. She would like the zoos that do have keeper education courses and lecture to get in touch with her.

Denise O. Bartenfelder
Baltimore Zoo
Druid Park
Baltimore, MD 21217

AAZK ACCESSORIES AVAILABLE -- TELL THE WORLD ABOUT AAZK

The official AAZK decal is available again through the Overton Park AAZK Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially your car's window! Cost is \$1.00 complete, prepaid.

Make checks payable to the "Memphis Chapter, AAZK" and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Avenue, Memphis Tennessee 38107.

The official AAZK T-shirts are now available through Carlton Bailie. They come in a variety of colors and all have the AAZK logo on them. For more information contact Carlton. His address is 11 Willway Ave., Richmond, VA 23226.

The Lincoln Park AAZK Chapter will be producing the "Keepers CARE" buttons again in the near future. Interested individuals should contact Pat Sammarco, Chapter President, Lincoln Park Zoo, 100 W. Webster Ave., Chicago, IL 60614 for details and availability.

Monotreme Symposium Proceedings are available from the Royal Zoological Society of New South Wales, P.O. Box 20, Mosman, NSW 2088. Australia

from the President

REFLECTIONS ON THE PAST . . . THOUGHTS FOR THE FUTURE

by
Dennis Grimm
Brookfield Zoo

As most of the zoos across the country slowly, but steadily, improve the methods in which animals are exhibited and the zoos are attempting to offer themselves as an educational facility to the public who are supporting them; the role of the animal keepers is also changing. Today's animal keepers have more responsibilities and functions than their counterparts in the past. They are simply expected to do more and to be better at it. Unfortunately, the increased demands on the individual keeper have not always been appreciated or reflected financially by the zoos in many regions. Many animal keepers today are woefully underpaid while their duties and benefit to the zoo are not realistically recognized.

Education and experience requirements have increased dramatically over the past several years. Many zoos now accept primarily applicants with a college background for prospective animal keeper positions. I feel this trend will continue and that persons interested in entering the zoo field will have to be better educated and qualified.

The professional zoo associations, such as AAZK and AAZPA are cooperating and communicating more at a level which they never had in the past. The net result for these cooperative efforts will undoubtedly be mutually beneficial to all persons involved. One of my primary goals for AAZK is to remain supportive to such associations and to increase these committed involvements. If AAZK is to be truly professional in nature, we will have to act accordingly.

I have been involved in zoo work for over nine years and have witnessed many changes in the field, some of which are definitely positive. The process of improving the conditions and respectability of professional animal keepers will be tedious and disappointing at times, but I'm optimistic about the future of animal keepers. It will take time and considerable effort, but I sincerely feel that zoo keeping will be widely accepted as a genuine profession in the near future.

Dennis Grimm is the President of the American Association of Zoo Keepers.

FELLOWSHIP WINNER WANTS YOUR SUGGESTIONS

I am an associate member of the AAZK. I have been nominated for a Thomas J. Watson Fellowship for an initial year of post-graduate study and plan to spend July 1979 - June 1980 in Great Britain, Germany, and Africa and/or Australia. I will be conducting a comparative study focusing on the areas of education, conservation, research and display. I would very much appreciate suggestions on which zoos or research facilities to visit. I would also be willing to act as a courier for your own research information.

Contact: Laurie E. Bingham
PO Box 2082
Davidson College
Davidson, NC 28036
704 892-6107

KEEPERS, THE WESTERN REGIONAL NEEDS YOU

The AAZPA Western Regional Workshop is to be held in Sacramento, CA., the week of April 22-25. Realizing that the expense of lodging can often prevent keepers attending, the Sacramento staff has decided to take some positive action toward remedying this situation.

We are willing to provide available beds and sleeping bag space in our homes for interested keepers. Transportation will be available to and from the conference.

If interested, please contact us before April 10. We need your participation--please come!

Sacramento Zoo
3930 W. Land Park Drive
Sacramento, CA 95822
(916) 447-7383
Attn: Keeper Accommodations

**** COMING EVENTS ****

4th North American Wildlife and Natural Resources
Conference

March 24-28, 1979 Toronto, Canada

for details write: Wildlife Management Institute,
1000 Vermont Avenue, N.W., 709 Wire Building,
Washington, D.C. 20005.

American Society of Mammalogists Annual Meeting

June 17-21, 1979 Corvallis, Oregon

The Elephant Interest Group will be included in
this conference. For information contact:
B.J. Verts, Dept. of Fisheries and Wildlife,
Oregon State University, Corvallis, Oregon 97331

AAZPA REGIONAL WORKSHOPS

March 4-6, Great Lakes, Detroit, MI
April 1-3, Southern, Knoxville, TN
April 10-12, Central, Wichita, KS

Connie Dillon announced an AAZK meeting on April 10, 7-9 at Wichita.

April 22-24, Western, Sacramento, CA

See announcement following.

May 6-8, Northeastern, Erie, PA

WHITEHURST ASSAILS CANADIAN PLAN TO KILL POLAR BEARS UNDER THE GUISE OF ENVIRONMENTAL RESEARCH

A Canadian plan to feed crude oil to four polar bears and then conduct autopsies to determine if there are adverse effects has been labeled "a cruel and ill-conceived project" by Congressman Bill Whitehurst.(R-VA)

According to a news report from Toronto, the experiment is to be carried out by Norwegian and Canadian scientists with full government approval. Results of the experiment are intended to show the effects of an oil spill.

"If people don't understand the devastating effects of an oil spill by now, then they never will. The thought of feeding crude oil to a polar bear and calling it environmental research strikes me as being a cruel and ill-conceived project."

Apparently there are many who agree with the Congressman. When Imperial Oil, Canada's largest oil company, heard what the experiment involved, they quickly withdrew their financial support and stated they would not become involved in any study that warranted the killing of polar bears. Several animal welfare groups have also lodged protests over the proposed experiment.

Feeding of the crude oil capsules to the polar bears is slated to begin in February of 1979.

ANIMAL WELFARE PROGRESS IN THE NINETY-FIFTH CONGRESS

Animal Birth Control

For the first time, funds for research in animal birth control will be available from the U.S. Department of Agriculture. Senator John Melcher (D., Mont.) proposed an amendment to the agricultural appropriations bill on the floor of the Senate to include twenty million dollars for veterinary research, recommending that five percent be allocated for research in animal birth control. The Senator said, "We have it almost within our grasp to provide for humane methods of controlling predators, decreasing the population of unwanted and uncared for dogs and cats. Stray dogs and cats in almost all communities are a drain financially, a public health problem, and humane control through lower birthrates is, in my judgment, a necessary and prime goal." The Senate passed the Melcher amendment. Although the House of Representative conferees brought the total down to five million, Secretary of Agriculture Bob Bergland confirmed that an additional ten million for special grants to animal health research is available. Thus, up to \$750,000 should be distributed in the general area of predatory and other animal birth control. Information concerning grant applications should be addressed to Dr. E.F. Splitter, Cooperative Research, Science and Education Administration, U.S. Department of Agriculture, Washington, D.C. 20250

This paper was presented at the 4th National Conference of the American Association of Zoo Keepers.

HAND-REARING GOLDEN LION MARMOSETS
Leontopithecus rosalia
AT THE OKLAHOMA CITY ZOO

by
Marcia A. Rohrer

Abstract

Eleven Golden Lion Marmosets *Leontopithecus rosalia* have entered the Nursery of the Oklahoma City Zoo for hand-rearing since 1971. The animals are fed "Similac with Iron" infant formula at two hour intervals, using a syringe. Entry procedures, methods of housing, record keeping, weaning procedures, and introductions into adult marmoset groups are discussed.

Brief histories of the marmosets raised are described and husbandry techniques are evaluated. Suggestions are made for applying the technique to other small primates and small mammals in general.

Introduction

Golden Lion Marmosets have been on display at the Oklahoma City Zoo since June 22, 1964, when two pairs of adults were purchased from an animal dealer. There are 14 marmosets at the zoo at present, distributed over four areas, many of which are direct descendants of these original animals.

The first successful attempt of parent-rearing of offspring occurred in April of 1970. Two males were born and raised by their parents without problems. Eight other babies had been born previously, all of which had been still born or lived only a few days.

In the following year, it became necessary to attempt hand-rearing of this species. On June 16, 1971, two male babies were born. Four days after birth one of the babies was found on the exhibit floor. Although the parents attempted to retrieve him, he appeared to be too weak to cling to their bodies, and it was decided to take him to the Nursery for hand-rearing.

Since 1971, ten other marmosets have entered the Nursery. Nursery supervisor Shirley Keffer was responsible for raising the first Golden Lion Marmoset that entered the Nursery, and for developing the technique we now use for raising them. The marmosets are removed from their parents only when it becomes obvious that they have been rejected by them.

Of the 11 marmosets that have entered the Nursery, six have survived to be transferred to other areas of the zoo. Of the remaining five, two died within hours of entering the Nursery, one died of pneumonia after being dropped in the exhibit pool before removal, and two died in the Nursery at two months of age from unknown causes. It is this last type of loss that is the most frustrating since so many questions remain unanswered about how husbandry could be improved.

An interesting occurrence that has developed only recently is the appearance of a color variation in two babies born in February 1978. Previous babies have been born with a black streak of hair on their heads beginning between their eyes and running down the backs of their

Hand-rearing Golden Lion Marmosets, continued.

heads. This marking appeared in various degrees of prominence and in some cases was nearly absent. In February, two males were born and subsequently Nursery-reared that had markings distinct from any others born in the zoo in the 14 years they have been present. The skin pigmentation and hair surrounding the faces of these babies was much darker than usual. Rather than a narrow black streak, the entire face was ringed with black hair. Although this coloration was a new one for us, it seems to be common in Golden Lion Marmosets in other zoos, the National Zoo in Washington D.C., for example. Two marmosets born in July of 1978 at the Oklahoma City Zoo have also displayed these markings and this may become a common occurrence for us also in the next few years.

Procedure

When a marmoset enters the Nursery it is sexed, and examined to determine its overall condition. Its temperature is taken, and it is weighed on a gram scale. If any medical problems are encountered the zoo veterinarian is consulted immediately.

An Armstrong X-4 Baby Incubator is used for the marmoset's first residence. This incubator is disinfected and lined with towels and baby blankets. A heating pad with rheostat control is used for heating, and is covered with bedding. An air temperature of 85-90°F. is maintained. A small piece of towel or wash cloth is provided for the marmoset to cling to or crawl under. For the first few days the animal is kept in an off-exhibit area of the Nursery. Once it has been established that the animal is progressing well, it is put into public view.

Marmosets are fed "Similac with Iron" infant formula (Ross Laboratories, Columbus, Ohio) using a syringe without a needle. One drop of formula is placed on the tongue at a time. When this is swallowed another drop is given. In this way the marmoset learns to lap the formula rather than to suckle a nipple. A 1 cc syringe is used for the first few days, but as the amount of formula consumed increases we switch to a 3 cc syringe for the rest of the animal's stay in the Nursery. A variety of small nipples have been tried, but have been discarded for various reasons. When the baby is in an extremely weak condition, even the softest nipple is too firm and the marmoset tires before enough formula has been consumed.

Formula is offered every two hours around the clock for the first 3-4 weeks. After this the night feedings are gradually discontinued and the time between feedings is increased until the animal is being fed at 8:00, 10:30 AM, 1:00, 3:30, 6:30, 9:30, 11:00 PM. At this time the marmoset is 5-6 weeks old. Small amounts of "Gerbers" baby cereal (Gerber Products Co., Fremont, Michigan) are added to the Similac when the animal is about three weeks old, and strained fruit baby foods are offered by syringe at this time also.

As in most aspects of animal husbandry, record keeping is a very important aspect in hand-rearing animals. When the marmoset enters the Nursery, a "Nursery Data Record" is used to record pertinent information. The species, its ID number, sex, time and date of birth and entry into the Nursery, distinguishing physical characteristics, and reason for removing it from its mother are recorded upon entry. The animal's weight and temperature upon entry and during its stay in the Nursery are recorded on this form also. Additional space is provided for vaccinations and medications.

Hand-rearing Golden Lion Marmosets, continued

Each feeding is recorded on a "Nursery Daily Care Chart". The type of diet and amount offered are recorded, along with the amount accepted, and whether the animal defecated or urinated. Additional space is provided for comments on appetite, solid food offered, appearance of teeth, unusual behavior, or any problems encountered.

When a marmoset enters the Nursery the zoo veterinarian is notified immediately. The animal is examined by him and if necessary, a pediatrician from a local hospital is consulted. After the first few critical days, the veterinarian examines the animal only if a specific problem develops.

For the first 5-6 weeks of the marmoset's life, it is taken home by the Nursery personnel for night feedings. The animal is carried in a pet carrying case lined with blankets and equipped with a heating pad. Special care is taken to isolate the animal from as many people as possible at this time to prevent exposure to disease.

When it has been determined that the marmoset is eating well, and when the night feedings have been reduced to three (6:30, 9:30, 11:00 pm) the marmoset is left in the Nursery at night. Trained night personnel are responsible for the feedings at this time. The Nursery supervisor is on call at all times to answer any questions or to handle any problems that may develop.

While in the Nursery the marmosets are weighed once each week using a gram scale. These weights are recorded and provide a reliable indicator of the animal's progress. These weights are especially important when the animal is being weaned and when it is under the stress of being introduced into an adult marmoset group.

When the marmoset outgrows the space in its incubator, usually at 2-3 weeks, it is moved to a glass fronted box or bed that has the dimensions 37"x22"x22". A wire mesh lid is placed on top. A heating pad is used as the heat source and covers approximately one-third of the bottom of the box. In this way the marmoset is not constantly exposed to the heat and can escape from it, if it desires.

The box is lined with towels and baby blankets and the heating pad is covered with bedding in the same way that the incubator was set up. Branches and dowel rods are added to the box and small toys may be added to provide some recreation and to help develop coordination in the growing marmoset. The wire mesh lid also provides another surface for climbing.

Marmosets are exposed to a sun lamp for two periods of 15 minutes each, twice daily. A timer is set to prevent exposing them for longer than is desired. The sun lamp is hung two feet above the top of the enclosure and 2-3 feet from the marmosets themselves. Since the Nursery facilities do not allow the marmosets to be outside even in favorable weather, it is hoped that this exposure will provide them with some artificial sunlight and promote the best possible health.

Most marmosets begin eating solid foods at an early age, usually at about 3 weeks. Gerber's baby cereal is added to the formula in increasing amounts and a variety of strained baby foods are offered by syringe. Small pieces of fruit (apple, banana, orange, raisins), crickets,

Hand-Rearing Golden Lion Marmosets, continued

and Zu Preem Marmoset Diet (Hills Division Riviana Foods, Inc., Topeka, Kansas) are left in the marmoset's enclosure during the day.

In most cases the transition from Similac formula to solid foods has been a smooth one. However, due to the difficulty encountered in weaning one of our 1977 babies, a new technique for weaning was used on two babies born in 1978. Instead of using cereal and baby food, these marmosets were weaned directly from Similac to fruit, marmoset diet, and crickets. The crickets played a major role in this weaning process. They were accepted by the marmosets quite readily and soon became their preferred food item. The marmosets showed steady increases in weight during the weaning period as compared to our 1977 "problem chile" who often showed small weight losses during weaning.

We have found that our marmosets have learned to eat solid foods most readily by mimicking the keepers. If a small piece of fruit is held up to the lips and smacking sounds are made, the marmoset usually show a great deal of interest in the procedure and tries to take a bite of the food itself. The procedure is repeated 3-4 times daily when formula is being offered. After the marmoset has learned to eat from the keeper's hand it begins to eat food from the dish left in its enclosure and weaning is nearly completed. When two marmosets are raised together they are at a definite advantage since they can learn from watching each other.

Feedings are reduced by one feeding/day each week until the animal is being fed at 8:00 am and 3:30 pm only. By this time plans have been made to transfer the marmoset to an exhibit and the animal should be ready to leave the Nursery. This usually occurs at about three months of age.

A variety of "Howdy" situations (methods of gradually introducing a new animal into an already established group) have been used to introduce hand-reared marmosets to any one of the four exhibits in the zoo. In the case of the first hand-reared marmoset born in 1971, when the animal was three months old, his parent-reared sibling was removed from his exhibit and introduced to him in the Nursery. They were placed in a specially constructed cage with a wire mesh partition for the first five days. At that time the partition was removed and the marmosets were allowed to interact for increasing periods of time. After two weeks, the marmosets were no longer separated and were interacting normally.

More recently a wire mesh cage has been placed inside the adult marmoset exhibit and the Nursery animal is placed in this cage for increasing lengths of time. This provides visual and some physical contact between the baby and the animals to which it will be introduced. At first the marmoset is returned to the Nursery at night, but after a week or two the animal will be left in the "Howdy" cage 24 hours/ day. In a few more days, it will be let out of the cage to interact with the members of the group. It is also important that the marmoset has adjusted to eating the same type of diet that he will be exposed to when introduced to the group.

If construction of the marmoset exhibit allows, another method may be used. The exhibit may be divided into two sections and the Nursery-reared animal placed in one section. Again, there are windows covered with wire mesh to allow contact as described above.

Hand-Rearing Golden Lion Marmosets, continued

Most of these introductions last from 4-6 weeks and results obtained have been very favorable. The marmosets are accepted into the new groups with a minimum of stress and are seldom the victims of aggression from group members. The marmosets are weighted weekly as long as is possible and although a slight weight loss is not unusual during the initial phases of the process, it seldom lasts longer than a week or two.

Although the marmosets seem to encounter few problems in adjusting to their new environments and cage-mates, their attachments to the keepers that raised them and to people in general may prove to be a problem, or at least a nuisance. When a keeper enters the exhibit the marmoset may come down to greet him or even jump on him. Although this is a minor problem for the keepers, this imprinting on humans could prove to be a hindrance to breeding when the marmoset reaches sexual maturity. The intensity of these attachments to keepers seems to diminish with time, and if the animal is introduced to other marmosets as soon as possible, it is hoped they can grow to be normal reproducing individuals. This problem is especially evident when one marmoset is raised alone. When two are raised together the adjustment of moving into new quarters seems to be made much easier and the animals are much less dependent on humans.

Discussion

Brief histories of the eleven Golden Lion Marmosets that have entered the Nursery over the last seven years have been summarized in Chart #1 "Golden Lion Marmoset Rearing Record". A few generalizations can be made from this summary: (1) Most of the marmosets are in a weak condition, often extremely so, when they are brought in and bite wounds on the hands, feet, and tails are common. (2) In all cases the baby has been found on the exhibit floor or has been dropped several times by the parents. The parents are given every opportunity to retrieve the offspring before the decision is made to remove it for hand-rearing. (3) Marmosets in an extremely weak condition may live only a few hours in the Nursery, but once the first few days are passed, their chances for survival are very good. (4) The age for removal from the Nursery and introduction into an exhibit has been decreasing as more experience in this process has been gained. At present the introduction into an exhibit has been decreasing as more experience in this process has been gained. At present the introduction is being completed at three months of age.

It is difficult to make generalizations about how our husbandry technique could be improved since every marmoset that enters the Nursery has a distinctive personality and presents different problems in rearing. Closer observations of the behavior of the mother and babies immediately after birth may have been able to prevent the deaths of the two marmosets that died from inanition, but this is difficult to say. Accurate observations are extremely important in cases like these.

Two marmosets born in 1976 died at two months of age within a few days of each other. The necropsy did not reveal a cause of death, but it was suggested that it may have been a viral infection. Again it is difficult to learn from this experience when the cause of death has not been determined. Even tighter restrictions on admittance into the Nursery or more thorough disinfecting may help reduce the possibility of viruses spreading, if that really was the cause.

GOLDEN LION MARMOSET REARING RECORD

Chart #1

Date of Birth	Sex	Age (days) At Entry	Entry Condition	Reason Removed From Parents
16 June 71	1/0	3	Weak; dehydrated	Rejection; found on floor
6 Aug. 72	0/1	1	Very weak	Rejection (2 still-born siblings)
25 Mar. 74	1/0	3	Very weak; starving	Rejection
20 June 74	0/1	1	Good	Found on exhibit floor
13 Apr. 76	0/1	35	Starving	Found on floor
13 Apr. 76	0/1	35	Starving	Found on floor
13 Oct. 76	1/0	9	Good but with minor bite wounds	Rejection
29 Oct. 77	1/0	5	Minor bites; dropped in pool	Rejection
29 Oct. 77	0/1	5	Minor bites	Rejection
25 Feb. 78	1/0	1	Good	Rejection
25 Feb. 78	1/0	1	Good	Rejection; dropped several times

Hand-Rearing Golden Lion Marmosets, continued

One Marmoset died from pneumonia a day after being dropped in the exhibit pool. Obviously this could have been avoided by draining the pool immediately after the female gave birth. This was an unfortunate accident that hopefully will not be repeated.

Improvements could also be made in our weaning technique which we are still experimenting with. Each marmoset goes through the weaning process differently than any other, and adjustments must be made to fit each animal. Hopefully, a basic technique can be established in the future that will be flexible enough to be practical.

It may be possible to begin our introduction process at a slightly earlier age than we are doing now, but beginning this at too early an age may prove to be detrimental to the animal. We should make all possible efforts to expose the Nursery-reared animals to other marmosets as soon as possible, however.

GOLDEN LION MARMOSET REARING RECORD

I.D. Number	Non-Survivors in Nursery			Survivors in Nursery	
	Date Died	Age	Cause	Date Removed	Age At Removal
1619-06				12 Nov. 72	1 year, 5 months
None	6 Aug. 72	5 hours	Inanition		
3589	28 Mar. 74	3 days	Inanition		
3850-18				19 Nov. 74	5 months
5476-25	21 June 76	2 months	Unknown		
5477-26	13 June 76	2 months	Unknown		
6080-28				1 Feb. 77	3 months, 2 weeks
6963	4 Nov. 77	6 days	Pneumonia (drowned)		
6964-33				14 Feb. 78	3 months, 2 weeks
7116-35				24 May 78	3 months
7117-36				24 May 78	3 months

Hand-rearing Golden Lion Marmosets, continued

Although feeding by syringe has proven to be quite satisfactory for us, it does involve some risk and must be done with great care to prevent aspiration of the formula. A variety of nipples and bottles have been tried, but are usually too firm to be practical. An appropriate nipple and bottle would make feeding safer, easier, and more natural for the animal.

The basic techniques I have described have worked well for our Golden Lion Marmosets and could be used for rearing any of the other Marmoset species. The method has also been used with success to raise the Slow Loris *Nycticebus coucang* and Senegal Bushbabies *Galago senagalensis*. An Indian Fruit Bat *Pteropus tonganus* was also fed by the syringe method and raised successfully. In addition to these species, a variety of small primates such as tree shrews, lemurs, other members of the family Lorisiidae, and some of the smaller cebid monkeys could also be raised using these techniques. This has proven to be a successful method for raising small primates, especially when they are in a weakened condition, and is versatile enough to be used for raising a variety of other small mammals as well.

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

CURATOR... responsible for administrating and managing animal department. Requires Bachelor's Degree in related field; two years of experience in zoo management. Salary: \$14,747.40 - \$19,718.40 Send resume to Kay Johnson, Personnel Officer, City of Louisville, Personnel Department, Civic Plaza Building, 701 West Jefferson, Louisville, KY 40202.

NUTRITIONAL TECHNICIAN... responsible for daily preparation, ordering and maintaining current inventories of animal foods, food animal colonies and operation of hydroponics unit; consults with animal health staff on diet formulation and delivery. Salary \$10,651 - \$12,193. Degree and zoo experience desirable. Send resume to Metropolitan Service District, 1220 S.W. Morrison, Portland, OR 97221 by February 15, 1979.

ZOOLOGIST... responsible for operation of medium-sized animal collection. Requires zoo experience in all aspects of handling, care and record keeping of a variety of wildlife and degree. Send resume by 19 February 1979 to Paul E. Meyers, Director, Utica Zoo, Steele Hill Road, Utica, NY 13501.

MARINE EDUATOR/CURATOR... assist in the care of marine exhibits (no mammals) and the development and teaching of marine science courses. Applicant must have a B.S. in Zoology or related field. Send resume to R.L. Bilodeau, Aquarium Director, Children's Museum of Hartford, 950 Trout Brook Drive, West Hartford, CT 06119.

AQUARIUM CURATOR... expected to help plan a new aquarium for which funds are currently being sought; responsible to Director. Minimum B.S. or equivalent required. Experience with aquarium species essential. Salary and conditions equal to major U.S. zoos and aquariums. Contact: Peter Crowcroft, P.O. Box 20, Mosman NSW 2088, Australia by 30 June 1979, with curriculum vitae.

PACHYDERM KEEPER... to perform routine duties with rhinoceros, hippopotamus, African and Asiatic elephants and to participate in headline and training of elephants for public show, under supervision of senior keeper and trainer. Pachyderm experience required. Salary: \$9,318 - \$9,880. Good benefits. Contact: Tom Foose, Zoological Curator, Oklahoma City Zoo, 2101 NE 50th, Oklahoma City, OK 73111. (405) 424-3344.

ASSOCIATE DIRECTOR... supervision of personnel and daily maintenance of animals primary responsibility. Will have extensive public contact. Requires knowledge of basic administrative principles. Prefer applicant with knowledge and ability for maintenance and upkeep of mechanical systems; filtration, plumbing, electrical and heating. Expected to be a working member of the staff; a general regard for animals, along with daily individual contact is necessary. Salary depending on experience. Send resume to Search Committee, Alaska Zoo, SRA Box 1728 W., Ankorage, AK 99507.

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Articles longer than three pages will be separated into monthly installments at the discretion of the Editorial Staff. Cite literature use in text and in final bibliography. Avoid footnotes.

Articles sent to Animal Keepers Forum will be reviewed for publication. No commitments to authors is made, but AKF will make every effort to print the article as soon as possible. All articles will be published in future issues of AKF for that calendar year.

Telephoned contributions on late-breaking news or last minute insertions is acceptable. However, phone-in contributions of long articles will not be accepted.

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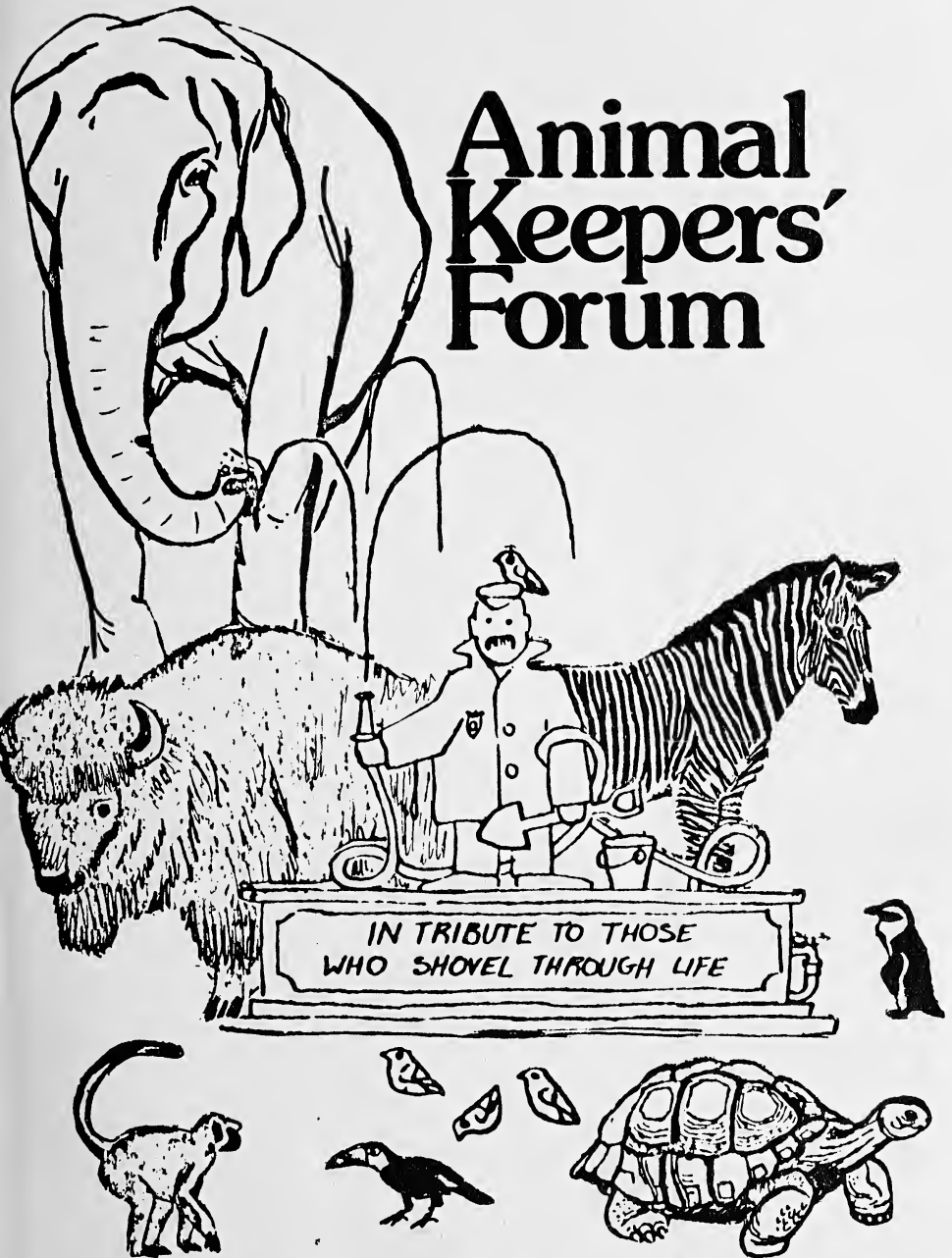
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Animal Keepers' Forum



Dedicated to Professional Animal Care

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SCOOPS and SCUTTLEBUTT

Andrew Main and Herb Clement give a tribute and a laugh on this month's cover. Those of us who have had a hard, hard winter can really use both! Andrew Main is from the Wellington Wild Animal Farm, Wellington, Conn. Thanks to both of you.

FIRE AT THE TOPEKA ZOO

On February 1 at 0800, the Topeka Zoo had a fire in its Tropical Rain-forest Building. The temperature during the night had sunk to an unbelievable -23° F.

The fire was confined to the Mechanical Room of the TRF, therefore did not directly damage the animals or plants in the building. The gas-fired boiler in the TRF malfunctioned causing the temperature to rise to 1500° or more. The aluminum flue melted and fell over onto the wooden roof of the Mechanical Room. The fire was confined to the roof and damage was confined to one of the two boilers. Estimate of the damage is \$27,000. There were no injuries to staff or firemen. Supplemental heating was provided by propane heating systems.

One week later there is evidence of minor plant damage. Two of the reptiles were lost, the Green Iguana and a Water dragon.

A TRIBUTE TO KEEPERS

Yesterday the keepers worked with shovel, broom, rake and hose. The animals were acquired by trade, birth, collecting, gifts and purchase by public funds. They were often exhibited in jail-like cages and were treated by "farm veterinarians" when they were sick. Animals were caught with lariat ropes when necessary and fed a variety of foods that were caught, raised or butchered by the zoo staff.

Animals are still acquired much the same way as in the past but they often live in open grottos and are treated by veterinarians specializing in zoo medicine. Tranquilizer guns are commonly used and specialized foods are brought to the zoo by the truckload.

Our present-day-realization of the need for humans to understand their place in nature as a partner and not a destroyer will lead us to build a "new" zoo...Yet with all the technology of the future plans, there will still be the keepers, the backbone of the zoo, caring for the animals with shovel, broom, rake and hose.

*from "What's in a Name?" by Hugh S. Davis, Former Director, Tulsa Zoo
reprinted from Tulsa Zoo: The First Fifty Years*

BIRTHS HATCHINGS

GETTING BY WITH A LITTLE HELP.....*Michael W. Dulaney, Cincinnati Zoo*

On January 19, 1979, a female domestic ferret (ISIS #M9030) gave birth to a litter of 11 offspring. This was the third litter for this particular female, but obviously the large number of babies were too much for her to take care of despite her motherly instincts. By the 21 of January, all 11 babies had died. On the 29 of January, 1979, a second female (ISIS #M9047) who is the daughter of M9030, gave birth to a litter of 9 offspring. Female M9030 was present for the birth of the nine to her daughter, and she immediately began helping her daughter with the chore of taking care of the newly born. Both females are now fully taking care of the babies. They share in the feeding (female M9030 is obviously still lactating enough) and protecting of the little ones. Both females very actively protect the babies from intruders as we try to clean around the group.

CINCINNATI ZOO INCREASES RODENT COLLECTION *Michael W. Dulaney*

The Cincinnati Zoo recently acquired several interesting new rodent species to add to its collection. 3/5 Prevost's squirrels *Callosciurus prevosti* recently arrived at the zoo. These beautiful tri-colored squirrels have settled in very well and a special attempt to breed them here at the zoo is being made. Other new rodent species added to the collection are... 2/2 Dwarf hamster, *Phodopus sungorus*; 2/2 Multimammatae mice, *Mastomys natalensis* (one pair has produced a litter of five offspring) and 3/3 European Harvest Mice, *Micromys minutus*.

Except for the squirrels all these rodents are being kept in the zoo's Nocturnal Animal House in an off-display section.

BRAZILIAN TAPIR BORN AT BROOKFIELD ZOO

Brookfield Zoo celebrated the birth of a male tapir calf on February 6. Both parents are on breeding loan from the Baltimore Zoo. The infant was born after an approximate 13 month gestation. Brazilian tapirs are on the endangered species list.

The infant tapir has been named Anta, the word for tapir in Portugese, the language of Brazil, one of the South American areas to which the tapir is native. As is usual with infants of this species, Anta has unique whitish watermelon-like stripes and spots which he will bear the first six to eight months of his life. Now standing about a foot tall and weighing about 20-30 lbs., he will grow to his parents' approximate three foot height and 500-600 lbs. Anta will eventually bear their uniform brown or reddish-brown coloration, as well. Life expectancy on tapirs is about 20 years.

June 5, 1979 is World Environmental day with the theme "Only One Future for Our Children--Development without Destruction."

SLOTH BEAR BIRTHS.

by Gordon Noyes, Senior Keeper - Bears
Washington Park Zoo, Portland, OR

The Washington Park Zoo, Portland, Oregon, had three sloth bears *Melursus ursinus* born this December. The zoo's first cub, born 12/6/76 to the same adults (both approximately six years old), died within 48 hours after birth. Preparation for the second pair of cubs was begun by putting the female in a maternity den a month before the suspected birth. The den had previously been wired for sound. Cubs were born on 12/25/77. We suspect that one was a still birth and we know the other cub lived fourteen days. No sure cause of death was ascertained as gross decomposition had taken place by the time we got the cubs.

This past year, before the female was brought into the den, we set up for both audio and video reception. The third birth occurred between December 19 and 21, 1978. The first cub was heard and seen on 12/19/78, on the next day, two were observed; and on the third day 12/21/78, another cub was seen and heard.

The three cubs are doing well as of this writing. The ability to see and hear them via our monitoring equipment is very convenient and necessary in order to avoid upsetting the mother. It also gives us an opportunity to watch the cubs and monitor their progress. By 1/23/79, approximately one month after birth, a full compliment of body hair cover was evident. Richard C. Jaffesons, 1975 International Sloth Bear Survey, records an average of five captive sloth bear births per year between 1965 and 1972, and estimates the total population of wild sloth bears at 7,600-8,400 without protection, while the polar bear population was at the same time estimated at 10,000-15,000 with an endangered classification.

A NEW GIRAFFE AT BROOKFIELD ZOO

Brookfield Zoo's 36th giraffe birth took place Monday, December 18, shortly before 5 a.m., when 12 1/2 year old Sandra gave birth to a male calf. The baby, Sandra's 4th, dropped about five feet to a sand-covered floor inside Brookfield's Giraffe House as the zoo's keepers looked on. Though steep, the drop is normal; females in the wild and in captivity give birth standing up.

The baby giraffe weighted an estimated 100 lbs. at birth. With the help of the keepers, the calf was attempting to stand approximately 1 1/2 hours after birth, though the giraffe baby had to take the usual numerous falls before he was steady enough to try nursing.

The baby is named Nicholas in honor of the holiday season.

ISRAEL TO GET AMERICAN BUFFALO

Two American buffalo were given by the city of Buffalo, New York, to its sister city, Diryat Gat, in southwest Israel.

The buffalo, the first in the Middle East, will be housed in the National Biblical Zoo in Jerusalem where special facilities have been constructed for their display and eventual breeding. The animals were donated to Buffalo by the U.S. Fish and Wildlife Service's Fort Niobrara Nation Wildlife Refuge in Nebraska where a herd is maintained.

The buffalo is more correctly known as American bison.

THE DEVELOPMENT OF A PREGNANT LIONESS

AND

THE MATURATION OF THE CUB

by
Richard P. Heithaus
Wild Animal Safari

Below are two timetables, the first one dealing with the progressive development of a pregnant female lion and the second one dealing with the progressive development of the resulting cub. The days and the corresponding events listed are based on my personal observation and care of 13 mothers and 16 cubs at Wild Animal Safari, Kings Island Park, Cincinnati, Ohio, and represent the averages of my total observations.

The Mother

- First day of pregnancy - considered to be 24 hours after copulating several times with a fertile male
- 2 to 94 days - no special care given as yet
- 95th day - isolate the female from all other cats and disturbances, increase her meat by 50% and add vitamin supplements, continue this until the cubs are 50 days old
- 96 to 107 days - Milk sac and teats enlarge at a rapid rate as compared to the earlier part of the pregnancy, the milk sac is very pendulous and the female is obviously large in the belly
- 107th day - less than 24 hours before dropping, the female will not eat, she drinks lots of water, paces and pants, acts very nervous, and ignores what is happening around her
- 108th day - parturition (I have observed two false pregnancies which followed the above events very closely except that no cubs were ever born)
- 109 to 113 days - female may not eat. She is easily irritated and is nervous and protective, she carries the cubs around in her mouth and may kill them, if she is disturbed
- 114 to 159 days - female settles down to the task of raising her cubs. At this point some mothers will not accept their cubs and leave them to die if they are not pulled
- 160th day - mother and her cubs are ready to be mixed back with the other lions
- 368th day - earliest the female was observed to come back into heat (usually 18 to 24 months in the wild). She can come back into heat within 4 days, if the cubs are pulled

The Development of a Pregnant Lioness and the Maturation of the Cub

continued

- 408th day - cubs start to show some independence from their mother and the mother's interest in them slackens until the break is complete within another year.

The Cub

- First Day - at birth the cub makes a high-pitched cry, can crawl around weakly, and the eyes can be opened or closed. Weight is 3 pounds.
- 6th day - eyes open and they are blue
- 25th day - milk teeth start to show through the gums, locomotion is a combination of crawling and walking
- 27th
- 27th day - cubs rub heads as a sign of friendly greeting. They stalk each other's tail and bite the backs of their litter mate's neck.
- 28th day - the cub starts to drink water on occasion, but is still wobbly when it walks
- 33rd day - the cub acknowledges the presence of people. They look up and follow peoples' movements, will open their mouth and hiss as a sign of aggression. They now walk confidently. The eyes are still blue.
- 37th day - the cubs are swatting at each other's face with their forepaws. They start to run, but fall down a lot. They are very aware of noises around them and are afraid of people.
- 41st day - eyes start to turn dark in color. They have a good set of teeth and claws. The weight is 10 to 12 pounds.
- 42nd day - they grimace and grit their teeth like adults when smelling feces and urine. They start to eat meat.
- 46th day - feline distemper shot given. The cub is weaned, but may continue to suckle until one year old.
- 50th day - start the process of mixing the cubs in with the rest of the lions (in the wild, the mother does this earlier)
- 65th day - weight is about 22 pounds.
- 73rd day - cubs are very active, but still entirely dependent upon their mother and run to her when frightened
- 74 to 239 days - growth period, further development of basic lion characteristics

The Development of a Pregnant Lioness and the Maturation of the Cub

continued

- 240th day - cubs were put out on display with the adults in an eight acre section
 - 270th day - mane starts to show on the males
 - 300th day - cubs start to show some independence from their mother (males sooner than females)
 - 373rd day - cubs were fed with the adults for the first time
 - 395th day - start to lose milk teeth to be replaced by permanent teeth
 - 1½ to 2 years - cubs become independent of their mother
 - 2½ years - female may come into heat (usually later in the wild)
 - 3½ years - male may breed (usually later in the wild)
 - 4½ years - have reached adult proportions with the male weighing 450 pounds and the female 310 pounds
 - 17 years - life expectancy of a lion in captivity.
-
-

from Don Bloomer, California

I recently attended the annual International Marine Animal Trainers Association Conference. The presentations covered areas such as Husbandry, Research, Training, and Breeding. There were excellent talks on many types of Marine mammals in the wild as well as in captivity.

IMATA is "dedicated to those who serve the advancement of marine animal sciences through research, technology training and husbandry."

I highly recommend membership in IMATA to zookeepers caring for Marine mammals. It is a valuable source of information that should be utilized. Please contact Don McSheehy, President, IMATA, NOSC, P.O. Box 997, Kailua, Hawaii, 96734, for further information.

?? INFORMATION, PLEASE ??

I am presently working with our flock of 24 Chilean flamingos at the Ft Worth Zoo in an effort to determine whether or not their social behaviors include the development of a pecking order. My search of the literature has turned up very little useable information directed specifically to flamingo behavior. Has anyone done work along these lines or know of published papers (or persons I might contact) which could aid me in my interpretations? Any help would be greatly appreciated.

Peter Shannon
c/o Fort Worth Zoo
2727 Zoological Park Drive
Fort Worth, Texas 76110

NATIONAL ZOOLOGICAL FOUNDATION PROPOSED BY WHITEHURST

Congressman Bill Whitehurst has introduced legislation calling for the establishment of a National Zoological Foundation. The Foundation would be responsible for awarding scholarships and fellowships for the training of professional and paraprofessional staff for zoos and aquariums in addition to funding pilot programs for the development of improved facilities.

Another area of Foundation concern would be the awarding of grants to establish survival centers for the captive breeding and preservation of endangered species.

According to Whitehurst, "The major purpose of our zoos and aquariums should be conservation and education. They're not just prisons of concrete and steel. But while many other cultural, scientific and educational facilities are able to obtain considerable Federal assistance, zoos and aquariums must in large measure continue to struggle to meet conservation and education responsibilities on their own. Believe me, it's an uphill battle."

The bill will first be considered by the Committee on Merchant Marine and Fisheries.

DDT RESIDUES STILL AFFECTING BIRDS

Although DDT was banned years ago, fish-eating birds are still showing the effects of the residue of the powerful insecticide. James Hale, a Wisconsin wildlife official said that herons, cormorants and other birds that eat fish lay eggs with shells so brittle they break.

MONKEYS BECOME ARMS AND LEGS OF HANDICAPPED PEOPLE

Two capuchin monkeys have been trained to aid disabled people by opening doors, flicking on lights, fetching objects, and even feeding the person.

Mary J. Willard, a consultant at Tufts New England Medical Center, has trained two that have been placed with a man who was handicapped in a motorcycle accident and a woman with a crippling muscle disorder. She is presently training two more, but funding has provided to be difficult to find.

???? INFORMATION EXCHANGE ???? ?

I would like to exchange information with anyone working with the following animals:

1. Striped Hyena *Hyaena hyaena*
2. Sloth Bear *Melursus ursinus*

Reply to

Mary E. Beetham
3 Sugarbury Ct. Apt 1A
Reisterstown, Maryland 21136

+++++

Rio Grande AAZK Chapter
Rio Grande Zoo
903 Tenth St. SW
Albuquerque, NM 87102

President....Viveca Ornelas
Vice Pres....Greg Smith
Sec/Treas....Cristi Cnare

chapter

news

Baltimore AAZK Chapter
Baltimore Zoo
Druid Hill Park
Baltimore, MD 21217

President....Steve Amos
Vice Pres....Cindy Clem
Secretary....Cynthia Butler
Treasurer....Carmella Biddle

Welcome to the newly formed Fresno AAZK Chapter
of Roeding Park Zoo
892 W. Belmont Avenue
Fresno, CA 93728

President....Sally J. Smith
Vice/Pres....Mary Swanson
Sec/Treas....Raymond Navarro

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AAZPA CENTRAL REGIONAL WORKSHOP, APRIL 8-11, 1979, SEDGWICK COUNTY ZOO

All keepers are invited to come to Wichita for a different kind of workshop.

Skills that can make you the most practical and valuable employee in your institution will be taught in the workshops at the zoo on Monday, April 9. These skills will be especially useful to those of you who work for smaller institutions.

A comprehensive blend of papers covering many areas of operations are scheduled Tuesday. Plan right now to bring that question you just can't get answered to Tuesday's problem-solving session; we'll all work together to find a solution.

Vice President Ron Kaufman of Topeka will chair the AAZK meeting Tuesday evening from 7:00 to 9:00 p.m. Plan to attend.

On Wednesday, professional management consultant Allan Hurst is leading a seminar on human development. His program on leadership, communications and motivation will help you get along better with others and take years off your climb up the career ladder.

For those with limited travel funds, information on economical accommodations is available. Contact Conne Dillon, Sedgwick County Zoo, 5555 Zoo Boulevard, Wichita, Kansas 67212 to find out more about this different kind of conference.

METHODS FOR RESERVING INSTREAM FLOWS IN 13 WESTERN STATES
EXPLORED BY INTERIOR DEPARTMENT PUBLICATIONS

The most promising methods of reserving instream flows for the benefit of fish and wildlife through governmental and institutional actions have been identified and evaluated in a series of reports for 13 Western States under a study announced by Lynn A. Greenwalt, Director of the Interior Department's Fish and Wildlife Service.

Through its Western Water Allocation Project, the Service has identified the existing laws, procedures, and methods for reserving the flows of streams and rivers to protect fish and wildlife.

The states included in this series of reports are California, Oregon, Washington, Idaho, Nevada, Arizona, New Mexico, Utah, Colorado, Wyoming, Montana, North Dakota, and South Dakota.

Separate reports for each state has been written because of the variety of laws regarding instream flows, as well as the differing State traditions concerning water rights and their past experiences in reserving instream flows.

Each of the reports is divided into three main sections--a guide to help the reader select the most appropriate strategy flow in any particular situation from among the various procedures and actions available in each State, a summary evaluation of the effectiveness of the strategy in the particular State, and a detailed narrative description of the procedures for implementing the strategy and an example of its use in the State.

Copies of these reports may be obtained from the Technical Information Officer, Western Energy and Land Use Team, U.S. Fish and Wildlife Service, 2625 Redwing Road, Fort Collins, Colorado 80526. Each of the 13 reports is entitled "Instream Flow Strategies for ... (State)." When requesting reports, specific States should be identified.

ANNUAL REPORT ISSUED ON MARINE MAMMALS

Although most of the marine mammal populations monitored by the Interior Department remained relatively stable during the nine months ending last March, biologists expressed continued concern about the manatee, or sea cow, in an annual report to Congress by the U.S. Fish and Wildlife Service. The Service has responsibility for the polar bear, sea and marine otters, walrus, dugong, and three species of manatees.

The report summarizes the following status information for each of the eight species: distribution and migration, abundance and trends, general biology, ecological and allocation problems, and current research.

THE STRUGGLE FOR SURVIVAL

Marine Mammals, continued

The report states that one of the manatees is faced with the most serious problem of any of the eight marine mammal species. It is the West Indian manatee, which concentrates seasonally in the rivers, estuaries, and coastal areas of Florida. It numbers only about 1,00 and has a low reproductive rate. It suffers losses in the Florida waters from encounters with human paraphernalia. Wounds inflicted by motorboats and barges are a major cause of manatee mortality. Encounters with flood control structures, fishing nets and hooks, water pollution, industrial contaminants, and herbicides also contribute to the animals' plight and affect their habitat and foods.

Limited numbers of the report are available to the public. Single copies may be obtained from the Director (WA), U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

PROCEDURES PROPOSED FOR DESIGNATING MANATEE PROTECTION AREAS IN FLORIDA

The Federal Government has joined the State of Florida in proposing to establish protection areas in Florida's inland and coastal waters to keep the endangered manatee from moving closer to extinction. The effort is aimed at reducing human contributions to last year's loss of an estimated 10 percent of the remaining Florida population of this unusual mammal.

Specific sites for Federal protection would be proposed, if necessary, to reinforce Florida's efforts under State laws passed last year. Florida has held a series of public hearings on the various areas it has proposed in 10 counties as manatee sanctuaries.

Under the proposed regulations, two categories of manatee protection area--refuges and sanctuaries--could be established, with water-related activities either restricted or prohibited altogether at certain times of the year. A new concept in protection designed specifically for the manatee and its unique problems, the protection areas have no relationship to national wildlife refuges, which are federally acquired lands.

Water-related activities include boating of any type, swimming, scuba diving, snorkling, skiing, or surfboarding. A refuge would have limits on boat speeds or the number of swimmers that could be in the water; a manatee sanctuary would prohibit any water-related activities.

The manatees are in greatest danger during the winter months when they congregate in warm water near natural springs or power plant discharges in search of the upper-60° temperatures that are essential for their survival.

The manatee is protected by the 1972 Marine Mammal Protection Act and has been listed as an endangered species since 1967. It has been protected by Florida State law since 1893.

WHOOPIING CRANES AND THE GRAYROCKS DAM CAN COEXIST,
INTERIOR AGENCY SAYS

The endangered whooping crane and the partially completed Grayrocks dam and power project can coexist along the Platte River System, Assistant Secretary of the Interior Robert L. Herbst said in releasing the U.S. Fish and Wildlife Service's formal biological opinion on the project.

Herbst said the alternatives suggested in the opinion would preclude jeopardizing the rare cranes and are supported by an out-of-court settlement agreed upon earlier by the two Federal agencies and several conservation groups and the State of Nebraska.

The biological opinion finds that the project would likely have an adverse impact on the cranes' critical habitat but says that the impact can be offset by totally replacing the 23,00-acre feet of water the power plant will consume each year, or by establishing a trust fund sufficient to improve, or, if necessary, to acquire additional habitat. Income from the trust fund could be used for measures such as physical manipulation of the habitat and/or acquisition of water or land or interests therein.

The out-of-court agreement also calls for a trust fund and places a "cap" or upper limit on the amount of water the power plant can withdraw from the dam and reservoir at Grayrocks.

At issue is the reduced stream flow and amount of water that will be depleted by the \$1.6 billion coal-fired plant served by the Grayrocks dam and reservoir. Although the dam site is 275 miles upstream from the whooping crane habitat, it will alter the river channel wetlands, and vegetation necessary for the cranes to survive.



AAZPA WESTERN REGIONAL WORKSHOP, APRIL 22-24, 1979, SACRAMENTO, CA.

The Sacramento, California, zoo staff are willing to provide available beds and sleeping bag space to keepers who want to attend the AAZPA Western Regional Workshop. They will also provide transportation to and from the conference. Please contact them before April 10.

Sacramento Zoo
3930 W. Land Park Drive 916 447-7383
Sacramento, CA 95882
Attn: Keeper Accommodations

PREVENTIVE MEDICINE AS RELATED TO THE ZOO KEEPER

by
Arnold Stillman
Busch Gardens

The first line of defense of injury and/or sickness to an animal is the Zoo Keeper. Most zoos are fortunate enough to have a staff Veterinarian or consulting Veterinarian on the premises during operational hours, and someone on call in case of emergency. However, it is impossible for them to observe all the animals on a daily basis.

The Zoo Keeper should be very observant when approaching his animal areas. The Zoo Keeper should look for the following:

1. the animals' behavior - this is important
2. the grooming or cud-chewing of the animal
3. the weight appearance of the animal
4. food consumption of the animal - checking for proper quantities of the animal's intake
5. the animal's stool - is it soft or firm; is the stool normal for this animal?
6. are the hooves in good condition?
7. is the animal's coat shiny or dull?
8. are there any sores, cuts, or abrasions on the animal?
9. does the animal have a nasal discharge: This could be the first sign of illness or respiratory disorder.
10. is the animal pregnant and/or close to deliver?
11. are all of the animals present? You might need to take a group count, but first you need to know how many should be there.

These are just a few ideas and questions that the Zoo Keeper needs to keep in mind when observing each animal. We can go back to the old theory of "Do we look when we see." Each animal is depending on us, remember, they can't tell us what is wrong with them.

When receiving a new animal in your area, if at all possible, the animal should be placed into some type of quarantine. While the animal is in quarantine, you should be able to get the vital signs; make note of the weight, sex, age, and stool sample. All of these should be noted for the animal's medical records, and for the future information of the animal. Once quarantine period is over, put the animal in a holding cage, and locate the cage inside the animal's permanent home, or new display. Throughout the entire quarantine period, and the transfer period, the Zoo Keeper should be observing the behavior and eating and drinking habits of the animal, making sure that the animal can eat and drink with no problem.

The Zoo Keeper will also experience births of the animal. It is most important that the Zoo Keeper approach the offspring as soon as permissible and check for:

1. the sex of the animal
2. check the mouth for cleft palate
3. check the body structure of the animal for deformities
4. be sure that the umbilical cord has been iodined
5. observe if the animal is nursing. Nursery care may be needed if problems occur
6. observe the growth rate and behavior of the animal
7. when possible, provide appropriate nesting area and material
8. take precautionary measure to prevent drowning.

PREVENTIVE MEDICINE, continued

The animal's cage is his home. The Zoo Keeper should check constantly for:

1. sharp objects such as wire, nails, glass,
2. paint flakings,
3. cleaning chemicals within proximity of animal area,
4. holes in the floor or in the ground,
5. animal's water supply, and keep it clean,
6. place feed so that the animal will not walk or defecate on it,
7. check the hard area - near feed - where hoof-stock can wear hooves,
8. temperature control,
9. ventilation,
10. electrical system.

Plant and pest control are both a necessity to the animal. It is imperative that the Zoo Keeper be aware of these two areas.

1. Native and exotic poisonous plants should never be within proximity to animal displays. Not only should they be removed from the displays, but they should not be placed anywhere close where a guest may unknowingly pick them to feed the animals. Therefore, knowing which plants are poisonous is very important and can easily be researched.
2. Rat, insect, and bird control needs constant attention. Control will prevent consumption or destruction of food purchased for display animals. The defecation of these pests mixed with the food can spread many diseases, internal parasites and bacteria. Zoological parks are obviously very dependent on public attendance, and with pests present this might discourage the visitor's return. These are a few reasons why a pest control program should be established. To help in developing this program, contact State Agricultural Extension Service or the Environmental Protectionist Agency.

Routine stool checks should be taken so that you can be aware if the animal has an infestation of parasites. The vet can then determine if treatment is needed.

Keepers should take every opportunity to research all available information pertaining to their animals. This knowledge can enrich the care and maintenance of these animals and help satisfy any questions asked by a visiting guest.

The above information is strictly a guideline for Zoo Keepers, and needs to be kept in mind each time you look at an animal. All of the above should become a routine system and come to mind automatically. When the Zoo Keeper works with the veterinarian and the curator, the health and well-being of the animal will be protected.

This paper was presented at the 4th annual conference of the American Association of Zoo Keepers.

CAPTIVATING THE CAPTIVE APE

by
Carol Glick
Pittsburgh Zoo
Pittsburgh, Pennsylvania

My co-workers are not beyond accusing me of being a fanatic where our gorilla is concerned, and that's partly why I'm here today before you-- to prove that their claims are not entirely unfounded. But more importantly, I feel that I must reiterate an article that I wrote about a year ago for *Animal Keepers' Forum*. In that article I suggested that captive apes would enthusiastically incorporate readily available and inexpensive leftovers around your zoo into their behavioral repertoire. Here I thought I was doing a service for the apes of America by making these recommendations. But none of the ten zoos I've visited since writing that article, have put my ideas to use. Is it possible that no one read *Animal Keepers' Forum* last year? Or, is it that those who did read the article didn't think too much of it? Whatever the reasons I'd like one more chance to expound on my ideas.

It seems that modern ape enclosures come in at least two popular varieties. One type of exhibit reflects a concern for maintaining the animals' health. Such a facility looks something like this. Basically, it is a square or rectangular enclosure. The walls are tiled or maybe muraled with a wilderness theme or perhaps they are moulded in such a way that one side of some rocks or tree trunks bulge from an otherwise flat surface. The floor is tiled or covered with concrete. Thankfully, the front of the exhibit lacks ominous-looking bars. They've been replaced with shatterproof glass.

This kind of exhibit is easily maintained. It can be periodically scrubbed out and disinfected. It protects the occupants from diseases that may be transmitted by the public. It minimizes abuses from the public. And, it provides an unobstructed view of the magnificent inhabitants. In summary, this is a sterile, safe environment that appeals to the public because it is spacious and barless.

The other type of exhibit looks something like this. It too, has square or rectangular contours, but the edges have been filed down a little to create a more realistic touch. Naturalistic, man-made rock forms a scenic backdrop. Some gunite boulders interrupt a basically flat terrain. And strategically-pace greenery, which in all likelihood is inaccessible to the animals, mellows out the man-made effects. But here is the clincher. This type of exhibit has no glass or barred partition in front. Instead an invisible moat separates the observer from the observed.

An exhibit such as this more or less protects the animals from the diseases and taunts of the public. In addition, it provides a panoramic view of the animals. And it satisfies the public's appeal for a spacious, barless enclosure.

But there is one characteristic that these two types of exhibits share with the more outdated barred enclosures of yesteryear--at least from what I've seen. Let me point out that I've had an opportunity to visit about twenty zoos in this country. And perhaps, that doesn't give me the expertise or right to make the following claims, but I'm going to, anyhow.

Captivating the Captive Ape, continued

These types of exhibits don't take all of the animals' naturally endowed behaviors into consideration, behaviors such as curiosity, adaptability, inventiveness or imagination, even climbing ability. I believe these considerations have been overlooked or unnoticed because the newer type exhibit is usually large enough to accommodate two or more individuals. When we look at such an exhibit, we are fascinated by the animals' interactions with each other. In turn, we tend to lose sight of the fact that animals do occasionally interact with their environment, too, at least in the wild they do. Captive situations, though, do not provide for this element of natural behavior. After all, how does an animal interact with a mural or gunite backdrop? It isn't easy. A rocky outcrop on the floor of the exhibit has more possibility--it at least can be climbed on, or leaned on, or even walked around. But is that so great? We are so impressed by the spacious, open quarters that new exhibits do have, that we forget that the quality of that space could be improved upon.

I think it's time to take a look at how we at the Pittsburgh Zoo have capitalized on the natural resourcefulness of our gorilla, George, and how we have encouraged the animal to interact with his environment. First, let me describe his quarters. Our zoo was built about 80 years ago. Apparently it was thought at that time that the animals which would occupy the cages would be of pygmy proportions. Unfortunately, this was a miscalculated prediction. George, for example, weighs in the range of 350 lbs. The dimensions of his indoor cage are an unyielding 25' x 15' x 12'. His outdoor quarters are larger, but not ideal. No structure of this era would be complete without its share of bars. And that we have. With such crude facilities and with no mate it would be easy to explain why the animal would pluck out his hair, or fingerprint with his feces. But George doesn't resort to this kind of amusement. Do you think he might be perverted? Well, I don't think so. You see, despite the fact that we don't have the most suitable environment for a 14 year old gorilla, we've taken pains to enrich the animal's setting.

Discarded rubber hoses of various lengths and about 1½-2" in diameter fit very nicely into a compact-sized cage. They can entertain a gorilla for hours as whips, for instance. Or during leisurely interludes, George might tuck them under his body in a nest-like fashion or twirl them between his feet while lying on his back. He's even been known to initiate a game of tug-of-war with his keeper or any other challenging prospect.

Tires, too, have limitless possibilities. Tires can be swung from, rolled, thrown, or sat upon. Our latest acquisition was a heavy-duty equipment tire which doubles as a springboard. After a workout, George often sinks his bottom in the hole and props his arms and legs along the edges. Visitors are moved by the fact that George can remodel his quarters simply by lifting the tire upright and rolling it to a more preferred spot. It took three men to put the tire into the cage. And I might add that the price was right on this gem. It cost us absolutely nothing. A local distributor assured us that the tire could not endure further repair and he was actually glad to have such clutter removed from his premises.

Other rubber objects of similar merit include rubber feed tubs. Obviously they are more suitable for sensitive derriers than hard concrete. And

Captivating the Captive-Ape, continued

it's not unusual for George to invert the tub on his head or to carry it around on his back in turtle shell fashion. Sometimes he places his tub in front of a steady stream of water that flows from a spigot in his outdoor cage. As the tub fills, George marches in it and slaps his chest. It's understandable that the water doesn't always have a chance to reach its maximum depth because George is too busy making waves. In fact, he frequently produces crests that are large enough to give bystanders a generous dousing.

When he doesn't feel like submerging himself in this activity there is another equally refreshing option. He holds his thumb over the spigot and waves his free arm and tongue in the oncoming mist. At the same time, and perhaps inadvertently, George manages to subject visitors to a simulated tropical rain shower.

George doesn't have, or rather he didn't have, access to a free-flowing water source in his indoor cage. But last summer Pittsburgh was blessed with a few days of miserable hot, humid weather. During one of these oppressive occasions, George had to stay inside where the heat was even more stifling. For this reason, I decided to mount the service hose to a pipe running along the wall beyond George's reach. Once the spigot was turned on, George spent a large portion of the day cooling off in the spray. So you see, even makeshift accommodations have appeal.

Despite the fact that our cage is less than spacious, we've managed to include a big log in the furnishings. One end of the log has blunt arms on it so that George has no trouble rocking or rolling it. It goes without saying that any captive audience appreciates the strength that such a feat requires. Especially since the log weighs over 1500 pounds. In addition, it provides a perch on which George can sit and look over and beyond spectators' heads.

Less bulky, but welcomed diversions are maple branches, straw, excelsior, (which, by the way, doesn't lose its integrity very readily) and burlap sacks, preferable large enough to plunge a whole torso into.

So you see, our ape facilities are old and small. At the same time, we must contend with the fact that we have only one gorilla. The ideal way to remedy this situation would be to get George a mate or send him to another zoo. No such deals have as yet materialized. But life must go on, and for George it does quite well, considering.

Contaminating an exhibit with man-made artifacts such as rubber tires, tubs, and hoses may be objectionable to those striving for the "natural look". But I can assure you that even though these novelties lack the authenticity of a forest habitat the behaviors they inspire are genuine enough. Rubber hoses, for instance, serve the same purpose in captivity that vines or branches do in the wild. If you don't believe me, then give your own charges a chance to appraise their value. Don't let another precious scrap of hose or any other salvageable material be relegated to a trash heap.

Placing hay, branches, or excelsior in the exhibit creates some extra work for the keeper, of course. Our cage often looks like a disaster area at the end of the day. But the disarray speaks for itself--George had a good day. And for that I can exert myself a little. I'll survive, I think.

Captivating the Captive Ape, continued

In a few zoos, the animals learn to operate computerized machines. If the animal feels like playing a game such as tic-tac-toe, he punches a button. This makes a light appear on a game board located in the visitor's area. A match begins when some person eager to match wits with a gorilla pushes his own set of buttons in response.

Although this is a costly way to get animals to interact with their environment, I respect the reasons for installing these devices. They help to bridge the gap between man and beast. And for those who don't have the time to understand the animals through patient observation, the machines provide a simple solution. Just press a button and the animal performs at an intellectual level that we can comprehend. Talk about being enlightened! We leave the zoo with the indelible impression that we have truly witnessed a remarkable creature, one that can operate a machine! How much like humans these animals are!

But why do we have to portray the human attributes of animals in order to appreciate them? Granted, seeing an animal perform scholarly feats on a machine is a memorable, if not educational experience, but hardly realistic in terms of what the animal is capable of doing in the wild.

To see the animal deliberately position a rubber tub so that it catches a steady stream of water--doesn't that tell you something about the animal's ability to reason, or to invent? To see how fastidious the animal is about making his bed, how he incorporates branches or branch-like objects into its construction--there's a lot of National Geographic credibility in this behavior. To see how gently he examines a sack, or fluffs a bale of hay or excelsior, how he strokes a handful of the stuff over his head--isn't this behavior indicative of the animals' gentle ways? Or in contrast to these delicate maneuvers, watching the animal effortlessly roll a 1500 pound log or hoist a heavy equipment tire upright--doesn't that tell you something about the animal's strength? Watching how the animal uses his teeth and lips to strip bark from branches--that surely suggests something about how the animal forages in the wild. Or to see how he uses inanimate props to dramatize and intensify his displays, how in one smooth continuum he beats his chest and while waving branches or hoses, he runs towards his big log, flips it, and then catapults himself to a proud halt on top of his oversized tire--isn't this performance representative of wild behavior? Tell me, isn't this the real ape we want people to see and remember?

This paper was presented at the 4th National Conference of AAZK.

CHICAGO ZOOLOGICAL SOCIETY SPONSORS "A JOURNEY TO SURINAM"

Director of the Brookfield Zoo, George Rabb, will lead the Chicago Zoological Society's first safari to South America. The 17 day trip will begin on March 10 and will feature boating, hiking, and day-and-night-time wildlife viewing and botanizing in the nature reserves of Surinam.

PROCEEDINGS OF THE BOARD OF DIRECTORS MEETING
NATIONAL CONVENTION OF THE AMERICAN ASSOCIATION OF ZOO KEEPERS

Awards

Individuals may be nominated for the National Keeper of the Year Award by individuals or by chapters. The same consideration will be given to the nominee regardless of which mode of nomination.

Chapter Affairs

The initial fee for newly formed chapters is \$10; annual chapter dues are \$5. This should help cover the costs.

The present Honorary Members will be retained. New ones must be supported by someone, usually the chapter.

Membership

Membership categories were redefined. Affiliate members are full-time, permanent animal keepers, including aquarium members, for \$10. Associate members are part-time keepers, non-keepers and students, \$10. Foreign members are \$15. Canadian members must pay in American currency. Contributing members are \$50 and up. Associate members may hold chapter offices, but not national offices. Renewals are on a yearly basis. Work will be done to encourage zoo supporting organizations to become contributing members.

Directory

A 1979 Directory will be put out in the spring. It will be free for Affiliates and \$3 for Associates. Pat Sammarco is in charge.

AAZK-AAZPA Liason

The Liason Committee has been discontinued. Ed Roberts is continuing in that capacity. Both associations are parallel and similar, but directed at different professional levels. It was proposed to the AAZPA to include a technical member category for animal keepers, but AAZPA did not accept the idea. Efforts to get this category will continue with contacts made to the committee personnel who are directly involved.

Administration Personnel

A Board member may hold another administrative or Regional Coordinator position if the work is done and no conflicts are present, however, an attempt will be made to have other people take over such positions.

Projects, present and future

Denise Bartenfelder is working on an AAZK Keeper Training Manual.

Changes in the AAZK Constitution By-Laws

Article I, Section 3: Chapters of the Association may be established and must be chartered by the Association in accordance with the procedures established by the Board of Directors. They shall be subject to the Constitution and will share all the rights and privileges thereto.

Article II, Section 2: The President shall appoint a Nominations and Elections Committee of at least five (5) members. This Committee shall select nominees, based on the qualifications for nominations determined by the Board of Directors, to run for election to the Board of Directors. The Committee Chairperson shall cause to be

Changes in the AAZK Constitution By-Laws, *continued*

published in the April issue of the national bulletin The Nominations Form as set forth by the Board of Directors requesting the recommendation of suitable nominees to be considered by the Committee. Recommendations must be received by the Chairperson no later than the last day of June following publication there-after to be distributed among the Committee members for consideration. The Committee shall select from among the nominations all qualified nominees.

Article II, Section 3:

. 1st line, change Chairman to Chairperson
. delete last two sentences starting with the words "Upon receipt" and replace with "The balloting envelopes shall be received by the Administrative Secretary and set aside until at least the fifteenth day of October. The balloting envelopes shall then be sent to the Committee Chairperson for counting of the ballots in the presence of a Notary Public."

Article II, Section 4: in line 3, delete "the Secretary and"

Article II, Section 6: Add "A Board Member who is not fulfilling his/her appointed duties may be removed from office by a majority vote plus one of the Board of Directors."

Article III, Section 5: (new) A Board Member must agree to uphold the Constitution of AAZK and must uphold AAZK policy wherein the Association is not a labor organization nor can it be utilized as such; must agree to appear at Board Meetings, traveling at his/her own expense (usually in conjunction with regional and national conventions); must agree to devote time to communications pertinent to all Board business, answering correspondence promptly and efficiently; must agree to accept Board assignments.

Article VI, Section 2: remove the word "Secretary" and replace it with "President".

Article VII (new): Any funds generated by a National Convention which remain after costs will be split equally by the host chapter and the parent National Association. Profits made on chapter projects which are sanctioned by the AAZK National Association will also be split equally between the chapter and the National Association.

ZOO WALK 79 AT MINNESOTA ZOOLOGICAL GARDEN

The MZG Newsletter tells about the walk-a-thon scheduled for May 5, 1979, with the theme The Northern Trek. The polar bear is the selection for the poster.

Last year's "Walk with the Animals" raised \$223,000 pledge dollars with 8,200 walkers and nearly 80,000 sponsors.

Best wishes for this year, MZG!

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

DEVELOPMENT OFFICER...seeking high quality development officer for special projects. Permanent position; excellent fringe benefits. Send resume to: Personnel Manager, Arizona-Sonora Desert Museum, Box 900, Route 9, Tucson, AZ 85704. ✓

EDUCATION SERVICES SPECIALIST... responsible for developing educational programs and materials, primarily at the elementary school level. Teaching experience required, with background in natural history and/ or tests and measures highly desirable. Send resume and references to: Metropolitan Service District, Att: Marlyn Daniels, 527 S.W. Hall Street, Portland, OR 97201 by 20 March 1979.

ZOO ATTENDANT... responsible for routine manual work in caring for a variety of animals and birds in an expanding zoo complex. Minimum of one year's experience in caring for or raising of animals. Prefer experience in the care of large mammals, especially African elephants. Salary: \$7,008 - \$9,384. Application deadline 30 March 1979. Reply to: Beverly Spencer, Personnel Technician, Department of Personnel, 1st Floor East Wing, City Hall Building, P.O. Box 1531, Norfolk, VA 23501.

EDUCATION DEPARTMENT... seeking teacher for group instruction at various levels - to include elementary through high school student, teacher workshops, adult seminars. Assist in development, implementation and evaluation of interpretive programs. Requires minimum of B.Z., as well as 3 years' teaching, or comparable experience. Salary \$14,000. Send resume to: Judith R. Kolar, Curator of Education, Lincoln Park Zoological Gardens, 2200 N. Cannon Drive, Chicago, IL. 60614.

ASSISTANT CURATOR/EDUCATION... administrative position, responsible for development and implementation of educational programs and overall operation of the education department. Must have bachelor's degree and grantsmanship ability. Send resume to John A. Dinga, Curator, Husbandry/ Education. Baltimore Aquarium, Harbor Campus of CCB., Lombard St. and Market Place, Baltimore, MD 21202.

* * * * COMING EVENTS * * * *

AAZPA REGIONAL WORKSHOPS

April 1-3, Southern, Knoxville, TN
April 10-12, Central, Wichita, KS see details on page 48
April 22-24, Western, Sacramento, CA see details on page 51
May 6-8, Northeastern, Erie, PA

AAZK NATIONAL CONFERENCE

September 24 - 27, 1979 Portland, Oregon

World Conference on Breeding Endangered Species in Captivity

November 12-16, 1979 San Diego, California

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INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10". Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Animal Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.

MEMBERSHIP INFORMATION

Affiliate (full-time keepers)	\$10.00 annually
Associate (part-time keepers, students, docents)	\$10.00 annually
Foreign	\$15.00 annually
Contributing	\$50.00 annually

All memberships include subscriptions to *Animal Keepers' Forum*. 50% of the member's dues are budgeted for the publication.

All new members receive an AAZK shoulder patch and a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

The AAZK Headquarters has extra shoulder patches available for \$1.25 and back issues of the *Animal Keepers' Forum* for \$1.00.

Send name and address and a check or money order, payable to American Association of Zoo Keepers to

AAZK HEADQUARTERS
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

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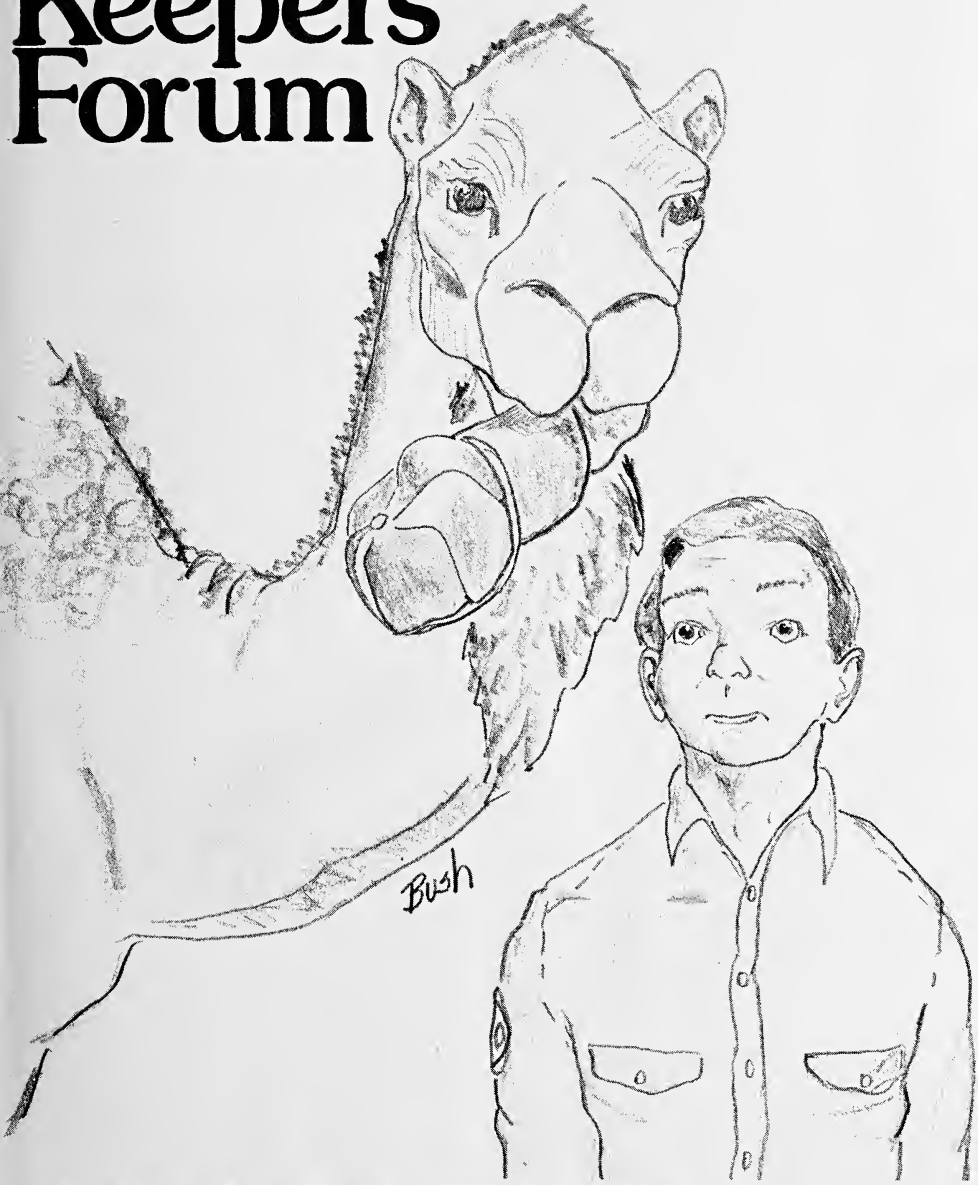
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APRIL 1979

Animal Keepers' Forum



Dedicated to Professional Animal Care

Editor-in-Chief: Ron Kaufman, Topeka Zoological Park
Executive Editor: Mike Coker, Topeka Zoological Park
Managing Editor: Lois Bogia, Topeka Zoological Park
Art Consultant: Elaine Shea

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SCOOPS and SCUTTLEBUTT

The cover sketch is by James M. Bush of a situation he encountered when employed at the Montgomery Zoo, Montgomery, Alabama. And what keeper has not encountered a situation where the animal is definitely one-up on the human? The title is 'Frustrated Keeper and Over-friendly Camel'.

WILDLIFE EXPO '79

by
Donald A. Rolla
Great Lakes Chapter, East African Wild Life Society

The importance of wildlife conservation will be presented to the public at the "Wildlife Expo '79" at the Randhurst Shopping Center in Mount Prospect, Illinois, on Saturday and Sunday, April 21 and 22.

Films, presentation, animals, artists, and information booths will make this the largest wildlife event of its kind in the U.S. There will be 20 wildlife and photography exhibitors. Six wildlife films and two program presentations are planned. Many organizations and agencies are planning to participate, among them the Brookfield Zoo, the Whale Protection Fund, World Book and the U.S. World Wildlife Fund.

AAZK ACCESSORIES AVAILABLE

T-SHIRTS

The official AAZK T-shirts are now available through Carleton Bailie. They come in a variety of colors and all have the AAZK logo on them. For more information contact Carleton Bailie, 3918 N.E. 1st Terrace, Gainesville, FL 32601. Note the change in address. Carleton has moved, and wrote AKF to inform anyone who wrote him at his old address, but has not heard from him to please write to his Florida address.

DECALS

The official AAZK decal is available through the Overton Park AAZK Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.00 complete, prepaid. Make checks payable to the "Memphis Chapter, AAZK" and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Avenue, Memphis, TN 38107.

THE PORTLAND WOLF SYMPOSIUM

August 14-16, 1979

Lewis & Clarke College
Portland, Oregon

Contact: Roger Thacker,
Northwest Trek,
Eatonville, VA 98328

BIRTHS HATCHINGS

CHIMPANZEE BIRTH AT MONTGOMERY ZOO *Laura Strickland*

The first birth of a chimpanzee at the Montgomery Zoo was recorded at 9:45 a.m. on January 19, 1979.

The male infant weighed approximately 3 pounds, and was in very good health. The parents, Benji, age 7, and Liza, age 9, were hand-raised from infants. Neither one has had an opportunity to observe breeding activity or the rearing of an infant.

The mother was a little confused the first few hours, carrying the baby upside down. However, she soon grasped the proper way to hold the youngster, and he was suckling in five hours. Liza is taking excellent care of the baby, and another young female, Sonya, age 4 (also hand-raised) has taken a very active interest in the baby.

We feel we are well on the way to developing a breeding colony from hand-raised chimpanzees.

We are interested in hearing from anyone who has successfully bred hand-raised chimps, or who have had hand-raised first time mothers who properly care for their offspring.

Please direct any information or inquiries to Laura Strickland, Montgomery Zoo, P.O. Box 3313, Montgomery, AL 36109.

PYGMY HIPPO BORN IN MEMPHIS. *Michael R. Maybry*

A pygmy hippo *Choeropsis liberiensis* was born at the Memphis Zoo and Aquarium on February 6, 1979. Labor began sometime after 10 o'clock that morning and the male baby was delivered with the mother standing on her dry platform at approximately 12:30 p.m. The baby first nursed at 1:05 p.m. Weighing approximately 6 pounds at birth, the hippo has grown noticeably during his first two weeks with weight no estimated at 10-12 pounds. This baby was number six for the mother, who has raised three others successfully.

TWO LITTERS OF TAYLOR'S CANTIL IN GLADYS PORTER ZOO. *Patrick M. Burchfield*

Gladys Porter Zoo in Brownsville, Texas, reports two litters with a total of six live young in a first successful breeding of the rare Taylor's Cantil. The Cantil is among the most beautiful of the Crotalid (pit viper) snakes, and has one of the most volatile temperaments. A specimen was caught in a locality near the Tropic of Cancer in coastal Tamaulipas. Taylor's Cantil *Akistrodon bilineatus taylori* has slate gray and brown crossbands with vivid yellow or orange in between them. It has a dark line running from the snout through the eye toward the rear of the jaw. The darkmarking is edged in white giving a mask-like appearance. The tip of the tail is sulphur-yellow or bone white in the adult snake.

SLOTH BEARS BORN AT GLADYS PORTER ZOO. . . *Michael L. Hughes, D.V.M.*

Two sloth bear cubs were born in December and are being hand-raised by the zoo staff. The cubs were full term, weighed one pound and appeared strong and healthy, but the mother did not care for them. Colostrum was collected from the anesthetized mother to give the cubs antibodies.

A REPORT ON THE AAZPA GREAT LAKES REGIONAL WORKSHOP IN DETROIT

From Larry Sammarco

GREAT CONFERENCE!

The AAZPA Great Lakes Regional Workshop held in Detroit was very successful in attendance and in educational value. And they throw a great party. Keeper attendance totaled nearly twenty-five and included AAZK President Dennis Grimm, board member Pat Sammarco, Regional Coordinators Randy McGill, Everett Harris, Don Rasmussen, and Larry Sammarco; and other Keepers from many zoos.

Larry Sammarco's presentation on the AAZK was well received, and a similar talk will be given at each of the AAZPA Regionals by local Regional coordinators.

Four Keepers presented papers:

John M. Miller, Cincinnati on "A Review of the Lowland Gorilla Births at Cincinnati Zoo, with Emphasis on Maternalistic Behavior."

Dick Mills, Cincinnati on "Parturition and Social Interaction in Captive Vampire Bats."

Gerald Payne, Detroit on "Care and Husbandry of Amphibians at the Detroit Zoo."

Don Rasmussen, Minnesota on "Animal Restraint: The Keepers Role."

AAZK information was available and many delegates took 'Keepers Care' buttons back to their zoos.

Keepers are encouraged to attend the AAZPA regionals in the name of professionalism and comradery and to get a different view of the Zoo World. Topics of various papers included Research, Cost Analysis, Education, Medicine, Photography, Budgets, TV, A Reptile Collecting Trip and the plans for, and progress of New Zoos.

Be sure to note the dates of the Regional Workshop in your area and make plans to attend.



KEEPERS CARE BUTTONS

Those sought after buttons to show that Keepers care about their Ecosystem are now available for the paltry sum of Fifty (50) cents, an unheard of bargain in today's inflationary economy. Imagine the joy and thrill of owning 1, or 2, or even 10 of these buttons! Remember that 50% of the sale price goes into the AAZK's National treasury to help give the members better service. Interested individuals please contact Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614

Dear Members,

Here are the nomination forms for the upcoming Board of Directors election. Three seats are up for re-election...those of Ed Roberts, Dennis Grimm and Ron Kaufman. Their terms expire in December of this year. Nominations for the election must be received by me no later than June 30, thereby allowing time for approval by the Nominations and Election Committee during July. The election ballot, and a short biographical sketch of each nominee will then be published in the August issue of AKF. Note that the forms are somewhat lengthy and detailed, whereas the qualifications are relatively simple. The object of this is that the organization wishes to give members every opportunity to become involved in its administration, but you have to be able to handle the paperwork! Please send completed forms to me at the following address:

Jill Grade
Busch Gardens
Attn: Zoo Office
3000 August A. Busch Blvd.
Tampa, FL 33612

Potential nominees who do not qualify will be notified of this by mail.
Good Luck!!

Sincerely,
Jill Grade, Chairwoman
Nominations and Election Committee

DUTIES OF THE BOARD OF DIRECTORS: (Constitution, Art. III)

1. To confirm appointments made by the President
2. To control and manage the Association and its property, passing upon acquisition and disbursements with approval of a simple majority of the board
3. To formulate policies, rules and regulations in accord with the Constitution and these By-laws.

QUALIFICATIONS FOR NOMINATION:

1. Nominee must presently (current Dues paid) be an active member of AAZK; must have been a member of the Association for at least 1 (one) year;
2. Nominee must agree to uphold the Constitution of AAZK; must uphold AAZK policy wherein the Association is not a labor organization and must not be utilized as such;
3. Nominee must presently be employed as an animal keeper/attendant by a recognized zoo or aquarium in the U.S. or Canada, must have been in the zoological field for at least 2 years;
4. Nominee must agree to appear at board meetings, traveling at his/her own expense (usually in conjunction with regional and national conventions); must agree to devote time to communications pertinent to all board business, answering correspondence promptly and efficiently; must agree to accept Board assignments.

Please complete this form on a separate sheet of paper.

1. Name of Nominee, Address, Phone, Age and Institution.
2. A brief statement by the nominator as to why the nominee warrants election to the Board of Directors.

NOMINATIONS FOR BOARD OF DIRECTORS, continued

3. A Biographical sketch presented by the nominee with the data
 1. Professional background, places of employment, titles, length of service
 2. Education background
 3. Membership in AAZK; National and local chapters, number of years, offices held, involvement in activities, AKF contributions, etc.
 4. Membership in affiliate organizations; AAZPA, NWF, Audubon, Etc.
 5. A brief statement of why you would like to be a member of the Board of Directors of the AAZK.

The form should be signed by both the nominator and the nominee. This will acknowledge that the qualifications for the nomination are understood and accepted.

Be it understood that false information or failure to complete this form will void the nomination.

ONLY FEMALE KIWIS IN U.S. ARRIVE AT SAN DIEGO ZOO

Two kiwis -- the only female specimens of the squat, flightless birds in the United States -- arrived in the San Diego Zoo on January 22 from New Zealand to begin a captive breeding experiment with two male kiwis.

If successful, the program may provide kiwi girlfriends for the three kiwis -- all males housed at other zoos.

The females are part of an exchange program with the Auckland Zoo in New Zealand, where the kiwi is the national bird. Though not an endangered species, the kiwi is highly revered by its countrymen and strictly protected by law. San Diego Zoo officials had to negotiate with the New Zealand government to arrange export of the two birds.

Graham Meadows, assistant director and veterinarian at the Auckland Zoo, accompanied the female kiwis aboard a Western Airlines flight to San Diego. He remained in San Diego for a week, touring Zoo facilities and advising Dr. Art Risser, curator of birds at the San Diego Zoo, on methods and techniques of breeding the odd-looking kiwis in captivity.

Said Risser, "Although kiwis have been displayed at the San Diego Zoo for many years, the arrival of these two females represents the first real attempt here at captive breeding."

After the quarantine period, the females were introduced to the two male kiwis on Valentine's Day. The celebration included a Valentine's telegram from a lonely kiwi in a Chicago zoo and a big, red heart-shaped box filled with just the thing to make a female kiwi's heart flutter--earthworms.

INCUBATION PERIODS...HOW ACCURATE?

by
Judie Steenberg
Bismarck, ND, formerly of Topeka, KS

Have you ever looked up an incubation period on a given species, from a general reference, and accepted it unquestioningly? It's a common practice. Recently, while doing research on golden eagles, *Aquila chrysaetos*, I found their incubation period listed as 25-35, 27, 28, 30, 35, 42, 43, 43-45, and 44-45 days in various publications and references.

The golden eagle gives us an excellent example of why incubation periods must be carefully reviewed. An incubation period is a biological fact, not merely a figure to be copied from a book (Nice (1954)). And, yet, incubation periods are copied and used even if they are strikingly inconsistent.

It would seem that the best approach to determining accurate periods would be to define what they are and work from there. That isn't always easy since readers will find disagreement on what exactly constitutes the incubation period. In general, "incubation is the operation by which the eggs are subjected to the requisite temperature to permit their development" (Nice (1954)), or, "keeping the eggs warm until they hatch" (Van Tyne, Berger (1966)).

The definition of an incubation period is not as easily stated. Is it--

- the time the parents sit on the eggs?
- the time from laying of the first egg of a clutch until it hatches?
- the laying of the first egg until the hatching of the last egg?
- the time from laying of the last egg to the hatching of the first?
- the time from laying of the last egg to the hatching of the last?

To further complicate the problem, it cannot be assumed a bird is incubating because it is spending a considerable amount of time on the nest; it may be sitting on eggs without applying warmth.

Because of the need for standardization in reporting information, and because it is difficult to obtain exact dates on each egg, a working definition of the incubation period is necessary. Thus, the incubation period, the time from uninterrupted incubation until hatching, is considered by most to be "the lapsed time between the laying of the last egg in a clutch and then the hatching of that egg when all the eggs hatch" (Nice (1954)). Occasionally the sequence of hatching will differ from the laying sequence, but usually the first egg laid is the first to hatch.

It really would be much easier to copy a figure out of a book, but, in the case of golden eagles, which one?

"The period of incubation has been given variously as from 25-35 days; probably 30 days is the average time." Oberholser (1906)

"...period of incubation is about 35 days," Arnold (1954)

"Two eggs, white flecked with brown or gray, are laid and incubated by the female for about 40 days." Burton (1969)

"In Europe the accepted period is 44-45 days" Brown, Amadon (1968). They go on to say..."incubation periods in Scotland 43-45 (days) ...California 43...yet many American records state 35 days".

"Both sexes incubate the eggs 44-45 days" Grossman, Hamlet (1964).

In "Problems of Incubation Periods in North American Birds" by Margaret Morse Nice, the incubation period for golden eagles is given as 45 days. In the section, Summary of Some of the Persistent Errors in North American Species, the following data is given for golden eagle incubation periods:

Bendire	1892	± 28
Burns	1915	35
Bergtold	1917	25 - 35
different	1920's	27, 30
compilations	1930's	28, 35
"	1940's	30
correct period		43

Her explanation for this variation begins with Aristotle who was responsible for the original belief in short incubation periods for birds of prey. Later, Bechstein and the Nauman's principles were that the incubation period matched the size of the bird. Bendire (1892-1895) played a key role in field reporting incubation periods in North America. He assigned 28 days to larger hawks and owls (including golden eagles). The majority of his guesses were wrong yet were accepted as facts to the present. They formed the chief basis for incubation periods of North American birds in many quoted compilations. Burn's (1915) and Bergtold's (1917) lists of incubation periods were also unreliable.

Aristotle, Bechstein, the Naumans and Bendire assumed that the length of incubation corresponded to the size of the bird or egg. Because of their prestige, their assumptions were accepted, without question, by the majority.

It was eventually determined that the incubation period for golden eagles is normally from 43 to 45 days.

For the past eight years, the golden eagles at the Topeka Zoological Park have incubated clutches of eggs. Based on the following data, the incubation periods have averaged 40 days, last egg laid to last hatched, and 41 days for an overall average from 15 eggs that hatched under normal conditions.

Topeka Zoological Park Golden Eagle Incubation Period Data

1969 - Three eggs laid, four days between the laying of the first and third eggs, second egg found on ground broken. First egg missing after 34 days. The third egg was removed from the nest 50 days after being laid; it was rotten.

1970 - Three eggs laid, seven days between laying of first and third eggs. All were removed for artificial incubation. Second clutch of two eggs found in nest six days after third egg of first clutch was removed. First clutch - artificially incubated eggs were checked after 58, 55 and 51 days respectively from date laid. The third egg showed a trace of fertility. Second clutch - after 43 days the eagles terminated incubating and the nest was found to be empty.

Incubation Periods...How Accurate? *continued*

1971-1976

<u>Year</u>	<u>Egg No.</u>	<u>Date Laid</u>	<u>Date Hatched</u>	<u>No. days from laid to hatched</u>
1971	1	23 March	2 May	40*
	2	23 March	5 May	43
	3	26 March	10 June tossed out of nest	
1972	1	25 March	5 May	41
	2	28 March	7 May	40
1973	1	16 March	no information	
	2	20 March	30 April	41
	3	23 March	1 May	39
1974	1	10 March	22 April	43
	2	13 March	23 April	41
	3	16 March	25 April	40
1975	1	21 March	5 May	45
	2	24 March	5 May	42
	3	27 March	6 May	40
1976	1	9 March	22 April	44
	2	12 March	22 April	41
	3	17 March	26 April	40

*probably had been laid a few days before being discovered.

Data from the last three years seems to bear out the fact that eagles may be sitting on the eggs but not actually applying heat to them.

The data on Topeka Zoo's golden eagle incubation periods is available because:

1. Zoo personnel carefully observed the birds and nest.
2. Observations were permanently recorded on the Zoo's daily record.

As a keeper, you may be in the unique position of being able to make accurate observations regarding incubation periods. If you are not making a permanent record of these data, you should be. It has been stated in several references that there is need for reliable data.

A keeper may have opportunities not possible in field studies where nests are often located after they contain complete clutches. Nests are often inaccessible for observations or an entire cycle may be interrupted by the destruction of the nest.

I am not suggesting keepers should be indiscriminately disturbing birds for the sake of making a determination of how many eggs have been laid or hatched. However, when opportunity presents itself keepers should take advantage of it, make careful observations and accurately record their findings.

Incubation Periods...How Accurate? continued

At Topeka, a ladder is propped up against the outside of the golden eagle unit near the location of the nest. The ladder is left in place year around. The eggs are usually observable for a brief period of time when the eagles are fed. In 1976, the female often left the nest to eat when food was placed in the unit. When this occurred, there were usually a few minutes before the male assumed incubating or the female returned to the nest. When the nest was unattended, quick but careful checks were made of the nest and eggs or nestlings. It is safe to assume this is about the same procedure used in previous years. All observations were then recorded on the zoo's daily report and also in the keeper's notebook.

When making observations, it is important to note the markings on the eggs to help determine if hatch sequence is the same as laying sequence. Also, differentiate, whenever possible, between sitting on the eggs and actual incubation. Notations on attentive and inattentive periods should be made throughout incubation. It should be remembered that prolonged incubation behavior may occur if the eggs fail to hatch. After hatching, brooding behavior is also important to record.

"Zoo staff and private individuals owning wild animals have a special responsibility arising from the opportunity they have to observe and record information. By so doing they can discover more about the animals in their care and at the same time make valuable contributions to science, conservation and wild animal husbandry." Jarvis (1969).

Herein lies a keeper's opportunity to make a difference...observe, record and report.

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?? INFORMATION PLEASE ??

The banded sea snakes, *Laticauda colubrina* and *L. Laticauda*, are typically difficult animals to keep in captivity. In attempting to maintain these two species on exhibit at the Detroit Zoo, several techniques have proven useful. Upon arrival these sea snakes were kept in salt water. No feeding was observed despite trying a variety of items. Upon introduction to fresh water, the snakes were immediately observed drinking. Feeding began on fish previously refused in salt and brakish water. In addition, shallow water levels have resulted in better feeding than in deeper water.

Any information on banded sea snakes in captivity would be appreciated.

Katherine Latinen, Assistant Curator of Reptiles
Detroit Zoological Park
P.O. Box 39
Royal Oak, MI 48068

PHILADELPHIA ZOO RECEIVES GIFT ANIMALS

The Philadelphia Zoo received a pair of Secretary Birds and a pair of rare pallas' cats recently.

The Secretary birds are a gift of the Allied Florists of Delaware Valley and a restaurateur Fank Palumbo. The birds are in quarantine until the last of April. Secretaries' Day is April 25 and the birds will be named and released onto the African Plains Exhibit. The long quills on the heads look like those that clerks in years gone by used to put behind their ears--therefore the name.

The pallas' cats are given to the zoo by Larry Magid and Allen Spivak, the nation's top concert producers. The species is native to the rocky terrain of Central Asia into Tibet and Siberia. It has a broad head with low forehead and widely separated ears and long grey fur with white and black markings. Zoo officials hope to learn a great deal of scientific information from the two new cats.

MUSK OXEN ARRIVE AT SAN DIEGO ZOO

Three musk oxen, the shaggy-coated wild oxen known for the unique defense ring the herd forms when threatened, will be on exhibit in the San Diego Zoo. Eighteen of the animals were captured in the wild, fifteen will form a University of Alaska study herd and three-two females and a male--will begin a herd at the San Diego Zoo.

One hundred years ago, muskox were extinct in Alaska. In 1936, 31 musk oxen were transplanted from Greenland to Nunivak Island in the Bering Sea off the coast of Alaska. This small herd eventually grew to over 700 animals, so small groups were taken from Nunivak Island and transplanted to other areas of Alaska. Nunivak Island still remains the most successful area for musk oxen -- wildlife biologists try to maintain the island's total population at 500 animals.

A spring-time fantasy...

A OPEN LETTER TO JOHN BARTMAN OF THE LEDGER-GAZETTE.....*Marily Levin*

In your past coverage of the Joseph P. Gearbevy Zoo and Insectarium, you have consistently ignored the good aspects while making it a point to report hearsay without regard for the sources, which have often been misinformed, if not downright malicious. Once again you have displayed your lack of concern for the facts in your article of Wednesday, January 20, headlined "A New Endangered Species at the Zoo: The Public!" In this article you state "The zoo obviously has no procedure for coping with escaped animals, and thus daily endangers their patrons, as well as the citizens who live in the surrounding area". You continue to the effect that even if such a procedure existed, it probably wouldn't work, probably wouldn't be followed, in case of an emergency. A review of the actual events of which you write will show this to be completely false.

On Sunday, January 19 at 12:30 pm, with a record attendance of 216 people in the zoo, it was discovered during a routine check by the keeper, that a mealworm had escaped. It was further established that this particular mealworm was being held in quarantine, after having savaged Senior Keeper Walter Watkins.

Zoo Policy Memo 83,769, Emergency Procedure--Escaped Animal, was immediately instituted. The escapee was sighted by Animal Keeper Arthur Green shortly thereafter, three inches from the outside door of Building 1763, where it had been quarantined. Mr. Green, keeping the mealworm always in sight to facilitate recapture, called to the other keepers in the building to report the matter to Security. This was attempted by the quickest means possible, as specified in the Policy Memo 83,769--in this case by telephone. Upon consulting the list of persons to be notified and in what order, Security was delayed, since the first person on the list was the Curator, and they were uncertain as to which of the Curators, Birds, Mammals, or Reptiles, was in charge of mealworms, as they were unfamiliar with the species. Fortunately the next person on the list was the Veterinarian, and one was on duty and was reached without delay. Security found they could not reach the Director, Assistant Director or the Public Relations Director, as the three were on a trip to another zoo. To be on the safe side, Security decided to notify the Supervisor of Parks, the Rangers, the Police Department, and the Fire Department. (In view of later events, this proved to be good thinking) Meanwhile Mr. Green was relieved at his post at 2:30 pm by Senior Keeper Jack Temple. (The facts are being covered in such detail to enable you, Mr. Bartman, to compare them with the procedure as outlined in Policy Memo 83,769, a copy of which is enclosed.)

Since the Memo wisely assigns the bulk of the activity and responsibility to the department most qualified and equipped to carry them out, Security was now in full swing. They notified Admissions to remain at their posts, allow no one to enter the premises and to give "Rain Checks" to those patrons wishing to leave.

Meanwhile, Dr. Garland, the Veterinarian, arrived at the scene, was unaccountable overcome by a fit of hysterical laughter, and had to leave. Jack Temple remained in charge. Carefully reviewing the implementation of the procedure up to this point, Mr. Temple realized that no one had notified the Assistant to the Head Keeper, who had important duties to perform, so he dispatched Keeper Frank Jones to find the Assistant and appraise him of the situation in detail. When Mr. Crieghton arrived, Mr. Jones, following the Memo, said "An animal is out of its compound."

An Open Letter to John Bartman of the Ledger-Gazette, continued

Several members of the public were within hearing.

Mr. Creighton instantly took appropriate action. He went to building 6082 where he gathered the locker containing the emergency equipment. Since it took some time to locate a truck large enough to convey the locker to the escape site, it was 3:30 pm before he arrived there. Since no veterinarian was available, capture gun equipment was not brought forward, but Senior Keeper Melvin Shore (a crack shot) had already arrived with the firearms in appropriate carrying cases, but without ammunition as none had been specified in the Memo. (This later showed great foresight on the part of the author of the Memo.)

Around 4:00 pm, rumors began spreading among the public and what you called "panic which rightly swept through the record crowd of 216 patrons." It was rumored variously during this time that 8 gorillas, 3 elephants, 1 wolverine, 2 Tasmanian devils, and a walrus (the zoo does not exhibit a walrus) were prowling about and attacking patrons. In fact, the only injuries (with one minor exception, and that was limited to zoo personnel as outlined below) were inflicted by patrons on other patrons, as is usual in riotous situations.

Furthermore, the streaker with zoo patches taped to his upper arms was NOT Keeper Gordon Vines, as you state, but a member of the public who was detained by Admissions when he tried to sneak through the gate. There is some thought that he may even have been the one who initiated the panic, as some reported screams of "Here comes the naked ape--run for your lives!"

By 4:30 pm, the mealworm was recaptured and returned to its proper quarters, and all equipment except the firearms had been returned to storage by 5:00 pm. The injuries to zoo personnel referred to above involved Security Guard Weldon Tallman who arrived on the scene at 5:00 pm. As Mr. Tallman works at night, he had received only a sketchy briefing of what had occurred prior to his arrival. Bystanders report that he seemed to become deranged at the sight of the firearms, snatching up a rifle and attempting to fire it, but as the gun was empty for the reason explained above, of zoo personnel. Mr. Tallman, in keeping with Policy Memo 91,662 has been given a Verbal Warning.

At the height of all this, Keeper Alice Spencer, also on the night shift, arrived and noticed that a goat had gotten out of the barnyard and was eating some new plantings. She opened the barnyard gate and herded the goat back in. For flagrantly violating all procedures relative to the Policy Memo 83,769, Miss Spencer has been terminated.

So, you see, Mr. Bartman, we do have a procedure for handling escaped animals; it works, and not exceptions are permitted. Despite the fact that this was the first implementation necessary since the procedure was instituted, everything went smoothly. But for the matter of public panic, for which the zoo cannot rightly be blamed, the whole matter would have been routine.

Joseph P. Gearbevy
Director
Joseph P. Gearbevy Zoo & Insectarium

THE BUSINESS SIDE OF A ZOO

by
Terry Cavanaugh
Business Manager, Topeka Zoo

There is no such thing as a free zoo. Someone has to foot the bill, whether it is for feeding the animals or capital improvements. Zoos are battling increased costs and tightened budgets. They are expected to help pay their own way.

The three main sources of revenue are admissions, concessions, and souvenirs. At the Topeka zoo the business manager is in charge of all three of these operations. An admission charge is basically a user fee, just as the charge for swimming at a municipally owned swimming pool. With a large percentage of the visitors from out-of-town and out-of-state, it is only fair that they help pay for the facilities they are enjoying. An admissions charge also helps cut down on vandalism. There are also educational aspects of the admissions policy. School groups from the city are admitted free. Senior citizens as well as other organized groups are given a reduced rate.

It is important to have pleasant, well-trained admission clerks. Our admission clerks are given a five day training session in which they not only learn the operation of admissions but public relations as well. It is very important that they know how to deal with children as well as adults.

Operation of concessions is becoming more important every day. Many zoos have their concessions leased out. In the quest for more revenue the Topeka Zoo took over its concessions operation three years ago. It has proven to be a very successful operation. Concessions are expected to have pleasant surroundings and good, fast service. People come to the zoo to have fun, therefore it is important to make their stay as enjoyable as possible. "Fun foods" should be served at a concessions stand. A good, successful concessions operation will be run professionally. Concessions management is kept up-to-date on the changes in the industry through publications and attending food seminars such as those at the AAZPA Management school in Wheeling, West Virginia, and at Cincinnati, Ohio. The Topeka Zoo concessions also belong to the National Association of Concessionaires, which offers invaluable information on concession operation and also a chance to exchange ideas.

We never have a lack of applicants for jobs because the zoo is considered a fun place to work. The concession personnel are given five days of training sessions which includes equipment operation, cleanliness of facilities, and public relations. We require uniforms as well as name tags. We consider our admissions clerks as well as the concession clerks to be our good will ambassadors. These employees are often the only employees of the zoo who are encountered by the public on a visit to the zoo.

The primary duty of a sales employee whether in concessions or souvenirs is service to the public. They are responsible for efficient sales transactions, good public relations, and often act as a sounding board for public opinion. Sales people need pleasant personalities. They must be cheerful, friendly, and courteous to the public, staff members, and fellow employees. They must be honest, have the ability to handle money properly, and be efficient in their duties. Punctuality, loyalty,

The Business Side of a Zoo, continued

neatness, and trustworthiness are prime requisites. A willingness to learn and a genuine interest in the visitor are important attributes to concession personnel. A person who lacks experience but is sincerely interested in learning is quite often more desirable than a person who had previous experience. The experience gained can sometimes be a detriment rather than an advantage. It is best to have personal interviews with prospective employees when possible. Methods of teaching are important. Staff manuals are important. Periodic staff meetings are good for exchanging ideas, suggestions, and constructive criticism. Above all, we strive for quality, not only in our employees but in our products.

On heavy attendance days, we operate three portable units throughout the zoo. All our employees are taught to keep a roving eye on the visitors as well as the animals. Often a potential problem can be stopped by reporting an unusual incident to an animal keeper. The concessions operation at a zoo must keep the welfare of the animals in mind. If paper items are thrown at animals or in exhibits, this can be a problem. Obviously, they can not be completely banned, but the problem can be alleviated by a 'no straws, no lids' rule. The problem can be reduced further by requiring that children be under adult supervision and also by having plenty of trash receptacles around.

A concessions operation can be frustrating and time consuming during the peak season, but with a top-notch, well-run operation it is a tremendous source of revenue.

Souvenirs are a third source of revenue. Everyone always wants to take home a memento or souvenir of the visit. Whether it is a T-shirt, a postcard or a poster, it all means revenue. The Topeka Zoo does well with zooimprinted souvenirs as well as state souvenirs. Whether there is a large walk-in gift shop or a small area, the need is there. It is important to have a clean, neat, well-lighted area. One would think that there would not be a problem with souvenirs and the welfare of the animals, but the Topeka Zoo found there could be a problem with balloons and some of the animals. In evaluating the 1978 season with the zoo director, this problem was discussed and the decision was made to ban balloons in the zoo. Revenue is not lost with this popular item because they will be sold outside the exit.

An effective way to increase attendance is with special events. These could include magic show, musical groups, Senior Citizens Day, Kids Day, Winnie the Pooh, animal films, displays by community groups; the list could go on and the ideas are unlimited. With increased attendance, concessions and souvenirs will increase also.

The Egyptian Ministry of Agriculture wishes to establish a national library on "Wildlife in Arid Ecosystems" to serve scientists and research workers throughout the Middle East. Donations of books, journals and periodicals are urgently required and should be sent to: *The Librarian, National Wildlife Library, Giza Zoological Gardens, Egypt.*

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Welcome to the new Cincinnati Chapter of AAZK
3400 Vine Street
Cincinnati, Ohio 45220

chapter

President...Kerry Hoffman
Vice Pres....Berry Pankuk
Sec/Treas...William P. Maynard

Welcome to the Metro Toronto Zoo Chapter AAZK
P.O. Box 280
West Hill, Ontario
Canada M1E 4R5

news

President...Chris Parker
1st Vice President... Oliver Claffey
2nd Vice President... Frances Turner
Secretary...Charlotte Coghill
Treasurer...Kathy Rettie

The chapter reports having 47 affiliate members and 11 associate members.

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The Louisville Chapter has formed a marathon running team. The week preceding the running of the Kentucky Derby, known as Derby Week, is host to a variety of activities such as the Great Steamboat Race between the Delta Queen and the Belle of Louisville, a hot-air balloon race, the Pegasus Parade, Celebrity Tennis Classic, etc. Also on the agenda is a 13 mile run through the city.

This year seven keepers are planning to run as a team, known as the 'Wild Bunch'. Hopefully this will get some publicity for the zoo and for the local AAZK chapter.

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**** COMING EVENTS ****

AAZPA REGIONAL WORKSHOPS

April 22-24, Western, Sacramento, CA
May 6-8, Northeastern, Erie, PA

AMERICAN SOCIETY OF MAMMALOGISTS

June 17-21, 1979 Corvallis, Oregon
Contact: B.J. Verts, Dept. of Fisheries & Wildlife
Oregon State University, Corvallis, Oregon 97331

AAZK NATIONAL CONFERENCE

SEPTEMBER 24 - 27, 1979 PORTLAND, OREGON

AAZPA National Conference

September 30 - October 4 St. Louis, Mo

World Conference on Breeding Endangered Species in Captivity

November 12-16, 1979 San Diego, Ca

AAZK AND AKF AWARDS ANNOUNCEMENT

In anticipation of the 1979 AAZK convention, nominations for the Annual AAZK Awards are being accepted. There are three award categories: Excellence in Zookeeping, Certificate of Merit for Zoo Keeper Education, and Excellence in Journalism.

EXCELLENCE IN ZOOKEEPING

This award is given to recognize out-standing people in the zookeeping field. Any keeper is eligible for the award and more than one award may be given each year. If five excellent keepers are nominated, five awards will be given. If none of the nominees qualify no award will be given.

Excellence in zookeeping cannot be determined on the basis of an isolated breeding success or upon one spectacular instance, but rather upon examination of the keeper's total performance. Each keeper has a slightly different idea of what the job entails. There are, though, basic themes which can be used in judging a keeper's performance.

Perhaps the most essential characteristic is commitment to the animals and to the profession. Commitment is defined as, "the state of being bound emotionally or intellectually to some course of action". This commitment is necessary because the needs of the animals often exceed the demands of an eight to five workday. Without this basic foundation of commitment, it is impossible to realize one's full potential as an animal keeper.

Another important quality is the ability to empathize. A good keeper must understand the animal's needs, both physiologically and psychologically, and fulfill them in the best way possible. This means a knowledge of the animal's behavior, physiology, and natural history is essential. A keeper should actively pursue greater knowledge of the animals through observation and private study, and should be able to communicate this knowledge effectively to other keepers and to the public. A keeper should be receptive to the knowledge and experience of others. The task that keepers face is too difficult to be stingy with knowledge or disdainful of another's opinion. Knowledge must be shared with other keepers and with the public to make them aware of the intrinsic value of the animals.

The keeper must function as the animal's representative in policy decisions and in planning. A keeper may not be an expert on an entire order or even a particular family, but he or she should be an expert on the animals in his or her care. Since an animal can not say whether new cage is inadequate or a new situation is too stressful, it is up to the keeper to represent those needs.

These are the basic criteria for examining the performance of a zookeeper. Any isolated single area is of little value. The ability to empathize with the animals is useless if you lack the knowledge and skill to improve their care. Knowledge and skill without commitment leads to a keeper who "keeps the animals alive and nothing more." Each area must be evidenced in the good zookeeper. The excellent zookeeper will excel in one or more of these areas, but cannot lack any of them.

If you feel that a keeper you know meets these criteria, submit his or her name along with a brief letter describing why they deserve the Excellence in Zookeeping award.

continued

AAZK and AKF Awards Announcement, continued

CERTIFICATE OF MERIT FOR ZOO KEEPER EDUCATION

This award will be given to the zoo most actively promoting educational programs for zoo keepers. Keeper training courses, staff seminars, and reimbursement for formal education are obvious examples of such programs. If you feel that your zoo merits such an award, please submit a brief letter of nomination, mentioning specific education programs.

CERTIFICATE OF EXCELLENCE IN JOURNALISM

This award is presented by AAZK for the best article submitted to the AKF during the period from July 1978 to July 1979. Selection of the best article will be made by the editors of the AKF on the basis of style and content.

Nominations for the Excellence in Zookeeping and the Zoo Keeper Education awards will be accepted up to June 15, 1979. Winners will be selected by the Awards Committee. Awards will be presented to the winners at the AAZK National Conference on September 24-27, 1979, in Portland, Oregon.

Please send your nominations to

Mike Coker, Awards Chairman
Topeka Zoo
635 Gage Blvd.
Topeka, Kansas 66606

EARTHWATCH Research Expeditions

Professionals doing field research and interested laypeople are matched by EARTHWATCH, a nonprofit organization headquartered near Boston. This has opened new sources of funding to academics seeking increasingly competitive research dollars, and most importantly, has brought science closer to non-scientists.

The expeditions are working experiences, sharing the lives of professionals in the field, contributing to serious, often vital research. Most team members are amateurs, people who simply want to work and learn. EARTHWATCH volunteers pay their own way to the project site and share in the costs, anywhere from \$474 (for three weeks of raccoon radio tracking in Georgia) to \$1,450 (for the 20 day study of spotted hyenas in Kenya). These contributions and out-of-pocket transit expenses are tax-deductible.

EARTHWATCH is sponsoring 135 research teams in 15 states and 27 foreign countries during 1979. The expeditions are in archaeology, anthropology, earth, marine and life sciences and the humanities. For more information write EARTHWATCH, 10 Juniper Road Box 127MF, Belmont, MA. 02178.

Expeditions described in the summer and fall 1979 catalogue include: Rhesus monkey Infant/mother feeding behavior in Kathmandu, Nepal, Spotted Hyenas of Kenya, Desert Ecology in Reno, Nevada, Endangered Birds of Hawaii in Hilo, the Natural Trap in Cody, Wyoming, the Elusive Octopus in St. Joseph Bay, Florida and many more.

An 18 minute film documentary of four of the expeditions is available to show the experience of the volunteers in archaeology, marine biology, animal behavior and geology. A contribution of US\$15 helps cover the costs of postage, cleaning and handling.

This paper was presented at the 4th Annual Conference of the AAZK.

PUBLIC RELATIONS AND ZOOLOGICAL ORGANIZATIONS

by
Forrest Bailey
President, Montgomery Chapter AAZK

I would briefly like to introduce the words "public relations" in a formal definition set by Random House; "the efforts of a corporation to promote good will between itself and the public". Three key words in this sentence are efforts, good will and public. This paper will deal in part with the effort and types of promotion. The remaining part will touch upon the types of news media and the human interaction involved which is a never-ending play.

A basic step involved in public relations work from any stand point is establishing a source. One source should be established with each medium and used for all your public relations. Although some people advise sending press releases to all the news media, our experience has indicated that one source will get you more coverage over-all. Once the source has been contacted, get him or her interested and involved in your organization, if possible. Make that source feel a part of what you are trying to do. This is a very important rule of thumb to follow in any of the media types. If that person is geared up enough for you and your organization, then goals are real and attainable.

MAINTAINING A WORKING RELATIONSHIP WITH YOUR SOURCE: In dealing with this aspect, never lie, even if telling the truth puts you or your organization in a bad frame. Keep an open relationship kindled and let this source know if you plan to release any information to another media.

In order to effectively use your information, the source must be contacted by the telephone or personally to talk of any new ideas that you are working with. In turn, you should attempt to learn his working schedule. Will he need a day or a week to put to good use the information you have given him. Dealing with news releases can be a very sensitive thing. Many organizations construct a release like they were planning a three week hike in the Grand Tetons. Make your news release clear, concise and short. Keep to as many simple sentences or paragraphs as possible. The person involved does not have time to sift through a great deal of wasted words. The heart of the matter should be in the first paragraph or sentence structure. Elaborate your information in the following sentence or paragraph. Type and double space your article for clarity. The release title should always be capitalized to establish an attention span. Use colored paper with a contrasting ink. Research shows people will read a message on colored paper more often than white. If you have access to a camera, have some pictures available to accompany a story. These pictures can be used to contrast the everyday, common place news story. Give your source the freedom to re-word the article if it seems necessary, and by all means, deliver the article to him in plenty of time.

In dealing with the public, one finds out how naive and uneducated they seem to be as a whole. Dealing with wildlife, conservation and natural history, the general public is like a Greek Warrior watching Saturday Night Fever at a drive-in movie. They are lost and begin to assume

Public Relations and Zoological Organizations, continued

things. There should be no room for assumptions after reading a press release. Objectives should be stated clearly and meaningfully.

I would now like to talk briefly about the three types of media. They are--television, newspaper and radio. Each type is outstanding in its own fashion, with a unique audience, sometimes mixed and sometimes not. By this I mean different age categories which can be a very important factor in choosing which media type is the best for your organizational coverage.

Television has a good strong appeal, but time is very limited. News is not covered from a community standpoint, unless it is of a tragic nature or out of the ordinary. These people will generally run public service announcements free at available times. They will grab at the opportunity for a feature story--an appealing animal character or activity at the zoo. These releases are transmitted only one time, usually, and are gone from the majority of people who need to be informed.

Newspapers reach a variety of people because most competent people can read. It is not so much this fact, but the fact that they can hold on to this article for an indefinite period of time and maybe use it later as a reference. It does not fade from the screen, but is right there in their hands. Written words and good photographs are retained longer by the general public in most cases. Feature stories and community news are also a favorite. Also, the best bet for free publicity is with a newspaper. The AAZK Conference was publicized in our home newspaper. The article told who was going, where, and what the conference was about.

I would like to emphasize again the personal relationship established with each of these media types as far as your source is concerned. The more contact that you or your organization has with the source, whether over the telephone or in person, makes an impressionable difference.

The last of the three media types is the radio. It is unique in that it can reach people just about anywhere in town. Considering the city dweller is in and out of his/her car at least once a day, or more, the chances of that person hearing a public service announcement are pretty high. These messages might be given three times a day for 2-4 weeks. In order for this type of public relations to be effective within the station as well as on your car radio, etc., you must educate the station personnel and make them aware of your problems or needs. Ask the manager or public relations director to come to the zoo and see first-hand exactly what you want conveyed in a message or what relevant problems exist within your zoo. He or she will more fully understand the areas of need.

Talk shows on the air are very effective in generating support because the public is not just hearing a disc jockey's hype, but they are catching first-hand news from the closest contact possible.

In Montgomery, we have a Zoo Day which is sponsored, in part, by the Number 1 radio station. We have a very big turn-out and people generally donate money to a project or theme which was or had been broadcast for 4-5 weeks before Zoo Day. At the same time, the radio personnel are milling about promoting their organization. In essence, this type of relationship is a means within itself and a very worthwhile one.

Public Relations and Zoological Organizations, *continued*

I have covered these three media types in hopes of providing some insight into effectively working with public relations and using it as a sharper tool in the future. If the public understands what is going on within your organization, how and why it is happening, then your objectives become obtainable and your foresight a reality.

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

ZOOKEEPERS... for hoofed stock/carnivores and responsible for the animal care/ management in an expanding and progressive zoological garden. Requires two year's experience in a recognized zoo and references. Starting salary \$8,940 - \$10,344; excellent benefits. Contact: Dale Stastny, Personnel Director, Audubon Park and Zoological Garden, P.O. Box 4327, New Orleans, LA 70178.

ZOO ASSISTANCE SUPERVISOR... responsible for obtaining financial assistance to help design and develop a new 740-acre, cageless zoo. Minimum of two years' grant administration; other financial duties involving research, planning, application preparation, contract negotiation, records and reports, site inspections, public relations, etc. Direct zoo or park and recreation financial assistance experience desired. First-year salary - \$17,900. Send resume by 1 June to: Stan A. Hemphill, Financial Assistance Administrator, Dade County Park and Recreation Department, 50S.W. 32nd Road, Miami, FL 33129.

MANAGERS... position available to a couple to manage animal display for the summer season. Man must have previous experience in handling and management of hoofed stock. Wife must be capable of overseeing office duties. Contact: Karl or Gloria Mogensen, Natural Bridge Zoo, Box 560, Natural Bridge, VA 24578. (703) 291-2420.

ASSISTANT CURATOR... to operate and manage major animal collection, includes husbandry, exhibition, records and labels, senior supervision, education, public relations, etc. Requires B.S. or B.A. degree in Zoology, Biology, Animal Science or related field; supervisory ability mandatory. Ability to write and speak on general and technical subjects pertaining to experience in zoological park desirable. Salary open, fringe benefits. Send resume to: David Allen, Assistant Director, Cheyenne Mountain Zoological Park, Box 158, Colorado Springs, CO 80901.

ZOOLOGICAL CURATOR... assume duties of major collection of exotic wildlife, including animal hospital and isolation facilities. Should have supervisory experience and an ability to manage a living collection of a wide variety of animals and possess a degree in animal sciences. Salary \$15,008 - \$19,846; excellent benefits. Send resume to: Mike Blakely, General Curator, Oklahoma City Zoo, 2101 N.E. 50th, Oklahoma City, OK 73111.

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INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10". Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.

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Affiliate (full-time keepers)\$10.00 annually
Associate (part-time keepers, students, docents)\$10.00 annually
Foreign\$15.00 annually
Contributing\$50.00 annually

All memberships include subscriptions to *Animal Keepers' Forum*. 50% of the member's dues are budgeted for the publication.

All new members receive an AAZK shoulder patch and a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

The AAZK Headquarters has extra shoulder patches available for \$1.25 and back issues of the *Animal Keepers' Forum* for \$1.00.

Send name and address and a check or money order, payable to American Association of Zoo Keepers to

AAZK HEADQUARTERS
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

ALL CHANGES OF ADDRESS SHOULD BE SENT TO AAZK HEADQUARTERS AT THE NATIONAL ZOO. DO NOT SEND THEM TO *Animal Keepers' Forum*. The journal is not available by subscription only.

**American Association
of Zoo Keepers
National Zoological Park
Washington, D.C. 20008**

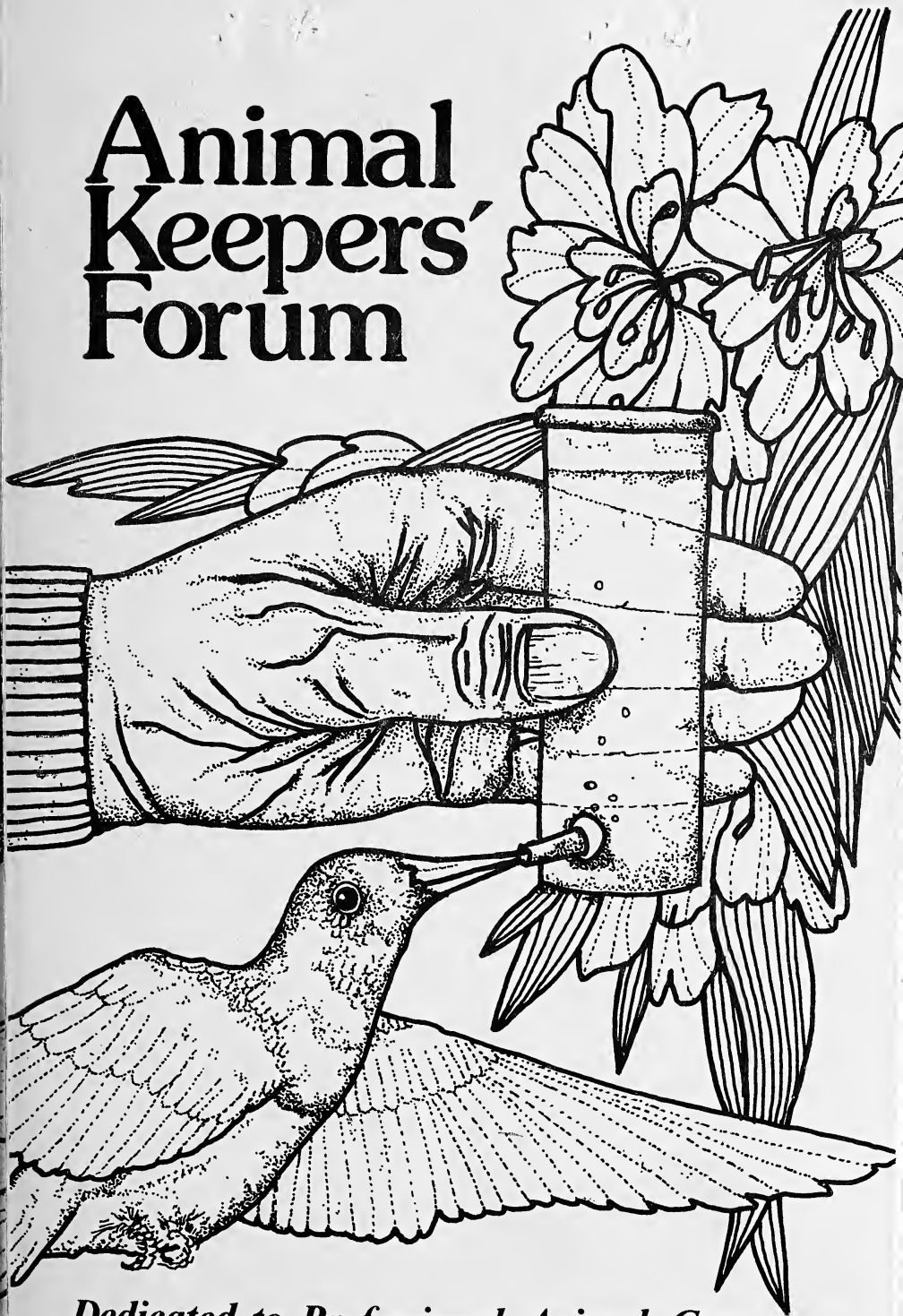
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Animal Keepers' Forum



Dedicated to Professional Animal Care

MAY 1979

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NATIONAL ZOOLOGICAL PARK, WASHINGTON, D.C. 20008
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Gary Tibbetts	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Helen Moore	Portland Zoo	WA, OR, ID, MT, WY
Jill Grade	Busch Bird Sanctuary	CA, NV, AZ, UT, HA

The exquisite cover drawing is by Lutz Kuschinski of Glasgow, Scotland. He wrote "My drawings signify a particular moment between keeper and animal." He submitted others that will be featured in future issues of AKF. They are all truly beautiful!

This issue, from hummingbird cover to papers on owls, cockatoos, and ostriches, is "for the birds"; but we hope all the subscribers will find plenty of interest and information.

We, the AKF staff, sincerely appreciate all of you who have written articles, sent in news, or submitted a cover illustration. The Forum is good, and getting better, because of your work. We rely on your participation--whether it is actively sending in materials or reading and using the information, and, perhaps, planning a future contribution to AKF!

SCOOPS and SCUTTLEBUTT

PORTLAND CHAPTER OF AMERICAN ASSOCIATION OF ZOO KEEPERS

INVITES YOU TO THE 1979 CONFERENCE

Monday, September 24 to Thursday, September 27

Conference theme is animal husbandry: care and propagation of exotic species. The schedule will include paper sessions in the mornings and workshops on the zoo grounds in the afternoons.

Papers will be limited to 20 minutes with 5 minute question period. Deadline for outline or abstract is August 1. Schedule of papers will be in the September issue of the *Forum*. Free registration will be granted for those people whose papers are chosen for presentation.

Some of the afternoon workshops planned are
elephants--tour of facility, management, and foot care,
chimpanzees--sign language and enrichment program,
felines--tour of new small felid exhibit with an explanation and
discussion of management techniques.

Our keynote speaker will be Gary Clarke, director of Topeka Zoological Park. Mr. Clarke began his career in zoos at the Kansas City Zoo. Having a desire to learn as much as possible about all zoo animals, Mr. Clarke worked with a variety of different species. His favorite area was the African velt, which was one of the earlier mixed exhibits in the country. In 1962, he was promoted to senior keeper and in 1963 went to the Fort Worth Zoological Park as the animal department supervisor. In 1964, he became the director of the world famous Topeka Zoo.

Registration forms will be in the June *Forum*. The fee will be \$40 for AAZK members and \$45 for non-members. Late registration, after September 1, will be \$45 for members and \$50 for non-members.

Red Lion Motor Inn will be conference headquarters. It is centrally located in downtown Portland with easy access to restaurants, theaters, and shopping.

All conference inquiries and correspondence should be addressed to:
Jonolyn Smith
Washington Park Zoo
4001 S.W. Canyon Road
Portland, Oregon 97221

BIRTHS HATCHINGS

GREY SEAL TWINS IN LOUISVILLE. *David L. Marshall*

On February 15, 1979, the Louisville Zoological Garden's pair of Grey Seals *Halichoerus grypus* gave birth to a set of twins, their sex being 1.1.

Twinning in pinnipeds is extremely rare, and our twin births of Grey Seals are the first of this species ever recorded.

At six days of age the male pup was rejected by the mother, for what reasons we were unable to determine. Staff members began an around-the-clock feeding schedule, tube feeding a specially prepared formula. We gradually eliminated the tube feedings and switched to force feeding of whole herring. Unfortunately the male pup never reached the point of taking fish on his own. There was no significant weight loss, but no gain either.

We are very sad to report that the pup, at 30 days, was found dead at 11:00 p.m. by two keepers reporting in for the night feeding. A post-mortem examination was performed, determining the cause of death to be aspiration pneumonia. The female twin is doing fine, eating whole fish on her own and progressing normally.

Last year our female gave birth to twins, again 1.1, but the female pup was still born. This year's twins make the 5th and 6th Grey Seals born in the Louisville Zoo.

HAWAIIAN NE NE GOOSE HATCHED IN BOSTON. *Franklin Park*

A downy gray gosling is the first of the endangered species of Ne Ne to be hatched at the Boston zoo in Franklin Park. A special fiberglass shelter was constructed off of the public walkway in the Aviary to protect the adults and nest. It allowed the sun to warm the area and supplemental heat was provided for the tropical geese. The hatchling, "Ronnie" weighed 65 grams. The native environment of the Hawaiian Ne Ne Goose *Branta sandvicensis* is the volcanic jungles of Hawaii and Maui.

SNOW MONKEYS AND TAPIR BORN AT MINNESOTA ZOOLOGICAL GARDENS

Two snow monkeys were born during the cold Minnesota winter weather in early February. The youngsters' mothers showed no hesitation to bring them outdoors, but kept them so protected from the cold at first that visitors were lucky to see even the top of a baby's head. Now with the warmer springtime weather, the infants will be more visible. Four snowmonkeys have been born at MZG.

SPECTACLED LANGUR AND PATAS MONKEY BORN. *Philadelphia Zoo*

A spectacled langur was born March 25, 1979, at the Philadelphia Zoo. It is bright orange, in complete contrast to the gray color of the parents. By the time the monkey is 6 months old, it will also be gray toned.

The Patas Monkey is two months old. This specie, also known as red hussar monkeys, are native to central Africa, where they live terrestrial lives in wooded areas.

AMERICAN ASSOCIATION OF ZOO KEEPERS



Financial Statement for Year Ending December 31, 1978

CASH ON HAND, JANUARY 1, 1978 \$4731.63

INCOME

Memberships, patches, contributions	8020.51
Interest on savings account	110.01

TOTAL \$8130.52

EXPENSES

Printing	\$ 760.15
Patches	568.29
Postage meter rental and base	393.69
Meter maintenance contract	63.00
AKF membership share	4187.50
Calligraphy	124.00
Bulk Rate, 1978-1979	80.00
Postage for meter	400.00
Address corrections	9.00
Wages and taxes (FICA, Federal Unemployment Tax)	2031.57
Office supplies	142.39
Miscellaneous postage	24.75

TOTAL \$8784.34

CASH ON HAND DECEMBER 31, 1978

CHECKING ACCOUNT	\$1429.25
SAVINGS ACCOUNT	2648.56

TOTAL CASH ON HAND \$4077.81

Wildlife Prairie Park will open May 5, 1979, to show animals and plants native to Illinois. It is a 1000 acre wildlife and nature preserve with a visitor center, exhibits, trail graphics and classroom.

A salmon-crested cockatoo is missing from the San Diego Wild Animal Park. A reward is offered for her return or for information. She is mostly white in color with some pink and has a crest that shows bright orange when raised. She has one claw missing and a crooked toe or her left foot, and a cloudy left eye.

+++++

chapter

Cincinnati Chapter of AAZK
Cincinnati Zoo
3400 Vine Street
Cincinnati, Ohio 45220

President...Kerry Hoffman
Vice Pres...Mike Dulaney
Secretary...Bill Maynard
Treasurer...Dick Mills
Trustee.....Roger Wilhelm
Trustee.....Rick Hiethaus
Staff Advisor
...Edward Maruska

news

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The 1980 AAZPA Great Lakes regional workshop will be held at the Cincinnati Zoo sometime in April, 1980. The AAZK chapter is looking forward to seeing a lot of AAZK members then.

NOW IS THE TIME FOR ALL GOOD ZOO KEEPERS TO

1. Send a nomination for the Board of Directors to
Jill Grade
Busch Gardens
Attn: Zoo Office
3000 August A. Busch Blvd
Tampa, FL 33612

See Page 64 of the April issue of AKF for the details.

2. Send a nomination for the Excellence in Zookeeping Award and for the Certificate of Merit for Zoo Keeper Education to
Mike Coker, Awards Chairman
Topeka Zoo
635 Gage Blvd.
Topeka, Kansas 66606

See Page 76 of the April issue of AKF for the details.

AAZK ACCESSORIES AVAILABLE -- TELL THE WORLD ABOUT AAZK

The official AAZK decal is available again through the Overton Park AAZK Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially your car's window! Cost is \$1.00 complete, prepaid.

Make checks payable to the "Memphis Chapter, AAZK" and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Avenue, Memphis Tennessee 38107.

BUTTONS

"Keepers Care" buttons are available from Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614

Great Ape Demonium

GORILLA BIRTH AT OKLAHOMA CITY ZOO.Fred Dittmar

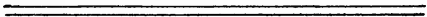
Born February 14 at Oklahoma City Zoo was a female lowland gorilla. This is the second gorilla birth at the zoo and to "Moemba" and "Kathy".

Kathy raised her first infant, Fredrika, with assistance from the keepers once she started to wean. This infant is being raised by Kathy with Fredrika and another adult female gorilla, Josephine, in attendance.

The infant, "Macho," was named after one of Dian Fossey's female gorillas killed in 1978 by poachers.

TWIN CHIMPS BORN AT MANHATTAN, KANSAS.Gisela Quinn

On March 28, 1979, a female chimp gave birth to a set of twins--both female! One was still born; the other one is in good condition. The proud parents are "Susie" and "Mac". This birth was their first. The baby has a loud and commanding voice like her mom. The Sunset Zoo and keepers are very proud and give credit to the good diet of monkey chow, fruits, vitamins and cod liver oil.



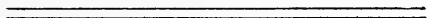
RARE MAURITIUS PINK PIGEONS AT RIO GRANDE ZOO. . . . Dora M. Jacobs

Rio Grande Zoo, Albuquerque, N.M., will soon have the distinction of being the only public zoo in the world to display the Mauritius Pink Pigeon, which is at present perilously close to extinction. At present, there are 30 in the wild on their native Mauritius Island, former home of the Dodo, off Madagascar; and 31 in captivity, including a small captive colony on the island managed by the World Wildlife Fund, a pair and their offspring managed by Gerald Durrell on Jersey in the Channel Islands off England, and the pair at Rio Grande Zoo.

Fay N. Steele, Curator of Birds at that zoo, spent last year in the employ of the World Wildlife Fund managing the Pink Pigeon plus two more endangered species on Mauritius Island. He was able to talk the Mauritius government into lending Albuquerque the pair on the grounds of distributing the few surviving specimens over a larger area as insurance against having the entire population wiped out in a natural disaster or epidemic.

Rio Grande's Pink Pigeons will be displayed in the soon-to-be-opened Rain Forest exhibit, along with many other species of birds and a herd of Suni antelope. The pigeons have engaged in courtship activity since their arrival around Valentine's Day. Last year they produced one fertile egg out of six laid, and it is hoped that this year they will raise some chicks.

The Mauritius Pink Pigeon, while not quite extinct, is nonetheless still far from being out of danger.



"Javan Tiger on Brink of Extinction"---Only four or five surviving Javan tigers were reported in a recent survey by the World Wildlife Fund in association with the Indonesian government.

In cooperation with the Ohio Department of Natural Resources, the Cincinnati Zoo is helping to preserve the Bald Eagle. On March 16, 1979, three Eagle eggs laid at the Cincinnati Zoo were removed from the nest at the Zoo and taken to Ohio State University to be placed in an incubator. The babies, when hatched, will be placed in the nest of wild eagles to be raised by them.

The eggs were removed without difficulty although the female returned immediately to the nest when the keepers left the cage. Our eagle cage (referred to as the "bird of prey flight cage") is built into a natural hillside with gunitite rocks and ledges and several large trees. The cage dimensions are 72 feet high, 140 feet long and 50 feet wide. The nest is 90% man-made of large branches and sticks interwoven. The pair of eagles will generally add to the nest various sticks which we supply in the cage.

If 1978, there were five pair of Bald eagles nesting in Ohio, which represents a 75% decrease in the last 20 years. Of these five, one is considered to old for reproduction and three pair may suffer from DDT residuals impairing their ability to lay hard shelled eggs. During the 1978 season, only one eaglet was fledged in the entire state.

It is hoped that our birds will recycle and lay another set of eggs. This second set would remain with the parent birds as they did hatch out one of two eggs last year.

* * * * COMING EVENTS * * * *

AMERICAN SOCIETY OF MAMMALOGISTS

June 17-21, 1979 Cornallis, Oregon
Contact: B.J. Verts, Dept. of Fisheries & Wildlife
 Oregon State University, Corvallis, Oregon 97331
The Elephant Interest Group will also meet. See Page

AAZK NATIONAL CONFERENCE

SEPTEMBER 24 - 27, 1979 PORTLAND, OREGON
See Page 81 for details.

AAZPA National Conference

September 30 - October 4, 1979 St. Louis, Missouri

Regional Conference for Zoo Support Organizations

October 27-29, 1979 Louisville, Kentucky
Contact: Nita Dean, Executive Director or
 Dr. A.J. Eilers, President
 Louisville Zoological Society,
 1100 Trevilian Way, Louisville, KY 40213

World Conference on Breeding Endangered Species in Captivity

November 12-16, 1979 San Diego, California
For details, see page

World Conference on Sea Turtle Conservation

November 26-30, 1979 Washington, D.C.
Contact: Ms. Vivian Silverstein
 1244 19th Street NW
 Washington, D.C. 200036

* * * * *

AAZK DIRECTORY

The deadline for updating the information for the AAZK Directory is June 1979.

Please submit additions to the directory entry before then. Address changes are made through National Headquarters, so do not send them to me, but be sure that the corrections are sent to the Headquarters in plenty of time to be forwarded to me.

Send information by June to
American Association of Zoo Keepers
National Zoological Park
Washington, D.C. 20008

It is helpful to identify the Keeper's areas of work and special interests for communication directly between keepers, so please include this information for directory publication.

It is helpful, and economical, if Chapters will send information on their members in the form of a list, since Chapter entries will be made together.

Please be sure your Chapter Chartering fees are paid, since only paid-up Chapters will be recognized in the directory.

The directory will be printed as soon as my typing allows, and will be available in the fall, before or at the Conference.

Thanks.

Patricia E. Sammarco
Directory Editor
Lincoln Park Zoo
100 W. Webster
Chicago, IL 60614

REGIONAL MEETING HELD IN WICHITA

The Sedgwick County Zoo Chapter of the AAZK hosted a regional AAZK meeting in conjunction with the AAZPA Midwest Regional Conference in Wichita from 8-11 April. Approximately 50 AAZK members attended the two-hour informal session. Members from zoos as far away as San Diego and Salisbury, Maryland, were among the 15 zoos represented. SCZ Chapter President Kathy Newby welcomed the participants and made a call for greater exchange of information between functioning chapters. Mike Coker of the Topeka Zoo then presided over an open discussion of current and ongoing AAZK projects and objectives. Topics discussed included the status of the keeper training manual under preparation, new amendments to the constitution, duties of the regional coordinators, activities for local chapters and future conferences or workshops. The host chapter provided refreshments after the meeting.

The Melbourne Zoo in Australia is constructing a Platypus Exhibit, an interpretive center to display the animal through glass and in an outdoor billabong setting.

A new world record was set by Baghdad, a Bengal tiger at Marine World-Africa, USA in Redwood City, California. She gave birth to eight cubs on April 15, 1979.

USDA RULES ON CALIFORNIA ANIMAL EXPORT PORTS

The U.S. Department of Agriculture is proposing to add the port of Los Angeles to the list of ports approved for exporting animals, including poultry. At the same time, it would drop the port of San Francisco from the list.

According to officials of USDA's Animal and Plant Health Inspection Service, an inspection of the Los Angeles facilities found them in compliance with the agency's standards for the safe and humane handling of animals and for veterinary examinations needed to certify their health. An inspection of the San Francisco port, however, found its facilities below these standards.

Air or ocean ports for the export shipment of animals must provide: proper lighting and restraining devices for veterinary examinations; paved, skid-resistant floors; safe gates and fences; adequate space for handling each shipment and separation of different lots of livestock; provision for feed, water and shelter; and office-laboratory facilities for the examining veterinarian.

In addition to Los Angeles, USDA has 17 approved ports. Those for export by sea are: Richmond, Va., Miami and Tampa, Fla.; and Brownsville and Houston, Tex. Those for export by air are Chicago, Ill., Harrisburg, Pa.; Helena, Mont.; Richmond, Va.; Miami, Tampa and St. Petersburg, Fla.; New Iberia, La.; Brownsville and Houston, Tex.; Moses Lake, Wash. and Newburgh, N.Y.

ELEPHANT INTEREST GROUP FORMED

The newly formed Elephant Interest Group is associated with the American Society of Mammalogists. This group was born on June 21, 1977, at Michigan State University at the 57th Annual Meeting of the American Society of Mammalogists.

The objectives of this organization are

1. to promote interest in, and to increase our knowledge of elephants.
2. to collect and disseminate information through publications, personnel communications, meetings, symposiums.
3. to assist members with any information or material needed so that research can be coordinated and consolidated instead of being duplicated.
4. to meet at least once a year to discuss and exchange ideas.
5. to provide a support system for individuals and institutions interested in conserving elephants.

This organization publishes a journal called "Elephant". Volumes I and II were a big success. A subscription of \$3.00 a year includes two publications yearly, a fall and a spring newsletter.

The next general meeting of the Elephant Interest Group (EIG) will be in Corvallis, Oregon on June 17-21, 1979. All interested persons who want information on the meeting or on the subscriptions are urged to contact

Jeheskel (Hezy) Shoshani
Dept. of Biology E.I.G.
Wayne State University
Detroit, Michigan, 48202

The pandas at the National Zoo have had an addition to their diet, powdered cottage cheese and a pandaminerol pre-mix to insure an adequate intake of calcium phosphorus, zinc and other trace minerals.

Veterinarians and Keepers.....

VETERINARIAN'S REPORT

Scott E. McDonald, D.V.M.
Resident, Zoo Medicine Service
Veterinary Hospital, U.C., Davis

Last spring the male hippopotamus at the Sacramento Zoo died. He had shown no clinical signs of disease or distress except that his appetite had lessened and his stools were scant. This was thought to be due to the adjustment of reintroduction to the female after a brief period of separation.

The animal was moved to the University Veterinary School at Davis where an autopsy was performed. The autopsy revealed that a small, hollow, rubber ball, approximately 3 inches in diameter, had blocked the small intestine. The ball caused ballooning of the gut in front of the obstruction where fluids and food accumulated. This marked distension allowed toxins, bacteria and fluids to escape into the abdominal cavity and blood stream. These absorbed materials caused shock which killed the animal.

Even if we had know a ball was lodged in the intestine, it would have been nearly impossible to successfully remove it because of the massive size of this animal (Wt., 3800 lbs.). Anesthesia would have been difficult to maintain as well.

All other organ systems were normal. However, when the stomach was opened, 3 nickles, 7 pennies and several bottle caps were found. These most likely had been thrown into the mouth.

It is hoped that with the publicity that this animal died from a foreign body, Zoo patrons will be more conscientious and refrain from feeding or throwing any objects at the animals. They're here for everyone's enjoyment and we must all help protect them.

from the Sacramento Zoological Society "Bulletin" with this note from the Editor

"Vanderbilt" was killed by the actions of an unknown visitor. At his death he was 11 years and 7 months old. Hippopotami have a life expectancy of 40 to 45 years.

METROTORONTO ZOO, CANADA, PRESENTS TV TO GORILLAS

A television set was presented to seven lowland gorillas in the Metro-Toronto Zoo by CTV's "LIVE IT UP" producer, Jack McGaw. The gorillas' reactions varied from fascination, to suspicion, to covering the ears. This reactions were filmed and will be shown later on the TV program.

The Zoo's General Director, Mr. Tom Thompson said, "This may become an interesting part of the Zoo's research to see how gorillas behave." The TV will be permanently installed in the night holding quarters of the gorillas' new exhibit. The gorillas will be limited to watching the 'tube' on special occasions, and the set will be used most when an individual gorilla has to spend time separated from the rest of the group. From experience in other zoos gorillas enjoy watching childrens' programs, and westerns.

NATIONAL ZOOLOGICAL FOUNDATION PROPOSED BY CONGRESSMAN WHITEHURST

G. William Whitehurst, congressman from Virginia has graciously sent to the *Animal Keepers' Forum* the text of his bill H.R. 806 on the proposed establishment of the National Zoological Foundation. He introduced the bill on January 15, 1979, and it has been referred to the Committee on Merchant Marine and Fisheries.

In introducing the bill, Whitehurst remarked, "As our society becomes ever more urbanized, zoos and aquariums will provide the only available exposure to the world of nature for increasing numbers of children and their parents. The hundreds of thousands of citizens across the country who visit these facilities each day make it clear that people enjoy being able to see a wide range of animals. However, while one function of zoos and aquariums is to provide visitors with a means of enjoyment and recreation, their major purpose is conservation and education.

"As what we like to call civilization continues to encroach upon the natural habitats of many animals, more and more will be driven over the brink to extinction. It seems to me that since zoos and aquariums are in effect rapidly becoming today's Arks, it is incumbent upon us to make them the best possible refuges for the few members of these species left, so that future generations may have at least a small sample of magnificent species that we have been able to take for granted. Making this possible with the best possible facilities and care is the purpose of H.R. 806."

H.R. 806 calls for the establishment in the executive branch of the Government an independent agency, the National Zoological Foundation, consisting of a National Zoological Board and a Director.

In brief, the Foundation will:

- (1) award scholarships and graduate fellowships for professional and paraprofessional staff for zoos and aquariums,
- (2) initiate and support basic research and programs to promote the development of methods to improve the welfare of animals at zoos and aquariums,
- (3) establish recommended standards of accreditation of zoos and aquariums,
- (4) make grants of funds for projects to assist in the maintenance or attainment of the accreditation standards,
- (5) make grants of funds for establishing pilot projects to serve as models,
- (6) make grants of funds for the purpose of establishing "survival centers" for the breeding, care, and perpetuation of endangered species,
- (7) initiate and support new programs to upgrade the care of animals and enhance their educational and scientific value,
- (8) foster the interchange of information among zoo and aquarium personnel in the United States and foreign countries,
- (9) evaluate the status and needs of the various zoos and aquariums.

National Zoological Foundation Proposed, continued

H.R. 806 specifies the composition of the Board, the qualifications and term of office of each member of the board, and the authority and limitations of the Board. The Director would be appointed by the President and would serve for six years.

The present bill calls for \$5,000,000 for fiscal 1980 to enable the Foundation to carry out its duties. It states that the Foundation shall not itself operate any laboratories or pilot projects or zoos or aquariums.

FOURTH ANNUAL SYMPOSIUM OF THE ASSOCIATION OF BRITISH WILD ANIMAL KEEPERS: MANAGEMENT OF WILD CATS. *Mark Stables*

The above Symposium took place on March 31st, 1979, at London Zoo and was chaired by Mr. C. B. C. Ralwins, Director of Zoos of the Zoological Society of London. A mixed audience of about one hundred keepers, directors and interested persons attended the all-day event to listen and discuss with eight speakers, mostly from Britain. Talks on specific collections included the big cats at Maxwell, breeding Cheetahs at Whipsnade, and the keeping of big cats at the West Midlands Safari Park where the traditional "drive-through" type of cat reserve has been abandoned in favour of drive-past enclosures which afford greater safety and comfort to animals and people alike.

Talks of a more general, though still practical, nature included the housing of cats in European collections, veterinary aspects in keeping non-domestic cats, and melanism in breeding cats by Mr. R. J. P. O'Grady of Glasgow Zoo, where he has applied basic knowledge of genetics to the breeding of melanistic Leopards from spotted/black parents, in a way that would work with other species in which melanism occurs.

Two other speakers talked about the conservation of cats in general; Terry Moore of the Cat Survival Trust delivered a talk on the conservation of the genus Felis, and Professor Paul Leyhausen of the Max-Planck Institute, Wuppertal, West Germany delivered a talk under the title "The Preservation of Felid Species: Can Captive Breeding be the Answer?" Professor Leyhausen's basic reply to this interrogative title was 'No', with few exceptions, which made a very interesting and potentially radical talk and resultant discussion.

Symposium Proceedings will be sent to all persons attending the Symposium; persons unable to attend who wish to have copies of the proceedings should apply to ABWAK Symposium Proceedings, c/o Graham Lucas, 5 Chequer's Cottages, Whipsnade, Dunstable, Bedfordshire LU6 2LJ, U.K..

TAMA ZOO, JAPAN, PROVIDES UNIQUE EXHIBIT

The publication, "Animals and Zoos", from the Tokyo Zoological Park Society contains an illustrated article on an artificial termite mound that was built in the enclosure of the troop of chimpanzees. This was to test the intelligence of the animals. The chimpanzees would get to the honey that was inside by poking sticks through small holes in the mound. The pictures show the chimps' reactions and fascination.

PROBLEMS ASSOCIATED WITH HAND-REARING OSTRICHES

Struthio camelus ostralis

by
Butch Haft
Keeper III, Louisville

Although Ostriches have been farmed since 1838, unfortunately only a limited amount of published information concerning the hand-rearing of Ostriches is available. It is probably due to this reason, a lack of guidelines to follow, that the success rate of hand-rearing Ostriches is low.

With just a small bit of help from their mate, our two Blue-necked Ostriches produced twenty-seven fertile eggs. The laying season began March 19, and ended July 10, with a total of

44 eggs laid
11 were found damaged.
The remaining 33 were incubated,
6 of which were not fertile.

Of the 27 fertile eggs incubated,
a frustrating 14 chicks died while still in the shell.

Of the remaining 13 fertile eggs, due to my anxiety,
-1 was removed from its' shell prematurely.

With 12 remaining
1 died 24 hours after hatching.

Giving us 11 eggs that successfully hatched.

The eggs, weighing an average of 3½ pounds each, were first rinsed of debris with lukewarm water. No disinfectant was used in fear of absorption through the shells' porous surface. They were then placed in a Humidaire Incubator where they were kept for 38 days. The incubator temperature was kept at 98°F. The eggs were automatically rotated every two hours.

On the 39th day, the eggs were moved to the hatcher, maintaining the temperature setting at a constant 98°F.

One of our many problems was one that seems to be very common and very frustrating. That is the problem of chicks failing to pip and dying inside their shell even though fully developed. However, those that did hatch, did at an average of 45 days and usually took between 24 and 36 hours to break free of their shell.

In some cases the chicks had to be helped from their shell. This practice should be done with the utmost of care. Pieces of shell, about one to two inches, were chipped away by hand in cases of those hatchlings that were having a difficult time hatching. Holes were made in the air chambers 48 hours after the eggs' movement began. The holes were ¼ inch in diameter. After waiting for 12 to 24 hours, had they still not pipped, a two inch by two inch piece of shell was removed. The removal of shell should be done as a last resort only, for it is believed that the hatchling requires a certain amount of exertion necessary to use up some of the yolk sac and to stimulate the chick's system. One must be careful not to tear the membranes while removing pieces of the shell, for the inner-most membrane contains numerous blood vessels.

continued

Problems associated with Hand-rearing Ostriches, continued

The hatchlings ordeal is not created by the shell alone. For it is the tough outer-most membrane within the shell that very often can slow down or in some cases even halt the hatching process. During the hatching process the membrane should be misted often to prevent its drying out.

Once free from the shell and membranes, the chick is left in the hatcher from 12 to 24 hours allowing enough time for complete drying. It is then placed in an infant incubator, temperature setting at 80°. The chicks stay there for 24 hours to assure drying and to acclimate the chicks to a decrease in temperature.

At this point the two day old chicks are placed in a four foot by four foot brood box. A lamp was placed above one corner of the box giving the chicks a chance to warm themselves when chilled. The temperature under the lamp stayed between 75°F. to 80°F. The floor of the brood box was covered with non-backed indoor/outdoor carpeting. This type of carpeting is easily maintained and holds up very well.

During the early part of the hatching season the chicks were exercised in a 20 x 10 feet outdoor pen after reaching the age of four to five days old. This pen consisted of a ground cover of coarse gravel over the soil (to allow adequate drainage), ½ inch thick sheets of plywood over the gravel and a surface covering of the same indoor/outdoor carpeting used in the brood box.

The diet consisted of finely chopped or grated escarole, carrots and apple. The grain mix was made of one quart Purina Game Bird Chow, three tablespoons of oyster shell grit, and two tablespoons of Dical-D, which was later reduced by our staff veterinarian. Of course, water was made available 24 hours a day. The chicks should be kept on a fairly low protein diet for it is believed that a high protein intake causing an excessive weight gain is the major contributing factor in leg rotation problems.

Possibly we have found that in some cases of chicks hatching with a splayed leg problem, if detected early enough, that wrapping the legs up under the chick for 24 hours on and 24 hours off cycle for as long as possible, could correct the problem. This is only based upon one chick in four recovering.

Earlier I mentioned an outside pen with a ground covering of indoor/outdoor carpeting. The use of this pen was discontinued after it was felt that the majority of impaction problems was caused by a lack of natural roughage in the crop, therefore leaving the crop underdeveloped and unable to grind up the fibrous substances entering the birds' digestive systems.

At this point, a 40 feet by 20 feet pen was fenced in. Of course, the area was searched carefully and cleared of sticks, wire, large stones, and other debris that might be hazardous if swallowed. An area was provided in one corner of the pen offering the chicks some shade from the sun. As primitive as this weed patch might seem to some, not one of the four chicks died of an impaction after the use of the pen was started and upon postmortem exam of the chicks that died while using the pen, it was found that all of the four chicks had healthy crops and clear digestive tracts.

continued

Problems Associated with Hand-rearing Ostriches, continued

Other problems we encountered included one of the chicks dying of a yolk sac infection. Two chicks had a problem of toe turning outward. Both cases were corrected with an adhesive tape brace pulling the toe back into place and after a period of four days the brace was removed.

One of our chicks developed a prolapsed rectum, the cause has not been determined. The problem was corrected by suturing the rectum partially closed using a purse string suture but allowing enough of an opening for the chick to defecate. Unfortunately, the rectum was so raw that it adhered to the anal wall and prevented normal defecation. As a result, the chick died a short time after.

Although we have not successfully raised any of the hatchlings, I am looking forward to next year's laying season with high hopes of success. For I feel as though we have experienced a great deal in just one season. This is not to say that we have all the answers to all the problems for I know there are many more obstacles to overcome and hopefully with our combined efforts there will never have to be another paper titled:

"THE PROBLEMS OF HAND-REARING OSTRICHES"

I would like to thank Mr. David Thompson, Assistant Director of the Gladys Porter Zoo for publishing his paper on his experiences with ostriches. Also thanks to Ms. Ann Thompson, Curator of Birds at Jacksonville Zoo for sharing her knowledge with me while visiting here in Louisville. Many thanks to Mr. Barry Wakeman, Curator of Education at the Cincinnati Zoo, for his informative paper on ostriches. Special thanks go to Mr. Robert Bean, our Director here in Louisville, for his suggestion of the "weed patch", and for allowing me to continue my attempts despite my many failure. To Dr. William Foster, staff veterinarian, for his suggestions and medical help. Thanks to fellow keepers Ray Doyle, Steven Taylor, Marian Jones, Rachele Rogers for helping me out when I needed it most. And last but not least, to my supervisor John Keeley, many special thanks for putting up with my extended lunch breaks while I worked with the birds.

But most of all to male ostrich "Turkey" and the two females "Tiny" and "Big Bird".

This paper was presented at the "First Annual Symposium on Captive Wildlife"

A baby lowland gorilla -- the first second-generation gorilla born in the history of the Zoological Society of San Diego -- will have a new home at the Wild Animal Park by the end of April. 'Alberta' had to be removed from her mother because she was not receiving enough nourishment.

"Crip" the oldest whooping crane known, died unexpectedly in the San Antonio Zoo where he was on loan from the U.S. Fish and Wildlife Service. He was the first wild whooping crane to breed successfully in captivity.

There are now 108 whooping cranes in the world. "Crip" was given his name by Service biologists when he was rescued in 1949 with an injured wing.

HAND RAISING A ROSE-BREASTED COCKATOO

Kakatoe roseicapilla

by

Marian Jones

Small Animal Area Curator

Louisville Zoological Garden, Louisville, Kentucky

The Louisville Zoological Garden has exhibited Rose-breasted Cockatoos for a little over ten years. There have been numerous hatchings and raising of young by our group of seven to eight birds until 1975. During 1975 and 1976, eggs that were laid and appeared for several days to be attended to, would be found cracked or broken. In the spring of 1977, after a clutch of three eggs was laid and then one found broken, the remaining two eggs were removed for artificial incubation. The first egg hatched, but the bird died within 36 hours. The second egg hatched at 4:30 a.m. on May 12, 1977, and the challenge of parenting a cockatoo chick began.

Weight was recorded on a daily basis along with information on physical development. At one day old, Lindbergh weighed $8\frac{1}{4}$ grams. He was naked except for a bit of downy fluff on his back. His eyes were closed. His first feeding was four hours after hatching when he was completely dry. At first, Lindbergh was kept in a small crock lined with facial tissue and placed inside an infant incubator. It was difficult to control the heat on this particular incubator, so the switch was made to a heating pad placed under the crock as a source of heat. This worked well and was used until the chick was feathered.

Formula was given by eyedropper for the first two weeks. The first feeding consisted of three drops. Lindbergh was fed every two hours around the clock for the first three days. The interval was then lengthened to every three hours. The amount per feeding was carefully controlled by watching the crop and throat area to guard against overfeeding. The chick was burped after each feeding using the fore and middle finger on the back of the neck and the thumb on the crop. A psst sound would be heard as the air was expelled. The basic formula ingredients were $\frac{1}{4}$ cup water, one heaping teaspoon peanut butter, one heaping teaspoon honey, and Heinz Hi-protein Cereal. A pinch of canary grit was added to this at the start of feather development. This mixture was made fresh daily, heating the water to dissolve the peanut butter and honey. The Prosobee was then mixed in. The Hi-protein cereal was added to thicken the formula. As the chick developed the mixture was made thicker. At two weeks of age, Lindbergh weighed 63.4 grams, his eyes were opening, the feeding interval was every four hours, and he was switched from an eyedropper to a spoon bent up on the sides to form a trough for feedings.

At a little over two weeks of age, the first and only problem during hand-raising was noticed. Lindbergh's right leg would not stay up under him to support him as well as his left leg. It extended out to the side. The nest material seemed to be the culprit. Wood chips used at this time did not give sufficient resistance for pushing against without giving somewhat. A couple of other materials were tried before deciding on an 'astroturf' type of carpeting cut in small sections to fit the bottom of the box that was his nest at the time. Extra pieces were cut to allow for cleaning. This worked very well, and gradually the leg improved until there was no longer a problem.

The three to four week old chick had a hearty appetite which showed in his weight of 234.2 grams at the end of this period. His feedings

Hand Raising a Rose-breasted Cockatoo, continued

were every four hours during the day with an eight hour stretch at night. Lindbergh would sit resting on the tarsometatarsus. His only gear was reverse. He was vocal and responsive, eating from the spoon with jerking motions simulating crop feeding by parent birds. There was much pin feather development around his shoulders. His tail was beginning to look more like a tail than just the end of his bottom. He would raise his stubby crest when approached.

Between five and six weeks, Lindbergh was feathering out well. The pink and gray coloring were becoming very noticeable. At this time he was beginning to walk in circles instead of backward, and doing much flapping of wings and stretching them out one at a time over and over. He could perch on a hand albeit unsteadily. With these developments, Lindbergh was moved to a parrot cage and introduced to a mashed scrambled egg/ whole milk mixture to which a little grit and small seed had been added. At first the feed was explored but not eaten. As he began to eat the mixture with more enthusiasm, the formula was gradually decreased. Assorted fruit in small pieces was added to the diet also. If there was a doubt about his intake, feeling the crop was an accurate indicator.

Lindbergh took his first flight at eight weeks of age. Landings were awkward. His interest in exploring and trying out his cockatoo screeches and shrieks was high. A great deal of time was spent grooming, ably using a toe claw to get to the area on top of his head and under his chin. By this time the very time-consuming and immensely rewarding responsibility of hand raising a Rose-breasted cockatoo was coming to a close.

Lindbergh's parents are presently housed in an off-exhibit parrot breeding area along with numerous other paired large parrots. This project is in operation for the second year with much hope for success. One pair of Moluccan Cockatoos are sitting on eggs.

This paper was presented at the "First Annual Symposium on Captive Wild Life" held on November 1-2, 1978, in Louisville, Kentucky.

WORLD CONFERENCE ON BREEDING ENDANGERED SPECIES IN CAPTIVITY TO MEET

World Conference III on Breeding Endangered Species in Captivity, sponsored by the Zoological Society of San Diego and the Fauna Preservation Society, is scheduled for Nov 12-16 in San Diego.

Held in the United States for the first time, the conference will highlight captive breeding strategies and progress for such animals as pygmy chimpanzees, giant pandas, sea otters, radiated tortoises and falcons. Speakers from the world's top zoos, wildlife preserves and university-backed programs are on the agenda.

Registration fee is \$60 per delegate and meetings will take place at the Town and Country Hotel in San Diego. Tours of the San Diego Zoo and the San Diego Wild Animal Park are included.

For a tentative agenda, registration forms or further information, please contact Ms. Jo Hammershoy, Conference Coordinator, San Diego Zoo, P.O. Box 551, San Diego, CA 92112.

BURROWING OWLS IN CAPTIVITY

by
Craig S. Dinsmore
Salisbury Zoo

The very name Burrowing Owl seems a contradiction to our usual image of owls as stately hunters of the night. What self-respecting owl would seek refuge, or even worse, nest and raise its young, in a hole in the ground? Burrowing owls do just that, and with no apparent loss of dignity. But their uniqueness doesn't end here, for there are many more unusual characteristics of these "un-owlike" owls. They have long stilt-like legs that look grossly out of proportion to their bodies; they are active and hunt both day and night; and when threatened in their burrows, they can do a fairly good impression of a rattlesnake rattling. But if we look beyond some of the comical aspects of these birds, we can see an example of a uniquely adapted and highly successful species, one which has evolved to fill a previously unclaimed niche in the owl world.

In general, the Burrowing owl can be described as a small brown owl approximately 9-11 inches in height, with very long legs (for an owl), a very short tail, and a compact rounded head with yellow eyes. It is a New World species, with its range extending from southern Canada through North America, Central, and South America. Within this range there are several subspecies, but only two are found in the U.S. The Western burrowing owl *Speotyto cunicularia hypugaea* is generally associated with the open, treeless plains and prairies west of the Mississippi Valley (Bent, 1938). More specifically, they are usually associated with prairie dog *Cynomys* spp. towns, whose abandoned burrows provide nest sites. In areas outside the range of the prairie dog, such as California, the burrows of other large burrowing mammals are used. A separate subspecies *S. c. floridana* can be found in the open flatland areas of central and southern Florida. Since there are no large burrowing mammals in most of these areas, the Florida burrowing owl has developed the unique ability to dig their burrows, a trait not shared by the Western burrowing owl. Throughout the North American range, the cultivation of land and destruction of natural habitat has forced the species to inhabit populated areas such as gold courses and airports, which provide the necessary open space they need.

We received our first pair of Burrowing owls at the Salisbury Zoo in May of 1976 on a breeding loan from the National Zoological Park. It had previously been decided to try and exhibit them in our already established prairie dog area. We first wing-clipped the pair and then placed them in a wire holding cage. The cage was then set in the exhibit area for five days, after which the birds were released and the holding cage removed. The owls were soon busy exploring the area and investigating the prairie dog burrows in the exhibit. It was decided not to re-clip the owls' wings, but rather to take the chance that the birds would remain even after regaining their ability to fly. There is evidence that at least some wild populations of Burrowing owls have seasonal migrations (Coulombe, 1971), so there was considerable apprehension about the outcome of this gamble.

Much to our relief, however, they did not fly away, and they remained in the zoo throughout the winter. They would, on occasion, fly out of the exhibit area; but never very far or for very long.

Although no breeding behavior had been observed that spring, on May 30, 1977, two chicks appeared above ground for the first time at their burrow

Burrowing Owls in Captivity, continued

entrance. Three more chicks appeared over the next week, bringing the total to five. Burrowing owl chicks are said to remain in their burrow for 2-3 weeks after hatching (Thomsen, 1971), and so are already beginning to feather out when they first appear above ground. The young owls begin to fly short distances within two weeks after emerging from the burrow, and are fully fledged within a month. Since our exhibit allows free flight, the young owls were captured with hand-held nets before they were fully fledged to avoid the risk of losing them. All five were eventually sent to other zoos.

The next spring (1978) breeding behavior was seen in March, with the male "treading" (mounting) the female on at least two occasions. This time it was quite obvious when the female began nesting, for she was not seen at all out of the burrow, and the male was often seen taking food down the burrow. This behavior intensified in mid-April, and it was obvious that the male was feeding more than just a hungry mate. In fact, the male was so intent on food gathering that he would often leave the exhibit at feeding time and fly 50 yards to the service barn, where he would meet his keeper coming out with the daily ration, which had been tripled. If offered food at this point, the male would quickly grab it, fly back to the burrow and carry the food down, and then fly back for more.

On April 29, the first chick was spotted, with a total of seven emerging from the burrow by May 9. This was one month earlier than the previous spring. Within days the young were moving around the exhibit, exploring and occasionally descending into other burrows. Over the next two weeks the parents allowed the young owls to wander throughout the exhibit, and gradually they began to fly short distances of a few feet or so. However, at the first sign of danger, the parents would sound the alarm and

all the chicks would rush down into the nest burrow, while the parents remained above ground to defend the burrow. By May 30, the young were all fully fledged, and we realized that we had been so busy observing and enjoying the antics of the young that we may have waited too long to catch them. One of the chicks did, in fact, fly out of the zoo one afternoon and it never returned. Another one flew into our bison shelter and was apparently trampled.

Capturing the birds after fledging proved to be a considerable task, for by now they were full-winged, and when approached with a hand-held net would usually take off for the nearest tree, fence post, or roof top. We decided to try using mist-nets, and after watching and chasing the owls for a few evenings to determine their favorite "hang-outs" and escape routes, we set up two nets (8' high x 30' long) at strategic points. This method worked very well, and we managed to catch four young the first night, and the fifth the next day. Although time consuming, this method was also much less traumatic for the birds than our daytime chases with hand-held nets.

Once captured, the young Burrowing owls had to be sexed and banded before being sent to other zoos. Burrowing owls are exceptional in that males are both longer winged and heavier than females (Earhart and Johnson, 1970). The reverse is true for most owl species. A more practical method of sexing, especially for immature Burrowing owls, was suggested by Mr. Charles Pickett, Associate Curator of Birds at the National Zoological Park. He has found that the white "eyebrows" found in both sexes are wider and more prominent in males than in females. This trait certainly holds true for our breeding pair, and to a lesser extent it could be seen in our young owls as well. This method at

Burrowing Owls in Captivity, continued

least allowed us to tentatively sex our young. As in the previous year, all of the 1978 hatchlings were sent to other zoos.

There are many advantages to a free-flight exhibit for Burrowing owls. This method allows for a more normal expression of behavior, eliminates the need for pinioning or repeated wing-clipping, and provides a more appealing exhibit for the public. We would like to think that the good breeding success we have had is due at least in part to the unrestricted movement our exhibit allows. There are dangers involved in this method, however. I have already mentioned the loss of two young owls this year; one which flew away and the other which was, we believe, trampled by our bison. Both of these incidents could have been avoided in a covered aviary-type exhibit. There is also the danger of other predators, particularly large raptors such as Great Horned Owls. This necessitates placing the exhibit in an area where such birds are not a common occurrence.

Our mixed Burrowing owl-Prairie dog exhibit has proven to be one of our most popular attractions with the public. The bar-less, uncovered enclosure; the diurnal activity patterns of both species; and the fact that the owls are free to fly in and around the area are all very positive factors where public opinion is concerned. We also feel that there is a good potential for education with this mixed-species exhibit, and we hope in the near future to set up a graphics display which will explain and illustrate the prairie ecosystem, symbiosis, and the particular attributes of the two species.

We have had very good success with our owls, and we would encourage other zoos to consider the Burrowing owl for exhibition and propagation. It has been demonstrated that they acclimate well outside their natural range, require very little in the way of special care, will thrive and breed in both indoor and outdoor exhibits, and, at least in our case, can be kept in an open, free-flight exhibit without losing them. The Salisbury Zoo has joined with the National Zoo and the Baltimore Zoo in a cooperative effort to maintain breeding pairs of Burrowing owls. It is hoped that other zoos will join in the effort to ensure the survival of this unique and remarkable little owl.

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1970. Size Dimorphism and Food Habits of North American Owls. Condor 72:251-264.

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1971. Behavior and Ecology of Burrowing Owls on the Oakland Airport. Condor 73:177-192.

This paper was presented at the 4th National Conference of AAZK. The theme of the Conference was "Our Education for Their Survival".

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" list listings. This is a monthly service to us, for you.

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ZOOKEEPER... The Minnesota Zoological Garden is currently accepting names of individuals interested in Zookeeper positions. These positions are responsible for providing daily observation and professional care of the animal collection and exhibits at the Minnesota Zoological Garden. Several vacancies are expected after July 1, 1979. The original State civil service examination procedure for Zoo keeper is undergoing revisions, and is expected to be reannounced shortly.

Individuals interested in being notified of the upcoming announcement should contact Mary O'Neill, Personnel Director, Minnesota Zoological Garden, 12101 Johnny Cake Ridge Road, Apple Valley, Minnesota 55124, no later than May 25, 1979.

EDUCATION OFFICER... Directly responsible to Director of Education, General Curator and Zoo Director. Will work with graph coordinator in the development of educational materials. Duties include instructing various classes, workshops and lectures as well as outreach programs; creating educational aids and materials to be utilized in educational programs offered by the zoo; coordinating and securing instructors for various programs and attending to the physical needs of the classroom. Applicant must have extensive academic and practical experience in zoology, biology; especially herpetology, mammalogy and general ecology. Prior experience in the educational process and writing ability are essential. General zoo experience and skill in making group presentations are highly desirable. Position available 4 September 1979. Applications shall be accepted through 22 August 1979. Contact: Robert Szita, Director of Education, Staten Island Zoological Society, 614 Broadway, Staten Island, NY 10310. (212) 442-3174. AN EQUAL OPPORTUNITY EMPLOYER. M/F.

MAMMAL TECHNICIAN... primarily responsible for care and maintenance of collection of approximately 80 specimens of both native and exotic mammals. Should be high school graduate, or equivalent, with two year's experience in the care of mammals; have a general knowledge of their habits, distribution, proper husbandry techniques, common diseases and treatment. Opportunity for personal development. Starting salary \$3.60 per hour. Send application by 8 May 1979 to Gordon Henley, Zoo Director, Ellen Trout Zoo, P.O. Drawer 190, Lufkin, TX 75901.

!!!

REMEMBER TO SEND IN YOUR NOMINATIONS! THIS IS YOUR ORGANIZATION.
See page 84 for details.

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* * * * *

International Symposium on the Use and Practice of Wild Animal Studbooks
October 19-20, 1979 Copenhagen, Denmark
Contact: IUDZG Studbook Symposium Secretary,
c/o Zoological Society of London
Regent's Park
London NWL 4RY, England

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Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10". Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.

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Send name and address and a check or money order, payable to American Association of Zoo Keepers to

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Animal Keepers' Forum



Dedicated to Professional Animal Care

JUNE 1979

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SCOOPS and SCUTTLEBUTT

ZOO WORKER SURVIVES MAULING BY BEARS

A worker at the Cheyenne Mountain Zoo was mauled by two polar bears for more than 30 minutes before zoo officials shot and killed one of the animals and rescued the man.

Guy Lichty, 24, of Colorado Springs, suffered cuts and bites over 70 percent of his body. He was hospitalized in serious condition.

David Allen, assistant zoo director, said Lichty was cleaning the cage Friday and apparently failed to secure a lock on the bears' alternate cage. Allen said he shot the male bear with a rifle after efforts to draw the two animals away from Lichty failed. The female backed away after the shooting and Lichty was rescued.

Elaine Bracken, formerly of the San Diego Zoo, did the delightful drawing for the June cover. It is from a photograph of Dick Sweeney, of the San Diego Zoo, nursing a young bontebok. Dick is the founder of the AAZK.

AAZPA SOUTHERN REGIONAL WORKSHOP REPORT.

Animal Keepers were again very visible at the Southern Regional AAZPA Workshop, many drawn by the many and excellent sessions dealing with elephant care, and a chance to see Knoxville's "Diamond".

Keepers and other AAZK members presented some fine papers including:

'Breeding, Birth and Rearing of African Elephants at Knoxville Zoological Park' - Pat Parks and Frank Griffin, Elephant Keepers, Knoxville.

'A Minimum Stress Restraint Procedure for Snakes' - Russell Jones, Reptile Keeper, Knoxville.

'Maternal Instinct of a Hand-reared Chimpanzee' - Laura Strickland, Montgomery.

'Elephants in U.S. Zoos, 1976' - Ken Kawata, Tulsa.

Papers also included "Role of the Modern Day Zoo Keeper" by Charles Wilson, Director, Memphis Zoological Gardens and Aquarium.

AAZK Board member Pat Sammarco and Regional Coordinators Larry Sammarco, Alan Stanley and Lynette Brown attended the conference, with Larry Sammarco standing in for Laura Strickland in giving the AAZK Theme presentation.

Thanks to the AAZPA and especially the Knoxville staff for an enjoyable and educational workshop.

Larry Sammarco
Regional Coordinator

1979 CONFERENCE OF AMERICAN ASSOCIATION OF ZOO KEEPERS

Portland, Oregon

September 24-27

Monday, September 24 - late registration at Red Lion Inn
evening - welcoming cocktail party

Tuesday, September 25 - morning: paper session
afternoon: 1-2:30 Tour of elephant facilities and handling techniques
or Presentation of chimp enrichment and sign language program
3-4:30 Elephant foot care
or Tour of Present primate facility with emphasis on areas under construction
or Penguin care and handling
evening: films

Wednesday, September 26 - morning: paper session
afternoon: 1-2:30 Repeat of tour of elephant facilities
or Tour of feline house with emphasis on new small felid exhibits
3-4:30 Repeat of elephant foot care
or (this slot unscheduled as yet)
evening: free

Thursday, September 27 - morning: paper session
afternoon: 1-2:30 Behavioral research in zoos
or Tour of bear grottos (both polar bear and sloth bear cubs born this year)
or Owl rehabilitation
3-4:30 continuation of Behavioral research
or Tour of nursery
evening: Banquet with Gary Clarke, Director of Topeka Zoological Park

Friday, September 28 - Post conference tour to be announced

* * * * REMEMBER - Deadline for paper outline or abstract is August 1.

To receive registration form, motel reservation information, and post conference tour information, please use form below.

I am interested in the 1979 AAZK Conference. Please send registration, lodging and post conference tour information to:

Name _____

Address _____

City _____ State _____ Zip _____

Mail to Jonolyn E. Smith
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, Oregon 97221



TRAVELING TO PORTLAND

AKF wrote the Acacia Travel, Inc., a member of AAZPA, and asked for information to help AAZK members plan their travel to the national conference. Keith Tucker, Co-owner and Wildlife Groups Director, replied to questions with these suggestions to consider.

AKF: *What do you suggest for economical travel?*

Greyhound gives a special fare for all the travel you want in the USA for about \$100, good for about 3 weeks.

Airlines give good discounts, providing one qualifies. This mainly means to book reservations as early as possible since only a few seats are set aside for the discount rates. You must pay and be ticketed 30 days or more before travel date. You must stick to the flights you have booked. Prices are sometimes nearly half the normal coach fares. These are called "SUPERSAVER" fares.

There is also a "Discover America" discount fare on some lines, but it is not as low as the SuperSaver. One can cancel a flight and not pay a cancellation fee. But it cannot be changed once it is booked unless it is changed 30 days or more before the flight date. These fares are sold to the traveler from many points in the USA to Portland and back, but no jumping around is allowed. The ticket is written only from the home city to the destination city and return, or to a destination city with the return to home city from another city.

Mr. Tucker wrote that his firm would be glad to send general information to any AAZK members about bus and air travel, covering the schedules, rates and rules and regulations for the types of discount fares. He suggested the possibility of other travel in conjunction with the conference, for example, flying to Portland for the meeting, the going north to Seattle and maybe British Columbia for a look at the Zoo there and maybe a light vacation. Or possibly, go south to San Francisco and then home. SuperSavers do allow going to one city and back from another. An ideal plan would be to fly into Portland to attend the meeting, then take a low-cost Hertz car rental for a week, unlimited mileage, to be picked up in Portland and dropped off for no extra charge in San Francisco. This would allow a great post-meeting trip through Oregon, along the beautiful coast line through the Redwoods with a flight home from San Francisco.

AKF: *What do you charge for these services?*

Travel agencies do not charge for their services. They act as agents for any of the airlines, hotels and car rentals who pay them a commission. The price of the plane ticket is the same whether bought at the airport or through the travel agency. The advantage of working through a travel agency is using their experience in the business of travel and knowledge of all the different airlines, and various rate structures. Payments for flights, etc., would be made directly to the travel firm who issues the tickets and sends them to you.

Mr. Tucker's address is Barnett Commercial Center, 4520 Pacific Highway, Suite 125, San Diego, CA 92110.

PLAN NOW TO BE IN PORTLAND SEPTEMBER 24-27



BIRTHS HATCHINGS

WHOOPIING CRANE HATCHED IN TEXAS *San Antonio Zoo*

A rare whooping crane chick was hatched at the San Antonio Zoo from one of the three eggs being tended by bantam jungle fowl hens. Another chick died after poking its beak through its shell. Another egg has been sent to the Patuxent Wildlife Research Center in Maryland for incubation.

Ektu, mate of the late Crip, (see last month's AKF) produced eight eggs in April.

MALE BARASINGHA BORN IN PHILADELPHIA

A beautiful male barasingha fawn was born on Friday, May 11, in full view of many fascinated Philadelphia Zoo visitors. The rare baby becomes the fourth member of the Zoo's herd of two males and one female.

Because of serious habitat destruction in India and Southeast Asia, the deer is considered to be an endangered species.

NEW ORLEANS PREVIEWS 'ASIAN DOMAIN'. *Margie C. Haire*

Four exhibits of the Audubon Park and Zoological Garden's new Asian Domain were viewed by the public in New Orleans on April 28, 1979. The event a 'Zoo-To-Do', was an evening affair designed to raise additional development funds.

Malaysian Sun Bear, Asian Elephants, Indian Wolves and Asian Leopards represented Asia as "East Met West" in the Old South. Grand opening of the Asian Domain, which will eventually include 9 exhibits, is scheduled for late May.

1979 REPTILE SYMPOSIUM IN KNOXVILLE

The Third Annual Symposium on Reptile Husbandry and Propagation will be hosted by the Knoxville Zoological Park on August 10-11, 1979. Arrangements are being made for papers and presentations by many leading herpetoculturists. Registration is \$40.00 per person, with special group and day rates. This symposium will immediately precede the SSAR Conference to be hosted by the University of Tennessee in Knoxville.

For further information, contact Howard Lawler, Department of Herpetology, Knoxville Zoological Park, P.O. Box 6040, Knoxville, Tennessee 37914.

For information on the meeting of the Society for the Study of Amphibians and Reptiles (SSAR), contact Arthur C. Echternacht, Department of Zoology, University of Tennessee, Knoxville, TN 37916. The conference meet August 12-16, 1979 at the University.

THE USE OF TELMIN FOR ROUNDWORMS IN PANTHERA LEO

By

Ann Schmidt and Richard P. Heithaus
Wild Animal Safari, King's Island Park, Cincinnati, Ohio

INTRODUCTION

Telmin (mebendazole) has been found to be a safe, effective wormer for the 35 lions at Wild Animal Safari, Cincinnati, Ohio. Telmin is manufactured by Pitman-Moore, Inc, as an equine wormer and although Zoo and Wild Animal Medicine (1978) does not recommend its use on carnivores, we have found it to have all of the necessary qualities to do the job where other wormers are lacking.

BACKGROUND

Fecals taken from our lions have shown that they are constantly exposed to roundworms. *Toxocara canis* and *Toxocara cati* moderately infect our lions every five months with some individuals more susceptible than others. Infestation occurs through the ingestion of the worm while it is in the egg stage. The original source for these eggs are the intermediate hosts, birds and rodents (starlings and mice in our case).

Reinfestation can occur in one of the following four ways:

- 1 the lion licks the ground while eating where an intermediate host has had access to,
- 2 the lion licks its anal region after defecating,
- 3 the lion licks its paw after walking through feces left by the other lions
- 4 mothers pass it on to their cubs prenatally (*T. canis* only).

We suspect all of the above are responsible in our situation.

LIFE CYCLE OF *TOXOCARA CANIS*

Once the eggs are ingested by a lion in one of the four methods listed above, they hatch in the digestive tract of their new host and penetrate the intestinal wall to enter the blood stream. From here, the larvae find their way to the lungs where they move up the trachea to be swallowed by the lion. The larvae find themselves back in the small intestines where they grow to maturity at the expense of the lion. This cycle takes about 2½ months to complete. Indirectly, a heavy infestation of worms lowers the general resistance of the lion making it more susceptible to a wide variety of disorders, especially mange during our cold winters. Symptoms include a loss of appetite and possibly weight, poor coat, sluggishness, depression, and secondary disorders. The life cycle for *T. cati* varies a little from that of *T. canis*, but the resulting disorders and symptoms are the same.

OUR PROGRAM

Our problem is probably more acute than most places because we have such a large number of lions in contact with each other and all have access to large open areas visited by the intermediate hosts. Obviously cleaning is very important and extra meat during the winter months help, but that doesn't totally eliminate the problem. We take fecals every three weeks which are usually negative for a period of 4½ months after the last worming. After this time, signs of roundworms start to show up and within a month are found to be numerous enough to justify a worming. To do this, we put a 9 gram dose of Telmin in a 5 pound bar

continued

The Use of Telmin for Roundworms in *Panthera leo*

of Nebraska Brand per adult. Following the recommended equation of 6 grams per 250 lbs. of body weight, this would be the correct dose for a 375 lb. lion. This dosage has been found safe for our smallest adult (226 lbs) and has been found effective for our largest adult (500 lbs.) making it unnecessary for us to isolate each individual lion and estimate its weight for a more exact treatment. However, since we had 16 young cubs varying in age, hence weight, we gave them a calculated fraction of an adult dose based upon their weight. Telmin was found to be so safe that this separation of cubs from adults for treatment was discontinued when the youngest cub reached the age of 16 months. Lions treated in this manner for just one day had to be wormed again in three months. However, when lions were treated with Telmin for two consecutive days (two 9 gram doses per adult or corresponding proportion for a cub) they didn't have to be wormed again for six months. Giving the second dose two weeks after the first dose is received has the same effect as doing it for two consecutive days. Either way, the second dose finishes what the first dose leaves behind and keeps the roundworms under control for close to half a year. One disadvantage of Telmin is that most lions don't like the taste. This can be offset by starving the animal the day before treating it.

SUMMARY

We have been worming our lions with Telmin for the past 1½ years. We have found it to be very safe, easy to use, and extremely effective. It is active not only against the roundworms found in our lions, but also against the hookworms and tapeworms occasionally found. Telmin has advantages over the other drugs we have used or considered using in the past (Levisol, Piperazine salts, thiabendazole, Disophenol, and others used on carnivores). These are suspected to be toxic in lions or they are not active against the type of parasitic worm found in our lions.



WILDLIFE EXPO '79

On the weekend of April 21-22, 1979, East African Wildlife Society presented a 'Wildlife Expo '79', a collection of animal organizations, and artists represented at booths along an enclosed shopping mall. Don Rolla of East African Wildlife Society is to be commended for his efforts at the organization of this successful exhibition which included slide shows, films, and group representatives.

AAZK was represented by the Brookfield and Lincoln Park Zoo Chapters with a display of slides depicting Keepers at work and at conferences, with members of both chapters there to answer questions. Many people passed the booth, enjoying the slide show, and asking a variety of questions. One of the first visitors was the sister of a Santa Fe Community College Teaching Zoo student. Twenty-three very interested people listed their names to receive AAZK Brochures and indicated sincere interest in joining. All in all, this was a great opportunity to put Zoo-Keeping and especially AAZK before the public. Other Chapters are encouraged to participate in similar activities if the chance arises, or, perhaps, organize an 'Animal Expo' of your own.

Ira Armstadter, Pres., Brookfield Chap.
Pat Sammarco, Pres., Lincoln Park Chap.

THE MENAGERIE CYCLE
THOUGHTS ON POPULATION MANAGEMENT IN ZOOS

by
B. Wayne Buchanan
Abilene Zoological Gardens

Few who are seriously interested in zoo keeping as a profession are not familiar with at least one of Heine Heideger's works. A point strongly evident in all his writings is the change in function and role of zoos in the past few decades. The change is not yet complete. Still many zoos are working hard to replace old, inadequate facilities. Rows of small, sterile, barred cages housing individual animals are giving way to more naturalistic and aesthetic displays. Education, conservation, and research are now among the prime functions of a modern zoo.

The menagerie is dying - or is it? In the seven years I have been a zoo keeper I have noticed a steady trend. In our quest to aid conservation, the breeding of existing animal collections has been attacked with a vengeance. Those species rarely or never reproduced in captivity are gradually succumbing to our propagation efforts. With reproduction increasing continually in almost all zoos the inevitable result is becoming quite clear. Zoos may be running the risk of over production.

I am not directly involved with animal marketing, so I must speak rather guardedly of my impressions of the situation. With that in mind, let me say first that the problem presently appears to affect primarily mammals, and second, it does not yet appear to be a critical problem. I'm sure that few of us do not have an antelope herd that is bigger than it should be; a primate group that is constantly squabbling. How often are you hard pressed to arrange for an isolation stall or cage? And do not forget how long it takes to sell an animal once it is surplused - especially if it is a male. Yet we do seem to manage, though it is increasingly difficult to do so.

There are ways of controlling this growing problem before it does reach a critical state. I would like to mention a few at this point. These are not necessarily original ideas by any means. Far too many 'bull sessions' have taken place to give proper credit. Nor do I claim that they are the only possible solutions. Indeed, I would be sorely disappointed if other possibilities are not suggested. My whole intent is simply to stimulate thought on the subject.

I. RESTOCKING THE WILD WITH CAPTIVE BORN ANIMALS.

This seems the most natural recourse, yet it may well be the least accessible goal of all. There are some definite possibilities in this area with North American animals. Our own continent is the only area of the world where there is a realistic chance to overcome the complicated legalities involved in releasing animals into the wild. Yet even if this is accomplished there must be somewhere to release the animals. Habitat destruction, being the prime cause for the demise of most troubled species, must be a major concern - a concern that is out of the direct controlling reach of zoos. Already most large North American mammals, especially carnivores, are likely beyond the application of a release program due to a lack of suitable habitat.

Politics and an ever growing human population create extremely limited bounds of potential accomplishment by release programs. Such an effort would be very expensive and time consuming, requiring much planning,

The Menagerie Cycle., continued

research, and follow-up field work. All of which would be impossible without a high degree of cooperation and coordination between zoos and state and federal wildlife agencies. Yet, it is the most logical and productive recourse I can imagine. We should never dismiss it completely. In fact, we should always aim for it.

The following three suggestions are merely aspects of something that zoos actually deal with constantly--management of their animal collection. In this instance, I refer specifically to reproductive management.

II. BIRTH CONTROL - There are three basic ways to control birth rate in any groups of animals. (A) By manipulating the collection to prevent breeding. This would necessitate sexual segregation during breeding periods. For amphibians, reptiles, and birds this would be quite feasible as these groups are generally quite seasonal in their reproductive cycle. However, mammals, who are presently the bulk of the population problem are seldom so cooperative. In many mammals females can come into estrus throughout the year. Others appear to have abnormal patterns and/or continued estrus cycles if the female is not bred. Additionally, sexual segregation may require more caging space than is available. (B) Use of chemical birth controls. Birth control pills and long term implants are already being used extensively in Felidae with good success. There remains a large amount of physiological research to be done before this method is perfected and its use expanded to more families. (C) The third method is sterilization of one of the sexes. This has been used in isolated cases in many zoos, but in general it is avoided. There is a prevailing fear that such a permanent act could be very damaging should that species become more marketable in the future.

III. SPECIALIZATION. Each zoo would become a specialist in the reproduction of a few, select species. Animals in the collection, but not in this select group, would be managed so as to prevent reproduction. These same animals would have to be available as potential breeding stock to zoos delegated the responsibility of reproducing those species. This would be necessary to prevent problems inherent with a very small gene pool. In effect, the majority of a zoo's collection would be reserve breeding stock for other zoos. It is impossible to imagine zoos establishing a level of cooperation on a national basis sufficient for meeting these requirements. Additionally, from this keeper's point of view, such a program would come very close to returning a zoo to a menagerie.

IV. EUTHANASIA. Most likely this word is quite disturbing to most of you but please try to read on objectively. Under this plan all animals in the collection would be managed for reproduction. Reproduction is one of the best indexes we have for judging the care we provide for our animals. Breeding should be managed as selectively as possible to produce the best confirmation and health possible. Based on a previously determined ideal breeding group size, housing area, sex and age ratios considered, the least desirable animals above this number would be marked for surplus. Those that can not be marketed are then euthanized. In the real sense we become the predators who will, with the knowledge obtained from education, research, and experience, cull the group of its least 'fit' individuals in order to maintain the vigor of the group. This is, without a doubt, the most practical and productive tool presently at our disposal. Yet, it is avoided because of our own weakness.

continued

The Menagerie Cycle, continued

As humans we suffer from the blessing and curse of emotions. We often spend more time with our animals than with our families. We have hand-raised some, nursed many back to health, watched them raise their own young, and received their trust and affection. It would indeed be difficult for most of us to detach ourselves far enough from animals we know as individuals, in order to be a party to such an act. Yet, it would, in the long run, be to the benefit of that group or population of animals. I believe such a decision will face more of us in the not-too-distant future.

There is one specific use of euthanasia with which I am greatly concerned. It is the reproduction of some species to supply the zoo nursery with a display simply because the public 'wants' to see baby animals. Then after they outgrow the nursery they are euthanized. Euthanasia should be used only to benefit a breeding group or end the incurable suffering of an animal. Would it not be better to educate the public to more fully understand the situation: I dare say the public would not 'want' to see baby animals under such circumstances.

I believe the best solution will evolve from a blending of these ideas and others yet to be heard. Still, there will be other issues. Such as, do we go to the same extremes of management for all captive populations, or will money (as in the past) limit us to high priority cases, i.e. endangered species?

We have a long way to go to solve this growing problem facing zoos. With nowhere to house or sell surplus animals, zoos will make all attempts not to breed any. Yet, if management is forced to become exceedingly stringent, zoos may be reproducing only a relatively few species. Either way, we will be back to the old menagerie idea. The education and entertainment value will be higher than the old menageries as will be their aesthetic appeal. But for me, it would not be as enjoyable working in a menagerie as in a zoo.



Kansas City Chapter
President.... Ernie Galbraith
Sec/Treas.... Julietta Thornton

Their activities include a newlsetter, speakers at monthly meetings, an ice cream truck for fundraising at "Zooballee" festivals, and working on a booth promoting Keeper activities and the AAZK chapter.

chapter

Little Rock Zoo has changed its name to the Zoo of Arkansas

Santa Fe Chapter had their first 'dog wash' of the season and made \$100; the second made \$80. Good Work!

news

SURVIVAL

THE BOLSON TORTOISE, NORTH AMERICA'S LARGEST LAND REPTILE,
LISTED AS ENDANGERED

The Bolson tortoise, the largest land reptile in North America, has been listed as an endangered species by the Interior Dept. It lives primarily in grassland areas of the states of Chihuahua, Coahuila, and Durango in Mexico. Adults may grow quite large, with shells measuring up to 39 inches in length. In spite of its size, the Bolson tortoise is one of the least know reptiles in the Northern Hemisphere.

A PLEA FOR PLANTS *from the IUCN Bulletin*

Conservation action on behalf of wild plants is minimal. In the world at large there is precious little awareness of the extent to which our lives depend on plants or of the rate at which they are being wiped out.

Yet in the chain of being, plants are primary. No plant life, no animal life. From the outset plants "learned" the trick of tapping the energy of the sun and the nutrients of the earth so as to sustain themselves and support other life-forms. Giving to all animals food, shelter and remedies for ailments, to man plants also give a great deal else.

"At present the greater part of man's agriculture is precariously based on less than 30 species of plants. The contrast between this statistic and the massive number of threatened species highlights the potential losses that could occur. Some of the threatened species may be potential crop plants in their own right; some may be near relatives of existing crops, and so particularly valuable for maintaining the genetic base available for future breeding and selection. Others may be needed as forage plants, for combating desertification, or for providing new drugs, medicines or other biochemicals. Others may prove valuable for their unique life-form or ability to thrive in unusual or particularly harsh environments."

Here in this one paragraph, taken from IUCN's latest Red Data Book on plants is the essence of the case, the overwhelming case, for plant conservation.

USDA STOPS BIRD IMPORTS THROUGH PRIVATE QUARANTINE STATIONS

The U.S. Department of Agriculture has temporarily halted exotic bird imports through commercially operated, department approved quarantine facilities, because recent outbreaks of exotic Newcastle disease in California, Florida, Arizona and Nevada appear to be related to deficiencies in the operation of these facilities.

RECOVERY TEAMS FOR EAGLE, PRAIRIE CHICKEN

Two more recovery teams were appointed by the U.S. Fish and Wildlife Service, one for the bald eagle *Haliaeetus leucocephalus* and the other for Attwater's greater prairie chicken *Tympanuchus cupido attwateri*.

Four bald eagle teams have been appointed to date. When the Pacific team is appointed, the 48 contiguous States will be



Great Ape Demonium

WITH MEMORIES OF MR. CHING

by
Helen Bathé



We received word that Mr. Ching, our male orangutan on breeding loan to the Rotterdam Zoo, Holland, died of unknown causes. We are sorry for this loss, as he was a long time inhabitant of our zoo.

For those who liked him, and enjoyed him...and there were many...he was an incredibly beautiful Bornean orangutan.

To people who had never seen him before, there was always an attitude of reserve and politeness. "What is that?", or "What do you call something like that?", or "Where is his head?" Since he sometimes stood on his head, this was an understandable question.

Children like him, too! They would smile and could be heard to say, "There's the cookie monster from Sesame Street."

Mr. Ching arrived at the Oklahoma City Zoo in October, 1959. He was one and one-half years old. He was moved to the Gladys Porter Zoo in Brownsville, Texas, on November 21, 1971. He returned to our zoo on August 20, 1975.

While in Brownsville, he fathered a male named "Big O" who later went to the Ruhr Zoo, Gelsenkirchen, West Germany.

The Oklahoma City Zoo acquired a Bornean female orangutan, Maggie, on March 16, 1977, and she and Mr. Ching were introduced July 18, 1977. Several breedings were noted and on Saturday, July 8, 1978, Maggie gave birth to a boy. He weighed 3 lbs, 2 oz, and was named Subarno, but was called Barney. Gregg and Nancy Petromilli accomplished an "above and beyond" job of raising the little Bornean Baby Barney and at the start of this year, delivered him to a new owner in Miami Beach, Florida.

Ching was such a longtime resident of our zoo, that the available information on him would fill a small book. Just about everyone has a favorite story. "Mr. Ching Goes to Rotterdam" was reprinted in the *Animal Keepers' Forum* May, 1978, p. 84.

A NEW BOOK

All About Gorillas is a new book by David P. Willoughby. His interest in the anthropoid apes has been lifelong so he is able to present an immense store of information.

He writes "The mountain gorilla is the most endangered of the African apes. Although it is no consolation, the plight of the orangutan is even worse than that of the gorilla, since its capacity to breed in captivity is far more limited and uncertain; therefore, it will perhaps be the first of the great apes to suffer extinction." P. 254.

Helen Bathé

PROBLEMS ASSOCIATED WITH PET REHABILITATION
AMONG CAPTIVE WOOLLY MONKEYS

Lagathrix lagathrica

by

Mary Jo Marshall

and

William R. Foster, D.V.M.

Louisville Zoological Garden

The woolly monkey is a South American monkey which inhabits the dense forests of southern Venezuela, Brazil, Ecuador and Peru. Their diet is said to consist primarily of fruit, supplemented by leaves, seeds, berries and some insects.

The main feature that distinguishes them from Old World monkeys is the prehensile tail. It is a remarkable organ and is sometimes referred to as a "hand-tail". It is used for hanging, picking up, carrying and reaching for objects beyond the reach of their arms. The fur coat is short, soft and dense, ranging in color from light silver grey, through brown to black, depending on sub-species. Woollys have long been hunted for their meat, which is said to be delicious. They are also used as catbait by the natives for capture of large and small cats for export or skins. But the heaviest market in the past has been for infants for the pet trade. Babies are very much in demand as pets and command higher prices than any other Amazonian primate. This hunting pressure and the demand for infants, together with a slow reproductive rate and preference for undisturbed forest habitat, have placed this genus in a precarious position throughout its range. It is for this reason every effort should be made to save woollys from extinction.

However, this feat seems to be easier said than done. Most zoo specimens are donated pets; unwanted after "the baby" has reached sexual maturity and has attacked his owner. Males are more prone to serious biting than females. When mature, however, they too can be very dangerous.

It is at this point, that no diaper cannot be removed, no drapery strong enough for a swinging 15 pound bundle of energy, no cupboard safe from very dexterous fingers and no chandelier that is not considered a "fun thing to hang around in". Too much for the owner to handle, the next step is a trip to the local zoo and the problem child is "donated". The owner leaves, sad to lose a "member of the family", but somewhat relieved and secure in a mysteriously newfound knowledge that he or she will be "happier with his own kind".

Some species adapt to their "own kind" with a minimum of difficulty, however, this does not seem the case with woolly monkeys.

In September of 1975, the Louisville Zoo began accepting donated pets with disastrous results. We must keep in mind that these animals had been raised almost like children. Many wore clothing, ate table food and slept in beds with the owners. A feeling of abandonment, confusion and fear may sound anthropomorphic to some, but in my opinion, the transition from pet to zoo animal seems to be an almost unsurmountable hurdle for many woolly pets.

continued

Problems Associated with Pet Rehabilitation among Captive Woolly Monkeys

30 zoos reported exhibiting woollys resulting in a total of 93 animals. Of these 63% were donated pets, 7.5% zoo births and 27% undetermined or did not know the origin of the animal. Only 9 zoos reported copulation and only 16 pregnancies resulted. It is a very important fact to note that of these 16 pregnancies, 11 were shared by 2 zoos keeping woollys in colony situation. 8 pregnancies resulted in viable births, of which 2 died early neonatal deaths. There were 3 stillbirth and 5 abortions. Our survey proved that most woollys in zoos are donated pets and that there is very little breeding activity. I feel that this abnormal social development is directly related to the pet factor.

In light of the compiled information from the survey we felt that we were one step ahead, being fortunate enough to have a breeding male. This, coupled with the fact that our females were adjusting very well, led to an all-out effort to establish a breeding program. We began a study of estrogen levels in urine in cooperation with the San Diego Zoo. We have found that this is the first work done with woollys in this area. We have plans to begin Karyotyping studies also with San Diego.

During the survey, I discovered that in some cases, private owners were having much better breeding success than zoos.

In August, 1978, I received a letter from a gentleman in Florida with a family unit consisting of one male, two females, and their six month old babies and a two year old offspring. Since the potential for propagation in our colony was very good, I felt that a lesson in motherhood would probably be very advantageous. In October, Dr. Foster and I took the 2 females to Florida to live for the winter in this family group. By November, the two babies were climbing off their mothers and our females were allowing them to crawl on their bodies for brief periods. Hopefully they will return to our colony with a healthy family attitude and be successful in raising their own babies.

In dealing with the woollys at the Louisville Zoo and through our survey, I have found that the three main problems with captive woollys are psychological instability, lack of breeding males, (both problems probably resulting from being isolated pets), and spontaneous abortion.

Pet rehabilitation is difficult at best, but I believe that with special attention, personal contact and general T.L.C., it can be successful. More research needs to be done, however, especially before we can honestly say that zoos have helped save this species from extinction.

In light of the compiled information, we have devised a plan for further study of the Woolly monkey, which is divided into two primary areas:

- I. Husbandry
 - A. Diet
 - B. Behavioral studies
 - C. Environmental influences
 - D. Management practices

- II. Medical research
 - A. Reproductive studies
 - B. Immunoassay of estrogen in Urine
(in cooperation with the San Diego Zoo)

continued

Problems Associated with Pet Rehabilitation among Captive Woolly Monkeys

A pattern began to develop: depression, diarrhea, refusal to eat, hunched posture, and a general "wasting away" would begin often immediately after arrival, sometimes up to several months later for no apparent reason. On necropsy, ulcerative colitis, apparently as a result of stress, was found. Out of six monkeys, four had died and one was returned to her owner when signs of depression began. It was at this time, with one lone survivor, Geraldine, whom we will hear more about later, that we decided something would have to change if we were to continue exhibiting woolly monkeys. Calls to other zoos with woollys were made, information exchanged and the realization dawned that we were not the only zoo having this problem. The phraseology of the syndrome varied. Some called it "low or invisible stress factors", "severe depression", "wasting away", and just plain "losing the will to live". Whatever the title, the end result was the same.

It was at this time we were offered a pair from a private owner. These animals had been kept with other woollys since they were very young, in fact, the female had been pregnant twice but had aborted both times. We accepted the pair and decided to try one more time.

We had learned, admittedly the hard way, that any stressful conditions must be carefully avoided. The highly emotional makeup of the woolly had to be considered above all else.

Previously, our woollys had been kept in one area during the summer months and moved to winter quarters in the Fall. We felt that this shifting may have attributed to the stress factor that we were trying to avoid so we decided to use the monkey island where vervet monkeys had been exhibited. The two islands, surrounded by a water moat, consist of 4,000 square feet of grass, trees, and ropes. The heated indoor enclosure is 500 square feet with ropes, shelves and a large cargo netting that serves as a huge hammock. In this exhibit, the monkeys have access to sunshine and fresh air and are locked inside only when the water moat freezes over.

The new pair arrived and seemed to acclimate very well. In fact, our female 'Geraldine' became pregnant. Unfortunately she aborted approximately 3½ months later. The male's original mate died of liver complications, but we felt very fortunate to have a breeding pair of healthy woollys. We then acquired four additional females and one male. All were originally pets. With the exception of one female, all had been in zoos since adolescence and had been with other monkeys. We were reluctant to accept the female directly from the private home, but decided to try her with the newly acquired pair. She has done remarkably well, gained weight and has begun to behave in a monkey-like fashion. I attribute this to the fact that the pair seemed to be much better adjusted socially than any of our previous isolated pets. All but one female, Geraldine, have developed affectionate bonds with each other. This seems much more prevalent among the females rather than male/female bonds. The males do not seem to have a particular 'favorite female' except, of course, during estrus.

In February of 1978, we had one male and three females on monkey island and one male with two females off-exhibit. It was at this time that Dr. William Foster, our staff veterinarian, and I circulated a survey among 142 zoos requesting information on captive woollys. The results were disheartening. Of 142 zoos polled, 77 responded.

continued

Problems Associated with Pet Rehabilitation among Captive Woolly Monkeys

- C. Comparative analysis as it relates to the Ortho Sub-human Primate Pregnancy Test
- D. Survey of Woolly mortality
- E. Karyotyping as a means of subspecies identification
- F. Pediatric care.

We wish to thank everyone who took the time to answer our survey and the private owners who corresponded with information on their collections. A special thanks goes to the many individuals and zoo representatives who offered encouragement and showed a sincere concern for the plight of the Woolly Monkey.

This paper was presented at the "First Annual Symposium on Captive Wildlife".

by
Ray Doyle
Keeper III, Louisville Zoo

The close of 1978 marked the end of the first full year of existence of the Louisville Zoological Garden's Raptor Rehabilitation Program. Our rehabilitation staff consists of four keepers, and all of our work with birds is done on a voluntary basis after zoo hours. Fortunately, our zoo's veterinarian is very enthusiastic about the program, and he donates much of his free time to the treatment of sick and injured birds. The following statistical analysis demonstrates why we are encouraged by our first year and we have hopes for even better results in future years.

TOTAL NUMBER OF BIRDS HANDLED	44
Total Number of Species	8
Percentage of Total by species	
R.T. Hawk <i>Buteo jamaicensis</i>	29.5%
Broad-winged Hawk <i>Buteo platypterus</i>	2.2
Marsh Hawk <i>Circus cyaneus</i>	2.2
Sharp-Shinned Hawk <i>Accipiter striatus</i>	2.2
Sparrow Hawk <i>Falco sparverius</i>	36.3
Great Horned Owl <i>Bubo virginianus</i>	11.4
Barred Owl <i>Strix varia</i>	4.5
Screech Owl <i>Otus asio</i>	11.3
Percentage of Total Released	45.45%
Percentage of Total Pending Release	18.1
Overall Mortality Rate	27.2
Percentage of Total Euthanized	4.5

This paper was presented at the "First Annual Symposium on Captive Wildlife".



PLAN NOW TO COME TO PORTLAND, OREGON, SEPTEMBER 24-27, FOR THE 1979
NATIONAL CONFERENCE!!!

THE MILLER PARK ZOO: HERE AND NOW

by
Bernard C. Feldman
Keeper, Miller Park Zoo

In the heart of central Illinois, the cornbelt of the midwest, is the prospering city of Bloomington-Normal where there exists a two acre Zoo. Let me introduce you to the Miller Park Zoo, a zoo that is growing in size and steadily upgrading its professional standards. I would like to discuss how this small zoo operates. Therefore, I'll be talking about the animal collection, Keeper training, our communications, our responsibilities, problem solving, and our relationship with management (which consists of one person, the Zoo Superintendent).

The community has shown interest in their zoo by raising enough money to Master Plan the 85 year old facility. With a three-phased Master Plan, Phase I being completed, we all look with enthusiasm to the enlargement of this Zoo. Phase I was the renovation of the main animal building, from eleven cages to four spacious exhibits for the large felines. Two new exhibits were constructed, a sea lion exhibit and a very attractive otter display. Phase II will see a Flamingo colony, an African Plains exhibit and a Prairie Dog Town. Phase III will be the construction of the Australasian and South American continental exhibits. There is also an active Zoological Society which provides advice and financial assistance needed for the continued growth of the Zoo.

Presently there are three full-time Keepers at the zoo and three part-time Keepers in the summer to work in the Petting Zoo. One of the Keepers is responsible for the Felines, Monkeys, Sea Lions, and Otters. Another Keeper is responsible for the Tropical Rain Forest exhibit, the Reptiles, and the Petting Zoo. The third full-time Keeper is basically a 'floating' Keeper, covering the areas of the other two when they're not there. We order the food and medications and often pick them up. We have a new van for transportation which we have used for just about everything, from transporting animals to bringing dirt in for the Rain Forest. It is said that in small zoos, the employees have to wear many hats. In this zoo, we have a closet full of hats. We wash the windows, clean the floors, maintain the restrooms, give tours, make holding or transport cages, and sometimes man the admissions booth--in general--keep the zoo. Versatility is obviously a must in this zoo. During the weekends and other times we answer the phone since there is no secretary. When the Cashiers and Zoo-venier shop attendants arrive, we are relieved of that work. Since our only form of surveillance at night is the Park Police, there is no night Keeper.

For the small size of the zoo, we offer quite an extensive and varied diet for the animals. The cats are given the Nebraska brand feline diet and horsemeat. To the meat is added various medicines and food additives for the different cats. For example, our Spotted Leopards have Vit-asil, a vitamin supplement, and Nutriderm a coat conditioner added to their diets. The monkeys are given various fruits, vegetables, monkey chow and meat. The snakes are fed mice, guinea pigs, rats, and an occasional rabbit. The hoofed stock in the Petting Zoo, which consists of the usual barnyard animals, are given good quality hay and grain. The Sea Lions are fed chopped mackerel with squid making up the lesser part of their diet. The otters feed on feline diet and mink chow that is worked together with water.

continued

The Miller Park Zoo: Here and Now, continued

Of all the animals, the birds in the Tropical Rain Forest exhibit have the most complicated diet. We have a meat mix which is ground horsemeat or feline diet, ground mackerel, ground apples, oranges, and carrots. This meat mix is then mixed with a vitamin supplement, mink chow, and a general mix which is ground dog chow, ground soft-billed bird diet, Roxanthin Red-10, and bone meal. This moist and finely crumbled meat mix is the fundamental diet for the insectivorous and omnivorous softbills in the bird collection. Alongside the meat mix in the food pans are spread chopped apples, grapes, romaine, tomatoes, sliced oranges, grated carrots, and soaked raisins. The soft-billed bird pellets by Zu Preem are sprinkled over the meat mix and occasionally mealworms are added. Frequently crickets are tossed into the Rain Forest for the inclusion of additional live food. It is noted that I tood some time in describing our diets. This was done so one can see that the diet system can be as complicated as one would find in a larger Zoo.

The animal collection is modest with its own stories of success and failure. Most of our cats are either breeding or in the process of introduction to each other. The Tropical Rain Forest has produced some Mandarin Ducks and Red-crested Cardinals to name a few. Numerous nests were built but some failed to produce. We reserve most optimism for better and more breeding in the Rain Forest when the plants grow more and present more nesting sites for the birds. The Rain Forest is just a little over a year and a half old. We've also experienced a severe rodent problem in this exhibit and with the Keepers going everywhere in that exhibit, many breeding instincts and attempts were disturbed. Many of our animal failures are in the headings of stillborns, infertile eggs, drownings, or a nest of eggs that just disappeared. Strangely, our pair of Greater Hill Mynahs managed to produce several offspring in the diet kitchen! Given an opportunity to breed in cramped conditions (meaning a parrot cage) the Mynahs showed us how to do it. A truly unique story of success.

The Tropical Rain Forest exhibit is perhaps the most talked about because it is a completely new design of exhibit to the Bloomington-Normal area, a walk-through exhibit without a railing or bars. It also demands the most out of the Keepers in maintenance. This exhibit is approximately 80 feet in diameter, 25-30 feet in height, has circulating water for its four pools of various depths and has at least 50 different types of plants necessary for the jungle itself. Moreover, it has stone walls which measure up to 15 feet. It is octagonal in shape approaching a circle which allows uninhibited flight of the birds. There is a central skylight dome, numerous windows and spheres for light and vita-lites to further promote plant growth. Several species of ground birds from White-faced Tree Ducks to Black Cranes find their niches while perching birds have greater difficulty. The perching birds are almost entirely softbills with a small psittacine bring the one exception. The softbills, from Peking Nightingales to Bare-throated Bellbirds, provide song and beauty. People seem to find the Iguanas the most intriguing and mysterious, and one always manages to rest in a branch of the Fig Tree overhanging the walk!

The four renovated feline exhibits provide spacious and natural-looking displays, homes for Jaquars, Spotted Leopards, Pumas, Sumatran Tiger, and African Lions. There are inside and outside dens in each exhibit with transfer doors connecting all four exhibits. The transfer doors are operated either by a winch and cable or slide along a track. Behind the scenes is quite interesting. When one goes into the gunnite rockwork, the inside dens and the unique working conditions command one's attention.

continued

The Miller Park Zoo: Here and Now, continued

One can actually work above the animal supported by a strong grating without the slightest chance of danger. Transferring the cats from one exhibit to another is usually done with a water hose for encouragement. However, after awhile the animals seem to understand that when a door is opened, they are expected to pass through. Each of the four inside displays is connected to the larger outside exhibits by a transfer door.

The Squirrel Monkeys live in an unassuming exhibit of various branches and ledges for running and jumping. We have seen some breeding but no results, The reptile exhibit, home for several Boas and Pythons, is now under renovation where the entire exhibit will appear natural instead of a huge holding cage.

The California Sea Lions live in a new exhibit complete with a rock island, salt bath, denning area, and a Diaclear filter that is required to keep the 17,000 gallons of circulating water clear. Our 500-600 lb. Sea Lion bull is a major attraction on hot summer afternoons when begging for his food and chasing the smaller cow.

The Otters are provided with a very spacious outdoor exhibit with two pools of circulating water and ample land space for frolicking and playing around, just like otters would. Inside they are provided with a private denning box and two holding spaces that are worked by sliding doors. The Petting Zoo, which is a favorite with everyone, offers the domestic barnyard animals in a contact area.

We have a consulting veterinarian who makes visits for a general question and answer session. We often go to his office to deliver fecal samples, to pick up medicine or for examination of a sick animal. All of the injections for worming or preventive measures are performed by the Keepers on the directions of the Veterinarian. These opportunities with and around the vet are most rewarding and certainly broadens one's awareness of hygiene and disease.

Since our keeper force is small, every Friday everyone is working and can get together. Usually we know how the other Keeper is doing and how his or her assigned area is doing by our weekly forms. We have complete freedom in using the report forms, as a suggestion column, a discovery medium, and a bitch forum. Our feelings show the emotional impact we have for certain areas of the Zoo. For example, I wrote, "Hooray! I saw the Red and Yellow Barbets breeding this morning!" Disagreements are sometimes aired and problems solved this way. However, our problem-solving is usually that of general confrontation. If that doesn't settle the problem, the Superintendent arbitrates. If that doesn't work, the Union, to which the Keepers belong, and the City Management try to settle it. Finally, for very important messages, we have a small blackboard in our one diet kitchen which we use constantly.

You might be wondering now - WOW, with a Keeper force that small and intact, how do you get along with the Superintendent? Well, simply, very good. Our boss, Mr. Randall Carney, is in constant communication with all of us. He is appropriately termed, a 'Working Supervisor'. Our true relationship with Randy is very relaxed but professional and stems from the fact that he doesn't ignore us, but sees our dedication and offers many good guide-lines to make our positions as Keepers enjoyable. All of us are open to new ideas to make a competent team of professionals that make the Zoo go.

continued

The Miller Park Zoo: Here and Now, *continued*

Recently under the Comprehensive Employment Training Act, CETA, a grant by the Federal Government afforded us the opportunity to expand the Education Program of the Zoo. An Education Coordinator position was created and an individual was hired to promote the understanding of zoo animals. Prior to this, the Keepers gave the tours and Randy went to schools with an assortment of animals for school programs. Now the Educational Coordinator does this and the program is growing. A Docent program was created by him to visit more schools. He is also doing the graphics. Previously, the Keepers and Randy made the Graphics. When time was short, temporary signs went up. Now the graphics have a professional job of illustrating and describing the displays, which does add considerable appeal to the exhibits.

In 1971, a program called the Junior Zookeepers was initiated for children in the pre- and early teens. They were given the basics of Zoology and Zoo Biology by teachers and completed a one year course, culminating in the awarding of a certificate. In the summer, the Junior Zookeepers help the part-time Keepers in caring for the Petting Zoo animals, a most rewarding aspect of the Junior Zookeeper program.

When I was hired in the spring of 1977 to work at the Miller Park Zoo, on the job training by the Keepers and the Superintendent was required to adequately perform the routine duties. After a three month probation period, the Superintendent evaluates your performance and determines if you are acceptable for the staff. By then, the newly hired Keeper should know the routines quite well, should be well aware of the public and know how to deal with people. Though my degree in Biology and personal animal library prepared me for zoological work, the actual application of this knowledge and communications with other Keepers and their experiences were the best teachers of animal husbandry in the Zoo. General and specific information on animal behavior can be found in many books, but observing and trying to understand behavior in captivity makes ethology in large and mixed exhibits quite an assuming and young science.

In my former Zoo positions, there were days when you completed your job routines and observations of the animals about noon and turned to observing people, unless a project was in the works. Here the routine work and observations consumes the greater portion of the day. Winters are quiet and lonely and we can get more done. Another difference is the attitude toward management. At the Miller Park zoo, owing to its small size, there exists a complete mingling of thoughts and ideas between the management and the Keepers--a true 'esprit de corps'.

This is a different type of paper to present at a Keeper conference, but one I hope touches on some of the suggested topics recommended for the conference. Along with the slides, I hope you can understand how we work, our communications, our responsibilities, and our professionalism.

The Miller Park Zoo is a 'here' Zoo because it is constantly trying to upgrade its standards as well as keep the facility appealing to the people as it is dedicated to the welfare of the animals. The Miller Park Zoo is a 'now' Zoo because it is professionally alive for the animals and the public.

This paper was presented at the National Conference of the American Association of Zoo Keepers. The theme of the conference was 'Our Education for Their Survival'.



We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

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BIRD KEEPER... to work in tropical bird house. The duties include feeding, husbandry and general care. Some experience is necessary. This is a progressive bird department with a large collection of 325+ species, 1400+ individuals. Contact Bruce, Miller, Supervisor of Bird Department, San Antonio Zoo, 3903 N. St. Mary's, San Antonio, TX 78212.

???

INFORMATION REQUEST

Hyena and Serval information is wanted from anyone having knowledge or experience in exhibiting hyenas and/or Serval in an open moated grotto. We want to alternate the Spotted Hyena in the lion grotto and the Serval in the Cheetah grotto.

Please send any information to: Ralph Konrath
Milwaukee County Zoo
10001 West Bluemound Road
Milwaukee, WI 53226

HAVE YOU... ? ? ?
sent in your nomination for the Board of Directors to
Jill Grade
Busch Gardens
Attn: Zoo Office
3000 August A. Busch Blvd.
Tampa, FL 33612

See page 64 of the April issue of AKF for the details. Nominations are due June 30. DO IT NOW.

* * * * COMING EVENTS * * * *

AMERICAN ASSOCIATION OF ZOO KEEPERS NATIONAL CONFERENCE
September 24-27, 1979 Portland, Oregon

AAZPA National Conference
September 30-October 4, 1979 St. Louis, Missouri

Regional Conference for Zoo Support Organizations
October 27-29, 1979 Louisville, Kentucky
Contact: Nita Dean, Executive Director or
Dr. A.J. Eilers, President
Louisville Zoological Society
1100 Trevilian Way, Louisville, KY 40213

World Conference on Breeding Endangered Species in Captivity
November 12-16, 1979 San Diego, California

World Conference on Sea Turtle Conservation
November 26-30, 1979 Washington, D.C.
Contact: Ms. Vivian Silverstein
1244 19th Street NW
Washington, D.C. 20036

* * * * *

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10". Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.

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Foreign	\$15.00 annually
Contributing	\$50.00 annually

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All new members receive an AAZK shoulder patch and a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

The AAZK Headquarters has extra shoulder patches available for \$1.25 and back issues of the *Animal Keepers' Forum* for \$1.00.

Send name and address and a check or money order, payable to American Association of Zoo Keepers to

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WASHINGTON, D.C. 20008

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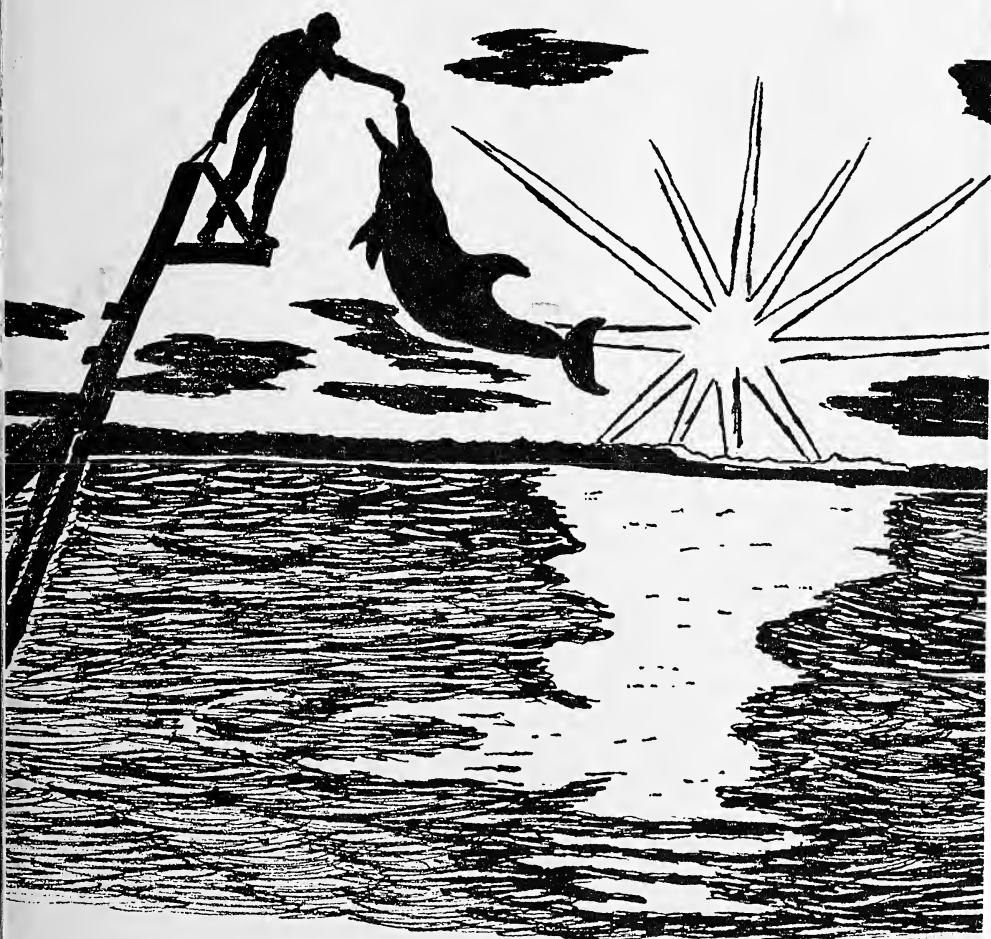
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Animal Keepers' Forum



Dedicated to Professional Animal Care

JULY 1979

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Executive Editor: Mike Coker, Topeka Zoological Park
Managing Editor: Lois Bogia, Topeka Zoological Park
Art Consultant: Elaine Shea

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SCOOPS and SCUTTLEBUTT

The July cover illustration is by Herb Roberts of the Zoo of Arkansas. He captured the serenity of a sunset after a warm summer's day. Lovely!

A GOOF AND AN APOLOGY

In the June issue on page 115, the title of Ray Doyle's paper was inadvertently omitted. It should read RAPTOR REHABILITATION REPORT. Our sincere apologies.

VISIT OUR REMODELED NURSERY. . . .Ann Littlewood, Washington Park Zoo

The Nursery at Washington Park Zoo in Portland, Oregon, will soon reopen after a year-long, \$25,000 remodeling. It can house baby animals ranging from tree shrews to elephants, from seals to owls. Caging, sanitation, lighting, and heating are improved, as is public viewing. The Nursery keepers initiated the design and contributed throughout the project. At the September AAZK Conference, tour our nursery and see what ideas you can take home!

REGIONAL COORDINATORS NEEDED

Jill Grade, head of the Regional Coordinator network, announces the vacancy of three Regional Coordinator posts--those of NY; and WA, OR, ID, MT, WY, AK; and the region of CA, NV, AZ, UT, HI. Anyone who needs more information on the job or would like to serve in one of these regions (or any portion thereof), can contact her.

Jill Grade is now at the Busch Gardens, 3000 Busch Blvd., Tampa, FL 33612 Attn: Zoo Office. Telephone 813 988-5171. Busch Bird Sanctuary in California is no longer in existence, and Jill reports some difficulty with getting her mail forwarded and asks that correspondents use the Florida address.



BIRTHS HATCHINGS

BROOKFIELD ZOO CELEBRATES BIRTH OF OKAPI

One of the Brookfield Zoo's rarest animals -- an okapi -- gave birth on May 30 to a little female.

Calmly accepted by mother Mufuh, 6, a six hour labor was attributed in part to the good size of the baby, who stands over 3 feet tall and weighs 49 lbs. The little okapi was up on her feet within 10 minutes of birth, seeking her mother's nipples five minutes after that, and has been nursing regularly since.

Based on the baby's arrival and first hours in the world, zoo staff decided on an appropriate mane: Mangese (man-Gee-zee) is a pygmy term for a youngster capable of doing great things.

Mangese is a third generation birth for Brookfield. In 1959, Brookfield Zoo was the site of the first okapi birth in the country. This rare species of large land mammal was unknown until 1900, when it was discovered in its native Central African rain forest area.

With the face, sloped back and parallel gait of its cousin, the giraffe, the okapi has a dark brown velvety coat and white striped legs. The stripe pattern of the hindquarters is the animal's "fingerprint," as no two individuals are the same. An adult okapi is about the size of a small horse.

The little okapi brings to six the number of this rare species at Brookfield Zoo. Currently, there are 17 okapis in captivity in the United States; 14 of these born in captivity.

MILLER PARK'S MOUNTAIN LION GIVES BIRTH ON MOTHER'S DAY

Miller Park Zoo's female Mountain Lion *Felis concolor* Leonita gave birth to 2.1 cubs on Mother's Day, May 13th. We have discovered that the female cub was so small she had to be given supplemental milk formula to more adequately compete with her larger brothers. All three cubs and mother are doing very well.

BRONX ZOO'S WORLD OF DARKNESS IS SITE OF BIRTHS

Night vision is the one requisite for enjoying three new-born nocturnal mammals at the Bronx Zoo's World of Darkness. A black-backed baby duiker was born on March 22. The duiker is a small, gentle antelope from West Central Africa. A baby leopard cat was born on February 15. The spotted cat, about the size of a house cat, is from Southeast Asia. A douroucouli, or owl monkey, was also born on March 22. It is the only nocturnal monkey and is a native of Central and South America.

SLOW LORIS BIRTH AT ZOO OF ARKANSAS. Emily Stoffregen

On May 19, 1979, a slow loris *Nycticebus coucang* was born at the Zoo of Arkansas in Little Rock. It was discovered on a limb at 10:30 a.m. when the animals were being fed. The birth was a complete surprise because no mating activity had ever been observed in these animals. Both females have a tendency to be overweight, hence, no pregnancy was observed.

The group consists of 1.2 slow lorises which have been housed together for approximately 2½ years. Since these are nocturnal animals, their "night" lasts for 10 hours, from 8:00 a.m. to 6:00 p.m. and is lit by eight 25 watt red light bulbs. White fluorescent lights are turned on from 6:00 p.m. until 8:00 a.m.. Their diet consists mainly of fruits, vegetables, feline diet, and crickets.

The first day the baby caused some concern because, although the mother checked on the baby frequently and licked it, she left it on the limb and it was not observed nursing. The mother picked up the baby at about 3:30, however, and carried it the rest of the day and went to sleep carrying it when "daylight" began. The baby was observed nursing during this time. The other female and the male showed great interest in the baby but did not bother it.

The baby is now over two weeks old and doing well. It stays on the limb from 8:00 a.m. until early afternoon when the mother returns for it. Often during the morning, the other female will hold and lick the baby and once it has been observed on the male's back. It is also beginning to crawl around on its own.

One interesting thing about the female's behavior is that, while carrying the baby, she becomes very distressed if it crawls around to her back or gets on her head or legs. She pushes and pulls at it until she gets it back on her chest or abdomen. Once there she ignores it completely and never assists it in hanging on.



from the IUCN Bulletin...

The Saudi Ports Authority is strictly enforcing regulations regarding the dumping of garbage and the flushing of oil tanks by ships in harbor or at anchor outside. Offending ships' captains have been heavily fined; Saudi flag vessels have also been penalized.

NEW PARTIES TO CITES: KENYA, JORDAN, INDONESIA.....IUCN Bulletin

Kenya ratified the Convention on International Trade in Endangered Species of Wild Fauna and Flora on 13 December, Jordan acceded on 14 December and Indonesia acceded on 28 December. They thus become, respectively, the 49th, 50th, and 51st parties to the Convention.

The ratifications of Kenya and Indonesia are particularly good news. The first should mean tighter control of ivory traffic, while Indonesia is a most important new link in the Far East chain of CITES parties.



Registration for members is \$40 and \$45 for non-members. Late registration, after September 1st, will be an additional \$5.

Registration forms and additional information are available from:

Jonolyn E. Smith
Washington Park Zoo
4001 S.W. Canyon Road
Portland, Oregon 97221

The Red Lion Motor Inn in downtown Portland has been chosen as conference headquarters. Single rooms are \$40 per night and double rooms are \$46 per night. Using information on the registration forms, we will match up people who wish to share a double room, but do not have a roommate. There will also be a limited amount of space available at the homes of Portland AAZK members which can only be offered on a first-come, first-serve basis.

Our post conference tour will be to Seattle's Woodland Park Zoo on Friday, September 28. Woodland Park has a large bird collection, including a well established bald and golden eagle rehabilitation program, and a very good reptile house. Portland has very small bird and reptile collections, so if either is your main area of interest, you should not miss Seattle. They also have a nice nocturnal house. By September, the gorillas will be in their new exhibit and the African velt area will be near completion.

There are still spots open for additional papers. Deadline for outline or abstract is August 1 and free registration will be granted to those whose papers are accepted.



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chapter

The Folsom Children's Zoo in Lincoln, Nebraska, has organized and elected officers:

President....Laura Trechsel
Vice Pres....Melody Bietz
Secretary....Laura Carroll
Treasurer....Lizabeth Ebers

The Santa Fe Community College Chapter has elected some new officers:

Sec/ Treas....Marlene Miller
Project Directos.... John Sills
Program Director.... Carleton Bailie
Editor....Paul Skipper
Advisor....Bill Greenhood

news

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HAND FEEDING BABY PARROTS

by
Ralph C. Small

What is a hand fed baby parrot? This is a baby that is taken from the breeding pair when it was hatched up to about 45 days and fed by some person by hand until it is eating by itself. The reason for doing this is to make a super tame house pet. A newly hatched baby is fed every two hours day and night. As they grow older, the time between feeding gets longer until it can eat by itself.

If the baby is taken before it has feathers, a thermostatically controlled brooder has to be used to keep it warm. The brooder is set at 100°. If the baby acts like it is uncomfortable from too much heat, the temperature is gradually lowered until the baby finds its comfort zone. This is usually 90° to 95° for newly hatched babies. As they start to grow some feathers, the temperature is gradually lowered until it is room temperature or about 72°. Humidity has to be kept in the brooder so the baby does not dehydrate too much. If the baby's skin starts to dry out, use a little larger pan of water in the brooder to supply more moisture.

Each baby is usually kept in a separate container. This is done so if one baby is restless it does not bother the other ones. This container can be a small box or any other suitable container. We usually use sawdust on the bottom of the boxes. The sawdust is hollowed out so sides are higher than the middle. A piece of kleenex or paper towel is put over this so it keeps the baby out of the sawdust. The hollow helps keep the legs from slipping out from under the bird. If the legs still do, put it in a smaller box so this cannot happen. If one of the legs does come out of position at the hip, tie the two legs together at the ankles. Depending on the size of the baby, it should be tied so that there is ½" to 2" slack so they can shuffled, but not enough that the leg can go out to "the side again." It is best to use yarn, shoe lace, or something soft to tie it with. It usually only takes a day to a couple of weeks to get back to the normal hip action. The younger they are, the less time it takes.

The new baby should be fed by a small spoon that has been squeezed in a vise so that it forms a funnel. This will help the formula go into the bill. The first feeding of the new baby should not be given until all food that parents have fed is out of the crop. If food is given before this, sometimes the parents' food becomes a solid mass and will not pass through. If this happens, give a little warm water and break up the lump in the crop by massaging the solid mass. This will help liquify it so it will pass. Newly-hatched babies can be fed high-protein pablum for the first 24 hours. After this, full strength formula is given. The first feeding of each day, one drop of a high potency liquid vitamin is given in the first spoonful of formula.

The formula that we feed is 2 parts raw peanuts, 2 parts hulled sunflower, 3 parts Purina High Protein (25) Monkey Chow, 2 parts Fruit Mynah chow, and 3 parts High Protein Pablum. Each part is 1/8th of a cup by volume. To this is added 1/16 teaspoon Vitamyacin (made by Pitman-Moore), 1/8 teaspoon powdered calcium, and 1/8 teaspoon iodized sea salt.

This is all ground as fine as possible in a commercial blender. If the formula is too wet from the oil in the peanuts and sunflower, add a little more high protein pablum to it. This we store in the deep freeze until it is time to be used. It is stored in one-pound plastic bags.

Hand Feeding Baby Parrots, continued

We take out one bag at a time, and in this way it stays fresher and also keeps the insects out of the formula.

To mix the formula for feeding, it is put into a small container of stainless, glass or plastic. Hot water from the tap is poured into the formula as you mix it. When the formula becomes the consistency of a thick soup, the container is then floated in a larger thermal bowl which is filled with hot water to keep the formula warm while feeding. Leave the formula set in the bowl for about five minutes. In this way, formula becomes saturated with water. If it is too dry after this to slide off of the spoon easily, add a little more water to it.

To feed the formula, it should be just warm enough that when you touch it to your lip, it will not burn you. If the formula gets too cold, the baby will not eat very well or refuse to eat at all. If it is too hot, baby will eat it, and if it was hot enough to burn the inside of its mouth and crop, baby will usually die in a few days. If the formula gets too thick while feeding, you can add water to the formula from the bottom bowl to thin it again.

Some babies will blow their crop up with air. If this happens just keep on feeding till crop is full. To check if crop is full or not, use a small flashlight and you will be able to see how much is air and how much is formula.

When you pick up the baby, put one or both hands under the body so the legs and feet are supported. If the legs are not supported, they usually kick violently and this can throw their legs out of joint.

Before feeding the baby for the first time, weigh it on a gram scale; also, weigh them before the first feeding of every day. This will give you an idea how things are progressing. The gram scale we use is an Ohaus #730, Triple Beam Metric with Animal Subject box.

When feeding, set baby on a bath towel or similar material. This is something that the baby can grab hold of to keep its balance. To feed, put your hand over its back so you can hold or steady its head while spoon feeding. If food should spill on the baby, clean it off before putting back in brooder. If it is left to dry, it is very hard to get off. When the baby starts to get feathers, it is even more important because they do not lose these feathers till the first moult. This is usually when they are five or six months old.

A bib can be made by taking a piece of cloth and cutting an X in it. Cut the X just big enough so it fits under the bill and slides just to the back of the head. Being made in this way, food does not get on the feather from the bill down.

The baby has to be kept warm while being fed. This can be done by wrapping a kleenex or a small cloth over its back and front. It will have to be left open enough in front so you can see just how full the crop is getting. It is always better to not quite fill crop up. If the crop is filled too full and the baby lies on it, it can force the food up and be asperated, and the death of the baby can result.

We have been able to handraise all babies we have tried except those that are $1\frac{1}{2}$ grams or less when hatched. These we usually over-feed. They

continued

Hand Feeding Baby Parrots, continued

are so small that just a couple of drops of formula can be enough for them to asperate and cause death.

Never leave a baby unattended on a table. They are quite fast and it only takes a few seconds for them to get to the edge of the table. If they do fall, they usually end up with broken bones or internal injuries.

The baby will usually show a gain every day. This will go on until they are about half to three quarters feathered out. This is when they start to refuse food and loose weight so they can learn to fly. This is usually the hardest time on the one that is doing the hand-feeding. At this stage, it may not even take the first spoonful offered, or it may take it and shake its head from side to side and spray the formula all over. Some will let you fill them up and then regurgitate all of it. This usually goes on until it can fly. We have never had any that have starved to death, but it is sure hard to see those grams coming off day after day.

The worst ones we had for going on a starvation diet was the Hawk headed parrot. They would go down to skin and bones, but all of them start eating better once they start to fly. They usually put the weight back on once they start to eat on their own.

The parrot mixture that we feed to all the adult parrots from the hyacinthine macaw to the African gray is by volume, 4 parts large gray sunflower, 1 part safflower, 1/2 part parakeet mix, and 1 part pigeon mix or dove without the corn. I also give a few raw peanuts, shelled. African grays get 2 or 3 kernels a day. If your birds start getting too fat, cut out the raw peanuts and add more safflower to the mixture. Try not to overfeed; if you do, they pick out what they like best and this is usually the fattening seeds. We also give one to two high protein monkey chow a day.

For fruit, they are given daily a couple grapes, pieces of apple, carrots, sweet potatoes. For greens they get either spinach, swiss chard, escarole, or kale. Over all this, I sprinkle a little powdered calcium Vitamycin or vitamin-mineral powder, and brewers' yeast.

If you have a single bird, use one or two drops of avitron in the water. If you have more birds, like we do, use 1 teaspoon of Head Start to a gallon of water, ¼ teaspoon sea salt (iodized), and ¼ teaspoon powdered calcium .

When the babies are about three quarters feathered, you can start giving a little of the adult seed mixture. Spread it around on the bottom of their box or cage. It is also at this stage that they start picking up everything with their bill and feet. This is also the time you can put them in a cage. A small box can be put on the bottom of the cage so they can go into it to play and sleep.

For toys, you can give them little sticks, wooden clothespins, and small stones that are too big for them to swallow. They also like cardboard cylinders cut into small pieces. They will also play with small pieces of green branches from apple, crabapple, and hawthorn trees. Whatever you use, be sure that they are not poisonous or have been sprayed with insecticides. Never let the baby play with things that they can get around their neck, that they can choke or hang themselves with.

continued

Hand Feeding Baby Parrots, continued

Some people are using teflon coated cooking utensils around their homes. If these utensils are left on a stove to burn dry, the fumes can kill birds very fast. Some will die a day or two later. We have had several people call us who have lost birds in this way. The safest way is not to use teflon around the house.

Quite a few of the parrot family like mirrors to admire themselves in. The glass ones they can break, so it is best to use stainless steel ones. Some of the larger parrots will use the stainless steel pancake turners.

When they start to feather out is the time that they become attached to the person who feeds and plays with them. This is when you can start giving pieces of fruit and vegetables. When they first start to eat these, be sure you peel grapes and oranges, and only give very small pieces. We learned this the hard way. Our first baby hyacinthine macaw was eating grapes whole, and peeling and eating all of the oranges. By the time we noticed that the food wasn't passing through the crop, it was already in trouble. It was actually starving to death with a full crop because the exit of the crop was covered with a grape or orange peel. We gave it baking soda in warm water. The next morning it had regurgitated whole grapes, orange peels, etc. We gave it a second dose of the medication and it regurgitated the rest of the pieces. From that time on, we are very careful to give small peeled pieces until the birds are completely on their own.

Some new owners find it hard to wean their babies off of the spoon. It is very important not to keep feeding them as much formula with a spoon once they start to crack and eat whole seed and fruit from the bottom of their cage or from the seed cups. If you keep on feeding the baby as much formula from the spoon, some will stop cracking seed and eating the fruit and vegetables. Once this happens, it is very hard to get them on solid food again.

When the baby starts to eat food on its own, cut out the noon feeding. Then, cut out the morning feeding. The last feeding to cut out is the night feeding. Most of the babies like this feeding because it is given just before putting them to sleep for the night. This feeding is sometimes kept up for quite awhile after it is eating by itself; this helps to keep it dependent and helps to make it tamer.

Hand-raising of baby parrots is very interesting to do. It does take a lot of time and work, and really keeps you home a lot more than you would like. But, when it is all over, and you see how happy the new owner is to have a super tame parrot that will probably make them happy for many years to come, it makes it all worthwhile.



??? INFORMATION, PLEASE ???

Has anyone tried using the Early Pregnancy Test Kits with primates? I would appreciate any information on the subject.

Thank you
Terry Weber
Keeper II: Primates
Jackson Zoological Park
Jackson, Mississippi
39209

???

THE STRUGGLE FOR SURVIVAL

STATUS OF SEVEN ENDANGERED MOLLUSC SPECIES TO BE REVIEWED

The status of seven southeastern species of molluscs now listed as endangered will be reviewed by the Interior Department's U.S. Fish and Wildlife Service to determine if they should be reclassified.

The species to be reviewed are the yellow-blossom pearly mussel *Epioblasma* (= *Dysnomia*) *florentina florentina*; the orange-footed pearly mussel *Plethobasis cooperianus*; the pale lilliput pearly mussel *Toxolasma cylindrella*; the turgid blossom pearly mussel *Epioblasma* (= *Dysnomia*) *turgidula*; the birdwing pearly mussel *Conradilla caelata*; the tan ruffle shell mussel *Epioblasma walkeri*; and the Cumberland monkeyface pearly mussel *Quadrula intermedia*. The mussels are found in Alabama, Kentucky, Tennessee, and Virginia.

FISH AND WILDLIFE SERVICE'S WEST VIRGINIA SOLAR ENERGY SYSTEM ONE OF THE LARGEST OF ITS TYPE IN THE WORLD

One of the world's largest space heating and cooling solar energy systems is harnessing the sun's power amid the hills of West Virginia to fuel the new home of the U.S. Fish and Wildlife Service's National Fish Health Research Laboratory.

This new solar unit is part of a larger, highly-sophisticated energy system based on the overall rise and fall of heat within the building. This system extracts and recirculates "waste" heat in a process popularly called "heat scavenging."

The laboratory has achieved worldwide recognition as the major center for the study of fish diseases. Eighteen staff members and specialists in parasitology, virology, bacteriology, immunology, physiology, epidemiology, and histopathology conduct research into the infectious diseases of mid-range and coldwater fishes.

ESSA PROPOSES TO APPROVE LIMITED EXPORT OF ALLIGATORS AND GINSENG

Limited export of wild American ginseng and American alligators would be permitted under proposals published by ESSA.

ESSA also proposed to approve conditionally the export of American alligators *Alligator mississippiensis* legally killed in Louisiana and Florida on or after June 28, 1979, the date on which the species will be officially reclassified from CITES appendix I, to II. In the U.S. export permits may be issued by the Fish and Wildlife Service if it is satisfied that specimens were not taken in violation of federal and state law and if the ESSA advises in its final rulemaking of August 10, 1979, that export will not be detrimental to the survival of the species.

PUBLIC MEETINGS TO BE HELD ON ENVIRONMENTAL IMPACT STATEMENT
FOR ENDANGERED SPECIES PROGRAM

Public meetings will be held in July to elicit opinion on the issues that should be addressed in a proposed environmental impact statement on the U.S. Fish and Wildlife Services's endangered species program. The proposed impact statement will discuss various aspects of the present endangered species program, including environmental, economic, and other effects. Alternatives to the present program will also be considered.



SECOND ANNUAL SYMPOSIUM ON CAPTIVE WILDLIFE

Sponsored by Louisville Chapter - American Association of Zoo Keepers

October 26 - 29, 1979

The Louisville Chapter would like to cordially invite all zoo keepers to attend the Second Annual Symposium on Captive Wildlife. The theme of this year's program is animal behavior.

Among those already scheduled to present papers are Dr. Michael Fox, Director of the Institute for the Study of Animal Problems, Dr. David Wildt of the Institute of Comparative Medicine, Mr. David Hancocks, Director of Woodland Park Zoo, and Dr. Erich Klinghammer, President of the North American Wildlife Park.

We would like to invite anyone who would like to present a paper to submit an abstract to us by August 1. The length of the talk should be approximately 20 minutes.

The Registration fee is \$15.00. The Hyatt Regency Hotel in downtown Louisville is the site of this year's meeting. Anyone wishing more information should contact:

Steven Taylor
Louisville Zoological Garden
1100 Trevilian Way
Louisville, Kentucky 40213
502-459-2181

? ? ? INFORMATION, PLEASE ? ? ?

I request information on the following:

- (1) Nasal problems and diets for all species of guenons *Cercopithecus*.
- (2) Diet and cage structures for all species of spider monkeys *Ateles*. Please include sex ratio, not indoor-outdoor access, if animals are on constant public display, breeding success and any types of cage furniture (e.g. branches, ropes, chains, etc.).

Send replies to:

Brookfield Zoo
Brookfield, Illinois 60513
Attention Carol Schifo, Primate House

? ? ? ?

THE USE OF BACTERIA FOR MOSQUITO CONTROL

by
William A. Ramoska, Assistant Professor
Department of Entomology, Kansas State University

Nuisance and disease carrying mosquitoes are becoming ever more tolerant to the insecticides used for their control. Additionally, most conventional insecticides are toxic to other "non-target" creatures living in the same environment as the mosquito. It is easy to see that alternative methods of mosquito control must be pursued.

Kansas State University and over a dozen other research centers are currently pursuing the use of insect pathogenic bacteria as a means of controlling disease transmitting and pest mosquitoes. Two of the most promising of these microbial agents are *Bacillus sphaericus* and *B. thuringiensis* var. *israelensis*. *B. sphaericus* was discovered in 1973 and has received much scientific scrutiny in the past six years. It is harmless to man and other animals including all insects except mosquitoes. Field test in Ft. Myers, Florida and the central American country of Nicaragua have demonstrated that *B. sphaericus* is capable of controlling nuisance and malaria carrying mosquitoes at the concentration of one part bacterial preparation to 100,000 parts water. At this rate, no mosquito larvae remain alive in the test sites 12 hours after inoculation.

Although *B. thuringiensis* was a later arrival to the bio-control scene (1975), it looks even better than *B. sphaericus* does. In laboratory assays, *B. thuringiensis* has been shown to produce a high degree of mortality upon the host population as early as two hours after inoculation. This is at a rate of one part *B.t.* per million parts water. Field testing of this pathogen will be initiated this coming summer. The reason these agents can work so effectively in such small quantities is that it is the nature of mosquitoes to consume microbes. In a manner of speaking, they are passively seeking the very entity that is lethal to them.

Both bacterial pathogens are currently being studied by commercial concerns in hopes of eventually mass-producing and marketing these pesticides. This process should take from two to three years. The products will then be available for professional use in mosquito control.

FAMILY THERAPY FOR CHIMPS

A breeding facility is being built and operated by the University of Texas for the National Institutes of Health because of the limited supply of chimpanzees available from abroad. But most of the chimps that will be first sent there have not been raised with other chimps so need to be taught by other chimps that have lived in a more natural environment in the Stanford Outdoor Primate Facility. Michale Keeling is the veterinarian in charge and the report is printed in the May 1979 issue of Psychology Today.

PESTICIDE WARNING PUBLISHED

The May 1979 issue of Psychology Today carries a report of a recent study titled "Pesticides Go to the Brain." The report was on sarin, which is similar pharmacologically to the common pesticides malathion and parathion. It increased both beta (high-frequency) brain activity and REM sleep activity.

PRESS INVITED TO BEAR SURGERY

Baltimore Zoo

Veterinarians
and
Keepers.....

Members of the press were invited to the Baltimore zoo to record an actual Zoo surgical procedure on a 1,000+ lb. female Kodiak Bear. The procedure involved the insertion of a pencil sized implant in the thigh. The surgery was performed by Dr. Michael Stoskopf, Zoo Staff Veterinarian. The purpose of the plastic time-release implant is to inhibit ovulation of the Female Bear, thus making it impossible to conceive. Its life is two years at which time it can be replaced during routine medical procedures.

Birth control is becoming a way of life in the world's zoos. Surplus animals are one of the Zoo's greatest concerns. Zoo breeding successes have made the importation of wildlife for stocking zoos basically unnecessary. Less than 1% of the animals imported into this country are imported for zoos. Animal produced by captive breeding can only find homes in other zoos as their return to the wild is not practical at this time.

Veterinarians
and
Keepers.....

PROTEIN DEFICIENCY POSSIBLE CAUSE
OF GIRAFFE DEATH

The Baltimore Zoo is sad to announce the sudden death of two female Angolan Giraffe within a twenty-four hour period on June 7 and 8, 1979. The probable cause of death has initially been determined as preacute mortality.

Dr. Frank Loew, Pathologist for The Johns Hopkins Division of Comparative Medicine, who oversaw the autopsy, describes preacute mortality as "Sudden death, with no apparent signs". Dr. Loew further states that autopsy samples suggest a possible protein deficiency.

Dr Loew's findings are further supported by a recent study of Dr. Murray E. Fowler, presented to the American Association of Zoo Veterinarians. In his study, *Preacute Mortality in Captive Giraffe*, Dr. Fowler draws the following conclusion, "The prime suspects as predisposing factors (in preacute mortality) are a protein and/ or other nutrient deficient diet combined with general stressors." Dr. Fowler's findings are based on indepth studies of Giraffe from 60 Zoos through out the United States and Canada.

In Africa, the protein intake of wild giraffe varies dramatically from season to season. Whole herds have been known to die swiftly and suddenly from preacute mortality or "Giraffe Syndrome" as it is locally known.

At present, Dr. Michael Stoskopf, chief veterinarian of the Baltimore Zoo with the assistance of Dr. Loew, is modifying and carefully observing the daily protein intake of the Zoo's giraffe herd. Our one male and four females are adapting well to their revised diets and appear to be in good health.

At the time of their death, the giraffe were 15 years old; both animals were pregnant.



THE KEEPER EDUCATION COURSE
AT THE BALTIMORE ZOO

By
Denise O. Bartenfelder
Baltimore Zoo

The theme of this year's conference "Our Education for Their Survival" reflects that zoo keepers are entrusted with a large responsibility. We are the caretakers of the many species that are, or soon will be extinct in the wild in a few years. How can we cope with the responsibility of managing an animal that, without us, might disappear from the face of the earth? The answer - - education.

Too often in-house keeper training has been hit and miss, passed on from old keepers to new, or even non-existent. At the Baltimore Zoo, keepers decided that their education was vital to the management of the animals in their care. The keepers suggested the course and their interests created the course. In a preliminary meeting with the Education Department the keepers delineated what topics they were interested in covering. With the combined help of the Education, Medical, and Administrative Departments the varied subjects were molded into a course of instruction starting September, 1977.

There were many problems to overcome. Previous years had seen several false starts in keeper education courses at the zoo, from tall tales of dangerous animal captures in the wild to a fifteen minute one-shot lesson in safety. After much debate, a time slot was finally resolved. Being municipally funded, the administration paved the way for the City of Baltimore to allot twenty minutes of work time and the keepers to give twenty minutes of their lunch time on Tuesdays and Thursdays. Keeper education was diverse, ranging from old-timers who had been at the zoo up to thirty years to the newly -hired college graduate. Would the course insult the senior staff by the implication that if they attended, they didn't know all about the animals in their care? Attrition was also a problem - how do you hold the interest of a hard-core reptile keeper when the subject is hoof and horn problems. These are just a few of the problems that were realized before and during the course.

Organization of the course was a multi-departmental effort. The major proponents and facilitators were the Zoo Veterinarian and the Director of Education, who did most of the work as well. They arranged the lecture presentations and their sequence, the lecturers and speakers, reference materials, lecture notes, media, etc. which entailed a great expenditure of time and effort for keeper benefit.

Speakers and guest lecturers included veterinarians from the Department of Comparative Medicine of the Johns Hopkins University, Baltimore Zoo administrators, curators and principal keepers, most of the lectures being shared by the Medical and Education Departments of the Zoo. Lectures included the topics of anatomy, physiology, taxonomy, zoogeography, public health, capture and restraint, parasitology, management, breeding, obstetrics and nutrition to name a few.

Keepers were given notebooks and typed lecture notes and diagrams. A variety of media were used to accent lectures. Slides of restraint techniques and procedures highlighted several lectures in a clear, precise manner. Overhead projections used in conjunction with take home handouts allowed for better class discussion and participation. A

Keeper Education Course, continued

variety of preserved specimens were used in the lectures on anatomy, physiology and parasitology. Field observations enabled keepers to observe sexual dimorphism and adaptive mechanisms in birds. Demonstrations also allowed keepers "hand on" experience, showing them the proper way to lift a rock python or handle a soft shelled turtle.

Finally, informal open book, take home tests were given. Keepers were generally in favor of the tests as a method of finding out just how much they had learned. Means, medians, high and low grades were given to the class, however, no records of the test results were kept.

Results and after affects of the keeper education course are visible. The keepers taking the course agreed that the knowledge and education that they received increased their professionalism and pride in their work. Serving as an educational stimulus, several keepers went on to research areas of interest to them.

A big bonus was in the area of communication. The course had a side benefit of fostering an interdepartmental sensitivity enabling keepers to see and understand the animals, hazards and duties in areas other than their own.

The keepers at the Baltimore Zoo felt that one of the primary objectives of the keeper course was to help them to understand illness and the prevention of disease spreading in animals. In this respect, awareness, observations and terminology learned in the keeper course are of importance to the Baltimore Zoo Veterinarian in treating the animals.

The keeper is better able to convey the ideas behind zoos, animal management, and zoo keeping as a profession to the public. Drawing from what he or she learned from the course, the keeper is better qualified to answer the technical questions posed by the public.

The keeper course was held weekly from September, 1977, through May, 1978. At the end of the course many keepers were curious in specific areas that interested them. Again, the keepers created the "Advanced Keeper Seminar" to begin the fall of 1978, with research and lectures to be given by the keepers themselves. Some of the topics included are: "Nutrition," "The hoof and its Problems," "Captive Diet of the Sloth Bear," and "Captive Management of the Marmot".

The professional attitude fostered by the keeper education course provided the impetus for keeper inclusion in exhibit planning. Species profiles were completed by keepers to aid architects in exhibit design.

Recommendations for beginning a keeper education course would be to garner the enthusiasm of the keepers and have them suggest what they are interested in learning. Enlist the help of the administration and all the department heads in the zoo to assist in organizing the course and to undertake the proposed lecture topics. For example, the zoo veterinarian would be a good person to ask to teach anatomy and physiology; the curator might agree to teach manual restraint techniques; and zoo administration may be willing to lecture on the principles of zoo management; while the graphics department could produce slides and illustrations for lectures.

The importance of written lecture notes and open book, take home tests cannot be stressed enough. Diagrams and slides help hold interest as

Keeper Education Course, continued

well as stress an important point. Be sure to include organized field observations and "hands on" demonstrations as experience is still the best teacher.

Keeper education is a no-loss proposition--everybody wins. The zoo management wins with a more professional staff member. The zoo-going public wins with informed zoo staff answering their questions. The zoo animal wins with a more knowledgeable keeper to meet his problems and needs. Finally, the keeper is the biggest winner with a better self image along with pride and confidence in his work.

This paper was presented at the 4th National Conference of AAZK.



"Bali and Caspian Tigers Disappear"--The Bali tiger is now considered extinct; and no positive signs of any surviving Caspian tigers have been found in Iran and eastern Turkey, although some individuals might still exist in the mountains of northern Iraq.

from the President

OPEN LETTER TO ZOO DIRECTORS AND ZOO SUPPORTING SOCIETIES:

There are a number of conferences throughout the year which would be beneficial for professionally-minded animal keepers to attend including the AAZK National Convention, AAZPA National Convention, and the AAZPA regional Workshops. I encourage you to offer your support to such keepers who wish to attend any zoo or animal related conferences by allowing sufficient time off and offering possible financial support to help cover registration fees, traveling expenses, or miscellaneous costs incurred. Those keepers who hold an administrative position in AAZK or other professional zoorelated associations or those who wish to present a paper should especially be considered for such assistance.

Animal keepers attending these important conferences not only are exposed to pertinent information relevant to their job and other zoo professionals at various levels of management, but also have much to offer to the delegates with respect to their knowledge and experience in direct animal management.

I urge you to consider such assistance for your animal keepers when feasibly possible. They'll appreciate your added concern and support.

Thank you.

Sincerely,

Dennis Grimm
President, AAZK
Brookfield Zoo
Brookfield, Illinois 60513

This letter by the AAZK President was printed in the AAZPA Newsletter.

Great Ape *Lordemonium*

'OLD MAN OF THE WOODS' DIES AT METRO TORONTO ZOO

by

Russ Atkinson, Keeper

Metro Toronto Zoo, West Hill, Ontario, Canada

"Mias", the zoo's only adult male Sumatran orang-utan *Pongo pygmaeus* died recently at approximately 25 years of age. At the time of death, he was under sedation for examination of a serious ear infection. A preliminary post-mortem revealed that his nasal cavities, throat sac and lungs were also seriously infected. There were no noticeable external symptoms of these complication.

His weight at this time was 350 lbs. His hand measured from the wrist to the tip of the finger was 11 3/4" long, and 9 3/4" wide from the base of the index to the base of the baby finger. The forearm measured midway between wrist and elbow was 23" in diameter.

During his five years at Metro Zoo, "Mias" fathered two offspring - a female now 4 years old and a male just 20 months. Along with these two individuals, he shared the orang-utan exhibit with three other females, aged 19, 12 and 7 years. Exceptionally well-mannered and tolerant, "Mias" very rarely used physical force to exert his dominance over the group.

Due partly to his large size and patient attitude, he became an extremely popular animal with zoo visitors. Thousands of people enjoyed watching the antics of the younger orang-utans as they seemingly harassed "the big guy" to distraction by searching his hairy bulk for small pieces of food. They would sometimes jump up and down on his head or swing on his long hair, and on occasion, grab his cheek flanges and shake them vigorously. "Mias" never reacted violently to this treatment and at times actually seemed to enjoy it. He will be missed by not only his keepers and the public, but also by "Chantek" (4 years) and "Agnes" (7)

After an autopsy is performed at O.V.C., University of Guelph, Ontario, his body will be preserved and placed on display at the Royal Ontario Museum, Toronto.

*A note left by Marta Hammond, Dickerson Park Zoo,
as a reminder to her fill-in.*

Lions and Tigers have
nothing to gain.
Just lay in the sun
each day is the same.

Content they will be
if each day at four
Their tummies are filled
with horsemeat and gore.

If kitchen help forgets
to thaw out their meat
Then at four
They will roar
And eat Keeper for treat!

ELEPHANT CONTROL

by
Ed. Roberts, Sr. Zoo Keeper
W.D. Stone Zoo, Mass.

My topic today is "Elephant Control", and you have probably all heard the expression, "how do you stop a wild charging elephant?" " You take away its credit card." Right?

Well, elephant jokes are almost as endless as the ideas different elephant men have on how to control their animals. But there is one unalterable fact, and all of them will agree on this--that discipline in the form of punishment is the force necessary to gain an elephant's respect.

So how do you discipline an elephant? There are a number of ways a good elephant handler can accomplish this. In the first place, you must enjoy working with the largest of all land animals. Since elephants are known to be very intelligent, it could be said that they make up their own minds on whether they will let you handle them! Elephants form their own likes and dislikes of certain people and others they will tolerate, very much like humans. I have seen zoo people stepped on, batted by a swinging trunk, and have seen an elephant handler get sandwiched between two elephants. If I hadn't yelled a warning to drop to the floor, that handler would have ended up seriously injured, if not killed! Ordinary persons seeing things like this, would think that the elephant was getting even for something that she was punished for. The fact of the matter was--the elephant did not respect the handler, did not fear him, and therefore tried to take advantage of the situation and, let me tell you now, an elephant will test you time and again, just to see if you've got the moxie to stand up to them.

So, to get down to basics, you gain an elephant's respect through fear of punishment. Never punish an elephant for no reason at all, only when it has done something it shouldn't have. Elephants are exceptionally inquisitive, and if they have access to wheel barrows, water hoses, rakes, shovels, buckets, water pipes, almost anything that their trunks can reach, they will, in their playful moods, proceed to become a demolition unit. If you happen to catch the brute doing something it shouldn't, discipline it immediately and not ten minutes later, for it will never understand what it is being punished for.

Now, you ask, what exactly do you do to discipline an elephant when it has done something it shouldn't have. All elephant men usually carry an elephant hook. A good elephant man never hits an elephant with the steel end part of the hook. You rap the animal smartly along the rib cage or the upper hind quarter with the wooden curved part of the hook which is shaped like a cane and shout "no!" a couple of times. Don't worry, the elephant will get the meaning very quickly, for as large as the animal is, they do not like punishment. The keeper who knows when to mete out punishment when necessary and praises his elephant with kind words and a lump or two of sugar or carrots when the elephant is good, will gain the respect and love of the animal, and, in turn, will love the animal also.

Once the keeper has gained this respect, he or she can start working the elephant from chain commands to doing some basic tricks like putting a foot on a wooden block if you wish to trim some toe-nails or work on the pads. To get an elephant to lay down may pose a problem, but I

Elephant Control, *continued*

have found that by exerting pressure down with the hook on the elephant's top neck, it will get the idea you want it to lie down. The command, along with the hook, would be 'down' followed by the elephant's name. To keep the elephant down, exert light pressure with the blunt end of the hook on its neck repeating the word 'steady' if it starts to rise up.

To move an elephant out of a building, freeze it in one spot with the command 'steady' repeated at intervals as you unchain. I often use the words 'easy, girl' and 'steady now' to freeze an elephant. Always walk on the left of your elephant; if she moves ahead, hook her above the left knee and pull back. Never hook an elephant on the trunk. If you want her to raise her trunk, pat the underside and give her the command 'trunk up' followed by her name.

To back an elephant up from a standing position, use the flat of your left hand, with you hook in your right hand (opposite for lefties) against her trunk, push forward with the command 'back' followed by her name. Chaining up for the night, you may have to hook her on her rear flank to get the leg you want to chain, and once she is in position, give again the command 'steady' while you proceed to put the chain around her leg.

Practice calling from a distance with the command 'come here'. She should come at a run and stop dead in front of you, if you've trained her right. Always praise your animal when she's good. Once she has accepted you as her handler and trainer, then you can trust her with your life.

Elephants manifest their pleasure in different ways. All of them rumble deep in their throats when contented, flap their ears rapidly when you come close, and some roar out a greeting and trumpet noisily when called by name. Our elephant "Babe" used to get so excited each morning she'd wet herself much like a puppy.

Remember, if you have the slightest fear or working with elephants, it would be to your advantage to stay away from them. If you decide to work with them, then punish only when necessary. If you let her get away with something she shouldn't have, then you have lost your control over your elephant.

The elephant must fear punishment and discomfort, and I repeat this, for if you don't chastise when necessary, then some day, she will get you. The reason would be that she did not respect you. More handlers have been maimed or killed by elephants than any other animal in the zoo (or in circuses without the attendant publicity) and the reason was, the elephant had no fear--fear of punishment--from her handler and trainer.

This is how you gain an elephant's respect and love, and you, in turn, can find that you, too, can love and respect such a huge beast.

This paper was presented at the AAZK National Conference, Gainesville, Florida.



We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

Oklahoma City Zoo has the following positions available:

SENIOR KEEPER/ASSISTANT TRAINER, PACHYDERMS... to supervise routine operations and keeper personnel in Pachyderm Building that includes Asiatic and African elephants (males and females of both species), rhinoceros and hippopotamus, and to assist heat trainer with elephant program that includes public demonstrations. Elephant experience mandatory. Salary: \$11,794 - \$12,626. Excellent fringe benefits.

PACHYDERM KEEPER... to participate in husbandry program of Asiatic and African elephants, rhinoceros and hippopotamus and to assist trainers with an elephant program that includes public demonstrations. Elephant experience required. Salary: \$10,046 - \$10,608. Excellent fringe benefits.

UNGULATE KEEPER... to participate in husbandry program with large collection of hoofed animals and some birds. Previous zoo or other large animal experience preferred. Salary: \$10,046 - \$10,608. Excellent fringe benefits.

For the above three positions, submit resumes to Tom Foose, Curator of Pachyderms and Ungulates. Oklahoma City Zoo, 2101 N.E. 59th, Oklahoma City, OK 73111.

SENIOR CURATOR/MAMMALS... must be a Primatology specialist. Applicant must have Ph.D. or equivalent in life sciences or related subject matter, plus extensive experience in management of captive primate collections and their exhibition. Experience in the conduct of behavioral research within a zoological park setting is mandatory. Salary range: \$27,453-\$32,442 per annum. Position available at the National Zoological Park. Applications should be sent to the Office of Personnel Administration, Attn: Ms. Janice Brambilla, 900 Jefferson Drive, S.W., Smithsonian Institution, Washington, DC 20560. AN EQUAL OPPORTUNITY EMPLOYER.

ANIMAL COLLECTION SECRETARY... requires experience in the care and maintains collection accounts and inventories, makes transportation arrangements for animal shipments. Demonstrated ability in a responsible position requiring a high degree of accuracy. Basic secretarial and clerical skills required, stenographic skill preferred. Familiarity with things zoological, experience with medical record keeping or laboratory management helpful. Contact Jean Coontz, Personnel Manager, Brookfield Zoo, Brookfield, IL 60513. (312) 485-0263, ext. 24.

ANIMAL SUPERVISOR... requires experience in the care and maintenance of a diversified animal collection and some supervisory experience. This is a working supervisor and applicant is expected to perform some animal maintenance work as well as supervise personnel within the areas of animal care and record keeping. Starting salary \$11,194 plus benefits. Contact George Speidel, Jr., Director, Salisbury Zoo, 750 S. Park Drive, Salisbury, MD 21801. (301) 742-2123.

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ANIMAL KEEPER ... to work with apes and Old and New World monkeys; extensive involvement with a marmoset colony. Responsibilities include daily maintenance of animals, building upkeep, behavioral research and participation in public education programs. Excellent salary, benefits and working conditions. Good opportunity for advancement and to work in a pioneering primate facility. Position available August 1979. Submit resume and letter detailing relevant experience to Jean Coontz, Personnel Manager, Brookfield Zoo, Brookfield, IL 60513.

* * * * COMING EVENTS * * * *

July 29-Aug.4 1979. 59th Annual Meeting of the American Society of Ichthyologists and Herpetologists to be held at the University of Maine at Orono. For further information, contact the University: or for pre-registration, mail to Conferences and Institutes Division, 128 College Ave. University of Maine at Orono, Orono, ME 04469.

August 10-11, 1979 Third Annual Symposium on Reptile Husbandry and Propagation to be held in Knoxville, Tennessee. For further information, contact: Howard Lawler, Dept. of Herpetology, Knoxville Zoological Park, P.O. Box 6040, Knoxville, TN 37914

August 22-26, 1979 5th Annual Convention of the American Federation of Aviiculture, hosted by the Gold Coast Exotic Bird Club at the Diplomat Hotel, Hollywood, Florida.

AMERICAN ASSOCIATION OF ZOO KEEPERS NATIONAL CONFERENCE
September 24-27, 1979 Portland, Oregon

AAZPA National Conference
September 30-October 4, 1979 St. Louis, Missouri

Annual Convention of the American Association of Zoo Veterinarians,
October 7-11, 1979 Stouffer's Denver Inn, Denver, Co
Contact: M.S. Silberman, D.V.M., Executive Secretary
Emory University, P.O. Box 23800
Atlanta, Ga 30322 (404) 329-7423

Second Annual Symposium on Captive Wildlife
October 26-29 Louisville Chapter AAZK
Contact: Steven Taylor
Louisville Zoological Garden
1100 Trevilian Way
Louisville, Kentucky

Regional Conference for Zoo Support Organizations
October 27-29, 1979 Louisville, Kentucky

World Conference on Breeding Endangered Species in Captivity
November 12-16, 1979 San Diego, California

World Conference on Sea Turtle Conservation
November 26-30, 1979 Washington, D.C.

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10". Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.



MEMBERSHIP INFORMATION

Affiliate (full-time keepers)	\$.10.00 annually
Associate (part-time keepers, students, docents)	\$.10.00 annually
Foreign	\$.15.00 annually
Contributing	\$.50.00 annually

All memberships include subscriptions to *Animal Keepers' Forum*. 50% of the member's dues are budgeted for the publication.

All new members receive an AAZK shoulder patch and a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

The AAZK Headquarters has extra shoulder patches available for \$1.25 and back issues of the *Animal Keepers' Forum* for \$1.00.

Send name and address and a check or money order, payable to American Association of Zoo Keepers to

AAZK HEADQUARTERS
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

ALL CHANGES OF ADDRESS SHOULD BE SENT TO AAZK HEADQUARTERS AT THE NATIONAL ZOO. DO NOT SEND THEM TO *Animal Keepers' Forum*. The journal is not available by subscription only.

**American Association
of Zoo Keepers
National Zoological Park
Washington, D.C. 20008**

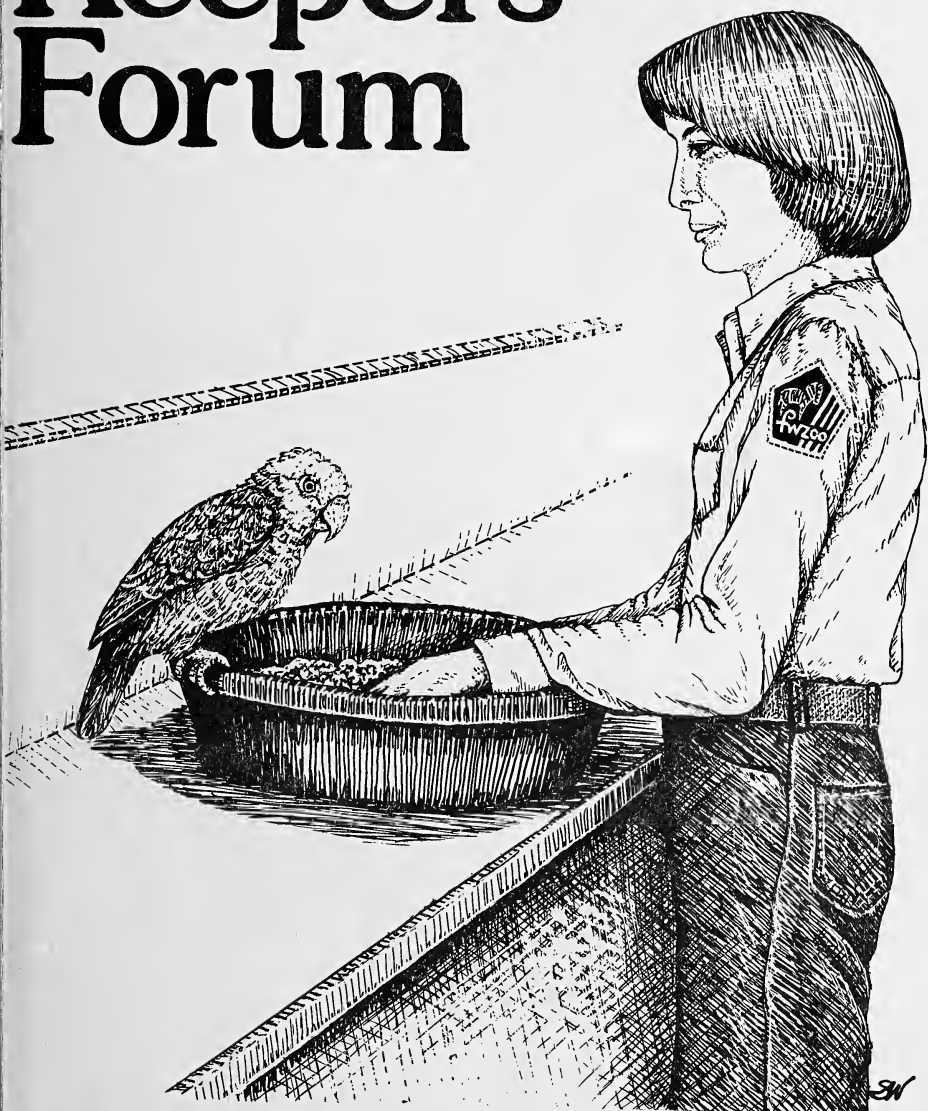
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Animal Keepers' Forum



Dedicated to Professional Animal Care

AUGUST 1979

Editor-in-Chief: Ron Kaufman, Topeka Zoological Park
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The cover artist for August is Sheri Williamson of the Fort Worth Zoo in Texas. She writes that her illustration is done "in the scratchboard technique and depicts a forty-year old Amazon parrot advising her favorite keeper in the preparation of Flamingo diet. 'Polly' lives in our bird house kitchen area and 'helps' us in many matters." Thanks, Sheri, for giving AKF 'Polly' as the cover girl this month!

SCOOPS and SCUTTLEBUTT

SAN DIEGO WILD ANIMAL PARK DISPLAYS ENDANGERED HANUMAN LANGURS

Sagar Tal, a home for a colony of endangered Hanuman langurs, has been constructed and opened at the San Diego Wild Animal Park.

Fourteen langurs -- leaf-eating monkeys from India and Sri Lanka who are noted for their silver-gray fur and black hands and faces and their gregarious nature--are part of a group that has been studied for social patterns since 1972. Six are adults and of the remaining eight juveniles, three have been born with the past year at the zoo.

The birth of a Hanuman langur is truly a group experience. Within minutes of birth, a baby Hanuman langur is held and fondled by all the females in the colony. The baby is passed from one to another, in contrast to many primate species in which the mother is extremely possessive of her newborn infant. This unique "infant transfer" behavior helps teach juvenile females to be good mothers and assures that one of the colony's females will adopt the baby should the mother die. It also serves to bind the groups socially, as even male Hanuman langurs join in the cuddling to a lesser degree.

Because of their venerated position in the Hindu religion, Hanuman langurs are seldom hunted and are not directly threatened by man.

ELEPHANT TRAINER'S DEATH INVESTIGATED

Morgan Berry, the first person to breed elephants in the U.S., was found dead in the pen of his bull elephant, Tonga. It is not known whether Berry died of his poor heart condition or was killed by the elephant. It took several hours for the authorities to retrieve Berry from Tonga who was guarding and tossing the body. Mr. Berry was an animal trainer and dealer for 38 years and has served as a keeper at the Seattle Zoo.

BONUS FOR ELEPHANT KEEPERS

Elephant Keepers at the Philadelphia Zoo will receive \$1,000 annual bonus for their demanding, dangerous work. The provision was included in a two year contract and is believed to be the first of its kind in any zoo.

THREE RARE HOOD ISLAND TORTOISES HATCHED

When three rare Hood Island tortoises hatched recently some 3,000 miles from San Diego in the Galapagos Island, San Diego Zoo curator of reptiles Dr. James Bacon started talking like an excited godfather.

"This birth is a banner event!" Bacon announced, " It is just short of fantastic!"

Cause for the jubilation was a particular closeness the curator feels for the tortoise father, known simply as Number 21, one of only three Hood Island tortoise males known living in the entire world and a San Diego Zoo resident for more than 40 years before his return to the Galapagos Islands in 1977.

The notice that Number 21 was a father of three land turtles means scientists at the Charles Darwin Research Center on the cluster of islands 600 miles off Ecuador have won another round in the fight to save the extremely endangered Hood Island (Espanola) tortoise, with the aide of the San Diego Zoo.

A NEW IDEA

The Japanese government, sandwiched hard between animal lovers and fishermen, hopes to solve its problems with a \$15,00 plastic replica of a killer whale. The whale has been designed to frighten dolphins which flock around a fisherman's net once it is loaded with fish. The killer whale is a natural enemy of dolphins and it is hoped the fake whale will reduce the slaughter of dolphins during fishing runs.

THIEVES STEAL ANIMAL BABIES FROM NURSERY..... Sally Smith

On July 20, 1979, thieves broke into the nursery at Roeding Park Zoo in Fresno, California, during the early morning hours and stole two young babies, a 5 week old ailing male Reeve's Muntjac and a 9 week old female Japanese Raccoon Dog. The Muntjac, a tiny Asian deer, has been frail since birth and at the time of the theft was on cortisone injections for an eye infection. It would take formula from no one but the nursery attendants. The Raccoon dog was one of the first two to be born and survive at our zoo, and may fare better in the kidnapping due to the fact it was eating solid food and has a hardier constitution. We feel that the thieves will not know how to care properly for these animals and they will probably die from stress or starvation.

This is the first theft in the 15 year history of Roeding Park Zoo's nursery, which was scheduled soon for installation of Sonitrol. Thieves used bolt cutter to enter and break into the cages. Nothing else in the building was touched, lending speculation that the thieves wanted an unusual pet.

UNDERCOVER INVESTIGATION LEADS TO SEIZURE OF RARE BIRDS FROM TAXIDERMISTS

The carcasses, skins, and mounted specimens of hundreds of protected birds--including peregrine falcons, eagles, hawks, owls, waterfowl, song birds and a number of exotic species--have been seized after a ten month undercover investigation by the Interior Dept. U.S. Fish and Wildlife Service. Some are thought to be stolen from the University of Michigan's Ornithology Department.

PORTLAND, OREGON

SEPTEMBER 24-27, 1979

Board meeting, open to all AAZK members, will be held Sunday, Sunday evening, and Monday; so everyone planning to attend needs to add an extra day onto their stay in Portland.

Registration for AAZK members is \$40, non-members-\$45. Late registration, after September 1, is an additional \$5.

Slim Lewis, author of I LOVED ROGUES, (Superior, 1978), is coming and will speak Wednesday afternoon, September 26.

Anyone desiring information on paper sessions (deadline for abstract was August 1), workshops (see tentative schedule in June *FORUM*), or post-conference tour of Woodland Park Zoo in Seattle, Washington (see July *FORUM*), contact:

Jonolyn E. Smith
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, Oregon 97221



ELECTION NEWS

The election for three seats on the Board of Directors, originally scheduled for August has been postponed until October. Mix-ups in the paperwork needed for recommendations of nominees (The Nomination Form), and for qualification of the nominations by the Nominations and Election Committee, have resulted in the acquisition of only three nominees--hardly sufficient for an electoral "race"! It has therefore been decided to adjust the election proceedings timetable as outlined in the Constitution to allow sufficient time to finish "processing" some of the recommendations received. Announcement of the new Board members, following the October election, will appear in the January 1980 issue of the *Animal Keepers' Forum*.

Jill Grade
Nominations and Elections Chairwoman

REGIONAL COORDINATORS are still needed for three posts: New York; and Washington, Oregon, Idaho, Montana, Wyoming; and the region of California, Nevada, Arizona, Utah, and Hawaii. Please contact Jill Grade, head of the network, for any information.

Jill Grade
3000 Busch Blvd Attn: Zoo Office
Tampa, FL 33612

BLANKET PERMIT TO EASE INTERNATIONAL
EXCHANGE OF COLLECTORS' SPECIMENS

In response to requests by museums and others in the scientific community, the U.S. Fish and Wildlife Service has developed a "blanket" permit to facilitate the international scientific shipment, by U.S. scientists and institutions, of the preserved specimens of Endangered and Threatened species in their collections. This permit is available to all recognized educational or scientific institutions in the country. The primary difference between this type of permit and those issued in the past is the waiver of separate permits and separate notices in the *Federal Register* for each shipment.

The blanket permit does not authorize new acquisitions, collections from the wild, or loans from foreign institutions. A separate permit is still required for these activities. Only animal specimens can be covered under this blanket permit. (Plants are covered under a separate blanket permit issued in accordance with 50 CFR 17.62 and 17.72.) Shipments must be made through the designated ports of New York, Miami, Chicago, San Francisco, Los Angeles, New Orleans, Seattle, or Honolulu.

Authority under this blanket permit does not preclude the institution from complying with other regulations, such as those issued under the Migratory Bird Treaty Act or the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Blanket permits under these laws have already been developed and can be used in conjunction with the Endangered species blanket permit to cover shipments of specimens protected by more than one law.

Applications and inquiries should be directed by mail to the Federal Wildlife Permit Office, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, or by calling that office at 703 235-1903.

ANIMALS AND THEIR LEGAL RIGHTS

The Animal Welfare Institute has just published the newly revised third edition of *Animals and Their Legal Rights*. This unique paperback book contains accurate information on existing laws for the protection of animals.

AWI is raising charitable funds in order to make one free copy available upon request to public libraries, police chiefs and humane societies around the country. To date, over 2,700 libraries in 49 states and 2,900 police chiefs in 48 states have requested the book, and the demand continues.

In providing the book to libraries, we hope to disseminate the vital and relevant facts concerning animal welfare to the general public. At the same time, *Animals and Their Legal Rights* will assist police chiefs in the enforcement of local and federal laws for the protection of animals against cruelty, abuse and neglect.

Animals and Their Legal Rights has nineteen chapters with an extensive appendix, together totaling 279 pages. It is available to individuals at cost price: \$2.00 per copy, from the Animal Welfare Institute, P.O. Box 3650, Washington, D.C. 20007

FUNDING PROSPECTS IMPROVED FOR
STATE WILDLIFE CONSERVATION PROJECTS

Millions of dollars in Federal funds for wildlife conservation tied up for months in a lawsuit over environmental impact statements, may begin to flow again under a recent court order, Interior Secretary Cecil D. Andrus said.

Andrus said the Fish and Wildlife Service was pleased with the court's ruling, which he said would remove "some of the uncertainty in all 50 States and Puerto Rico on their fiscal situation and their ability to plan conservation projects." He said the Fish and Wildlife Service could renew State projects 20 days after submitting environmental assessments or impact statements to the plaintiffs.

In dismissing the suit brought by animal welfare groups against the Service, Federal District Court Judge Charles R. Richey ruled that requiring 182 impact statements on past conservation projects would be of "merely historical interest." He also found that cutting off reimbursement to the States for work already performed would be "punitive and not in conformity with the public interest or the purposes of the Federal environmental laws."

The Fish and Wildlife Service has already submitted environmental assessments on 15 projects that expired during the winter and will submit 62 more.

BOBCAT, SEA OTTER, AND TRUMPETER SWAN TO RETAIN
STATUS UNDER ENDANGERED SPECIES TREATY

The U.S. Fish and Wildlife Service has reconsidered its original proposal and will now recommend that the bobcat remain on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The proposal had generated controversy, but little additional data was received.

Evidence did not clearly show whether the southern sea otter should be classified in Appendix I (threatened with extinction) or Appendix II (potentially threatened with extinction). It was decided to leave it on Appendix I. The trumpeter swan was omitted by clerical error from the Appendix II, but is included.

The Convention met in Costa Rica on March 19-30, 1979 to consider these and other proposals. All proposals must be approved by the party countries in the Treaty.

ALLIGATORS RECLASSIFIED, MAY NOW BE HUNTED

American alligators in nine parishes of Louisiana have been reclassified from "threatened" status to a less restrictive "threatened (similarity of appearance)" category. This will permit a controlled harvest of alligators in the nine parishes.

LAND AND NATURAL RESOURCES DIVISION ESTABLISHED

Attorney General Griffin B. Bell announced a major new effort by the Department of Justice to stop illegal trade in wildlife and plants.

The program will consolidate all the Department's civil and criminal jurisdiction over wildlife laws in the Land and Natural Resources Division, headed by Assistant Attorney General James W. Moorman. This increased centralization will enable the Department to use its resources more efficiently and to concentrate its efforts against the growing illegal trade.

"Working closely with the Fish and Wildlife Service, the Customs service, and the Departments of Agriculture and Commerce, the Justice Department will vigorously enforce all criminal and civil laws regulating trade in wildlife and plants," Mr. Moorman said.

MIGRATORY GAME BIRD HUNTING REGULATIONS FOR NEXT FALL PROPOSED

Preliminary hunting regulations for ducks, geese, and other migratory game birds for the 1979-80 hunting season have been proposed by the Interior Department's U.S. Fish and Wildlife.

Species discussed in the proposals include ducks, geese, brant, and swans; doves and pigeons; cranes; rails, coots, and gallinules; and woodcock and snipe. No major changes from last year's hunting regulations are proposed at this time.

To make it easier for disabled sportsmen to hunt, the Service has proposed to allow paraplegics and single and double amputees of the legs to hunt from stationary motor vehicles or other motor-driven land conveyances, the use of which are prohibited at present.

LIBERIA TURNS TO CONSERVATION

The May, 1979, issue of the IUCN Bulletin outlines the turn about of the country of Liberia to a policy of conservation. Dr. William R. Tolbert, President of the Republic of Liberia, is committed to the conservation of wildlife and has instructed the Forestry Development Authority to act on proposals which came from a recent assessment of the situation.

ENDANGERED PEREGRINE'S FLIGHT HONORS RACHEL CARSON

"Rachel," a young female peregrine falcon raised on the roof of the Interior Department building, flew for the first time, a symbolic testimony to the work of biologist Rachel Carson, in whose honor the endangered bird of prey was named.

"Rachel" is one of four fledgling peregrines placed in an attempt to restore this species to the Nation's Capital.

"Rachel Carson documented the disastrous consequences of DDT and other pesticides on the Nation's wildlife -- effects which in large part caused the peregrine to become extinct as a breeding bird in the East," said Interior Secretary Cecil D. Andrus.

Great Ape Demonium



SHE DID IT, SHE FINALLY DID IT!

by
Fredrick Dittmar
Primate Supervisor, Oklahoma City Zoo

Fern, a 20 year old Lowland Gorilla at the Oklahoma City Zoo gave birth to a female infant at 1430 hours on 8 June 1979. She has tried four times before without success. In March 1973, Fern aborted a six month fetus. Since then she conceived three times only to retain the fetus sixty to seventy days.

This time she made it all the way. There were no birth complications. Fern was confirmed pregnant with a urine test in December 1978. Fern's last breeding date was 12 October 1978 which gives this pregnancy 238 days gestation. On the day of birth, she showed no signs of impending birth as she ate her normal diet between 1230 and 1330 hours. At 1400 hours, blood spots were noted in the cage, 1415 hours first signs of straining or contractions were noted, then fifteen minutes later she had the infant in her arms. On 30 May, nine days before birth, she had showed signs of bleeding.

In the cage with Fern at the time of birth was another 20 year old female, Boma. During the first two hours after birth Fern carried the infant in fairly good positioning, but was noted to be nervous. Boma kept "bird dogging" Fern so they were separated.

Observers from the Primate Staff spend the night watching Fern. Although she was given burlap sacks, she still appeared nervous the next day. It was felt that if Fern was in the bedroom cage away from the public view, she might calm down some. To accomplish this, we had to put Boma back in. No sooner were they together when Boma grabbed the infant. Fern took two or three minutes to regain possession of the infant which now had two small cuts. Our Zoo Veterinarian said they needed medical attention. While at the hospital, it was noted that the infant also suffered a fractured jaw. Due to this, we are now hand raising the infant gorilla.

Post birth weight (18 hours) was three pounds, thirteen ounces. She is now, at three weeks, four pounds ten ounces, taking sixty cc's a feeding of Similac with iron for seven or eight times a day.

Projected plans are to move Fern to the Gorilla Building first with Kathryn and her two youngsters, Fredrika and Macho (see AKF May 79); second, when Fern's infant is three to four months old to move her to a "howdy cage" in the Gorilla Building next to the other gorillas. This way she will have sight and smell contact with the group. Using a Kind-erkage, we will take Macho out of the group and allow her to play with her half sister. Then, at about seven months of age, we will introduce Fern's infant into the group.

San Diego Wild Animal Park received a prestigious national award for community beautification at ceremonies at the White House.

THE PROFESSIONAL ZOO KEEPER

by

Bruce Miller

Bird Supervisor, San Antonio Zoological Gardens & Aquarium

Over the past years, I have observed an interesting phenomenon regarding zookeepers scattered across the U.S. This does not apply to those who are possible recipients of awards for excellence in zookeeping or to those dedicated individuals who are really good and enjoy their calling. I refer to the bulk of those who are new in the world of zoos, as well as those who feel critical of their zoo and its management. It is often the first and only zoo they have worked in! Some of the common complaints voiced are: "We do not get proper respect," "We are underpaid", and "We are thought of as mere dung-rakers who can be replaced at a moment's notice." These are only a few of the common ones and should include a statement of the zookeeper's low self-image. I may have a biased point of view, based upon my early training in the zoo field. However, if this type of training could be accepted here in the U.S. and lead to eliminating the above objections and developing better keepers, so much the better.

I started as a keeper apprentice in a European zoo. The hours were 6 a.m. to 6 p.m. with a hiatus from 11:30 a.m. to 2 p.m. for classes, other training and lunch. Money? I was concerned not about making a fortune, but about learning as much as possible in order to begin an exciting career. In fact, at this time (mid-60's) I was paid a whopping 52¢ per hour. No, I could not buy fancy clothes nor even spend a lot of time going out to entertain myself. I was there for a purpose...to learn. I have great difficulty coping with the "new breed of zookeeper," who after 6 months declares he knows everything there is to know and is ready to move up to a top position..with all the accompanying money.


Under the apprentice system one would learn and master a particular area of interest (herps, fish, small mammals, primates, etc.). As one worked, studied and passed oral and written comprehensive exams, advancement to the next level came. And with advancement came more detailed learning, more responsibility, and some more money. But, most importantly, one gained self-respect, and respect from others who knew that you worked for what you got because your professional progress could be documented. Experience, knowledge, and understanding come with time, not overnight. Maybe Europeans are more patient. Career zoo people at ALL levels realize there are a finite number of zoos in the world with a limited number of positions available at any given time. On a smaller scale, consider how many zoos exist in your state or in your city. Because of the limited number of positions available, competition is stiff. It is not easy to find a person with experience and education.

I have never met anyone in the zoo business who got into it to make money. Those who are strongly money-motivated should be out selling insurance or real estate. Something other than money motivates a person to be in the zoo business. I don't imply that money is not at all important, for all the intrinsic joy in the world will not pay rent or buy groceries. There are reasonable well-paying positions for QUALIFIED people. The competition is keen, and those considered for such positions have, in addition to knowledge and experience, a good 'professional manner.' The zoo grapevine is active. What does this mean to a prospective employee? It can mean hearing about that ideal position before it is advertised. It also means those doing the hiring generally know when a talented person is shopping for a slot somewhere. It can also

put an end to a career based upon fancy talking with nothing to substantiate the claim of experience and knowledge. Bad references can follow one for years. Simply bad-mouthing the local establishment to everyone in the immediate world can sour prospective employers. One should be careful, as this is "conduct unbecoming a professional." Those who are really talented and excel have a high market value and greater opportunity. The grapevine usually gets wind of a good up-and-coming person. If you are really good, others will know.

Back to the common complaints: "We are not treated as professionals nor with respect." When a large number of 'experienced' keepers have to be told to clean water bowls or feed dishes or even worse, put food into an enclosure for several days before someone else points out that the animal has been dead during that time, SOMETHING IS WRONG! Either the training provided to those keepers was inadequate or they are not demonstrating professional care which is worthy of respect. These people need to be weeded out to make room for the 'real' keepers. The mere fact that such a keeper can name all subspecies of a particular group of endangered animals and current population estimates, holds a degree in wildlife science or biology, and has a basic understanding of metabolic processes and digestion doesn't make him a good keeper if he/she can't master the basics! Why should any respect be forthcoming for such an individual? Why should any business pay top wages for shoddy work? Zoos are no different. Yes, mere dung-rakers are easily replaced, and usually at a moment's notice. Why? You don't need years of experience nor education to rake dung and put it into a wheelbarrow, folks!. It is hoped that all of us realize a zookeeper's job is much more than that.

It may come as a shock to some, but when an individual respects him/herself and those around him, it leads to mutual respect. Professional manners are important! Not many will hire someone who has only unpleasant things to say about past zoos worked at or how dumb all the staff was or who claims that they, Phineas T. Goatraker, with one year of experience at several places has all the answers. To those of you who are keepers by choice and not by default and really enjoy your calling, take heed: You are one of the most important links in the zoo. Any department is only as good as its keepers. The best collection in the country with the sharpest, most progressive department curator can do nothing if the system breaks down at the primary care level. All progress would stop if curators had to worry daily about whether or not young animals raised after many years of work are going to get fresh food and water. The more experienced people are the inspirations and models for the new people just entering the zoo business. It is an exciting time in their lives. It is also crucial that the examples set by those experienced keepers are of the highest standard. It is very easy for a new person to get the idea that no one enjoys zoo work when all he hears is how bad everything is. If a new person sees an experienced person ignore some detail, it may be assumed by the newcomer that details are really unimportant. Although it is up to the department heads to provide better training, it is also up to the keepers to be responsible and willing to be held accountable for their work and to earn respect.

We will get respect, joy, knowledge, as well as frustration, for our efforts, and for those who make that extra bit of effort, the positions and money which goes with them will come their way. 

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HAPPY BIRTHDAY, PHILADELPHIA ZOO! ! 105 Years!

HAPPY BIRTHDAY, BROOKFIELD ZOO! 45 Years!

chapter

Welcome to the Milwaukee
County Zoo AAZK Chapter
1001 W. Bluemound Road
Milwaukee, WI 53226

President...Sam LaMalfa
Vice Pres...Jack Uphill
Secretary...Valerie Werner
Treasurer...Nina Schaefer

news

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THE WESTERN REGIONAL AAZPA WORKSHOP - A KEEPER'S VIEWPOINT

by
Jane Hansjergen
Ungulate Keeper

The Sacramento Zoo hosted the 21st annual Western Regional AAZPA workshop this year. The four days were the culmination of months of planning, preparation and anticipation which resulted in a workshop overwhelming in its success.

Monday evening a meeting of the American Association of Zoo Keepers was held and we had the exciting surprise of finding close to 40 keepers in attendance. This was one-third of the total attendance at the Workshop! A two-hour meeting concentrated on development of "professionalism, dedication, unity and growth of the AAZK."

From the inside looking out, I can say the Western Regional AAZPA workshop was the best thing that could have happened to the Sacramento Zoo. It got us motivated to start and complete projects that somehow kept getting put off or buried under the daily load (or overload) of work. It forced us to rely on each other and believe in our capabilities as true professionals. We came to appreciate each other in new and exciting ways and we were shown how smoothly and effectively we can run a zoo when we totally care for our facility, animals and each other.

excerpted from the BULLETIN of the Sacramento Zoological Society.

??? INFORMATION PLEASE! ???

I am attempting to teach American Sign Language to our 4½ year old male orangutan at Houston Zoological Gardens. Anyone who has any advice or experience with the teaching of ASL to an ape or any type of specific information on orangutans, please send it to

Patty Smukall
c/o Education Department
Houston Zoological Gardens
1513 Outerbelt
Houston, Texas 77030

By
Michael L. Hughes, D.V.M.
Resident Veterinarian, Gladys Porter Zoo

How does one perform a pregnancy test on an adult female gorilla, or what is the procedure for drawing blood from an elephant? And, finally, how may one administer an oral parasite medication to a rattlesnake?

These and other similar situations must be dealt with in most zoos on a daily basis.

To perform any type of examination or treatment on wild animals, some type of restraint must be practiced. The method that stresses the animal the least, allows maximum safety for zoo personnel, and still is adequate for the intended procedure is the best method.

Many types of restraints are available to the zoo veterinarian, some beknown from work with domestic animals, and others improvised for use with wild species.

Whole books are written on the subject of wild animal restraint. This article is only intended to give the reader a general view of the basic procedures and equipment used.

In the simplest form, restraint may merely involve the isolation of animal to a quiet enclosure with minimal distractions. This may be done to facilitate visual examination or to provide a suitable recovery area for a post surgical patient.

Rarely, one may encounter a tame animal that responds to vocal restraint with minimal physical reinforcement. Vocal restraint may include soothing voice tones as well as commands.

A more severe method of restraint involves the use of various squeeze devices. Many forms of squeezes are used, but all utilize the ability to slide one wall of the device toward the opposite wall. This allows the animal to be trapped in a somewhat immobile position. This technique is best limited to giving injections and very rapid examinations.

Some wild animals require very special handling. Snakes, especially poisonous ones, would fall into this category. One must remember that aside from the obvious danger to the human, a snake is an animal capable of being injured. The task of restraining these animals is generally left to a few individuals with considerable experience and skill. Their tools include hooks, clear plastic tubes, bags, and shields.

Probably the method most people envision when wild animal restraint is mentioned is the use of drugs delivered with a rifle. Chemical restraint has become a popular method of restraint only in the last 15 years. Because drugs have been used a relatively short time on a very limited number of animals, and because each species of animal responds differently to the various drugs, the use of drugs can be unpredictable at times. An example of variation of response to M99 (a popular restraint drug) would be the 6000-pound elephant and the 200-pound Yellow-backed Duiker. The total does of M99 required by each of these animals is essentially equal.

continued

Animal Restraint, continued

Even with the unpredictable factors involved, the use of drugs has greatly reduced the danger to the animal and its handlers during a restraint procedure. Before the use of present day drugs, the immobilization of many species was impossible.

An attempt to describe the drugs used would be very lengthy so suffice it to say that several good drugs or combination of drugs are available that tranquilize or anesthetize wild animals. These drugs are usually delivered in a special dart constructed so that it injects the drug on impact. The delivery devices are many, the most popular being the capture rifle that uses either CO₂ power or powder charges. Pistols are also popular for short-range work. Other delivery devices include cross bows and blow guns. A syringe can also be fitted to the end of a pole that allows the veterinarian to inject from a distance of up to six feet.

The last method of restraint I will mention is the use of manual restraint. That is actually physically overpowering an animal. This requires a knowledge of the animal (some animals are more likely to become shocky or injure themselves). It also requires quick, planned action by trained and experienced personnel. Many ancillary devices such as nets, ropes, bags, shields, and heavy gloves are used.

In many instances, a combination of procedures is used. An animal may be physically restrained while an inhalent anesthetic is administered by applying a face mask.

Perhaps by answering the questions posed at the beginning of this paper will give the reader a better picture of wild animal restraint:

1. The gorilla is simply kept in an enclosure with a hard, smooth surface and when it becomes available, a urine sample is collected which is sent to the laboratory for testing.

2. The elephant is chained and vocally and physically restrained by a respected and trusted Keeper. The veterinarian then draws blood from a vein on the ear.

3. The blackbuck is darted with an anesthetizing drug. The key is to keep the animals, including undarted animals, from fleeing the handler and injuring themselves. After the animal has been darted with the correct dosage of drug, it will lay down in 10 to 20 minutes. It is then removed from the enclosure, given a drug to reverse the effects of the anesthetic, and placed in a well-bedded shipping crate.

4. The snake is hand caught by use of a snake hook or one may coax the snake into a clear tube and once inside, the body can be restrained without danger from the fangs. Once in hand, the fangs of the snake are occupied by placing a piece of foam or food into the mouth. The wormer is then squirted down the back of the mouth.

I hope the reader will realize that Zoo personnel must deal with restraint everyday and that much thought and experience is needed to achieve the desired objective without injury to the animal or to the people involved.

This paper was reprinted from the Gladys Porter Zoo News, Brownsville, Texas, by permission of the author.



INFANT MORTALITY AMONG GIANT
RED KANGAROOS IN A ZOO ENVIRONMENT

by
James L. Powell
Keeper, Oklahoma City Zoo

Abstract

What I have attempted to do is to investigate the incidence of infant mortality among Giant Red Kangaroos in a captive situation. We at the OKC Zoo have attempted to record accurately the number of births, rejected births, and in particular the sex and age of rejected births of Giant Red Kangaroos at our zoo. I think it is possible that the adult female kangaroos have the ability to control (probably instinctually) the quantity and distribution of a captive group of animals by rejection of offspring.

Methods and Procedures

The kangaroos have been and are presently housed in a 6 foot chain-link fenced enclosure with a dirt substrate and 20 trees (some Hackberry, Scrub Oak, Austrian Pine, and Chinese Elm). The size of the enclosure is approximately 10,500 square feet. There are also two inside enclosures of 150 square feet each. The enclosure is terraced with a rise from one level through three levels of approximately 5 feet. There are two pools each 5 feet in diameter and 1 to 2 feet deep. The diet fed from 1965-1972 was whole corn and lab chow (8 ounce per individual) with alfalfa (approx. 1 pound per individual) as a browse substitute. The corn and lab chow were fed in wooden troughs and the alfalfa was spread out on the ground. The diet was changed in 1972 to sweet feed which is presently being used along with alfalfa. Fruit and spinach greens are given 3 times a week.

Results

The group began with the purchase of one male and two females in September of 1965. In 1973, one male and one female was purchased. From 1965 to 1977, 133 kangaroos were born. Of this number of births, 45 were rejected (29 males and 16 females). One male joey was rejected in 1965, none were rejected in 1966-67, and there was a steady increase of rejections from 1969 on. Of the 45 rejected joeys, 15 were newborn and never made it to the pouch; 6 were one month of age, 1 was two months, 8 were three months, 7 were four months, 3 were five months, 1 was six months, 2 were eight months, and 2 were ten months of age. At birth the kangaroos were an average of 3/4 inch long and weighed 1 gram. They had no hair, eyes were closed, forelimbs well-developed with nails on the ends of the digits, hindlimbs under-developed, tail formed and the sex of the animal obvious, but not complete in development. At six months of age, the hair begins to cover the joey and it is full developed weighing about 8 pounds. The youngest rejected kangaroo that has been successfully hand-raised in our nursery was three months of age. The average number of adults in the exhibit during this period from 1965-1977 was 40 with a ratio of 1/30. Average number of pouchers in the group year-round was 6.

The present group male has been at the OKC Zoo since 1973 and has had a good disposition toward the female members of the group and keepers compared to the previous male who was known for his unpredictable

Infant Mortality among Giant Red Kangaroos, continued

attacks on keepers. Stress seems to be minimal on this group since their location is not a mainstream of public flow through the zoo, and public harassment does not take its usual toll. Some feral dogs have entered the zoo and caused a couple of injuries. The majority of the group have become tolerant of zoo life and individuals have not lost their instinct for survival and protection. If a keeper approaches too quickly or makes sudden moves, one or half a dozen 'roos will simultaneously sprint away plopping their feet in alarm.

Discussion

Weather plays an important role at our zoo since the winters get quite cold. Since the inside enclosure space is limited, the number of animals in the group must be carefully monitored. We have had no deaths due to severe weather. Lumpy jaw occurs occasionally and the entire group is put on medication for a limited time. We feel that the inadequate supply of alfalfa forces the kangaroos to eat the stems since they normally eat strictly the leaves from the alfalfa. It is possible that stems may cause trauma and hence the disease.

Since a couple of newborn kangaroos have been found partially eaten by adults 'roos, it can be assumed that there are a number of 'roos born and rejected that we are not aware of. I find it very interesting that there were more males rejected than females. Since the number of adult male 'roos in the exhibit is kept at a minimum (no more than 4), in theory, the female 'roos may be regulating this ratio by rejecting males that they conceive in order to keep the balance. Since females can delay development of a fetal kangaroo in the wild due to drought, it does not seem impossible for them to control the development of the group in a zoo environment. As for rejected joeys of different ages, there is only speculation on the sporadic change in group ratio because of sales to other zoos and deaths.

Comprehensively, we feel like we have had good success with our group of Giant Red Kangaroos. Behaviorally, they seem to follow patterns studied in the wild. No physical problems have arisen that are not unusual for a captive situation. We hope we have learned better feeding techniques, better restraint procedures; and learned how to understand medical problems associated with marsupials and how to treat them. We hope we have a better understanding of this animal and other related species and how they fit in a zoo environment. Through this understanding, it should be possible to present this animal as an exhibit animal while the animal survives extinction in the best possible way.

This paper was presented at the National Conference for the American Association of Zoo Keepers.



??? **INFORMATION PLEASE!** ???

Please send information about the best available diet for Bushdogs and also general dietary requirements to

Elizabeth Krohn
Small Mammal House
Lincoln Park Zoo
2200 Cannon Drive
Chicago, Illinois 60614

OUR APOLOGIES AND A CORRECTION

The July issue of AKF, page 135 has a letter from the president of AAZK Dennis Grimm to zoo directors and supporting societies. A postscript at the bottom of the page indicates the letter was printed in the AAZPA Newsletter. This was not the case. The editors of AKF extend their apologies to the AAZPA for this error...

Alternatives... Education and P.R.

The Animal Keepers' Forum receives newsletters and news releases from many zoos and would like to share some of the creative, stimulating educational ideas that these publications contain. The events are presented in a brief form to serve as an inspiration for ideas that can be adapted to your zoo and its needs and resources.

SHEEPSHEARER TO SHEAR SHEEP AT PHILADELPHIA ZOO

Thirteen Philadelphia Zoo Suffolk sheep and two Angora goats were sheared by William McCauley, a 4-H Club leader. A weaving demonstration was presented using the shorn goat hair.

MONTGOMERY ZOO HOSTS CITY DIGNITARIES FOR A NIGHT SAFARI

The Montgomery, Alabama, zoo took advantage of the difference of viewing a zoo world at night and invited city officials for a Sauntering Safari.

MONTGOMERY ZOO SPONSORS A SAFARI TO THE ATLANTA ZOO

Montgomery Zoo chartered a bus to take interested members and guests of their Society to visit the Atlanta zoo for a glimpse of behind-the-scenes action at a major zoo. It was a day-long expedition.

PHILADELPHIA ZOO HOSTS HANDICAPPED

The Philadelphia Zoo and the Rotary Club are sponsoring a special day at the zoo for handicapped persons from local institutions and organizations. They will be assisted through the zoo by Rotarians and Boy Scouts. Several animal demonstrations are planned.

NATIONAL ZOO PRESENTS " MINGLE WITH THE MONKEYS"

"Mingle with the Monkeys" is an ongoing series of tours about primates and primate behavior presented at the National Zoo. It was conceived and organized by three keepers, Linda Mahn, Bruce Kirtley-Hodess, and David Kessler as a response to the questions of an interested, but sometimes mis-informed public. "Mingle" takes place about feeding time and includes both the observable behavior and other issues such as Zoo philosophy, social structure, long term effects of public feeding.

THE CAPTIVE BIRTH of a CALIFORNIAN SEA LION

by
Mark Crosbie, Zookeeper
Walter D. Stone Memorial Zoo

The Stone Zoo Sea Lion herd, consisting of one bull and three cows, were wild-caught and shipped to us some eleven years ago. The first birth occurred in the third week of May, 1974; a pup was stillborn or died almost immediately after birth; in late May, 1975, again a birth. The female had delivered on a pedestal surrounded by water approximately 10 feet deep with a several foot drop from the lowest point of the pedestal to the water. The mother had failed to cut the umbilical cord and this was done by myself under the direction of our staff veterinarian. The pup lived twenty four hours before it drowned after being taken to the water by its mother.

The second week of June another pup was born to a second female. Again, the pup lived only twentyfour hours before it died of cranial damage, perhaps due to tossing by the mother. The second week of June in the same year, another pup was stillborn. The female who delivered the previous year did not produce and died a few months later of natural causes.

The third most dominant female remained barren. At times she would also act dominant to the bull, which usually ended up in a loud and sometimes viscious scuffle.

On June 3, 1977, our present pup, "Bo Jangles" was born. He was born in our old polar bear exhibit, while the sea lion tank was undergoing renovations to better accomodate a rookery type of a situation. The polar bear exhibit is a flat cement area built in a semi-circular design surrounded by a moat approximately 15 to 20 feet in depth. Just inside the moat area is a smaller pool about 6 feet deep. In the rear of the exhibit is a den large enough to house a bear, and just to the right of the den is the keeper entrance door. The back wall is one side of our mammal house, running the length of the exhibit, about 20 feet high.

"Bo Jangles" was born in the early morning. The mother's actions prior to the birth were somewhat unusual in that she did not eat and appeared oblivious to her surroundings for about a week. After delivery, she licked the pup clean but failed to eat the placenta. The pup had been born on cement and we were quite concerned about overheating when the afternoon temperature reached the eighties. The mother, quite purposely kept the pup by the waters edge, occasionally splashing with water to keep him cool. One interesting observation was that the mother became dominant over the bull at once. She would display threats and even go so far as to bite the bull. This happened especially when the bull vocalized and approached them. The bull seemed to be most tolerant of the female's actions and displayed affection towards the pup.

The sleeping pattern was at first thought to be pure chance, but it turned out to be very deliberate indeed. The bull and the female would arrange their bodies in such a manner as to block any possible entry in to the water by the pup. Using a "V" type formation, they would keep their bodies at waters edge with the pup between them. (Note: the waters edge is a six foot deep pool on one side and the twenty foot deep moat on the other, each filled to the brim with water.)

continued

The Captive Birth of a Californian Sea Lion, *continued*

The second female occasionally would approach the pup, possibly out of curiosity, but the mother would give an audible sign of protest, and the bull would immediately proceed to chase away the "intruder". Curiously, the second female refused food the preceding week as did the expectant mother. The pup nursed and vocalized to the mother; she would answer and then nuzzle the pup's face with her snout.

As the days went by, the pup's mobility steadily increased. He would go into periodic spurts of activity, constantly inspecting his surroundings. If the parents were in their sleeping position, they would keep track of his movements by gently touching him with one of their flippers. When the pup started to leave them to wander or to "inspect" the water's edge, one of the adults would sweep him back between them with a gentle but firm movement of a flipper.

Several times each day, the pup would manage to fall into the water despite the parental protection. He was always promptly recovered by the female. The bull, as expected, did little as far as the rearing of the pup. He did show, however, a great deal of parental protection. When it was obvious that the adult's sleeping pattern was deliberate, I was somewhat surprised as I have never seen any mention of a bull doing this in captivity.

Vocalizing between the mother and the pup was almost constant during their awakened hours. This gradually diminished as the weeks went by. Following each vocalizing session would come a brief period of stroking each other's face with their snouts. It was noticed that the bull would rub the pup's face with his snout in what seemed to me to be an open gesture of affection. As the pup's mobility increased, he would chase after his mother almost frantically, apparently wishing to feed. The mother would take to the water, leaving him on land, but the pup would refuse to follow her into the water.

It has been noticed that should the pup fall into the water, the rescue by the mother was not always gentle. On occasion she would actually toss the pup several feet to land and there was worry by the keepers that she may accidentally injure him. Fortunately, it never developed into a serious problem.

The mother did not take to the water at all until the pup was six days old. For a few days the pup would become extremely alarmed at his mother's absence. When she was in the water, she would look back to the pup every few seconds and would swim over to him and rub snouts. Then she would swim away leaving the pup crying on the water's edge. The pup did not venture into the water voluntarily until his twenty-first day, although he had shown some minor swimming ability when he fell into the water. At best, his attempts could be described as frantic and clumsy. If he got himself back on dry ground without help from his mother, he was visibly exhausted.

The pup's first voluntary interaction with the water started with his lying on the edge of the pool with his head partially submerged. He very slowly lowered himself over the edge into the water. He remained motionless approximately one foot under the water for about twenty to thirty seconds. He then very lazily began to maneuver his flippers and swam under water for approximately forty feet, following the curved edge of the moat. The pup managed to haul out on his own and showed signs of fatigue. This procedure started to occur on a regular basis

The Captive Birth of a Californian Sea Lion, continued

for a couple of days. The bull showed signs of excitement when the pup ventured into the water, but made no attempt to chase him or in any other way try to remove him from the water. The mother would swim over to the pup, but remain very calm and seemingly unconcerned. When she did this, the bull also seemed to quiet down until the next time the pup went into the water.


From this time on, the pup's weight and mobility continued to increase. As the pup got older, the second female was gradually allowed to go near him. They eventually became quite good friends, chasing one another around the pool. When this action would start, it seemed almost contagious, for the bull would soon join in on the play and chase any member of the pool that was in front of him. The bull would catch the pup with little difficulty, but would refrain from overtaking him. The pup would make good his escape and the chase would again be on.

As the next summer approached, we became concerned that the mother might again give birth. The pup was not yet weaned and after careful deliberation, we decided to remove the pup to private inside quarters. The den was modified by building an enclosure using a bathtub with a tiled platform adjoining it, totally surrounded by plexiglass. The bull showed a great deal of protectiveness when we removed the pup, but all went well. The pup took to his new quarters extremely well, only becoming upset when he could hear the herd vocalizing. He was fed on live shiners, then gradually changed over to dead shiners and then to chopped herring. As it turned out, the mother did not deliver another pup and "Bo Jangles" was returned to the pool after about six weeks with no re-introduction problems.

Several problems were associated with this birth. The first precaution taken was to rope off the section of the public viewing area closest to the mother. Also, no keeper was allowed in the exhibit for fear that the mother might take the pup to the water and cause accidental drowning. This procedure was continued until the pup had no difficulty maintaining himself in the water without his mother's assistance.

New England suffered an unusually severe winter. It was observed that as the weather got colder the pup was becoming less and less active. He would constantly go next to the wall of the building to sleep even though the adults kept to the water. This problem was solved by installing a large propane heater, suspended on a wire approximately seven feet off the ground in the area where the pup slept. It would keep that area about fifty to sixty degrees. The pup took to it at once and would even allow his keeper to approach him and pet him rather than jump into the water. This helped out tremendously in getting the pup used to humans.

Another problem was the moat inside the exhibit, which was not originally constructed to hold a full volume of water for long periods of time. There was a leak from the drain, so water had to be constantly flowing into the exhibit. If a proper balance was not maintained, the level would drop, creating a lip around the edge. To a new pup, a several inch lip was almost an impossible obstacle, should he fall into the water and have to rely on his own resources to climb back out. Constant surveillance was necessary in this area.

At the time of this writing, "Bo Jangles" is over fifteen months old and approximately seventy pounds. Soon he and his family will be going back into their original sea lion tank that has been long in renovating. 

The Captive Birth of a Californian Sea Lion, continued

Equipped with a new filter system, a ramp going down into the water for easy exiting, a rookery and a beautiful network of man-made cliffs surrounding the area, the exhibit should be an excellent encouragement for breeding certain species of marine mammals as well as a natural and pleasing sight to our visiting public.

The success of this project involving our sea lions has been a joint effort between the zoo staff of the Metropolitan District Commission and the Boston Zoological Society, both of whom are to be commended.

This paper was presented at the 4th National Conference of The American Association of Zoo Keepers.

* * * COMING EVENTS * * *

AMERICAN ASSOCIATION OF ZOO KEEPERS NATION CONFERENCE
September 24-27, 1979 Portland, Oregon

AZPA National Conference
September 30-October 4, 1979 St. Louis, Missouri

Annual Convention of the American Association of Zoo Veterinarians
October 7-11, 1979 Stouffer's Denver Inn, Denver, Co.
Contact: M.S. Silberman, D.V.M., Executive Secretary
Emory University, P.O. Box 23800
Atlanta, Ga 30322 (404) 329-7423

Second Annual Symposium on Captive Wildlife
October 26-29 Louisville Chapter AAZK
Contact: Steven Taylor
Louisville Zoological Garden
1100 Trevilian Way
Louisville, Kentucky

Regional Conference for Zoo Support Organizations
October 27-29, 1979 Louisville, Kentucky

World Conference on Breeding Endangered Species in Captivity
November 12-16, 1979 San Diego, California

World Conference on Sea Turtle Conservation
November 26-30, 1979 Washington, D.C.

VIIIth Congress of the International Primatological Society
July 7-12, 1980 Florence, Italy

CHANGED YOUR ADDRESS LATELY?

Since AKF has been granted Second Class postage, the Forum is not forwarded. Please let us know before you move, if possible, as the process of changing your address does take some time.

Send changes of address to
Elizabeth Glassco
Administrative Secretary
American Association of Zoo Keepers
National Zoological Park
Washington, D.C. 20008

Thanks

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ASSISTANT ZOOKEEPER... Supervise and direct the work of a crew of Zoo Attendants engaged in operating and maintaining an expanding Municipal Zoo Complex. Minimum of two years experience in care of a variety of animals including Zoo operations experience. Prefer knowledge and experience in use of immobilization drugs. Salary range - \$8,520 - \$11,400. Application deadline August 31, 1979. Reply to Beverly Spencer. Personnel Technician, Department of Personnel, 1st Floor, East Wing, City Hall Building, P.O. Box 1531, Norfolk, Virginia 23501.

ANIMAL ATTENDANT I... two keeper openings to be available 1 October 1979. Interested persons should request an information and referral card in order to be notified on how and when to apply. Contact: Dudley Brown, Assistant Director, Fort Worth Zoological Park, 2727 Zoological Park Drive, Fort Worth, TX 76110.

AVICULTURIST... duties involve the care of cranes, maintenance of facilities, artificial insemination, operation of incubators, supervision of volunteers, and assistance to researchers. Starting salary \$10,000. Send resume to: Chris LaRue, International Crane Foundation, City View Road, Baraboo, WI 53913

ASSISTANT PLANNER... for all educational exhibits. Responsible for coordination of design and graphics consultants, liaison with staff, research and project reports. Background in zoology or biology and in museum exhibit design and preparation. Send resume by 30 August to: Lydia Kowalski, Education Director, Boston Zoological Society, Franklin Park, Boston, MA 02121.

POSITIONS WANTED

ZOOKEEPER... several zookeeper trainees will complete a one-year training on 30 September 1979 and will be available for employment. The training has involved on-the-job work, as well as classroom training. A description of the training program and recommendations are available from: Glenn Coughlin, Administrative Assistant, Crandon Park Zoo, 4000 Crandon Blvd. Miami, FL 33149. (305) 361-5614

AAZK ACCESSORIES AVAILABLE

BUTTONS

Buttons printed with 'Keepers Care' and a logo are available for fifty cents (50¢) from Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614. 50% of the sale price goes into AAZK's national treasury.

DECALS

The official AAZK decal is available through the Overton Park AAZK Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.00 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Avenue, Memphis, TN 38107.

T-SHIRTS

The T-shirts come in a variety of colors and have the AAZK logo on them. Contact Carleton Bailie, 4400 NW 39th Avenue, #214, Gainesville, FL 32601.

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INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10". Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.



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- Affiliate (full-time keepers) \$10.00 annually
- Associate (part-time keepers, students, docents) \$10.00 annually
- Foreign \$15.00 annually
- Contributing \$50.00 annually

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All new members receive an AAZK shoulder patch and a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

The AAZK Headquarters has extra shoulder patches available for \$1.25 and back issues of the *Animal Keepers' Forum* for \$1.00.

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AAZK HEADQUARTERS
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Animal Keepers' Forum



Dedicated to Professional Animal Care

SEPTEMBER 1979

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Lutz Kuschinski of Glasgow, Scotland is the artist who did the cover for this issue. His artwork of the rhino and keeper is appropriate for the Conference month of the AAZK. His drawings also appear in ZooLife, the publication of the Zoological Society of Glasgow and West of Scotland, of the Calderpark zoo. Thank you for sharing your talent with AAZK!

SCOOPS and SCUTTLEBUTT

KAUFMAN RESIGNS BOARD POSITION by Ron Kaufman, Editor-in-Chief, AKF

I have recently been appointed Education Coordinator for the Topeka Zoo. This is a new position for the zoo and I am looking forward to the challenges it will provide. On the other hand, I will miss my involvement in animal care.

Too, I must resign my position on the AAZK Board of Directors. This does not mean that I will be dropping from AAZK, an organization I deeply believe in. I think my best contributions to AAZK have come through AKF and I will continue my involvement in AKF.

STOLEN ANIMALS FOUND. Sally Smith, Roeding Park Zoo, Fresno, CA

At midnight on July 25, Acting Zoo Director Ron Tremper was notified by police that the two missing animals had been found alive. We accompanied a Fresno Police Detective to a small town about 40 miles away to claim the animals. We found them to be in relatively good condition after their ordeal, although thin and nervous. The Muntjac had been found in an orange crate in a wooded area, with someone providing milk. The Raccoon Dog was found in a private home. One week later both have returned to normal in the Zoo Nursery with medication continuing on the infected eye of the deer.

The thieves have not been apprehended, but we are pleased to have the animal back in good health.

Sally also wanted to add some information to the report of the baby Lowland Gorilla in the May 1979 *Forum*. 'Alberta' was born at the Roeding Park Zoo in Fresno, the first gorilla ever born at our zoo and the first for either parent. The male belongs to Roeding Park Zoo and the female is 'Alvila' on loan from San Diego Wild Animal Park, who has been at our zoo two years. 'Alberta' is the first second-generation gorilla in the history of San Diego, but she was born at Roeding Park Zoo. Due to the breeding loan agreement, however, after her necessary removal from the mother and a critical month regaining her health in Fresno, she was taken to San Diego for permanent residence.

Migration of Birds is available for \$4.25 from the Superintendent of Documents, W.S. Government Printing Office, Washington, D.C. 20402. # S/N 024-010-00484-3. It is an updated version of the classic work by Frederick C. Lincoln. The 120 page book contains color drawings by the noted Fish and Wildlife Service artist, Bob Hines.

BIRTHS HATCHINGS

SIBERIAN TIGER BORN AT MINNESOTA ZOO

June 6 was a red-letter day at the Minnesota Zoo with the first birth of Siberian tigers. Mother and cubs are doing well and can be seen on TV and in the tiger maternity den.

CONCAVE-CASQUED HORNBILL CHICK EMERGES FROM NEST AT BRONX ZOO

For the first time in the United States--and only the second time ever-- a concave-casqued hornbill chick has emerged from its nest. The event took place recently at the Bronx Zoo. As far as is known, Singapore is the only other zoo in the world to have reared a chick of this species.

The male and female of this species look exactly alike except for their eyes; the male has red eyes and the female's are white. So far, the youngster at the Bronx Zoo appears to have white eyes, although it is reported that they seem to be getting darker in color.

The youngster and her(?) parents are on exhibit in the Zoo's World of Birds.

PHILADELPHIA ZOO HAS BABY BOOM

An Orang-utan baby was born on July 14 and is being raised by members of the Zoo staff. The baby, a female, is named Sabah after an area in Borneo where captive orangs are being taught how to return and live in the wild. Sabah was rejected by her mother and is living in the Animal Nursery.

Also in the Nursery are two leopard cats who lost their mother.

Another baby born in the Philadelphia Zoo is a kerodon or rock cavy.

PYGMY HEDGEHOG TENRECS BORN AT TOPEKA ZOO

The Tenrec *Echinops telfairi* colony was increased in population by the births of 30 babies during the months of July and August.

The Topeka zoo also reports the births of 0.1 Onager, 0.0.2 Rock Hyrax, and 0.0.1 Eland.

ROTHSCHILD'S GIRAFFE BORN AT OKLAHOMA CITY ZOO Marcia Rohrer

A male Rothschild's giraffe was born at the Oklahoma City Zoo on 31 July 1979. The animal's legs were extremely weak and motor control was so poor that he was unable to nurse from his mother. The calf was taken to the zoo nursery on his date of birth. The underdeveloped condition of his legs and hooves and his weight (only 98½ pounds, 44.7 kg.) lead us to believe he was born prematurely. At three weeks of age, the giraffe had already made tremendous improvements in his coordination and his legs were strengthening daily due to exercise and dietary supplements.

Papers have been selected for the conference. They include:

- captive breeding work with the hammerhead stork(Franklin Park Zoo)
- Malayan sun bears(Roeding Park Zoo)
- African lions(Washing Park Zoo)
- captive management of snow leopards(Woodland Park Zoo)
- Chimpanzees, mandrills, and colobus (Washington Park Zoo)
- black rhinos(Memphis Zoo)
- reptiles(Roeding Park Zoo)
- handrearing Humbolt and Adelie penguins(Sea World, San Diego)
- adoptive parenting as an alternative to hand rearing(Baltimore Zoo)

also included is a slide presentation of rhino and giraffe births(Phoenix Zoo)

Further conference information can be found in the May, June, and July issues of "Animal Keeper's Forum".

Extra, Extra

An AAZK Non-Animal Auction will be held on August 27 in the evening. The Auction will take place during the Conference banquet. Samples of items to be sold: An original chimp painting, blown eggs from San Diego, much, much more.

Any person wishing to donate to the auction, please give all items to Jonolyn Smith upon arrival at conference.

Registration material can be obtained by contacting:

Jonolyn E. Smith
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, Oregon 97221
1-503-226-1561 ext. 61



Attention Conference Goers

AAZK Board Meetings will be held on Sunday, August 24, and on Monday, August 25. Please submit items or ideas for discussion at the meeting to AKF no later than Sept. 20. An agenda of items to be discussed will be posted at the Conference.

"Remember" submit any and all items for AAZK Board discussion to Animal Keeper's Forum.

(Please, no later than Sept. 20)

At the 31st IWC meeting, a total moratorium on factory ship whaling for all species except the minke was voted and passed by member nations and the entire Indian Ocean north of latitude 55° south has been declared a sanctuary for all whales for the next the years.

vandals killed 25,000 brown trout valued at more than \$7,000 at an experimental hatchery of the Interior Department's National Fisheries Center in Leetown, W. Va. Drain pipes were pulled on two raceways, letting the water run out and the fish suffocate.

FREE-FLIGHT MACAWS IN A PLANTED EXHIBIT

by
Ron Kaufman, Topeka Zoological Park

This paper is intended to report on an on-going project that is being carried out at the Topeka Zoological Park. The project, attempts to exhibit certain psittacines in free flight in a heavily planted exhibit, has been going for about two years in the zoo's Tropical Rain Forest. The animals involved have been blue and yellow macaws and scarlet macaws, with some data taken from Finsches and yellow-fronted Amazon parrots and from orange-fronted coures. In the following paper, I will examine the motivations for and the theories behind the techniques used, as well as the results to date and some predictions for the future.

The traditional method for exhibiting many psittacines has been to either feather clip or pinion the birds and then place them on an attractive arrangement of dead branches. The idea behind this method seems to have been two-fold. One, the bright splash of active color the birds presented made a very attractive exhibit and; two, if the birds were let loose, they would reek havoc with their powerful and destructive beaks. Indeed, it became necessary to regularly replace the perches the birds roosted on, due to chewing. This is the technique that was being used in the Tropical Rain Forest exhibit.

The Tropical Rain Forest is a one-hundred foot diameter circular building. A geodesic dome rests on 10 foot concrete walls to create a bright, sunny environment for a simulation of the Amazon rain forest. The TRF is heavily planted with tropical plants throughout, creating a dense forest, broken only by public walks and occasional exhibits. Many of the plants would cost several thousands of dollars at retail, not because of rarity, but because of size. It was in this exhibit on an arrangement of dead branches, anchored on a small island, surrounded by a pool, that we first exhibited our macaws. Our macaws went through a range of activities that many zoos probably see. There would be occasional squabbles, where one or two birds might be forced off the perches, and while off, would nearly destroy nearby plants from chewing. Or, at night, the whole bunch would spook and scatter themselves around and really do a number. And, of course, the problems of acquiring and arranging the proper kinds of branches for the perch was one of logistics as well as labor. Topeka used osage orange, the hardest wood found in the area. It is frequently used for fence posts (untreated) and will easily burn up a chain saw or a drill bit. The macaws had no problem chewing several feet from the perch tips within 3 months time. At Topeka, we always search for a better way, but nothing ever surfaced for exhibiting psittacines in a more natural setting. The macaws solved the problem for us.

One female blue and yellow macaw had emerged as an outcast of the group and was found one afternoon, in an Indian Rubber Tree, having been forced off the regular perch. Casual observations revealed that she was making no attempt to chew on the tree. Furthermore, she was making an effort to conceal herself in the boughs of the tree. The tree is a marvelous specimen, thick and bushy, about fifteen feet tall and quite healthy. In short, she seemed content to stay put. We began to feed and water her in the tree.

At the same time, the other macaws on the perch seemed to settle down. There were fewer social squabbles, fewer sorties into the surrounding

Free-flight Macaws in a Planted Exhibit, continued

bushes and reduced chewing. We decided to allow the wayward macaw to stay in the live tree, as long as she didn't chew her way out of house and home. She never tried. She stayed on the tree for about four months when we decided to allow the other macaws to fly off the tree as their wing feathers grew back naturally. This was done primarily to allow them to develop their flight muscles, looking forward to the day when they would fly free. During this time, they were fed only on the home perch and chased back to it, rather than carried. This did three things...1. it helped to gradually develop their flight muscles..2. it made them realize that they could fly and 3. that food was available in a familiar location, if they would only fly to it. During the two-year period to date, as the birds began to fly around, satellite feed and water stations were set up and gradually implemented so that the birds no longer use their original home perch. The variety of techniques and animal combinations that were used over the period of time are too numerous to mention here. But based on observation of their behaviors, the following theory was developed.

A. Some chewing for macaws is natural

1. To condition jaw muscles for natural feeding
2. To condition the beak for natural feeding
3. To provide manipulation for the sensitive tongue.

B. Excessive chewing for macaws is unnatural

1. It exceeds the normal body demands for conditioning
2. It tends to destroy the animal's habitat--an ecologically and evolutionarily unsound behavior--usually reserved for man
3. It is frequently directed toward objects that would not serve to condition beak or jaw--soft things.

C. Excessive chewing is caused in large measure by stress

1. Social
 - a. overcrowding
 - b. too few feeding stations
 - c. incompatible individuals
2. Reproductive
 - a. presence of competitive individual for reproductive purposes
 - b. incorrect sexing
 - c. lack of suitable nesting location
 - c. lack of ability for pairs to segregate at season
3. Environmental
 - a. temperature extremes
 - b. lack of cover from each other and from public
 - c. restrictive environment (related to overcrowding)
4. Psychological.
 - a. boredom
 - b. continuing, incessant excitement
 - c. lack of bathing facilities.

How, then, did the Topeka Zoo correct each problem? Many of these may occur all at once in the same exhibit.

Free-flight capabilities with not one, but several feeding stations provide the following corrective measures.

1. Social

- a. overcrowding was eliminated because our 100 foot diameter

Free-Flight Macaws in a Planted Exhibit, continued

- building held only 2 correctly sexed pairs at the most.
 - b. too few feeding stations - eliminated.
 - c. incompatible individuals - behavior watched and aggressive, incompatible animals were removed, only established pairs remained.
2. Reproductive
- a. presence of competition - removed when pairs were correctly sexed.
 - b. incorrect sexing - laparoscopy used.
 - c. lack of nesting locations - two set up, on opposite sides of building, out of visual contact with each other
 - d. ability to segregate - pairs can find their privacy in tangle of plants.
3. Environmental
- a. Temperature extremes - eliminated, birds can choose their own, sun, shade, breeze, etc.
 - b. cover lack - plenty in building, as far away from people or each other as they saw fit
 - c. restrictive environment - relative freedom in building.
4. Psychological
- a. boredom - substantially reduced as animals become involved in pair bonding, food, water finding, casual browsing, interspecific relation
 - b. excitement - reduces as cover increased, away from poking finger, whistles
 - c. bathing - plenty of water in pools or morning misting, also access to plant waterers.

The results of this program have been good. Some chewing is acceptable, but there must be cooperation with the horticulturist. Topeka uses trees that can not be killed from chewing (not totalled out, but merely casually nipped). Hard perches provided here and there will be used. Ficus is an especially good plant to use.

We have macaws flying around free in our exhibit, mingling with the other animals, with only a small amount of acceptable chewing going on. We are anxious to try it out with some other psittacines as the building continues to develop.

Some interesting challenges have occurred.

1. Many perch-bound macaws are reluctant to fly. They would make every possible effort to walk or climb to food, rather than fly. Some seemed almost to prefer to starve than fly. Others were used to being fed on "a silver platter," it is hard to break old habit...extrapolated to turning zoo animals free in the wild. Each bird had to be shown the location of each dish and the animal made the choice. The animal was walked around.
2. Each bird is an individual. They are very intelligent. Some, held as pets develop chewing habits and other habits that could not be broken. They were 'neurotic,' so to speak and could not adjust, period.
3. Some took a very long time to develop muscles or grow back the clipped feathers - females seemed to grow feathers back faster.
4. Something unexpected happened to stressed individuals - trying

Free-Flight Macaws in a Planted Exhibit, continued

- to figure it out and correct it. In many cases it was incorrect sexing.
5. Free-flight birds are hard to catch!
 6. Interspecific - the juvenile tamarins, part devil, would delight in pulling tails, swinging on tails or playing dodge-um with that beak. For the most part, they get along well with the other birds and animals. They tend to get spooked by the Indian Giant Fruit Bats flying - but everything does.
 7. The macaws even ate the meat intended for the ibises. They were fed SBB and hard Monkey Chow. They make no attempt to raid other bird food plates which contain some fruit - nor iguana feed plates which are fruit and chopped vegetables.

This paper was presented at the 1978 AAZK National Conference.



ADDENDUM, August 1979

Recently, the zoo had to clip the macaws again and place them on an established perch. Changes in the population of macaws and changes in the population of the Rain Forest, seemed to have an effect on the individuals. They began chewing on plants. It seems that the success of this technique is highly variable, depending upon surrounding conditions and individual personalities. Initial success was good and very encouraging, later it deteriorated. Overall success has been termed "moderate", but it was an excellent learning experience.

It is interesting to note that the birds seem quite content on the perches and can sit in the shade of overhanging trees. They have access to tree branches that overgrow onto the perches...and they don't chew them...!

REPORT ON THE AAZPA WESTERN REGIONAL WORKSHOP

by
Michael Dee, Los Angeles Zoo, AAZK Representative

The AAZPA Western Regional workshop was a very successful conference. Roughly one-half of the delegates in attendance were animal keepers. The keepers from the Sacramento Zoo are to be commended for their outstanding contributions to make this a very worthwhile conference.

All the talks were very interesting, and elephants seemed to be an especially intriguing subject. George "Slim" Lewis' talk on elephants was especially well received.

Thirty-eight people attended a discussion on the history of AAZK, its goals, and importance and problems of local chapters. Marvin Jones is to be commended for his help during this discussion. Also, participation at the AAZK National Convention in Portland, Oregon was brought up.

Bill Meeker, his staff, the Sacramento Zoological Society, and AAZPA should be thanked for allowing AAZK to be actively involved in the AAZPA Western Regional Workshop.



SO YOU WANT TO BE A ZOO KEEPER?

by
Ed. Roberts, Sr. Zoo Keeper
Walter D. Stone Mem. Zoo, Mass.

There are those who believe that just because some one has an inherent love for animals, they could very easily become a keeper to work with wild animals in captivity. True, an affection for animals is a desirable trait for entering the zoo field, but there is a lot more to it than that. The glitter and dazzle of working in a zoo wears off in direct proportion to the piles of mess you clean up daily. Many a would-be keeper becomes sick to the stomach at some of the odors associated with zoo animals. As a matter of fact, some of these odors penetrate into your clothes and keeper friends of mine have been known to walk into a bar for a drink or two and in no time find themselves the only customers there.

Well, you may say, I've already had my taste of it out here and my stomach is in good shape, so I'm ready. All right, let's get down to some basics. The attitude of the embryo keeper must be such that he or she can withstand the boredom of routine daily work in the care, cleaning and disinfecting of animal quarters and compounds. Since the public is the first to notice how clean an area is, and also the first ones to complain about it, the trainee keeper must be instructed in the proper method of cleaning such quarters.

He or she must be able to work under variable climatic conditions: that in some places range from the upper 90's to well below zero. If you enjoy working outdoors then this may be your particular forte. Usually, the head keeper or a senior keeper will take the trainee on an orientation tour of the zoo introducing you to your fellow keepers, explaining the various animals in the zoo collection. He will then turn you over to an experienced keeper for training where you will learn that the emphasis of zoo operation will indicate punctuality in feeding schedules which are critical to the maintenance of the animals, cleanliness of their quarters, safety of the keeper and the public under all types of conditions and situations. There are times when the only person between the public and an animal is the keeper.

The trainee will be encouraged to ask questions about the breeding habits, gestation periods, animal peculiarities, winter and summer quarters, types and amounts of various animal feed products used for food, how to spot a sick animal and what to do about it, keeping record of food intake, births, deaths, breeding cycles, etc.

We have found, and I'm sure some of you more experienced keepers can attest to this, that through no fault of the trainee-keeper other than his or her trying to make a good impression, a more clumsy, uncoordinated individual can no where else be found! The trainee will trip and fall over hoses, rakes, shovels, brooms, tip over wheel barrows, leave cage doors open and unlocked, give out wrong diets to different animals, fall into moats and heaven only knows what else! But, eventually, out of this chaos there emerges a successful animal keeper who enjoys and understands the work with his or her animals and who is now able to keep a sharp eye out for any irregularities in their behavior.

continued

So You Want to be a Zoo Keeper? *continued*

Points to be taken into consideration by the head keeper in the training of new keepers are as follows: 1. reaction time, 2. observation, 3. initiative, 4. reliability, 5. mobility, 6. empathy, 7. drinking habits, 8. respect for animals.

I have put 25 years working in a zoo and have done some extensive traveling talking to other keepers, listening to their gripes, asking how they enjoyed working their animals and with them, whether they were large or small, feathered or scaly and so forth. I found it was reasonable to concede that they all enjoyed working with animals because they felt very strongly, that at least they were doing their part to preserve that which is only too fast disappearing from the face of the earth...the animal kingdom.

This paper was presented at the 1978 AAZK National Conference



Alternatives...Education and P.R.

The Animal Keepers' Forum receives newsletters and news releases from many zoos and would like to share some of the creative, stimulating educational ideas that these publications contain. The events are presented in a brief form to serve as an inspiration for ideas that can be adapted to your zoo and its needs and resources.

PHILADELPHIA ZOO SPONSORS 'SKETCH A ZOO'

Philadelphia hosted ninety young artists who sketched animals on the African plain. The youngsters, ages 6-18, were part of a program of art instruction.

Philadelphia plans to have easels, stools and drawing boards available for rent to encourage all artists to enjoy a day of drawing at the zoo.

BIRTHDAY CELEBRATION AT METRO TORONTO ZOO

The Metro Toronto Zoo 5th birthday party included many Toronto celebrities, a puppet show, special feedings for many of the animals, and a giant birthday cake for the elephants.

BRONX ZOO HOSTS ASIAN FESTIVAL

Wild Asia is the Bronx zoo's newest and largest exhibits area. Other animals of the world's largest continent can be seen in natural habitat displays in the World of Birds, the Reptile House and the Rare Animals Range Exhibits.

The Asian Festival was held one summer weekend and included the red kerchief dance of Mongolia, the martial arts of Thailand, and dancers and musicians from Tibet. These events highlight animals that visitors would most likely never be able to see in the wild.

PROCEDURES USED FOR THE PRODUCTION OF HYDROPONICALLY GROWN BARLEY

Hordeum vulgare

AT THE CHICAGO ZOOLOGICAL SOCIETY, BROOKFIELD ZOO

by

H. LeClere and S.J.H. Cogswell

Introduction. Hydroponics is the common term for soilless cultivation; or the use of any method for the growth of plants without the use of specially compounded soil based composts or natural earth. Douglas (1976) describes over thirty different hydroponic methods and leaves 2-1/2 pages blank for the student to add other methods that they might know. He lists the method used at Chicago Zoological Society as "fodder growing machiner" or "grass incubator". This method dates from the 1930's and its primary object is to provide an optimum environment for the germination and growth of grass fodder. The process normally takes from seven to ten days between planting and harvest; depending on the kind of seed used, temperature, humidity, methods of management, structure used, etc. This form of hydroponics is used at a number of zoos including the Bronx, Phoenix, Honolulu, San Diego, and Lincoln Park Zoos (Sullivan, 1976).

The Brookfield hydroponics unit is a "Magic Meadow", Model #224 manufactured by Hydroculture Inc., Glendale, Arizona. The unit has been in use for seven years and was originally acquired to provide a substitute for lettuce. While it is difficult to accurately estimate all costs, it has been conservatively estimated to save \$5,000.00 per year in foodstuffs that would otherwise be bought.

During the last five years, oat *Avena sativa* and barley *Hordeum vulgare* seed have been used, however certified barley is planted exclusively due to greater ease in handling and cleaning. The barley is planted daily with each day's planting being allowed to germinate and grow for seven days before harvest. This gives a continuous daily harvest year round.

Physical description. Table 1. The hydroponics unit is similar to a house trailer in that the exterior is vinyl coated aluminum and rests on a trailer undercarriage. The interior walls are plastic sheeting, the floor is fiberglass. Centered on the lengthwise wall, directly across from the entry door is a double-tubbed, galvanized sink. The sink drains have valve closure. In each quarter of the room is a set of shelves seven rows high. Each shelf is made from two parallel pipes off-set so seed trays will drain toward the wall. Each shelf will hold up to eight trays horizontally. Pipes closest to the center of the room carry water to spray nozzles for the next lower shelf.

There are two air conditioners, one mounted at each end. Mounted directly in front of and onto each air conditioner is a heating element. The temperature is thermostatically set at 19°C year round. Each air conditioner/heater is capable of maintaining unit temperature by itself, however there is some loss of homogeneity. This also causes excessive wear on the system.

There are two forty-eight gallon sumps, one at each end of the unit. Their primary purpose is to store water for use during the spray cycle and to collect water drained from the seed trays. A float valve acts to add water during the spray cycle and otherwise maintains water level. Water in solution with nutrients and sodium hypochlorite is pumped

Hydroponically Grown Barley, continued

from here every six hours for ten minutes.

Light is provided twenty-four hours a day by twenty cool-white fluorescent tubes set in the ceiling.

TABLE I. Specifications for "Magic Meadow", Model 224 Hydroponics Unit at the Chicago Zoological Society

Building

dimensions.....9'8" x 9'9" x 22'6"
shell.....plywood
exterior.....vinyl-coated aluminum
interior walls and ceiling...ABS plastic sheet
floor.....fiberglass painted with epoxy (BZ)

Heating and cooling

air conditioners (2).....8,000 BTU
each thermostatically controlled
heating elements (2).....2,000 watt
each thermostatically controlled

Light

lights.....20 cool-white fluorescent bulbs
5 waterproof fixtures, ceiling mounted
(BZ)

Water system

water.....approximate Ph 7.5, 1 ppm chlorine
sumps (2).....48 gallon capacity
water added by float valve
pumps (2).....each connected to one sump
controlled by electrical timer
spray nozzles (84).....3 per 8 tray shelf

Other

trays.....plastic, 12" x 36" x 2"
total tray capacity.....224

BZ = modification from original design by Brookfield Zoo

Daily harvesting, planting, and maintenance. Upon entering, the unit's temperature is checked and the entire unit is briefly checked for any signs of malfunction.

The bottom row of trays contain grass ready for harvest. Each tray is individually removed and harvested: i.e., the grass is removed from the tray and put into a large container set in the doorway. Both tray and grass are inspected for signs of mold or fungus. This process continues until all bottom trays are harvested.

Remaining rays are shifted down one shelf and across the aisle. This allows water to drain in a different direction through the seed and roots. This also gives a better distribution of light over the grass. Trays are set so they do not contact walls or shelving side supports, leaving contact only with the supporting pipes.

continued

Hydroponically Grown Barley, continued

One sink tub is filled with water as hot as is barely comfortable. Sodium hypochlorite (household bleach) is added to a solution of 500 ppm. Trays are scrubbed inside and out with all surfaces coming into contact with the solution. Extra care is taken on interior corners and drainage slots at the ends of the trays. The sink is then drained and rinsed.

The sink is again closed and a screen set into the drain. Seed to be planted for the day is put into the sink and another solution of water and sodium hypochlorite (500 ppm.) is added. The seed is stirred thoroughly to destroy air pockets and to even temperature variations in the water. This is to clean the seed and it should be noted that this is the first time the seed comes into contact with water. Currently, soak time is twenty minutes.

Planting simply consists of evenly distributing an allotted amount of seed into a washed tray, leveling the seed throughout, and setting the tray on the top shelf. One tray is done at a time.

The sink and tools used (bucket, screen, scoop and sponge) are washed in hot running water. The floor is swept of all dirt and debris.

Major cleaning is done every second day. The sumps are drained. A "Doodle-Bug" scrubber is used to clean all surfaces inside the unit. Surfaces are then hosed down, being careful not to splatter into the trays. Sumps are scrubbed and all residues washed down the drains.

On days when the sumps are not drained, the unit is not hosed down. Instead the floors are squeegeed into the sumps after being swept and residues removed. Since we are now running half the unit, floors are squeegeed to the sump on the side that does not have grass growing.

A 20-20-20 water soluble fertilizer is put on the floor to be drained into the sumps after the first spray cycle: twenty-eight grams on each end that is planted. Eight fluid oz. of a 5.25% solution of sodium hypochlorite is added to each sump.

The mean time spent in the above procedures is 1.5 hours per night including the period while the seed is being soaked.

Discussion. Ideal germination and growth temperature for barley is 21°C - 23°C (Douglas, 1976) in combination with the highly humid, wet environment of the grass incubator is a prime environment for molds and fungi. As a result, molds and fungi are an endemic problems and combating overt contamination to the grass is a primary operational problem. Procedures that aid in this situation can be discussed under three major headings: suitable cleaning and handling techniques, prevention of introduction, and manipulation of environmental variables.

Techniques used in handling and cleaning are regular, frequent, and thorough cleaning with an emphasis on identifying sources of contamination. It is essential that cleaning be done without contaminating another area in the process. Hosing is done in a sequence and manner that prevents the spreading of spores, etc. Special attention is given to areas, such as corners and behind pipes, where there is poor air circulation and a collection of moisture. Tools are used only for their specific operation and cleaned after use. When necessary, the design of the unit has been modified to eliminate sources of contamination.

continued

Hydroponically Grown Barley, continued

To prevent the introduction of contaminants, passage into the unit is regulated. During daily cleaning, etc., passage into and out of the unit is kept to three times including while the seed is being soaked. After the floor is squeegeed or hosed, access is denied to the interior. Routinely used tools are stored inside. Rubber overboots are worn and used only in this operation. Seed is disinfected before being put into the trays.

Also important in the prevention of introduction of contaminants is the use of Certified seed. "Certified" is seed that has been handled to maintain purity and genetic identity. Standards for specifications are maintained through various state agencies and co-ordinated by the International Crop Improvement Association (Hartmann and Kester, 1968). Standards for Certified seed are high and result in a cleaner seed than what is often found in other seeds.

Altering environmental variables often involves a trade in lower gross weight gain in barley for lower gain and proliferation of molds and fungi. This kind of compromise has resulted in the present setting of 19°C in interior temperature. Another environmental variable, the moisture accumulation at one end of the tray as opposed to the other, is changed by the daily shifting of trays from side to side. Also, cleaning processes are timed so the first spray cycle starts within sixty minutes after they are done. This gives the greatest amount of consecutive time possible for drying through the twenty-four hour day, while maintaining the integrity of a spray cycle once every six hours.

During the past five years, considerable variation in the performance of different varieties of barley has been noted. Due to this factor, there is an initial period of adjustment of the hydroponics machine. As an example, a recently procured lot of seed was introduced and during a trial and error period, procedures were changed until a peak in performance was subjectively observed. The changes were an increase in dry weight planted per tray, a raising of the interior temperature, and a shorter soak period.

In order to finely adjust the environment and to check the validity of the changes, it was decided to systematically explore the variables that might affect growth of the barley. A null hypothesis that there was no difference between a twenty minute soak period and a forty minute soak period in gross weight of harvested barley was selected. Forty-eight pounds dry weight of certified Barsoy barley was planted every day during two, twenty-one day periods. For one period, seed was soaked for twenty minutes; for the other, it was soaked for forty. Gross weight of each day's harvest was taken to the nearest half pound. Temperature of the unit when initially entering the unit and temperature of the soak solution was recorded for use in later studies.

Results were a mean gross weight of 334.74 lbs. per day's harvest for the twenty minute soak period and 321.07 for the forty minute soak period. A standard t - test for a difference between two independent means (Bruning and Kintz, 1968) was calculated with $t = 2.37$ and significant at $P = .05$ and insignificant at $P = .02$. (A t - test was also calculated for the unit temperature means with t being insignificant at $P = .10$.) Bases on these results the null hypothesis that there was no difference in stated soak times and a twenty minute duration was established as a consistent planting procedure.

continued

Hydroponically Grown Barley, continued

It has been essential for peak production that procedures be rigidly standardized, that there be accurate and consistent records to monitor production, and that the process not become static to the extreme where variations in the environment and materials cannot be adjusted for. Since fodder incubators are closed self-contained environments, the unit is ideally suited for the use of results from systematic methods of investigation for a basis in changing operational procedures.

Because of the performance variability of barley, it is again recommended that Certified seed be used because of its high standards in maintaining genetic identity and purity. This allows for a consistent performance and nutrition. When initially procuring seed, available lots are compared for purity (percentages of Variety seed, crop seed, weed seed, and inert matter) and germination percentage. Less than 90% germination is not acceptable. Before buying a specific lot, several bags of seed are tested in the unit for germination and all around suitability. Buying as much as possible of a specific lot number also aids in getting a genetically consistent seed.

Additional note. Table II contains nutritional analysis results for two hydroponically grown barleys. The Brookfield Zoo barley is Certified Variety Dickson, Lot #E1269-D65,620 (Wisc.) with a germination rate of 97%. Purity was 99.95 (inert: 0.03%; weed seed: 0.01%; Crop seed: 0.01%). It was analyzed 5/77 and grown as described in this paper. The other barley was grown and analyzed in South Africa (Douglas, 1976).

Due to the wide variation in nutrition of seed (National Research Council, 1972) according to the variety, location, and conditions under which it is grown, it is felt that this is of limited use. Another limitation in its use is that many species prefer one portion of the grass over another while the analysis data is for the grass as a whole. However, it is included here for the purposes of comparison and dissemination. See next page for Table II.

Acknowledgments. We would like to thank Bruce Brewer for his help in organizing and understanding the nutritional data and the Science and Technological Section of the Chicago Public Library for allowing us to check out books not normally available. Special appreciation goes to Gay Kuester for her last minute help in typing the manuscript; may her typewriters always be golden.

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TABLE II
NUTRITIONAL ANALYSIS RESULTS FROM TWO HYDROPONICALLY GROWN BARLEYS

	SOUTH AFRICA		BROOKFIELD	
	DRY	FRESH	DRY	FRESH
Moisture %		91.2		92.14
Dry Matter %		8.8		7.86
Crude Protein (Nx6.25) %	26.3	2.29	15.44	1.21
Fat %	n/a	n/a	3.67	0.29
Fiber %	25.3	2.22	24.46	1.92
Ash %	4.81	0.42	4.70	0.37
Nitrogen Free Extract %	n/a	n/a	51.73	4.07
Digestible Carbohydrates % ¹	n/a	n/a	53.10	4.18
Total Digestible Nutrients % ¹	n/a	n/a	69.90	5.49
Estimated Digestible Protein % ¹	n/a	n/a	11.27	0.89
Nitrogen %	n/a	n/a	2.47	0.19
Phosphorus %	0.84	0.073	0.41	0.03
Potassium %	n/a	n/a	0.45	0.04
Magnesium %	n/a	n/a	0.18	0.01
Calcium %	0.38	0.033	0.17	0.01
Sodium %	n/a	n/a	0.14	0.01
Zinc mg/kg	35.0	1.65	54.0	4.0
Iron mg/kg	n/a	n/a	198.0	16.0
Manganese mg/kg	10.5	0.91	19.0	1.0
Copper mg/kg	35.0	3.04	99.0	1.0
Aluminum mg/kg	n/a	n/a	128.0	10.0
True Vitamin A	n/a	n/a		4900.0 USP / lb.
Vitamin E (total Tocopheral)				171.3 IU per lb.
β -carotene mg/kg	237.0	20.6	n/a	n/a
Selenium ppm	n/a	n/a	n/a	0.014

n/a = analysis result not available

1 = calculated for lactating cattle

South African barley green fodder from farm hydroponics unit and analyzed by J. Muller Laboratories, Capetown (from Douglas, 1976).

Brookfield Zoo barley green fodder from hydroponics unit and analyzed by United States Testing Inc., Rochelle, Illinois.

This paper was presented at the 1978 AAZK National Conference.

Nine Puerto Rican Parrot chicks have increased the wild population count to 28 during 1978. Wild populations reached a low of 13 birds in 1975.

BREEDING SNOW LEOPARDS AT THE OKC ZOO:
THE APPLICATION OF RECORDS-KEEPING TO HUSBANDRY AND MANAGEMENT

by
Steve A. Clevenger
Animal Technician II

Captive propagation is necessary to the very survival of some species today. This is unquestionable. However, if we attempt to breed animals in captivity without keeping a detailed record of all their interactions, we are neglecting not only a very useful descriptive tool, but also a means of actively changing husbandry and management practices to increase the probability of births and hatchings.

The solitary nature of the snow leopard *Panthera uncia* and the relative inaccessibility of its habitat combine to make this very uncommon cat rare in captivity. Recent studbook figures indicate a world captive population of 169 individuals. Continued persecution in the wild (despite protection) and their natural scarcity further point to the need for captive propagation and careful management of the species. No species deserves the fate of extinction.

In 1975, we began taking steps to consolidate four welded-wire "corn-crib" style cages in the breeding area into a single facility for maintaining (and hopefully breeding) 1/3 Snow leopards. This was accomplished by joining the four separate cages with three foot square chain-link fencing tunnels which are closed by sliding or guillotine doors. This configuration, when used with the dens in each of the cages, allow us to introduce the male to as many as three different females at one time. It also allows for denning in the event of pregnancies.

Our quest for reproductive success with this species began with four animals, all of which are first generation captive-born. The females are all Oklahoma City born: "Damascus" in May of 1972, "Elektra" in May of 1974 and "Tangla" in June of 1975. The male of our group, "Old Man" was received in October of 1975 and was born in San Francisco in 1970. By the latter part of 1975, the facilities were completed and all the animals were in place. We began introducing the male to the two older females at this time for roughly two week periods. We have continued to switch the male back and forth based mostly upon outward indication of estrus in the females. This method has been fruitful in producing four births in the last three years.

In the middle of January 1976, "Old Man" and "Damascus" were introduced. As with subsequent introductions, the female in each case was the more dominant animal. Copulation was observed and/or heard (snow leopards have a distinct vocalization while mating) early in February and late in March. Early in June "Damascus" did not eat for three straight days. Ninety days after the first recorded copulation, "Damascus" gave birth to two male kittens.

"Old Man" was introduced to "Elektra" in February of 1977. Late in March breeding was observed and heard for approximately 30 minutes one afternoon. Because of this single isolated instance of copulation, the male and female were not separated (as is generally done when we suspect an animal is approaching parturition). Ninety-six days later "Elektra" gave birth to 2/1 kittens. Subsequently, none of this litter survived. "Elektra" had barely attained puberty (at this time she was 3 years, 2 months old), the litter was fairly large and all the kittens seemed relatively small at birth.

continued on next page.

Breeding Snow Leopards at the OKC Zoo, continued

"Old Man" remained with "Elektra" on into the winter months of 1977 and in the middle of February copulation again was observed over a two day period. By the middle of April, she was showing an obvious weight gain and began staying in the nest box at night. She did not eat starting 25 May 78 and three days later we heard kitten noises from the nest box. The gestation was 101 days.

In the fall of 1978, "Damascus" and "Old Man" were re-introduced. Copulation was observed on 3 Dec 78 and heard throughout the next three days. By the middle of February, 1979, "Damascus" was "definitely" pregnant and on 11 March became extremely seclusive, not eating and staying in the den all the time. Two days later she gave birth to 2/1 youngsters. Gestation was 99 days.

Thus far attempts at introducing "Old Man" and the young (three and a half year old) "Tangla" have resulted in several aggressive encounters. We do not feel that this is an indication of incompatibility. "Tangla" was first introduced to "Old Man" in the late stages of puberty. There seem to be strong indications also that on those occasions when we've attempted introduction, "Tangla" has not been in estrus.

By consulting the records of these animals, we can not only get an overview of snow leopard behavior in captivity, but may also draw several conclusions concerning their reproductive behavior. These may then be applied to husbandry and management of the species.

Past records indicate several things:

1. All observed copulations which resulted in births occurred during the period of December through March.
2. The average of the four gestation periods is 98.5 days.
3. The females in three of the four births became extremely seclusive for short periods immediately prior to giving birth.
4. In two of the four births, the females stopped eating (or their appetites decreased significantly) just before copulation occurred.

These four generalizations may be applied to future husbandry in the following ways:

1. Indications are that (like all snow leopards) our females are seasonal breeders during the winter months. Introducing the male regularly to each female for a short period of time during the period November through mid-March would create conditions most favorable to breeding.
2. The average gestation period of our females will allow us to accurately predict dates of birth after an initial breeding is recorded.
3. Extreme seclusiveness will be viewed as an indicator of immediately impending birth.
4. A decrease in appetite during the receptive period (November through March) will be viewed as the onset of estrus, giving us an indication of the best possible time to introduce the male to a female coming into heat.

By controlling the period and frequency of introduction, we hope to more efficiently produce young in this species without causing undue reproductive stress in our adult animals.

continued on next page.

Breeding Snow Leopards at the OKC Zoo, continued

These conclusions came about primarily as a result of consulting our animal records. Records are a readily available tool to assist zoo professionals in their day-to-day duties. By devoting a small amount of time daily to this simple task we stand to reap great rewards in furthering conservation, in improving our husbandry methods and in simply taking better care of our animals. Records-keeping may be approached in three steps:

1. Record carefully noticeable changes in behavior regardless of their apparent relation to the events of the day.
2. So much as is possible, retain the recorded material for as long as you can.
3. Periodically, review the material to check for generalizations which may be drawn from the material, trends which may be identified or potential problems which might develop. In reviewing records I have found it very helpful to wait for a period of 8 weeks before looking back in the files - this tends to give one a more detached and objective view of the situation.

By cultivating the habit of recording significant or possibly significant changes in the behavior of our animals, we stand to benefit in two ways: At the very least, we become more knowledgeable of and acquainted with our animals. We may also be able to contribute positively to the propagation and maintenance of all animals in captivity. And, after all, isn't that what zoo-keeping is all about?

IN MEMORIAM



Our Topeka Zoo family suffered a great loss with the untimely death of Carl Joseph "Joe" Dreyer, Jr. He was killed in a one car accident on 13 July 1979.

Joe was a Senior Keeper on our staff and recently was promoted to Area Supervisor. He was a familiar sight in the Animals and Man building, as he regularly worked that area and the gorillas and orangutans were four of his favorite animals. He was well liked and respected by his professional colleagues, and was extraordinarily polite, patient, and helpful with questions from the Zoo Docents and other volunteers. Joe was a favorite with the school children whenever he was asked to speak to any of the Zoo classes.

All of us on the Zoo Staff are extremely grieved at this tragic event. Joe's life was much too short, and he left his mark on each of us in one way or another. An appropriate memorial for him will be developed at the Zoo. Contributions may be made to the Joe Dreyer Memorial Fund in care of the Zoo.

Gary K. Clarke, Zoo Director

An illustration of Joe appeared on the cover of the June, 1978, edition of the Animal Keepers' Forum. He was portrayed feeding a rainbow lorikeet. He was truly dedicated to professional animal care.

??? INFORMATION PLEASE! ???

I am seeking any information regarding Wobbler's Syndrome in Zebras. Thank you.

Marcia Arland, Animal Keeper
Indianapolis Zoo
3120 East 30th Street
Indianapolis, IN 46218

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We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available listing. This is a monthly service to us, for you.

DEPARTMENT HEAD/DESIGN AND EXHIBITION... responsible for design and production of educational and exhibit materials. Supervise the activities of department personnel and contract workers, and work with other zoo staff, supplying creative input to the needs and desires of zoological, educational and visitor services managers. Demonstrated managerial abilities mandatory. Must have broad-based knowledge in graphic arts, technical illustration, industrial design, or equivalent in training and experience. Salary range: \$18,000 - \$25,000, plus excellent fringe benefit package. Applications should be sent to Personnel Manager, Brookfield Zoo, Brookfield, IL 60513.

HORTICULTURIST/MANAGER... responsible for organizing, planning and supervising day-to-day activities of large horticultural staff. Full spectrum of horticultural work required for 2000-acre park. Excellent salary and fringe benefits. Send resume, including education and work history to: Personnel Manager, Brookfield Zoo, Brookfield, IL 60513.

ZOOKEEPER/HOOFSTOCK... responsible for animal care and management in an expanding zoological garden. Requires a minimum of three years' experience and references. Excellent salary and benefits. Contact: Dale Stastny, Personnel Director, Audubon Park & Zoological Garden, P.O. Box 4327, New Orleans, LA 70178

SUPERVISOR... responsible for supervision of animal care in quarantine stations and a holding facility. Veterinary background an asset. Salary commensurate with experience. Send curriculum vitae and photograph to Michken Corporation, 01314 Charlevoix St., Montreal, Quebec, CANADA H3K 2Z0. (514) 935-9174 or 937-2577

BIRD/REPTILE CURATOR... responsible for diverse bird and reptile collection. Share supervisory duties for entire keeper staff with mammal curator. Will take part in renovating design of present facilities and master planning of new exhibits. Responsible for research programs, as well as public and professional presentations. Degree in applicable field and at least two years' experience in the care and maintenance of exotic birds and reptiles, with at least one year in supervisory position. Professional work may be substituted for formal education. Salary: \$13,000 - \$15,000 annually. Reply to: Minot Ortolani, Interim Director, Buffalo Zoological Gardens, Delaware Park, Buffalo, NY 14214.
EQUAL OPPORTUNITY EMPLOYER.

INFANT CARE SPECIALIST/KEEPER... provide care to orphan neonates full time and keeper assistance to Children's Zoo during exhibit season. Qualifications should include supervisory keeper experience; neonate husbandry and medical/veterinary experience; behavioral observation training; working knowledge of exhibit repair and minimum of two years' college education. Salary: \$9,268. Send resume to: Director of Veterinary Medicine, Boston Zoological Society, Franklin Park, Boston, MA 02121. Closing date 1 October 1979.

ASSISTANT CURATOR/MAMMALS... requires Bachelor's Degree in Zoology and closely related field plus two years' supervisory experience in a recognized zoological park or five years' experience in a zoological park, three of which must be in a supervisory capacity. Prefer in-depth

opportunity
conk

OPPORTUNITY KNOCKS, *continued*

experience with carnivores and hoofstock, plus organizational skills. Responsible for assisting the Curator of Mammals in management and exhibition of mammal collection, administrative duties and research. Contact: Dale Stastny, Personnel Director, Audubon Park and Zoological Garden, P.O. Box 4327, New Orleans, LA 70178

ZOO KEEPER... knowledge of and experience in caring for hoofed animals. Starting salary \$10,500. Excellent fringe benefits. Send resume and references to Robert Lotshaw, General Curator, Cincinnati Zoo, 3400 Vine Street, Cincinnati, OH 45220.

ZOOKEEPER/LABORER... applicants with previous experience preferred. Excellent benefits, starting salary \$11,648 per annum. Send resume to: Roger Valles, Director, Roger Williams Park Zoo, Providence, RI 02905

* * * COMING EVENTS * * *

AMERICAN ASSOCIATION OF ZOO KEEPERS NATIONAL CONFERENCE
September 24-27, 1979 Portland, Oregon

AAAPA National Conference
September 30-October 4 St. Louis, Missouri

Annual Convention of the American Association of Zoo Veterinarians
October 7-11, 1979 Denver, Co

Second Annual Symposium on Captive Wildlife
October 26-29 Louisville Chapter AAZK

Contact: Steven Taylor
Louisville Zoological Garden
1100 Trevilian Way
Louisville, Kentucky *see p. 130, July AKF*

Regional Conference for Zoo Support Organizations
October 27-29, 1979 Louisville, Kentucky

World Conference on Breeding Endangered Species in Captivity
November 12-16, 1979 San Diego, Ca *see p. 96, May AKF*

World Conference on Sea Turtle Conservation
November 26-30, 1979 Washington, D.C.

VIIIth Congress of the International Primatological Society
July 7-12, 1980 Florence, Italy

* * * * *

? ? ? INFORMATION PLEASE! ? ? ?

Information (references, personal communications, etc.) is wanted concerning breeding and maintaining river otters *Lutra canadensis* in captivity.

Regina Grebb, Animal Keeper
Pittsburgh Zoo
P.O. Box 5250
Pittsburgh, PA 15206

? ? ?

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10" (15 cm. x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.



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**SPECIAL
ELECTION ISSUE!!**

Dedicated to Professional Animal Care

OCTOBER 1979

Editor-in-Chief: Ron Kaufman, Topeka Zoological Park
Executive Editor: Mike Coker, Topeka Zoological Park
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The October cover illustration is by John Wiessinger of the International Crane Foundation. The ICF is proud to announce the hatching of a Brolga Crane Chick (see article under Births and Hatchings). Congratulations!!

SCOOPS and SCUTTLEBUTT

The 1980 National Conference of the American Association of Zoo Keepers will meet in Montgomery, Alabama. It will be hosted by the active chapter of the AAZK of the Montgomery Zoo, the zoo, the Parks and Recreation Department and the Dixie Zoological Society. They are planning a red carpet welcome for their fellow keepers from around the country.

PHILADELPHIA ZOO DISPLAYS ASIATIC LIONS

Three rare Asiatic lions were given to the Philadelphia Zoo by the Provident National Bank in the name of its employees. Two young females and one male give the zoo the opportunity for captive breeding and eventual restocking of the original habitat. The Asiatic lion was slaughtered almost out of existence by 19th century trophy hunters. Numbers were further diminished by advancing civilization and altered habitats. About 200 of the lions exist in the wild in and around India's Gir Wildlife Sanctuary.

PYGMY C. IMPS SENT TO YERKES PRIMATE CENTER. Alan Sharples

On May 29, 1979, 1.1 Pygmy Chimpanzees were transferred from the Atlanta Zoo to the Yerkes Primate Center. They will join Laura, a female born at the San Diego Zoo, who went to the Center several months ago. The male, Bosondjo, on loan to Yerkes from the Zaire government, was sent to the zoo on April 21, 1978, to meet Laura and was joined a few weeks later by Laura's sister Lorel. Despite frequent matings, no pregnancies occurred and this was the reason for the transfer, as it was felt that the Primate Center was better equipped to deal with any reproductive problems. With only a dozen individuals in the U.S. and most of them descended from one pair - Kakowet and Linda at San Diego, we hope that this breeding project will be successful.

ARMADILLO AN AMBASSADOR FROM BROOKFIELD TO RUSSIA

"Artie" armadillo traveled 5,600 miles to become an ambassador in an exchange program between Brookfield Zoo and the Moscow Zoo. Brookfield had an armadillo, but Artie will be somewhat exotic in Moscow, Director George Rabb explained.

BIRTHS HATCHINGS

FIRST HATCHING OF BROLGA CRANE

Chris LaRue, Head Aviculturist
International Crane Foundation

On August 30, 1979, the International Crane Foundation hatched its first Brolga Crane *Grus rubicunda*. This bird is believed to be the first of its kind ever hatched in the United States and possibly the first outside of Australia.

ICF received 4.1 Brolga Cranes through the Australian government in 1974. One male was selected to pair with the single female and they were placed in a 45' x 60' enclosure. In an attempt to simulate the Australian rainy season in which they breed, a water sprinkler was used in the pen for three years without success.

This year the artificial rain was intensified by using three 25' soaker hoses and watering for 1 hour in the morning and 1 hour in the afternoon. Student researcher Kate Lindsay operated the watering system daily and recorded behavior during and after the rain.

The male Brolga began producing good semen at the beginning of May and continued through August. The female Brolga laid her first and only egg on July 30, 1979. The brownish spotted egg weighed 198.6 grams and was incubated at 37°C dry bulb and 30°C wet bulb. During the incubation period the egg showed a 13% weight loss. The egg was automatically turned every two hours while in the incubator. On day 26 of incubation, the egg was moved to the hatcher and was not turned thereafter.

The silver gray chick which was produced through artificial insemination hatched after an incubation period of 31 days. The chick actually pipped on day 30 and was helped out 28 hours after piping. The chick weighed 122.1 grams after hatching and is being reared on a 23% protein starter diet in 1/8" pellet form. The adult Brolgas are fed a 20.5% protein breeder diet in 1/16 pellet form.

MALE AFRICAN ELEPHANT BORN AT GLADYS PORTER ZOO IN TEXAS

"Fanti" a male African Elephant *Loxodonta africana*, was born 20 May 1979. at the Gladys Porter Zoo, Brownsville, Texas. Fanti is a Swahili word meaning "sir," an appropriate title for an animal that will one day weigh seven tons! The baby was 200 pounds at birth. Gestation period was 21 months, 17 days.

AFRICAN BONGO ANTELOPE AND GIBBON BIRTHS AT STONE ZOO

On July 30, the birth of a rare African Bongo antelope occurred at the Stone Zoo, Boston, and was recorded on video tape. The baby, a male, weighed a healthy and above-average 59 pounds at birth, and keeper Mark Crosbie reports the Bongo baby, still nursing, is exploring and adjusting well to his environment.

A male gibbon was born at Stone zoo on August 14 in the Children's Zoo.

SEVENTH ORANGUTAN BORN AT ATLANTA ZOO. Alan Sharples

Sungei, 25 years old, gave birth to a female infant on June 16, 1979. The infant has been named Penari, which is Malay for Dancer. The father is 24 year old Bukit. He is also the father of Molek, a male born on June 24, 1978. His mother is Sibou, 25 years old. Both infants are being raised by their mothers.

Sibou is a noteworthy Orang, as her first baby, a female named Seriba, was the first Orang to be born at the Yerkes Primate Center. She is also the mother of Pensi, a female now at the National Zoological Park.

All of the Orangutans (2.3) at the Atlanta Zoo belong to the Sumatran race *Pongo pygmaeus abelli*.

MONKEY BIRTH AT ATLANTA ZOO Alan Sharples

On June 28, 1979, our pair of Spot-Nosed Guenons *Cercopithecus ascanius schmiti* gave birth to a male infant. The mother guarded the baby very closely, making observation difficult.

This viewing problem wasn't improved any by the father who became quite defensive, rushing to the front of the cage whenever any of the primate keepers were within sight. Unfortunately, the infant was found dead on the morning of July 1. The cause of death has yet to be determined.

A premature still-born infant was found in November, 1978. This was the female's first pregnancy, and the loss of the infant was attributed to the young age of the mother.

Our adult pair was born at the Birmingham Zoo, Alabama.

BLUE LORIES HATCHING AT SAN DIEGO ZOO

Tahitian blue lories, *Vini peruviana*, among the world's rarest bird species, have hatched and are being raised at the San Diego Zoo, Dr. Arthur Risser, curator of birds, announced.

"A male and a female blue lory chick are out on their own, away from the nest and their parents are sitting on another clutch of blue lory eggs," Risser said. "In addition, two other blue lory chicks have hatched and are being cared for in the nest by another set of parents."

This is the second recorded successful breeding of the strikingly-colored parrot-like birds in captivity. Risser attributed the Zoo's success in rearing birds of the parrot family to an experienced group of enthusiastic bird keepers.

CAPYBARA AND NILE HIPPO BORN AT BALTIMORE ZOO

The Baltimore Zoo is extremely pleased to announce 2 births. Five capybaras, the world's largest rodents, were born, a first for the Baltimore Zoo.

The other birth is a Nile hippo. This is the first to be raised successfully. It was not a planned birth. The mother was obtained from another zoo, with assurances that she was not pregnant. She was!

THE KEEPER'S ROLE IN ZOO ANIMAL HEALTH

by
Judie Steenberg

INTRODUCTION

More than ever before in the history of zoos, wild animals in captivity should be receiving optimum care and treatment for their general good health and well-being. This is not to say that zoo animal medicine has reached its peak. On the contrary, it must still be considered to be a new field of veterinary medicine. My statement regarding optimum care is based on the many advances that have been and are being made in zoo animal medicine, increased training and participation of zoo personnel and an over-all cooperative attitude.

In recent years many zoos have employed veterinarians on a full-time basis to tend to the medical needs of the animals in their collections; other zoos have part-time veterinary services based on daily or weekly visits and emergencies. Some zoos must still rely on veterinary services on an on-call or emergency call basis only, and a few zoos have Directors who are also Doctors of Veterinary Medicine.

Other medical staff, occasionally found in zoos, are veterinary technicians or assistants, lab-technicians and pathologists. Most zoos rely on local laboratories to run tests on blood, urine or tissue samples.

This paper deals specifically with the role of the animal keeper in zoo animal health. In actuality, the keeper is at the end of the line in a zoo's chain of command regarding animal health, coming after the director, assistant director, curator, zoologist, head or supervisory keeper and perhaps even after other keepers with more seniority. However, the keeper responsible for the daily care of zoo animals, and especially the keeper of a sick or injured animal, is in a unique and important position. Yet it is a tenuous position, dependent upon several things on the part of the keeper, the administration and the veterinarian; namely attitude, personalities and policies.

- the role a keeper can play as an integral part of a team effort in a zoo's animal health program should be recognized.
- the keeper must be aware of his or her relative position in a zoo's animal health program in terms of accurate observations and communications, following directions on care and treatment, and maintaining a cooperative attitude.

Before a keeper can be a participant in an animal health program, there must be some training or background to draw from. Zookeeper training programs may or may not provide this basis. As a minimum instruction a keeper should be made aware of what procedures to follow when an animal is sick or injured. Some zoos have keeper training programs which include preparing a keeper to participate more fully in animal health. Regardless of a zoo's training program, individual effort and self-preparedness, on the part of the keeper, will probably be the key factor as to whether the keeper is a help or hindrance to the animal, to other zoo personnel and the veterinarian in a time of need.

KEEPER, KNOW THYSELF

One of the definitions of "attitude" is ... a manner of acting, feeling or thinking that show one's disposition, opinion, etc.. An attitude can

The Keeper's Role in Zoo Animal Health, continued

be reflected as a spontaneous reaction to an emotion or experience, or it can be developed as a vital part of an individual's personality. Keepers' attitudes regarding the well-being of animals in their keep may range from anthropomorphic to antagonistic, or, on the other hand, can be rational and cooperative.

Animals often elicit an emotional response from keepers, especially if something has happened to cause the animal discomfort. These emotions may intensify if the keeper immediately responsible for the care of a sick or injured animal feels helpless to relieve the problem. The attitude reflected by the keeper of a sick animal can have an effect on the speed and efficiency with which the animal receives medical attention. The rational, cooperative keeper will evaluate the situation, take whatever immediate action is necessary and, according to the seriousness of the problem, notify the proper people.

The keeper with an antagonistic or know-it-all attitude who cannot, or will not, accept the role of others in treating a sick or injured animal, can hamper proper treatment and complicate the condition. This attitude can also cause the breakdown of communication and cooperative efforts and in the end result in feelings of resentment toward the keeper. The keeper who tends to be anthropomorphic or anthropathic and doesn't deal with the problem, may not be capable of being objective and realistic regarding the care and treatment of sick animals. These attitudes are difficult for other people to work with and should be avoided.

Although it may seem, to some keepers, that going through the chain of command to notify the veterinarian that an animal needs attention is an unnecessary waste of time, it serves two important purposes. It can put the keeper in contact with several members of the zoo staff. This would be the case in zoos where the policy is that the keeper contacts the senior keeper, then members of the administrative staff and then the veterinarian, instead of passing the responsibility to another person and then sitting back and waiting. There are pros and cons to this method and the individual keeper must be considered. This would not work with all keepers but would be most effective in establishing good working relationships with the rational, cooperative keeper and his administrators and veterinarian.

The second important advantage of going through a chain of command is that everyone concerned has been notified of the problem and, therefore, may be able to help. At least they have been apprised of the situation. Whatever the zoo's policy is, the keeper should work within the system rather than against it. If there are serious problems in the chain of command and in communicating information, they should be dealt with and the problems resolved.

The attitude expressed by a keeper and the relationships that are developed are what the keeper's reputation is based upon. A keeper should take care to establish a good reputation with immediate co-workers, supervisory personnel, the director and veterinarian. The reliable, capable, cooperative and knowledgeable keeper who can communicate is an important part of zoo animal health.

Also of importance is that the keeper understand and work within his or her degree of authority. This applies to the apprentice or novice level up through senior or supervisory levels, and keepers should act accordingly. It should also be remembered that with increased authority comes increased responsibility to act.

continued

The Keeper's Role in Zoo Animal Health, continued

When keeper professionalism is discussed, many qualities are listed. The keeper "is the first to begin to interpret some communication from the individual animal" (Nall 1972-73). How well the keeper responds to that condition has a great deal to do with professionalism. "Zoological medicine is in its infancy" and "we as keepers and veterinarians are working toward the same goal. We can benefit ourselves and our animals only by working together and sharing our discoveries" (Stoskopf 1975-II:2). On the other hand, the keeper who hoards information as "professional secrets" can hinder the progress of an animals' recovery. Such a person doesn't belong in a zoo.

Another potential attitudinal problem is over-dedication; coming to work no matter how debilitated, no matter how sick the keeper feels. Zoonoses, defined as 'a disease that can be transmitted to man by vertebrate animals' (Webster 1970) works the other way, too. A sick keeper can transmit disease to animals as well, especially to primates. In "Zoonoses and the Animal Keeper" (Bielitski 1977), keepers are reminded to consider the possibility that they may also carry bacteria and viruses from home to work, from persons with whom the keeper lives, from pets kept at home and from farm animals the keeper may be in contact with.

Another point regarding a keeper's attitude is that all animals should be equally well cared for; the small, insignificant animals deserve the same consideration regarding their welfare as do the more exciting, expensive animals.

Communication

For a keeper to be effective in his or her role in zoo animal health, communication skills must be developed to share information with others and also to seek out the knowledge and advice of others. There is an art to asking and answering questions. The way a question is phrased and presented drastically affects the type of response. Conversely, the way a person answers a question generally reflects a person's attitude, training and personality. Questions should be a means to learn more about a situation or to share information with others, not to challenge someone's position. Well-intended, well-phrased questions will usually bring about the information being sought. Demanding answers to questions may result in no answer at all and have a closed door effect.

Note-taking and record-keeping are important to all concerned. "Proper recording of information is important to document techniques, routines and data for the benefit of all employees and for analysis:" (Peel 1975). Important data should not be trusted to memory. The experienced as well as a novice keeper would do well to carry a small notebook and pen or pencil to record observations and data as soon as they become apparent. The next best practice is to record notes at the first opportunity. It is conceivable that a new keeper would spend time taking notes throughout the day, until procedures, the facilities and especially the animals become familiar. Veteran keepers may only take notes occasionally, but must take care not to take too much for granted and thereby deny others the benefits of his or her experience.

Records in zoos vary a great deal as does the keeper's participation in record keeping and data retrieval. Fortunate is the keeper who is allowed to participate in the record keeping system. Data retrieval from a zoo's records is as important to a keeper's training as is the case history to the veterinarian. However, regardless of the keeper's position in relation to the zoo's recording keeping policies, there is value in

The Keeper's Role in Zoo Animal Health, continued

keeping a "keeper's notebook". It can serve as a means of review and for sharing experiences and information with co-workers.

The sharing of information is especially important between the keepers in an area, such as the regular and relief keepers. The responsibility of informing the other keeper lies with the keeper directly involved with a new situation. This does not, however exclude the less-informed keeper from asking questions about an animal's condition or a prescribed treatment if not properly informed. "I wasn't asked" or "I wasn't told" are no excuses for not briefing each other when problems with an animal's health and welfare are apparent, and such attitudes should be reprimanded. A keeper returning to work from days off should seek information to be brought up-to-date on the condition of all the animals in the area.

Personality Traits

"Keeper, Know Thyself" should include a self-evaluation of one's personality traits, both the strong and weak characteristics.

Awareness is knowing what's taking place; observing and interpreting what one sees, hears or feels, knowing what conditions are present. Some people seem to be naturally observant, but actually, "we see only what we know". (Goethe). It is possible for a keeper to develop powers of observation by watching things with an active, inquiring mind; by learning as much as possible about the animals being kept.

Ego must never interfere with the welfare of a keeper's animals. Self-confidence is important but over-confidence can be dangerous to the keeper, the animals and anyone else involved in a situation. A zoo is not the place to bolster one's ego. Super-egos not only lose sight of what the process of animal health is about, but can interfere with the beneficial actions and attitudes of other keepers. Wearing decorative scarves, or jewelry, pendants, necklaces, bracelets, etc, to enhance the appearance of the keeper is inadvisable. Such items can be attractive to some animals and if given an opportunity grabbed by the animal and ingested. The concern here is not for the personal loss to the keeper but for what effect an ingested item will have on the animal. An informed, conscientious keeper is aware of this possibility and takes care to keep easily-grabbed pens or pencils, pack of cigarettes, glasses, keys or any other loose items well out of the reach of primates, elephants, raccoons or any other animal that has the physical ability and inclination to take such items.

At some time during a keeper's career, it will probably be necessary to handle a situation where a member of the public is teasing or actually injuring animals. It is a time when self-control may be difficult and the keeper would prefer to take the offenders to task rather than dealing with them rationally. The immediate objective is to make the harassment stop! Whether a keeper can handle the situation alone or needs help from other keepers or security personnel depends on the situation. The keeper should be prepared, mentally, to size up the situation and deal with it in the best way possible. When dealing with the public, the keeper is always serving in the role of public relations agent and even at a time like this, an effort should be made to remember that role. Generally wrong-doers cease their actions when they realize they've been caught and often will leave the area on the run. But, if not, a keeper should keep cool-headed and act promptly.

continued

The Keeper's Role in Zoo Animal Health, continued

Another emotion-charged situation is the emergency. It is also a time when cool-headedness and composure can help relieve the problem while panic and hysteria only add to it. It's not unusual for the novice keeper to become somewhat excited in an emergency situation, but as long as the excitement is under control and the keeper can function properly, he or she can still be of help. A keeper's calmness during a time of excitement can have a quieting effect on the animals, too. If a keeper realizes he or she has a problem controlling emotions or has an aversion to pain, blood or death, it is best for all concerned for the keeper to come to grips with the problem. If that's not possible, if the emotional reaction is too strong to cope with, then it must be realized that this particular keeper cannot be depended on in an emergency.

Another personality trait that could have a serious, negative effect on the health of a zoo animal is a keeper's inability to admit mistakes. Everyone has and will make mistakes. If a mistake is serious and causes an animal to be injured or become sick, it must be admitted to facilitate treatment. An example of this would be the over-graining of an equine. The quantity and kind of grain fed is important for the veterinarian to determine the degree of seriousness of the situation and to know what to be prepared for to treat the animal. Withholding such information could result in the treatment not being effective and the animal becoming permanently lame.

Self-preparedness

A keeper can do several things to improve his or her value as a participant in the health of zoo animals. Again, knowing the zoo's procedures and policies can facilitate treatment of a sick or injured animal. A keeper should not be asking 'who do I call' or 'what do I do' but should be acting instead. Knowing a routine and the animals well comes from being observant, asking questions and taking notes. It also requires some effort on the keeper's part to research the natural behavior of the animals being cared for. "For the keeper to begin to determine the abnormal, he (she) must fully understand and know the normal" (Nall 1972-73). A keeper may or may not have time to do this research during working hours, but in either case it is important that it be done. Another invaluable source of information is the zoo's records. Although quite time-consuming, reviewing the history of each animal being cared for will reveal important useful data.

Until working in a zoo, a keeper may not have heard words such as amplexus, cloacal, monotreme or olfaction, must less agonistic behavior, colostrum, ecdysis or fecal. Becoming familiar with the definition of words such as these, and many others, will aid in communications. Here again it's up to the individual to make the effort to learn zoo terminology. A good way to start is simply to ask for the meaning of unfamiliar words. Note-taking helps and a dictionary is indispensable. The AAZPA* Zookeeper Training Guide lists more than 150 such words with definitions. Most zoos have a copy of the guide.

An understanding of basic medical terminology can be an asset in communications between the veterinarian and keeper. Many of the definitions of basic medical terms can be learned through self-study. Local libraries have such books as Learning Medical Terminology Step by Step, Young and Barger. A keeper might also consider taking a medical-terminology course at the local Vocational-Technical school. In any case, when a medical term is used or instructions given using medical terminology,

* American Association of Zoological Parks and Aquariums.

The Keeper's Role in Zoo Animal Health, continued

if the meaning of a word is not fully understood the keeper should ask for an explanation.

Zoo books have become more common in recent years and some care must be taken when purchasing some of these books. Care should be taken that they are authoritative. If there is but one set of references that a keeper should become familiar with, it would be the International Zoo Yearbooks. Published on an annual basis, the Yearbooks are described as "...an indispensable publication for everyone concerned with care, conservation, biology and behavior of wild animals" (IZY 1976). Each volume contains a section on a specific topic. Other sections contain articles on breeding, husbandry, hand-rearing, buildings and exhibits, conservation, education, veterinary care and statistics and surveys. There are many other good references, some old stand-bys and others published in recent years. Some of the most helpful references are listed at the end of this paper. (ed. note: at the end of the last installment) Reading is a form of self-education that should never end.

In a keeper's day it's hard to imagine that something hasn't happened that's worth making a note of for future reference. A seemingly insignificant observation can later be the key to further discovery. Note-taking is a habit that can be developed. The tendency to keep notes whether on a personal basis or for the zoo's records may diminish in time. A keeper should guard against this happening. Beyond note-taking, a keeper should seriously consider writing of his or her experiences and observations for sharing with others in the zoo field. And this does not just apply to animal health. Ideas and knowledge should be communicated, shared with others who can use the information to better care for their animals.

While preparing oneself to become a more knowledgeable keeper through self-study, it would be well to remember that "chance favors only the prepared mind" (Beveridge 1957).

"Keeper, Know Thy Animals" and the Bibliography will follow in future issues of AKF.



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REVERSIBLE VASECTOMIES TRIED ON LIONS

by
Richard P. Heithaus, Lion Keeper

Two male lions from Wild Animal Safari, Kings Mills, Ohio, were the subjects of a new type of vasectomy. In this new procedure, each lion was fitted with two implants in their vasa deferentia rendering them infertile. These implants can be removed at a later date restoring fertility--thus making the vasectomies reversible. This new technique is the work of Dr. David Frisch, a physicist, and Dr. Moshe Shelev, a veterinarian, both from the Massachusetts Institute of Technology.

The implants were installed on May 24, 1979, on a pair of 23½ month old males, Woody and Eugene. These males weighed 300 lbs. and had started copulating with our lionesses a month earlier. Since we did not have a need for any cubs and all seven of our young males were reaching sexual maturity, it was decided to give the five youngest cubs standard vasectomies and the two oldest cubs the new reversible vasectomy. As it turned out, a semen sample taken from Woody revealed a large number of mobile spermatozoa indicating that he may already be able to father a litter.

In preparation for the actual surgery, both males were darted with 500 mg. of Vetalar with 200 mg. of Rompun. They went down in 20 minutes and Eugene was lifted onto a table set up at the lion huts where he became the first lion to receive a reversible vasectomy. Both were given two supplemental doses of 200 mg. of Vetalar each during their operation to ensure that they stayed down. Due to the delicate nature of the operation, Sernalyn was not used since it causes convulsions. Each lion also received 5 cc. of Floccillin after the operation to reduce the chance of a low grade infection.

Dr. George Reed, veterinarian for Wild Animal Safari, handled the pre-op and then made an incision through the skin layers to expose the vas deferens on one side (for details of this part of the procedure, refer to Dr. Reed's description in *Zoo and Wild Animal Medicine*, 1978, pp. 655-656.) Once exposed, a longitudinal incision was made directly over the vas deferens where a siliastic ring was implanted into the lumen perpendicular to its walls. This porous doughnut shaped ring is made of Mular polyester with an outside diameter of 0.040 inches, an inside diameter of 0.008 inches, and a thickness of 0.002 inches. This implant is held in place by a suture until fibrils (scar tissue) can grow into the pores of the ring holding it tightly in the correct position. The incision made over the vas deferens was closed with small interrupted suture followed by the closing of the incision made through the skin layers. The lion was then rolled over and the vas deferens on the other side was implanted in the same manner already described. Sometimes two vas deferens can be found on one side in lions so three, instead of two implants would be necessary. Surgery time was 40 minutes per lion as compared to 20 minutes for a standard vasectomy, but due to the supplemental dosages of Vetalar, both lions stayed down for three hours. Woody and Eugene were placed back with 28 other lions to go on display within 36 hours of the operation.

The design of the implant is the key to its effectiveness. Being doughnut shaped, the larger hole in the middle allows for drainage while the smaller holes in the outer part give the fibrils a place to catch hold to tightly secure the position of the implant. Eventually, fibrils will fill in the middle hole, but only after the drainage of the fluids

Reversible Vasectomies Tried on Lions, continued

formed in reaction to the operation is complete. The implant is now solid enough to block the flow of sperm released by the testes from meeting with the seminal fluid during an ejaculation rendering the male infertile at the time of copulation. At the same time, the implant is porous enough to allow the sperm to slowly penetrate it and be harmlessly released at a later time. Once this sperm trickles through the implant and reaches the other side, it will die there in the vas deferens due to the absence of a seminal fluid medium necessary to sustain the normal life of the sperm. This dead sperm is released during a future ejaculation or while urinating. It must be remembered that a lion will not reach infertility until approximately three weeks, or X number of ejaculations after the operation due to the reservoir of sperm left between the implant and the penis. It is important to note that since all sperm that is produced does eventually exit the body, even though dead, the testes will continue to produce it. Thus, the implant can be removed at any time restoring fertility. In a standard vasectomy, where a 2 cm. section of each vas deferens is removed, the sperm has no outlet, so after awhile the body treats it as a foreign protein to be broken down by enzymes to be absorbed by the body. Eventually the body reacts to this situation and shuts down sperm production in the testes. It has been suggested that discontinuing sperm production causes a raise in cholesterol levels in the animal, but this has not been conclusively proven yet. Another method of birth control used in male lions involves a hormonal implant. However, this method causes an increase in the female hormone and a decrease in the male hormone in the animal resulting in atrophy of the hair follicle. The end result is that the mane falls out.

This type of reversible vasectomy has been tried in dogs with successful results. We plan on removing the implants from Woody and Eugene in one year and see if they can the produce offspring. The final objective is to use this procedure in man, reducing the present need for microsurgery to reverse a vasectomy with a slim chance of restoring fertility.



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chapter

Congratulations to the
San Diego Chapter formed
July 5, 1979

- President...Michael Kachuba
- Vice Pres... Barbara Normington
McIlraith
- Sec/Tres....Diana E. Quintero

news

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ELECTION

The election is to decide who will take the seats on the American Association of Zoo Keepers Board of Directors. Three are up for election...those of Dennis Grimm, Ron Kaufman, and Tom Goldsberry.

Those elected will begin their term of office on 1 January 1980 and will help lead the Association in the years to come. The times ahead are important ones, as the professional zoo keeper takes a place alongside the other persons that manage our captive wildlife resources. Choose your selection carefully.

HERE ARE THE RULES:

1. *Short biographical sketches of the candidates follow. Select three of the individuals and mark your ballot. (The ballot is at the end.)*
2. *Do not write your name on the Ballot. Mail it to*
Elizabeth Glassco
Administrative Secretary
American Association of Zoo Keepers
National Zoological Park
Washington, D.C. 20008
3. *Mail your vote before Midnight, 30 November 1979. Your anonymity will be preserved in the counting of the ballots.*

The nominees are listed in alphabetical order. The biographical sketches were compiled from statements taken directly from the nominees. All information in the sketches has been reviewed and approved by the NEC.

DENISE BARTENFELDER

Nomination by Bela J. Demeter

" I would like to offer for your consideration the name of Denise Bartenfelder for a position on the Board of Directors. Ms. Bartenfelder has been an extremely active member of AAZK ever since she first became involved with the organization. She was instrumental in forming the Baltimore AAZK Chapter, was in attendance at the Board meetings during the last conference, and has been working on an AAZK keeper training manual. She has, I believe, the energy and dedication it takes to be a good Board member."

Denise is presently employed by the Baltimore Zoo as a Zoo Hospital Keeper in the Veterinary Department, where she has worked for the past two years. She attended Essex Community College and George Washington University majoring in psychology, and also attended Keeper Education Courses I and II given by the Baltimore Zoo. She is presently a member of the Baltimore Chapter of the American Association of Zookeepers, having held the office of Vice-President in 1978. Denise has been a member of the National organization for one year. In October 1978, Denise attended the National AAZK Conference in Gainesville, Florida, where she presented a paper entitled, "The Keeper Education Course at the Baltimore Zoo". As current Regional Coordinator of Maryland, Pennsylvania, Delaware and New Jersey, she corresponds and travels to meet

Bartenfelder Biography, continued

other zoo keepers. In May 1979, Denise attended the Northeast Regional AAZPA Workshop, where she spoke with many zoo professionals and gave a talk entitled, "AAZPA and AAZK: A Look into the Future", which concerned itself with the goals of AAZK, and AAZK's relationship with AAZPA and zoo management. She is presently collecting information and educational material to edit for use in a zookeeper education manual to be published by AAZK, and assisting with a keeper data information survey for use by AAZK members. Denise is also a member of the Baltimore Zoological Society, The National Wildlife Federation and The American Association of Zoological Parks and Aquariums.

In submitting her biographical sketch, Denise wrote, "I feel that the care of exotic animals is a job requiring special skills and talents. AAZK unites zookeepers in pride and recognition of their profession for the benefit of animals, zoos and themselves, I feel that AAZK is largely responsible for the change in the modern zookeepers role to that of a member of the professional zoo team."

MIKE COKER

Nomination by Ron Kaufman

Michael Coker is currently employed at the Topeka Zoological Park in Kansas where he cares for a wide variety of small mammals, birds, reptiles, amphibians, invertebrates, fish and several species of hoofstock. He began his career in 1970 working as volunteer Zoo Answer Man. In 1971, Mike took over Zoo Answer Stand operation in our Animals and Man Building and continued as Zoo Answer Man as well. In 1972 Mike was promoted to a part-time Animal Keeper. He worked in this capacity from 1972-1975, while attending Kansas State University at Manhattan. In 1977 Mike was rehired as a full-time Animal Keeper for our Zoo. He was assigned to elephants and giraffes. Mike has worked quite extensively with reptiles and amphibians recently being assigned to our Animal Kingdom Building.

Mike was promoted to the newly created position of Area Supervisor in 1979.

In May 1978, Mike received his Bachelor's Degree in Fisheries and Wildlife Biology from Kansas State University. Mike has been a member of AAZK for numerous years as student, part-time keeper and full-time keeper. In 1977 Mike accepted the position of Associate Editor for *Animal Keepers' Forum* which is published at the Topeka Zoo. In 1979, Mike was appointed to AAZK Awards Committee as Chairman to review all nominees for selection for Zoo Keeping Excellence Awards and Zoo Keeper Education Programs. Mike is currently in this third year as Editor for *Animal Keepers' Forum*. Mike has written several articles for AKF; one on reptiles, pesticides (not published, but submitted), one on elephants.

Mike is an Associate member of AAZPA. He has recently had an article published in the AAZPA Regional Proceedings for 1979. Also, Mike has written articles for Zoepka Zoo's own Z^O Magazine.

Mike is a member of several organizations, including the National Wildlife Federation, Elephant Interest Group, Society for Study of Amphibians and Reptiles, Kansas Herpetological Society, Whale Protection Fund, Kansas Zoo Association.

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The experience gained over the last seven and one-half years at the Topeka Zoo has been invaluable. I worked my way up from an employee of the Friends of the Topeka Zoo to a full-time animal keeper. I have the drive and ambition to succeed in making a contribution to this zoo. I am very involved in my work with the animals, giving presentations to the public on zoo time and on my own time. I am involved with the American Association of Zoo Keepers, an international organization for the education of zoo keepers in the animal care profession. I have written several professional papers on zoo animals. I have prepared myself for public speaking by taking several academic courses. I have presented a variety of lectures, demonstrations, slide presentations and tours to a large variety of age groups--preschoolers to senior citizens.

Mike wrote, "I feel it would be advantageous to have an editor of the Animal Keepers' Forum on the Board of Directors. I have been an involved member of AAZK for several years. I want to be on the Board of Directors because I know I can contribute to the organization on a national level for the advancement of the Animal Keeping Profession."

BERNARD C. FELDMAN

Nomination by Jill Grade

"It is with sincere hopes for Bernard Feldman's election to the Board of Directors that I submit his name as one of the nominees. Bernard has been a very active member of AAZK for several years. Known to me is his work as a Regional Coordinator, a member of the Nomination and Election Committee, and head of the Animal Data Transfer Form project. I first met Bernie at the Gainesville Conference, where he presented a paper, and contributed to all Board meeting discussions. But his most impressive attribute is the extensive correspondence he undertakes in his involvement with any facet of AAZK. His letters are always prompt and never lacking in content. He follows through on all assigned tasks. As communication is one of AAZK's main goals, I feel that a supporter like Bernard would be a most positive addition to the Board."

Biography

Bernard Feldman is currently employed at the Miller Park Zoo in Illinois where he cares for several species of birds and reptiles, occasionally working in the Petting Zoo. He began his career at Snyder's Darien Lake Zoo in N.Y. where he worked for one year as a keeper of hoofed stock and waterfowl, later becoming involved as a Maintenance person. He then moved on to the Buffalo Zoo where he worked for another year, again in Maintenance, and in the care of many species of small animals in the Children's Zoo. He has held his current position at Miller Park since April 1977. Bernard earned an Associate in Science Degree at Genesee Community College, N.Y., and a Bachelor of Arts in Biology Degree at State University College, N.Y. He has been a member of AAZK since 1973, belonging to the Buffalo Chapter while still living in that area. He is currently serving on the Nominations and Election Committee, and was formerly a Regional Coordinator for the Northeast Region. Bernard has contributed to AKF, and attended the Chicago and Gainesville Conferences, presenting a paper on the Miller Park Zoo at the latter. He has also recently helped to formulate the Animal Data Transfer Form which was published in the August AAZPA bulletin for membership response. He has been a member of AAZPA since 1973, as well as a member of ZOOACT

Feldman Biography, continued

since its beginnings, ZOO REVIEW since its beginnings, The American Federation of Aviculture, and the American Pheasant and Waterfowl Society.

Bernard wrote, " I should like to be a member of the Board of Directors of the AAZK to demonstrate to other animal keepers in the field that the duties of a professional Animal Keeper go beyond the daily routine responsibilities of caring for animals. Your involvement in any organization reflects your interest and drive in your career. As a Nominee for the Board of Directors for AAZK I'm showing my commitment to this very diversified organization of caring for wildlife. A simple motto that I live by is: We learn by doing. We should continue to learn by being active in whatever we are engaged in."

JILL GRADE

Nomination by Dennis Grimm

"I would like to nominate Jill Grade as a candidate to the AAZK Board of Directors. Jill has been active in AAZK for some time and has gained valuable experience on a national level in recent years as a Regional Coordinator and as the Chairperson for the Nominations and Election Committee. Jill is prompt and extensive in her correspondence and completes her duties and responsibilities at her various posts on time. She is one of the most reliable individuals in the Association and performs admirably at whatever job she is assigned. Jill has attended AAZK National Conventions in 1976 and 1978, where she had considerable input during the Board Meeting discussions. She is frank and straightforward and unafraid to let her opinions be known. I feel Jill has the ability, knowledge, and energy to become a very effective, responsive Board member."

Biography

Jill Grade began her career at the Magic Mountain Children's Farm in California where she worked for three years as an animal keeper and educational program MC, hand-raising and presenting to the public in an educational manner animals representing every taxonomical order. Among these was a llama owned by herself for use as an educational aid in an elementary school program of her own. During this time Jill also took courses in animal behavior, training and veterinary care in the Wild Animal Training and Management Program at Moorpark College, Ca., but left to pursue interests in zoo husbandry and management little dealt with in that particular school. Jill began working at Busch Bird Sanctuary in 1973, her first zoo responsibilities there being centered on her position as an Endangered Species Program tour guide, where she gained experience enough to enable her to later contribute to the development of a new educational program there. As a keeper, Jill then worked with a variety of birds in a large freeranging collection, eventually renovating both the waterfowl and Psittine breeding programs. In 1978 she was promoted to Senior Keeper, thus responsible for all animal maintenance, working the various strings intermittently. Jill currently works as a zoo keeper in the bird department at Busch Gardens, Tampa, Fl., where she was relocated when the L.A. park was closed. Jill has been a member of AAZK since 1976, and was a member of the Los Angeles Zoo Chapter while still living in that area. She attended the San Diego and Gainesville conventions, contributing to Board Meeting discussions at both. She requested and received the positions of Nominations and

Grade Biography, continued

Election Committee Chairwoman, Regional Coordinator for the Western Region, and Director of the Regional Coordinator System, her work on the NEC resulting in several changes in the Constitutional By-Laws. She has contributed articles on keeper status in zoos to the AKF. Jill has also been a member of AAZPA since 1977, attending a convention that year. She is a member of the World Wildlife Federation, National Geographic Society, Audubon Society (local and National), Smithsonian Institute and several zoo associations, as well as subscribing to many wildlife publication.

Jill writes, "As the role which today's zoos play in the struggle to preserve our vanishing wildlife becomes increasingly significant, so must the roles of the people working in these institutions. A progressive zoo intent on the breeding of threatened and endangered species is hampered by archaic, menagerie-based methods of managing its valuable charges. It is the responsibility of zoo directors, curators, and keepers alike to form a viable, harmonic team capable of creating the most effective ways in which to maintain and propagate animals in captivity. As zoo keepers, we therefore must do everything within our bounds to insure that we keep pace with the progress our zoos are making. We must cater to the more sophisticated needs of today's animal collections, through use of a thorough knowledge of those animals, I believe that the American Association of Zoo Keepers is here to secure that knowledge--to secure it, and pass it on. It would be an honor for me to take part in that function; to work toward the utilization of keepers in all zoos to their full capacities as knowledgeable contributors to the difficult task of saving our jeopardized wildlife."

RICHARD GRUDZIEN

Nomination by Bernard Feldman

I would like to nominate Richard Grudzien as a candidate to the AAZK Board of Directors. Richard has been an Affiliate member of AAZK in good standing for many years. After working with Rich at the Buffalo Zoo in New York, I could see the true and deep devotion he had for the zoo profession. Not only being a thorough and conscientious Animal Keeper, Rich has also demonstrated a strong but versatile personality with others. His aggressiveness in standing up for what he believes is correct is also a quality worthy to consider Rich for the Board of Directors. Combine his versatile personality and an aggressiveness in attitudes and I can certainly see this individual giving AAZK continued honor, respectability and wisdom.

Biography

Richard Grudzien began his career in zookeeping at the Buffalo Zoological Gardens. He held a variety of positions there: Caretaker for 3 months, Utility Worker for 4 months and Animal Keeper for 4 years, totalling five years at that institution before moving on to the Washington Park zoo in Portland, Oregon, where he has been employed as an animal keeper for over a year. Rich earned an Associates in Science degree at Dixie Jr. College in Utah, and has taken a 15 hour animal keeper course in basic biology offered by the Buffalo Zoo. He is a member of the AAZK National, and was the Secretary-Treasurer of the Buffalo Chapter of AAZK from Jan. 1976 thru April 1978.

continued next page

Grudzien Biography, continued

Rich writes, "I would like to be on the Board of Directors so I could learn more about the organization and thus in turn help others in their local chapters."

PHIL PREWITT

Nomination by Pat Sammarco

Because of his enthusiasm and dedication to AAZK, I would like to nominate Phil Prewitt for election to the Board of the American Association of Zoo Keepers. Phil has not only attended national AAZK Conferences, but has participated actively in making them productive meetings. Phil has been a Chapter president, and therefore has executive experience as well as enthusiasm to be an active AAZK Board member.

Biography

Phil Prewitt began his career as a zoo keeper at the Memphis Zoo. He worked at that institution from 1971 to 1973, and again from 1977 to the present. The interruption in his career from '73 to '77 was terminated when Phil's attendance at the 1976 AAZK Conference in San Diego rekindled his interest in his "calling in life". He now enjoys his work with the Pachyderms at the Memphis Zoo most, although he has worked with the entire mammal collection, with the exception of the primates. Phil has also spent a great deal of time traveling to other zoos, the number of institutions visited now reaching over 30. He attended the '78 AAZK Conference in Gainesville, as well as the '79 AAZPA Southern Regional, and a gathering of the American Society of Mammalogists at a beaching site where he was able to assist with the necropsy of sperm whales.

Phil writes, "I feel I owe the AAZK for encouraging me to re-enter the business."

THIS IS THE OFFICIAL BALLOT...VOTE FOR THREE INDIVIDUALS...DO IT NOW!

_____ DENISE BARTENFELDER

_____ JILL GRADE

_____ MIKE COKER

_____ RICHARD GRUDZIEN

_____ BERNARD C. FELDMAN

_____ PHIL PREWITT

This ballot must be completed and postmarked no later than midnight, 30 November, 1979. Do not write your name on this ballot.

Mail to

Elizabeth Glassco
Administrative Secretary
American Association of Zoo Keepers
National Zoological Park
Washington, D.C. 20008

* * * COMING EVENTS * * *

Second Annual Symposium on Captive Wildlife
October 26-29 Louisville Chapter AAZK
Contact: Steven Taylor
 Louisville Zoological Garden
 1100 Trevilian Way
 Louisville, Kentucky 40213

Regional Conference for Zoo Support Organizations
October 27-29 Louisville, Kentucky

World Conference on Breeding Endangered Species in Captivity
November 12-16, 1979 San Diego, California

World Conference on Sea Turtle Conservation
November 26-30, 1979 Washington, D.C.

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We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

INFANT CARE SPECIALIST/KEEPER... provides care to orphan neonates fulltime and keeper assistance to Children's Zoo during the exhibit season. Qualifications: Supervisor, keeper experience, experience in neonate husbandry, medical/veterinary experience, behavioral observation training, working knowledge of exhibit repair, minimum two years college education. Salary: \$9,268.00. Send resume's to Director of Veterinary Medicine, Boston Zoological Society, Franklin Park, Boston, MA 02121.

ZOO KEEPER I... The Jackson Zoological Park is now accepting applications for the entrance level of Zoo Keepers. Salary range \$717.00 - \$845.00 per month. Standard benefits. Duties include the general care and maintenance of a wide variety of mammals, birds, reptiles, and children's zoo animals. Applicants must have a high school education. Practical experience desirable; however, we will train the proper persons. Send resume to James L. Swigert, Director, Jackson Zoological Park, 2918 West Capitol Street, Jackson, Mississippi. 39209.

SENIOR ZOO KEEPER... Ideal position for individual on the way up as a professional in animal care. Newly created position in the City of Clovis, New Mexico. Fifty-five animal City Zoo offers opportunity for a innovative individual to be instrumental in the development of a Zoo Master Plan, and to supervise the care and feeding of animals housed at Clovis' Hillcrest Park Zoo. Animals presently owned include carnivores, large felines, hoofed animals, and mammals. Management/Professional position with minimum starting salary of \$10,000 per year. Prefer individual with two years experience in a recognized zoo and college level courses in Zoology, Veterinary Medicine or related field; individuals with less training will be considered based on number of years of progressively responsible experience, the most recent of which should have been in a supervisory position. Send summary of training, experience and salary history to: Director of Personnel, City of Clovis, P.O. Box 760, Clovis, NM 88101

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ZOO FOREMAN... (Deputy Director/General Curator)... individual knowledgeable in captive management of wild animals, responsible for day-to-day operation of Zoo, under general direction of Director. Requires 4 years zoo experience, 2 years in a supervisory capacity. Salary \$11,350 to \$14,830. Send resume to: Personnel Department, City of Little Rock, Markam and Broadway, Little Rock, AR 72201.

EDUCATION ASSISTANT... plan educational exhibits for children 3-9, develop and implement children's programming during spring and summer, run Zoomobile program, assist as keeper. Qualifications should include early childhood education, teaching/exhibit development for young children, animal handling of nondomestic animals. Salary: \$9,700. Send resume to: Lydia Kowalski, Education Director, Boston Zoological Society, Franklin Park, Boston, MA 02121.

EDUCATION CURATOR... must have graduated from accredited four-year college or university with major in elementary education. Graduate-level degree and some background in science or natural history preferable. Minimum of two years successful teaching experience, must have public speaking ability and willingness to appear on television and radio programs and accept occasional weekend, holiday and after-hour assignments. Salary approximately \$13,000. Send resume to Palmer Krantz, Director, Riverbanks Zoo, 500 Wildlife Parkway, Columbia, SC 29210.

ASSISTANT OR ASSOCIATE CURATOR/MAMMALS... managerial experience and advanced degree preferred. For job description, salary and other information, contact: Mrs. J. Coontz, Personnel Manager, Brookfield Zoo, Brookfield, IL 60513.

PLANNING A MOVE?

Since Animal Keepers' Forum has been granted Second Class postage rates, it is not forwarded. Please send your change of address as soon as possible to

Elizabeth Glassco
Administrative Secretary
American Association of Zoo Keepers
National Zoological Park
Washington, D.C. 20008

The four peregrine falcons who grew up and learned to fly atop the Interior Department building in Washington, D.C., are now independently flying free and taking their own food. This was the first attempt to restock the endangered peregrine back into its former range. (AKF, p. 146)

Stranding of marine mammals should be reported to: The Law Enforcement Division of local National Marine Fisheries offices; the U.S. Coast Guard; or Shirley Maina, Smithsonian Institution, Washington, D.C. 20560. 24 hour telephone service (202) 381-4174.

HAND-REARING THE SAIGA

by
Marcia A. Rohrer
Oklahoma City Zoo

The Saiga *Saiga tatarica* is a medium-sized ungulate native to the Soviet Union. The species occupies an intermediate position between the sub-families Caprinae (wild goats) and Atilopinae (antelope). The exact taxonomy of this species is debatable. The most distinctive characteristic of the saiga is its proboscis-like nose which functions to warm and moisten the cold air of its environment. Saigas are found on treeless plains and eat low-growing shrubs and grasses many of which contain a high level of poisonous substances and salts making them inedible to other species. The female bears 1-2 young after a gestation period of 5 months. Although nearly extinct at the end of World War I due to hunting pressures, predation, and severe winters, this species has been protected by the Soviet government for over 50 years. Saiga are so plentiful now that 250,000-300,000 are harvested annually for their meat and hides.

In May 1979, the Oklahoma City Zoo had two herds of saiga in its collection. A herd of 1/6 saiga was on public display and 1/3 saiga kept in an off-display area. On the evening of 9 May 1979 one of the females in the display herd gave birth to triplets (1/2). Triplets are rare in saiga births. Over 14,000 newborn saiga had been examined in the wild in a 2 year period and triplets had been found in only four cases (A.G. Bannikov, 1967).

The herd male became aggressive towards the offspring and they were taken to the Zoo Nursery temporarily until the male could be removed from the herd. Then it was decided to return both females to their mother in the herd and leave the male in the Nursery for hand-rearing. The newborn females were returned to the herd the morning after their birth. It was noted two days later that one of the females was not nursing and appeared to be growing weaker. She was transferred to the Nursery permanently on 12 May. The other female remained in the herd and matured without problems.

Upon entering the Nursery, the male saiga weighed 7 lb. (3.18 kg) and the female weighed 5 lb. (2.27 kg.) Their temperatures were 100°F. (37.7°C) and 101°F. (38.3°C). Each received 122 cc. of Bovine Antibacterial Serum (Anchor Lab. Inc., St. Joseph, Mo.) both orally and subcutaneously at weekly intervals until the animals were six weeks old. Their umbilical cords were treated with iodine to prevent infection.

The following comparisons were made to determine what formula should be used for saiga: The analysis of saiga milk was given by A.G. Bannikov (1967) and the other values taken from USDA Composition of Foods.

COMPARISON OF MILK

	Saiga's	Cow's (Whole)	Cow's (Evaporated) (Canned)	Goat's
% Fat	6.7	3.9	7.9	4.0
% Protein	5.37	3.5	7.0	3.3

continued on next page

Hand-rearing the Saiga, continued

These figures showed that not even goat's milk approached the high fat content of saiga's milk. It was decided to feed a mixture of 4 parts evaporated milk to 1 part water. This ratio resulted in a formula with 6.3% fat and 5.6% protein which we felt was a sufficient approximation of saiga's milk. In addition vitamins A and D were added once daily, 4 days per week. For their first feeding both saigas received goat colostrum and two doses of *Lactobacillus acidophilus* were given 18 hours apart. A plastic bottle with a rubber lamb's nipple were used for feeding and all equipment was sterilized between feedings.

The weight of the saigas determined the quantity of formula offered. It is our procedure with hoofed stock to feed 4 oz. (120 cc) of milk for each 10 lbs. (4.5 kg) at each feeding, with 4 feedings daily. Following these guidelines the male saiga received 2½ oz. per feeding (75 cc) and the female received 2 oz. (60 cc). The amounts per feeding was increased by ½ oz (15 cc) at weekly intervals until 6 oz. (180 cc) was being offered at each feeding. Both saigas nursed readily and normal stools indicated the suitability of our formula and amounts being offered. No health problems were encountered.

We usually begin weaning hoofed animals at 3 months of age. However, the saigas started weaning themselves before this time. At 2 months of age, they were regularly refusing bottles and were accepting formula only rarely during the remainder of their stay in the Nursery. This agrees with Bannikov's finding (1967) that young saiga consumed milk until 2-2½ months of age and at 3 months were completely dependent on vegetable matter. He also notes that they begin eating solid foods at a much earlier age (at 3-4 days) than most hoofed animals. Ours were observed eating solids at 5 days of age. In contrast to this however, E. Orbell and J. Orbell (1976) reported that their hand-reared saiga did not eat solids until Day 14.

The young saigas were transferred from the Nursery at the end of August. We feel that the formula we devised was a good one. The formula resembled saiga's milk in both fat and protein content, the ingredients were easily obtainable, it was easy to prepare, and most important--our animals thrived on it. If it is necessary to raise more saiga in the future, the only change we would make in our present procedures would be to begin the weaning process at 2 months of age rather than at 3 months.

Literature Cited

- Bannikov, A.G. (editor) 1967. The Biology of the Saiga. Israel Program for Scientific Translations Cat. No. 1833, 252 pp.
- Orbell, E. & J. Orbell. 1976. Hand-rearing a Saiga Antelope at the Highland Wildlife Park. International Zoo Yearbook 16:208-209.
- Watt, B.K. & A.L. Merrill. 1950. Composition of Foods. USDA Agriculture Handbook No. 8, 147 pp.



ELEPHANT TRAINING AND MANAGEMENT
AN INTERVIEW WITH STEVE CLARKE
SUPERVISOR OF MAMMALS, FORT WORTH ZOO

Steve Clarke visited the Topeka Zoo as a consultant in the elephant training program. Mike Coker, Executive Editor of the AKF, interviewed him.

AKF: *How long have you worked with animals?*

I started in 1964 with Asian elephants. I went with the head keeper for two days of training on two Asian elephants in Kansas City. Then he said, "It's all yours. I'm going on vacation for three weeks." The elephants wouldn't even let me in the pen! That's when Benny Henry came through the building and told me to act like I knew what I was doing. So when they would keep me from coming in through the bars, I'd give 'em a push with my shoulder and use the hook and act like I knew what I wanted.

AKF: *You've been at Fort Worth since 1969. Have they experienced any major problems with elephant management? We've had some here at the Topeka Zoo.*

The problems we had were with a female Asian. There were certain people who didn't exert their authority enough or who didn't get their bluff in on the elephant.

AKF: *At the Topeka Zoo, we keep an Asian and an African together. Do you feel this is good? African and Asians do things differently sometimes. But they are social animals.*

A lot of zoos have that. We had that at one time. Of course, the African was the dominant animal. But I didn't see any problem. After the Asian died, there was a big problem. The African had lost her companion and was alone for two years. She wouldn't go into the pool, or do anything that she used to do. But when we got the next young one, it was almost as if she got a pep pill. She perked up and was a different elephant. I don't think it makes any difference to them whether it is the same species or not, just so they have a companion. But when one dies, I think all effort ought to be made to get another one, regardless of species. If you start out with one alone, it really needs a lot of attention from the keeper since elephants are social animals and physical contact is needed.

Just thinking back over all the injuries that have happened with Asian elephants, I don't know if more have been when there is just one animal or two in the zoo. Maybe that's something someone should research. When you have two they're always interacting. When you have a keeper for each elephant that gives them a lot of attention. Elephants can be jealous, too; they're like little kids, each wanting more attention.

AKF: *What technique has worked best for you? Do you use a lot of force, pushing the animal around?*

My main experience is with the African and I feel that a lot of force is not necessary. It comes down to taking time with the elephant, especially the African, and showing them attention. Of course, they are individuals; some require more force. It depends on the animal and on the situation.

continued

Elephant Training and Management, continued

AKF: *So you would state your theory or philosophy of training elephants as--go in, know what you are doing, be confident, and treat them as an individual.*

Yes, and if they keep doing something wrong, maybe you are doing something wrong with the way you're training them. Stand back and think for a second, maybe it is you!

AKF: *Yesterday, at the seminar, you made the point that the animal may want to play, but you want to do the routine, and it's a matter of crossed signals.*

You have to know the animal, so you can interpret their actions and behavior. Again, it's like kids! I have two kids and when they've been playing and then one wants to watch TV and the other still wants to play. One will get angry and give the other a whack. With elephants, when you've been petting and rubbing them and tickling the tongue, and all that (which is a form of playing) and then you want to clean up, but they want to play--so you give them a whack! You have to know their individual behavior and that takes time.

AKF: *Do you feel keepers are doing fairly well in training elephants?*

It seems like most every zoo has one or more dedicated elephant people who are really good elephant people. Sometimes it boils down to management at the supervisory level. People are shuffled in and out too fast. It takes time to establish a relationship. Sometimes the animal is blamed when it is too frequent changing of personnel. You can't always have the right people. You don't have to go in with them if you have it set up to move them, clean up and move them back in. That's OK if your set-up is like that. But we have to train them because we have to go in with them.

AKF: *A lot of zoos have men and women working elephants. Have you seen some good women elephant keepers? We've had some good ones and some not so effective here.*

It seems like a lot of women really want to do it, are really enthusiastic, but they seem to baby them so much and not exert their authority when it is needed. I haven't seen many, but then I've really not observed that many. In Ft. Worth, we have had a lot of men who weren't very effective either.

AKF: *Elephants are really a delicate animal. We've had problems with the feet. They get some kind of rot started in the pads and the nails get long and bumpy.*

People think that the elephant is a big, hardy animal; but it seems like every so often you hear of a healthy mature elephant suddenly dying. Our African has a spur on her left rear knee joint. She's not very old, but arthritis has set in the joint. Our male has tusk troubles, keeps breaking his tusks off all the way to the hollow core. It goes all the way to his sinus cavity and keeps draining. People look at them and think they're big and hardy with that tough skin. 'Pachyderm' means thick skin, but it is sensitive skin. People think they never get sick, but elephants are sensitive to drafts and cold.

continued

Elephant Training and Management, continued

AKF: *Is there anything you can recommend to a person who is an elephant keeper or thinking of becoming an elephant keeper?*

I think a person should get acquainted with one and then really evaluate the whole thing. Can I do it? You have to have confidence, authority in your voice, and get your bluff in first. Elephants are big and challenging. There are 'born politicians' and born elephant keepers.

AKF: *What, in your opinion, is the future of elephants in zoos?*

With the uncertainty of the wild populations, and the more professional personnel in zoos, more of an attempt to keep males will be made. All of the aforementioned will make the future good for elephants in zoos.

AAZK ACCESSORIES AVAILABLE

BUTTONS

Buttons printed with 'Keepers Care' and a logo are available for fifty cents (50¢) from Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614. 50% of the sale price goes into AAZK's national treasury.

DECALS

The official AAZK decal is available through the Overton Park AAZK Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.00 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Avenue, Memphis, TN 38107.

T-SHIRTS

The T-shirts come in a variety of colors and have the AAZK logo on them. Contact Carleton Bailie, 4400 NW 39th Avenue, #214, Gainesville, FL 32601.

IN MEMORIAM

PHILADELPHIA ZOO'S ASSOCIATE SUPERINTENDENT OF ANIMAL SERVICES DIES

The Philadelphia Zoo is saddened to report the death of Associate Superintendent of Animal Services Norman Hess. "The Zoo has been very fortunate to have had Norman Hess on its staff for more than 30 years," said Zoo President William V. Donaldson. "His warmth and grand sense of humor will be missed by all."

Mr. Hess began his zoo career in 1934 as a keeper for zebras and camels. He later worked with the animals he most admired--the elephants. He said in an interview in 1974, "I used to come to the Zoo when I was a little boy just to watch the elephant keeper. I thought he had the most admirable job in the world."

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10" (15 cm. x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.



MEMBERSHIP INFORMATION

Affiliate (full-time keepers) \$10.00 annually
Associate (part-time keepers, students, docents) . \$10.00 annually
Foreign \$15.00 annually
Contributing \$50.00 annually

All memberships include subscriptions to *Animal Keepers' Forum*. 50% of the member's dues are budgeted for the publication.

All new members receive an AAZK shoulder patch and a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

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Animal Keepers' Forum



Dedicated to Professional Animal Care

NOVEMBER 1979

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The art work for the cover is by Sam LaMalfa, primate keeper of the Milwaukee County Zoo. It illustrates Sam, the keeper, offering "Samson" the 29 year old male lowland gorilla his morning ration of jello and vitamins. Sam also authored the article in this issue on the gorilla "What Makes Sammy Run?" AKF deeply appreciates those who use their writing and drawing talents to communicate their love of animal life and to share their knowledge.

SCOOPS and SCUTTLEBUTT

PHILADELPHIA ZOO'S LIVING FOSSILS ON WAY TO ST. LOUIS

The Philadelphia Zoo has made arrangements to send its pair of rare tuataras to the St. Louis on breeding loan. The tuatara is a unique reptile of great scientific importance. It is the sole living representative of an otherwise extinct order of reptiles, found only on approximately 31 islets off the coast of New Zealand. It is an endangered species rigidly protected by the New Zealand government. It is intriguing because it has remained virtually unchanged through 150 million years.

The St. Louis Zoo has a pair of tuataras and adequate space to maintain 4 adult animals. It is believed that the prospects of captive reproduction will be greatly increased in a group situation with adequate space that will enable the animals to establish home territories, and demonstrate normal patterns of behavior.

INTERNATIONAL EFFORT SAVES RARE ARABIAN ORYX

Four female Arabian oryx have been transferred from the San Diego Wild Animal Park to the Shaumari Wildlife Reserve, 118 km. from Amman, Jordan. The four females (one was born at the WAP and the other three were born at the Phoenix Zoo) will join four male oryx sent in 1978. These eight oryx, plus three sent from Qatar, will form the nucleus of a breeding herd destined to replenish this part of the Middle East which once teemed with wildlife.

Plans were begun in 1962 when conservationists on three continents united to save the Arabian oryx from extinction. Oryx were captured from the wild and placed in a suitable captive environment for propagation. Three were sent to the Phoenix Zoo and were joined by six captive-born oryx sent from London Zoo and the rulers of Kuwait and Saudi Arabia. These nine were called the World Herd.

Today, the World Herd consists of nearly 100 animals in herds at the San Diego WAP, the San Diego zoo, the Phoenix Zoo and the Gladys Porter Zoo in Brownsville, Texas. There are captive herds of Arabian oryx at the Los Angeles Zoo and at the Hai-Bar Reserve in Israel, although these animals are not included as part of the World Herd.

BIRTHS HATCHINGS

SOUTHERN WHITE RHINO BIRTH. *Drue Bauer & Houston Winbigler*

On September 5, 1979, Memphis Zoo experienced the birth of a 120 pound, (54.5 kg.), female white rhino, *Ceratotherium simum simum*.

Both wild-caught parents have shared the same quarters since 1976. Breeding has been observed at infrequent intervals. The last breeding was observed in May of 1978. Early this year the female began to exhibit signs of pregnancy. She was separated from the male on September 4 and gave birth sometime during the early morning of September 5.

The calf appeared strong, but was unable to get to her feet. After exhausting herself, she was tubed with dextrose and several hours later she was standing. During the night she was observed standing, but by the morning of the 6th, she was in a weakened condition. She was tubed again with dextrose, but never regained her footing and died shortly thereafter. Three days later the pair were reintroduced in hopes of renewed breeding. Breeding attempts were observed on September 27.

Reproduction in a single pair of white rhino is rare. We would appreciate any information on other occurrences. Please write to us in care of the Memphis Zoo, Memphis, TN 38112

GREATER KUDU BORN AT MEMPHIS. *Michael R. Maybry*

A male Greater Kudu was born at Memphis Zoo and Aquarium on September 30. With this birth a long history of Kudu rearing was renewed at the zoo. A very successful breeding herd during the sixties and early seventies was decimated in 1974 when several individuals died from suspected bad feed and possible lead poisoning from a freshly painted roof. The two remaining herd members were sold when it was decided to use their lot for a different species.

In early 1978, 1.2 Greater Kudu were received from Oklahoma City through an animal dealer. One of the females had frostbitten ears and was returned leaving us hopefully with a compatible pair. The male was barely a year old and the female approximately six months.

No breeding activity had been observed, but early this summer we suspected the female was pregnant. By September, there was no doubt as evidenced by a rapid increase in the size of the abdomen and a swelling udder. After a week of increasing size of the vulva and a huge udder, the calf was delivered during the night in the straw-covered stall. After two days inside, mother and calf were released into the lot, much to the curious pleasure of the male. The calf has spent his first two weeks lying up in the weeds at the rear of the lot, coming down only to nurse.

We are currently attempting to secure another female to fill out our breeding nucleus and are looking forward to more reproduction from this striking large antelope.

TRIPLLET MARMOSETS REARED BY PARENTS

by
Emily Stoffregen

In April, 1979, and September, 1979, the pair of common marmosets *Callithrix jacchus* at the Zoo of Arkansas successfully raised two sets of triplets. Apparently this is a very unusual occurrence in that one baby in a set of triplets usually dies when all three are left with the parents. There is no agreement on the reasons for this, but it has been suggested that it may be due to a lack of sufficient quantities of milk or the "inability of the mother to cope with three babies". Stevenson, Sutcliffe (1978) According to Pook (1974), "There is as yet no record of triplets being successfully reared by their parents. Although all of them may be fed for several days, one infant usually perishes before the end of the first week." A more current reference, Stevenson, Sutcliffe (1978) states "To date no female has succeeded in rearing more than two infants at once. The excess young should be removed and hand-reared."

Our marmosets first gave birth to triplets in September, 1978. All three babies appeared healthy, but one was found dead at one week of age. At the time these babies were born, there were numerous older brothers and sisters in the cage and the babies were being passed back and forth a great deal at a very early age. We thought that in the confusion one baby may have missed out on feedings or have been stressed too much. The post mortem revealed that pneumonia was the cause of death.

In April, 1979, when the next set of triplets was born, all offspring but the two young of September, 1978, had been removed. It was decided to leave all three babies with the parents to see if they could raise them without the "help" of the other offspring. They did, in fact, raise all three babies with no problem. Early in September, 1979, with another birth imminent, the two young of the previous September were removed. On September 16, the female again gave birth to triplets. At this writing, they are three weeks of age and all are healthy and growing rapidly. The father is just now starting to let April's triplets carry the new babies for short periods. It seems, in our case at least, that marmosets can successfully rear triplets if both parents are healthy and there are not too many eager brothers and sisters "helping out".

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- Pook, A.G. "The Hand-rearing and Reintroduction to its Parents of a Saddleback Tamarin" *The Jersey Wildlife Preservation Trust 11th Annual Report*, 1974.
- Stevenson, Miranda & Sutcliffe, Alistair. "Breeding a Second Generation of Common Marmosets" *International Zoo Yearbook*, V 18, 1978.

HAVE YOU VOTED FOR YOUR CHOICE OF CANDIDATES FOR THE BOARD OF DIRECTORS?
USE THE OFFICIAL BALLOT ON PAGE 197, OCTOBER ISSUE OF AKF.

The board positions of Dennis Grimm, Ed Roberts and Ron Kaufman will be filled by this election. The position of Tom Goldsberry will be filled by appointment.

"WHAT MAKES SAMMY RUN"

by
Sam LaMalfa
Primate Keeper, Milwaukee Co. Zoo

Just as the title of this article was a Broadway hit some years ago, so it suggests to us our own stage play here at the Milwaukee County Zoo. Samson, or as we often refer to him, "Sammy", has his own stage where he acts out his own play time after time. Being a showman at heart, he really seems to know he has the capability to captivate his audiences regardless of what he is doing at the moment.

At 29 years of age, he has had plenty of time and experience to learn. Gorillas can live into the 40's. The record "Massa", at the Philadelphia Zoo, celebrating his 48th birthday proves that. Getting back to Sammy's performance, gorillas, when provoked, intimidated or for just releasing tension, will do their thing. That is by "displaying", which consists of roaring, chest beating, the uprooting of plants and vegetation, running and usually winding up by slapping the ground. This form of aggression is all meant to threaten a potential enemy or perhaps regain law and order among his gorilla band or sometimes just plain blowing off a little steam. In Sammy's case, he roars, runs and winds up slapping the windows, sometimes with considerable force, for much the same reasons as a gorilla in his natural habitat does. Of course, there are no windows in a bamboo forest. If teased by one of his observing admirers he will react in such a manner. Many times though, Sammy will go through his repertoire in a play-like manner directed toward his viewers to gain attention if he feels neglected or ignored. Terra (his female roommate) usually moves rather spritely out of the way. After all, he's like a locomotive on the loose and any sane person would not stay on the tracks of an oncoming train. Sammy sometimes responds in such a manner, in a jealous way, aimed at me. I, being his closest human companion, make him feel left out if he sees me paying attention to someone other than him. After all, as far as he is concerned, I am a part of his social world. Gorillas, being very social among themselves in the wild, need the companionship of one another. A gorilla in confinement such as Sam is somewhat altered in his behavior patterns but still responds similarly under similar situations. In fact, he comes to my defense by attacking the glass with intent to ward off the would-be-attacker if he feels or assumes some harm is about to come to me by another person. After all, I am his principle security, working with him longer and more frequently than anyone else.

At present, Sammy tips the scales at around 500 pounds, (227 kg.) which is a comfortable weight for him. An average sized male in the wild may attain a weight of 400 pounds (182 kg.) or so, but then Sammy is a larger than average male gorilla. At one time, back in 1971, his maximum weight was recorded to be 652 pounds (295 kg), but I reduced this in recent years by dieting him. He is more active and much healthier trimmed down. After all, how can one remind an overweight gorilla not to pound windows, run from end to end in his cage and slide back and forth. Gorillas too, can have heart attacks just as humans do, for many of the same reasons, overweight being one of the main causes. Some may say that many gorillas in the wild develop huge stomachs, but what of them: The truth of the matter is some do, but then their diet tends to be quite different from captive gorillas. The very fibrous low protein seemingly unnutritional foodstuffs they consume by what seems like volumes, consisting of herbs, shoots and assorted plant

What Makes Sammy Run, continued

matter, tends to keep them fat and sassy, but is not near as filling as the fruits, vegetables, nuts and bread they are fed in captivity. One might ask if this is the case, where do they get enough protein in the jungle to attain such size and proportion as they do. Actually, millions of micro-organisms living within the plant life they consume are responsible. This is why zoo gorillas must have controlled diets. Every morning, along with breakfast, the gorillas receive 1/2 pitcher of jello (liquid) in which vitamins, anti-tuberculin pills and oral medication, when necessary, are camouflaged. In fact, our orangutans get a cup of the same. I hold the pitcher up to the bars while they drink its contents from their side of the cage. They love it.

Sammy and I sometimes carry on a conversation. He enjoys my talking whether it is in English or gorilla. He frequently answers--in gorilla, not English. As far as he is concerned, it is not so much what I say but how I say it. When scolding him, if it seems necessary, he reacts like a hurt little child, but if I speak to him in soothing tones, he responds positively.

He enjoys a good game of tug-of-war on occasion. Just as children will do with a simple game, he will egg me on to continue this play until I become bored by it all and stop. He encourages repetitious play by feeding me the end of the rope again and again through the bars after each successful winning of the game. Once in awhile, he lets me win. He's a real good sport that way.

I'd like to end by saying I feel very fortunate in having the opportunity I've had in caring for our three very unique gorillas all these years. Each one is individual in physical characteristics as well as personality and one does become very attached to them. They are my very close friends and I dearly hope that I am theirs.



UNIQUE CHINA-SAN DIEGO ZOO EXCHANGE

The People's Republic of China is sending two Chinese lesser pandas (also called red pandas), two dholes (also called Asiatic red dogs), four Jankowski's swans and 16 Derbyan parrakeets to the San Diego Zoo. The San Diego zoo is sending six Chilean flamingos and two white rhinoceros to the Kwangchow Zoo in Canton. This is the first exchange between American and Chinese zoos since the People's Republic of China was formed in 1949.

Great Ape *Academium*



ZOO TRIANGLE DISSOLVES

The old adage that "three's a crowd" certainly applies to the gorilla threesome at the Philadelphia Zoo--the famous Ramar, and his two female companions, Haloko and Samantha. Ramar finally made the critical decision by selecting Samantha as his mate, and Haloko is on her way out--to the Bronx Zoo.

chapter news

KEEPER ACCOMMODATION LIST

The Metro Toronto Zoo chapter of AAZK is establishing a Keeper Accommodation List as a chapter project.

WHAT IS THE PURPOSE OF K.A.L.?

This will be a list of Keepers or other AAZK members who are willing to put up a fellow keeper with or without family, for one or more nights. We would like to promote more contact among keepers all over North America. Keepers do travel a lot, and not only to workshops and conferences. This list may help people planning some travel by providing accommodation and contacts at zoos and cities all over the continent.

HOW WILL IT WORK?

Our chapter in Toronto will maintain a list of contact persons, one per chapter or zoo all over North America (we hope!). These people will each have a list of fellow keepers in their area who are willing to put up a traveler.

Anyone wishing to travel will contact Toronto with a list of zoos or cities they wish to visit. We will then provide them with the relevant contacts. It will be up to the individual to write to these contacts, with travel dates and details (number traveling, etc) to make his or her travel plans.

YOU CAN HELP

Appoint someone in your chapter as the contact for your zoo or city. Send that single name and address to us in Toronto. Keep your own list of colleagues who will provide accommodations.

Accommodation can be just a place to stay, or you may be able to offer meals or cooking facilities. Individuals can work out whether or not a charge would be acceptable, depending on circumstances.

So start writing! Any suggestions or criticism welcome. Remember, we only want one contact per zoo, chapter or city.

Write K.A.L. Chris Parker
M.T.Z. AAZK Chapter
Metro Toronto Zoo
P.O. Box 280, West Hill, Ontario
M1E 4R5 CANADA

MEMPHIS CHAPTER AIDS PBS TV

During September, the Memphis AAZK Chapter attracted favorable publicity by helping the local PBS affiliate, WKNO-TV, with its annual fund-raising drive. Phil Prewitt, who co-ordinated the effort, Mike Maybry, Steve Reichling, John Stokes, Cathy Write, and Houston Winbigler spent several hours answering phones, providing information, and helping solicit funds for the station.

AMERICAN ASSOCIATION OF ZOO KEEPERS AWARDS

Awards for Excellence in Zoo Keeping

Michael Dee, Senior Animal Keeper, Los Angeles Zoo, California

Henry Mills, Keeper, San Antonio Zoo, Texas

Gary Van Muir, Keeper, Salisbury Zoo, Maryland

Marge Seymour, Keeper, Lincoln Park Zoo, Illinois

John Stokes, Keeper, Memphis Zoo, Tennessee



ANIMAL KEEPERS' FORUM

Marcia Roher, Oklahoma City Zoo, Oklahoma. Best Mammal Paper:
"Hand-Rearing Golden Lion Marmosets *Leontopithecus rosalia*"

Janet Gailey-Phipps, Baltimore Zoo, Maryland. Best Bird Paper:
"Techniques of a Successful Penguin Colony"

Denise Bartenfelder, Baltimore Zoo, Maryland. Best Narrative Paper:
"The Keeper Education Course at the Baltimore Zoo"

Zoo Keeper Education Programs

No Nominees

BEAN AWARDS

AAZPA/AZK

Mammals -	Pacific Walrus Andy Soric, Hanna Barbara Marineland Ed Asper, Sea World, Orlando
Birds -	Red Bird of Paradise Richard Mendez and Willaim Todd, Houston Zoo
Reptile -	Bismarck Ringed Python David B. Barker, Dallas Zoo and Aquarium
Fish -	Wolf Eel Dr. Jeffrey B. Marliade, Vancouver Public Aquarium
Invertebrates -	Giant Asian Walking Stick Milan K. Busching and Mark H. Evans, Cincinnati Zoo
Amphibians -	No award

by
Phillip T. Robinson, D.V.M.
Director, Veterinary Services, San Diego Zoo

Receiving, treatment and shipment of animals are routine procedures in zoo collections. The keeper facilitates these processes by assuring that the correct conditions are present. Thinking out the steps in advance can greatly improve success rates and prevent delays and injuries. Since keepers working in hospital or quarantine areas are confronted with new arrivals on a weekly basis, many of the techniques become second nature but the thoughts behind the process are often overlooked by personnel in other parts of the zoo. The major problems can occur, however, when the new animal is transferred to the exhibit collection.

Receiving New Mammals

1. Anticipate how the housing will be arranged to allow introductions to new individuals.
2. Provide visual barriers when feasible to allow the animal to adjust to new limitations in the strange environment.
3. Check to be sure that feeding facilities will be adequate to avoid undue stress from forced interaction.
4. Assume that the animal (e.g. antelope) may try to cross exhibit barriers.
5. Closely monitor the new arrivals' interaction with others and that they are able to find adequate food, shelter and privacy.
6. Be knowledgeable of identifying tags, ear notches and markings, particularly when the animal may be confused with other animals in groups.
7. Communicate with relief keepers and other staff providing direct care for the group to assure continuity on your days off.
8. Do not assume that a new animal which was calm and easy-going in a previous location will react that way on your string.

Treatment of mammals

Many mammals receive medical treatment or undergo testing procedures in their housing unit on the zoo grounds. Since such activities often involve chemical restraint, special precautions are often required. The keeper plays a key role in preparing the animal for treatment and must set the stage.

1. Where will the restraint take place? (in exhibit or holding area)

continued

The Keeper's Role in the Successful Treatment and Movement of Mammals

2. Are other animals likely to interfere with or be unduly alarmed by the activity?
3. Have the area prepared to carry out the treatment. This is often facilitated by cleaning the cage (e.g. primates and some carnivores) before personnel must enter to remove the patient.
4. A common problem is the inability to move sliding doors or open locks - which may be seldom used except for catching or moving.
5. Needed ropes, nets, stretchers, forklifts, panels, gloves, catch poles, etc., should be available and in good repair.
6. Enough personnel should be present to handle the job - this entails preplanning and communication.
7. The withholding of food and water is usually a necessary condition for chemical restraint to prevent potential problems of regurgitation, aspiration or bloat. Specific instructions on these matters can improve the success of treatment involving anesthesia.
8. Animals recovering from anesthesia may need special care (e.g. extra warmth, darkness, quiet and close observation.)

Outgoing shipments

1. More than one zoo has shipped the wrong animal - be sure that you know who is leaving and positively identify.
2. With patience, some difficult-to-move species (giraffe, large bovids, hippos) can be coaxed into loading chutes and shipping crates - success rates vary inversely with how big a rush job it is.
3. It is prudent to stop a loading procedure when things are not progressing in a reasonable fashion.
4. Outgoing shipments are greatly expedited if good crating capabilities are designed into the exhibit at the outset. Later modifications are often second best and/or more expensive.
5. Proper crate selection is essential to safe shipment (appropriate size, security, good repair). The color can greatly influence inside temperature.
6. Be sure that after crating the animal is given shelter (heat, cold) and that the crate is moved gently and not placed in a noisy area where the animal may become alarmed.
7. The crate design should allow you to visually evaluate the position and condition of the animal inside.
8. Watering, bedding and even cleaning the crate (with the animal inside) should all be preplanned.

continued

The Keeper's Role in the Successful Treatment and Movement of Mammals

There are many other contingencies in mammal handling procedures. Those listed above account for some of the more commonly encountered factors. The more planning and thought which can be brought to bear, the greater your animal's opportunity to continue a healthy and productive life. The keeper plays a key role in making this possible.



NEW FEDERAL REGULATION ENCOURAGES CAPTIVE BREEDING OF ENDANGERED SPECIES

A marked increase in captive breeding of endangered species is the anticipated result of a new regulation issued by the Department of the Interior's U.S. Fish and Wildlife Service. The rule eases Federal regulation of interstate transfer of certain captive species covered by the Endangered Species Act of 1973.

The action was prompted by evidence that stringent regulatory procedures have led to decreased breeding by zoological parks, bird breeders, and others. Breeders have pointed out that tough Federal restrictions--while intended to protect and propagate such species--have sometimes had the opposite effect. In some cases, persons who would otherwise breed endangered species have ceased to do so or have limited the number of offspring produced because they could not be readily transferred to other facilities.

Under the new regulation, a zoo, wildlife park, aquarium, and other organizations or individuals can register with the Fish and Wildlife Service to become a licensed shipper and receiver of captive-born endangered species. After registration, reports will be required annually.

Wildlife affected by the regulation includes non-native U.S. endangered species and native U.S. endangered species that are sufficiently protected from unauthorized taking or are in low demand. The rule provides that native species will be designated on a case-by-case basis. One species, the Laysan teal, was designated in the rulemaking.

Formerly, breeders were required to obtain a Federal permit before engaging in interstate commerce or exporting of captive-bred wildlife. This time-consuming process led to higher maintenance costs of animals awaiting shipment, increased difficulties in handling adult animals instead of young ones, and unavailability of breeding stock when needed.

The Fish and Wildlife Service determined that activities involving captive wildlife should be regulated as required by the Endangered Species Act, but only to the extent necessary to conserve the species. According to Service biologists, the new regulation should help reduce inbreeding--which has been cited as a factor in juvenile mortality--by facilitating exchange of animals. It is also hoped that the rule will reduce the demand for wildlife that might otherwise be taken from its natural habitat.

The regulation was published in the September 17, 1979, Federal Register.



Remember to vote for the Board of Directors for AAZK. The official ballot is on page 197 of the October issue. Vote for 3 before November 30.

Alternatives...Education and P.R.

The Animal Keepers' Forum receives newsletters and news releases from many zoos and would like to share some of the creative, stimulating educational ideas that these publications contain. The events are presented in a brief form to serve as an inspiration for ideas that can be adapted to your zoo and its needs and resources.

PHILADELPHIA ZOO EMPLOYEES RECEIVE CPR TRAINING

Employees of the Philadelphia Zoo will receive training in Cardio-Pulmonary Resuscitation (CPR), a method of sustaining victims of cardiac arrest until medical help arrives. The zoo feels a responsibility to its employees and visitors.

ROYAL MELBOURNE ZOO ESTABLISHES HANDICAPPED CHILDREN'S PROJECT

The Melbourne zoo has built an education facility for the Handicapped Children's Environmental Learning Project (HELP). The children can touch, smell, and experience a wide variety of animals, animal artifacts, "environment zones", and physical activity areas.

NEW YORK AQUARIUM OFFERS FAMILY WORKSHOPS

The New York Aquarium in Brooklyn offers special family workshops for parents and children over five. Each workshop is designed to provide a general introduction to sea life. The workshops center around the family--how members interact with and learn from each other.

BALTIMORE ZOO PROUD OF CONSERVATION PROJECT

Sixteen newly-hatched Gulf Hammock Rat Snakes from the Baltimore Zoo collection were shipped to Florida to be released in the wild. The snake is not particularly rare, but may be threatened because of its tiny natural range--4 or 5 counties of Florida.

ZOOS PROVIDE HALLOWEEN EVENTS

Several zoos are sponsoring "Fright Night" or a "Halloween Happening" with scary events like a Mystical Magic Show or the Haunted Express. Prizes are offered for best costume, and, of course, Best Animal Costume is one of the categories. Hay rack rides and traditional foods are also part of the fun.

SOUNDS OF MUSIC MINGLE WITH SOUNDS OF ANIMALS AT SAN DIEGO ZOO AND WAP

The San Diego Zoo and WAP hosted different types of musical groups during the summer. The "Up With People" group, a family entertainment chorus and band, presented a show saluting the International Year of the Child. The WAP hosted the Second Annual San Diego Wild Animal Park Bluegrass Jamboree with "Country Gazette" and the "Footloose Cloggers".

THE KEEPER'S ROLE IN ZOO ANIMAL HEALTH

by
Judie Steenberg

This article is part of a series. An introduction and "Keeper, Know Thyself" were printed in the October issue.

KEEPER, KNOW THY ANIMALS

It's hard to imagine that one could ever learn all there is to know about zoo animals.

A basic knowledge of the anatomy and physiology of the animals a keeper is caring for is important to give guidelines for meeting the animals' basic needs. It is also important to know what to avoid. The quality of the captive environment is dependent on several things; useable space, proper temperature and humidity and avoiding hazardous designs. The animal's nutritional requirements, social needs, sensory apparatus and reproductive process should all be given consideration and provisions made for them.

Knowing what is normal for a species and what special needs they may have will help a keeper tend to the animals properly. It will help the keeper be more aware of the need to stimulate an animal's sensory apparatus and see that the body functions are operating normally.

The Individuality of Animals

"The keeper must know what normal is for every one of his charges...everyday behavior, eating habits, gait, odors, discharges, fecal and urination characteristic."

(Porter 1975-11:7)

Learning the individual habits and needs of the animals takes time and careful observation. Nall (1972-73) points out that many times it takes much close observation for even the most experienced keeper to interpret a communication from an animal.

Communication between people is again a key factor. The senior keeper should share all of the knowledge he or she has about individual characteristics or habits of the animals with the new keeper. Once a new keeper is aware of certain habits, peculiarities or abilities of an animal, an effort should be made to become familiar with them and to remember them.

Animals as a group and as individuals are quite expressive. Hediger (1968) lists four main areas of animal expression: acoustic, optic, olfactory and internal. Some animals make sounds (vocal, nasal or dermal) such as clacking beaks, grinding teeth or shaking rattles to express their psychological state and/or intentions. Still other animals produce sounds with the help of objects; beavers use water surfaces to make sounds, rabbits thump the ground primates can make a variety of sounds in a cage by banging or shaking it. These expressions along with the varied calls of animals can be to express territorialism, alarm, fear, aggression, anticipation, courtship, recognition and well-being. The keeper should learn the meaning of these expressions.

Optical expressions can be facial expression, gestures, color changes or changes in stance or contour. In facial expressions the ears, jaws,

The Keeper's Role in Zoo Animal Health, continued

teeth, lip position, dilation of pupils, the tongue, the position of the nose (elephant, tapir, seal) and yawning such as is used by primates and hippos, all mean something. A keeper should also be aware of tension of the neck, limbs or entire body, the bristling of the mane or rump patch, of a ruffling of feathers and/or raising the crest. These are all expressions.

The olfactory expression that immediately comes to mind is that of the skunk. There are other animals capable of emitting strong scents too, as an expression of alarm, to mark territory or as a defense mechanism.

According to Hediger (1968) internal expression phenomena are principally a reaction of the digestive tract such as regurgitation or diarrhea. He cites such examples as: snakes and lizards may regurgitate after eating if handled improperly, various birds regurgitate when excited, elephants, and camels are noted for emptying their bladders or discharging watery diarrhea, some amphibians and tortoises express fluid as a defense, appetites may diminish or the animal may refuse to eat altogether as an expression of stress. Loose stools are a common digestive expression. "Consistency, color, smell etc. must be examined regularly so that possible digestive troubles may be treated at once" (Hediger 1964).

Still another form of expression not covered in the four main areas, is "shamming". An animal may exhibit a limp or not use a limb while being observed openly and yet move about normally when no one is watching. If this sort of behavior is suspected, the animal should be observed from a hidden point to determine if the hunch is correct.

A keeper must know what reaction animals have to various stimuli (noise, unfamiliar people, changes in routine, temperature, pasture or pens, etc.). The psychological state is closely allied with the physical state; the mind controls the body to the extreme of convulsions, hysteria, regurgitation and flight reactions when an animal is stressed severely. Psychological stress often manifests itself physically, and no two animals will necessarily react alike. There is also variation in the reactions of young animals versus old animals. Experience applies to animals, too. Stress plays an important part in the overall welfare of animals and can have a pronounced effect on reproduction. It's up to the keeper to know the signs of stress, avoid causing it and when it occurs, eliminate the cause.

Hediger (1968) lists six areas to be aware of regarding an animals' behavior: 1. acquisition and assimilation of food, 2. maintenance of living quarters, 3. social activity, 4. reproduction and care of the young, 5. care of the body and comfort behavior and 6. play. A keeper should be able to identify these behaviors according to the individual animal, not just the species. As a group a species of animals will generally act or react in a certain way, but there is frequently individual behavioral modification.

It is important for a keeper to be able to identify the animals just from their appearance, too. A veteran keeper when asked "How can you tell them apart?" about a group of animals with few or no obvious differences in color, size or markings, may well answer..."they don't look alike" ...and not be facetious. It is frustrating to be told that however, when to the untrained observer, they DO look alike. It takes time and effort to learn to tell similar-looking animals apart, but it

The Keeper's Role in Zoo Animal Health, continued

can be done. Obvious identification marks make it possible for anyone to tell the animals apart and ear-notching, tagging or banding can be useful for that purpose. Animals are also sometimes tattooed for the purpose of identification, but usually in an inconspicuous place. If an ear tag or band is lost, it should be reported and replaced promptly. If it isn't replaced, the hole or tear in the ear can serve as an identification mark.

If an animal has been assigned a house name or I.D. number, a keeper should know it and use it when reporting data on a particular animal. At the risk of being repetitious...if a keeper doesn't know how to identify an animal he or she should ask for advice or help.

Nutrition requirements and feeding habits of zoo animals vary. Quantity, frequency of feeding, location of food pans or hay bunkers, etc., temperature, consistency, container size, the animals' age, health, social status and climate are some of the factors affecting good animal nutrition. How much each animal is actually consuming when it is in a competitive situation (dam/offspring, herd, sibling rivalry), or how much food is carried off by transient birds or rodents must be considered.

The social status of an animal may be solitary, pairs, small family groups or herds. A keeper should be knowledgeable of what the normal social structure is for his or her animals, and what ramifications there may be from a drastic change from the norm. Animals in a group situation exhibit various levels of dominance which can vary during breeding season or as younger animals assert themselves. A keeper must be aware of changing social situations, the problems of increased social stress, or the lack of stimulation a social animal can suffer if kept by itself. Supervisory personnel should be kept informed of any changes in an animal's behavior or social status. Adjustments in diet, the exhibit or populations should be made according to the seriousness of the problem.

In areas where there are weather extremes according to the seasons, a keeper should be alert to the animal's comfort. All properly designed exhibits should provide shelter from the elements--wind, rain, sun, etc.. Proper drainage is also a must; exhibits, pens or yards should not be constantly wet or damp. Substrate, such as concrete, can be detrimental to an animal's well-being. Limbs, shelves, platforms, nest boxes or bedding can help break up the hard surface of concrete and remedy the problem.

A keeper should know what temperature various animals require for basic comfort and what indications they give to express discomfort. Humidity and ventilation are also factors in an animals' environment. Adjustment in temperature, humidity and ventilation should be made according to the seasons or an animal's needs, such as for the newly born or hatched. A keeper should know how to properly operate any temperature or humidity control equipment in any of his or her areas.

In some species, breeding behavior can be rough and possibly upsetting to the inexperienced keeper. Biting, kicking, squealing and knocking the females to the ground is not unusual for some species. Breeding posture and the duration of copulation also vary according to species. It behooves a new keeper to learn about the age of sexual maturity, frequency of breeding (seasonal, etc.) and the behaviors to expect from

The Keeper's Role in Zoo Animal Health, continued

the animals he or she is responsible for. A keeper should also be able to tell if intromission was achieved.

Breeding attempts and successes should be carefully recorded and the probable date of birth or hatching determined. During the months prior to parturition preparations should be made. Plans need to be made to separate the pregnant female from the male or herd; if necessary, nest boxes may need to be built and placed in the unit early enough for the parturient female to become familiar with, or the animal may need to be given relief from visual contact with zoo visitors. In some cases it may be necessary to remove the animal from the exhibit, or block the exhibit off from the public, until after the young have been born, are being cared for by the mother and she is ready to accept other stimuli.

Awareness of an animal's needs and making preparations for a pending birth can make the difference between an animal successfully raising her young, or rejecting it so it needs to be hand-raised or even her destroying the young as has been the case with some jaguars and polar bears in zoos. A careful check of the facilities should be made prior to the arrival of young to detect any places the young could "walk-out".

With the birth or hatching of young, a keeper has a new set of responsibilities and must be aware of the normal process of development of the young animal(s) according to the species. How soon after birth the young animal attains a standing position, when it first suckles or picks up food, the duration of its feeding attempts, the first time it defecates or urinates, the color and consistency of the feces, the amount of urine or feces passed are all important to record for future reference. These things give an indication of the overall strength and condition of the young animal. Also worth noting are the dam's reaction to the baby, to the presence of people and the time lapsed until delivery of the afterbirth.

As the young animal grows and begins eating solid foods, how much it eats and what solids were eaten should be recorded. Other data of interest are: when the eyes first opened, reactions to visual stimuli, changes in pelage, physical size and appearance, changes in dentition, vocalizations, when the young animal first left the nest, followed dam, swam, or moved about independently of its mother.

If it is necessary to remove a young animal for hand-raising, the date of birth, date removed from mother, weights and measurements should be recorded. Records should also reflect the quantity and kind of food offered, consumption, the number and frequency of feedings offered during a 24 hour period and the method used to feed.

Whether mother-raised or hand-raised, the date and details regarding diet changes and prophylaxis or treatments should be recorded.

To summarize the keeper's knowledge and recognition of an animal's individuality, a mark of success is the relationship that is established between the keeper and the animals. Good relationships are conducive to animal health. Poor relationships can mean repeated stress which could result in health problems. A keeper need not be "friends" with each animal but must be aware of the animal's psychological as well as physical needs and reactions, and try to work with them, not against them. "From the very start, a person is either sympathetic or anti-

The Keeper's Role in Zoo Animal Health, continued

pathetic to the animal. This fact is of the greatest importance in keeping animals." (Hediger 1964).

Facilities and Equipment

A conscientious keeper is aware of the condition of the facilities in the area and either makes necessary repairs promptly or reports the need for them to the proper people. A daily check should be made to spot needed repairs or locate potentially hazardous conditions. A keeper who is on good terms with maintenance personnel has a better chance of getting work done than one who is at odds with them. Proper communications can make the difference in getting the work done promptly or having to wait for it to be done. When a problem arises, it must be determined what effect it will have on the animals in the area (i.e. a broken fence), and safety precautions must be taken. It may mean keeping the animal off-exhibit or moving them to another area.

Weakened barriers are an invitation to trouble and should be given routine maintenance to keep them strong. Even with a seemingly sufficient barrier though "...the rule applies that the effectiveness of a barrier is inversely proportionate to the strength of the animal's degree of excitement." (Hediger 1964).

An area should never have loose fencing, wire, nails, bailing twine or wire, tools, loose boards or protruding nails in it. All items (tools, wire, etc.) taken into an area for making repairs must be removed before allowing the animals access to the area.

Protruding wire and nails must be bent back to prevent possible injuries. For years after construction has taken place in an area, nails, bolts, etc. can work their way to the surface. Regular checks should be made and in large areas a magnet sulky should be dragged across the ground.

"Hardware disease" is caused when a foreign object, usually metal, punctures the reticulum of a ruminant. The problem is not rare since ruminants are generally indiscriminate eaters.

Another preventive practice a keeper should be doing is keeping an eye out for foreign objects thrown into exhibits, moats, etc., such as paper cups, plastic bags, coins and polaroid film discards; any object that might be consumed by an animal.


All units should be as predator proof as possible and an effort made to trap nocturnal predators such as owls, fox, skunk, raccoon, possum, etc.

Locks in all areas should be in good working condition and replaced when they become defective. The location and condition of capture and restraint equipment, and the proper way to use the equipment should be known.

"No Smoking" signs should be posted in any area in which there is a potential fire hazard, and care must be taken when using vehicles around hay storage areas. Keepers working in an area that has the potential of burning, especially old buildings, should have a plan of what to do if a fire breaks out. Knowing where fire extinguishers are, and being sure they've been checked and are functioning properly, knowing what kind of fire the extinguisher is meant to put out, and knowing the location of the nearest telephone can help reduce fire

The Keeper's Role in Zoo Animal Health, continued

loss. All telephone locations should have local fire and police numbers posted near them. Fire procedures and what to do in the event of a natural disaster such as a tornado, severe storm or flood should be emphasized as a part of a keeper's training.

This is Part II of a series. Nutritional Requirements, Diseases, Injuries, and other subjects will follow. 

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I certify that the statements made
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Signature and Title of Editor

Ronald L. Kaufman
Editor-in-Chief

We are deeply indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

ANIMAL KEEPER FOREMAN... Responsible for coordinating and supervising the daily activities of approximately a 25 person animal keeper force, including scheduling, some animal moves and shipping arrangements, record keeping and exhibit improvements, supervising the security force and doing special projects as assigned by the General Curator.

Five years of experience in a zoological park including progressive responsibility of a supervisory nature involving the coordination of personnel is desirable. Some college level coursework in an animal science is also desirable.

Send resume, publications, etc., before November 20, 1979, to Robert McCabee, Metro Service District, 527 S.W. Hall, Portland, Oregon. 97201

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ZOOLOGIST/PRIMATOLOGIST... responsible for management and breeding of large and diverse primate collection under the direction of the curator of mammals. Duties include close supervision of all primates within the zoo, including their care and diet formulation; cooperation and frequent liaison with research, veterinary and academic personnel; some administrative and supervisory responsibilities. Minimum qualifications include an advanced degree in zoology, primatology or related field and two years' experience in the husbandry and propagation of primates in captivity. Supervisory and research experience would be helpful. Contact: Personnel Office, San Diego Zoo, P.O. Box 551, San Diego, CA 92112.

CURATOR OF BIRDS... responsible for the management of bird portion of zoo collection and related facilities. Incumbent is involved in the planning and implementation of programs to achieve the objectives of exhibition, care, propagation and scientific study of a large number of species of birds. Salary: \$18,384 - \$25,872. Contact: Larry O. Calvin, Director, Dallas Zoo and Aquarium, 621 East Clarendon Drive, Dallas, TX 75203

ELEPHANT HANDLER/TRAINER... applicant must be experienced handler/trainer. Duties will include operation of elephant rides, supervision of riding track employees and daily care of elephants, as well as elephant training. Salary commensurate with experience. Benefits include hospitalization and 4 weeks vacation. Interested individuals should send resume stating salary requirements to: James B. White, Personnel Manager, New York Zoological Society, 185th St. & Southern Boulevard, Bronx, NY 10460. AN EQUAL OPPORTUNITY EMPLOYER - M/F.

CURATOR OF MAMMALS... seeking an individual to manage a balanced mammal collection. Individual expected to design and implement captive-breeding programs, assist in the development of new exhibits, plus attend to usual curatorial responsibilities. Applicant should possess curatorial experience with a proven supervisory ability. Detailed job description is available on request. Send resume with three references to: W.B. Amand, V.M.D. Director, Philadelphia Zoological Garden, 34th and Girard Ave., Philadelphia, PA 19104. AN EQUAL OPPORTUNITY EMPLOYER.

continued on next page

ASSOCIATE SUPERINTENDENT/ANIMAL SERVICES... seeking mature individual to assist the Superintendent/Animal Services Department. Applicant should have minimum of two years' college training in appropriate field of study (or equivalent experiences), as well as three to five years' animal keeping experience including no less than two years in a supervisory position. Experience with large mammals preferred. Detailed job description available upon request. Send resume with references to: W.B. Amand, V.M.D., Director, Philadelphia Zoological Garden, 34th & Girard Avenue, Philadelphia, PA 19104. AN EQUAL OPPORTUNITY EMPLOYER.

PUBLIC RELATIONS/ZOO EDUCATION DIRECTOR... all phases of public relations, photo experience with lab a must. Requires community and media rapport; coordination of Zoomobile and Animal Adoption programs at zoo; special events and public relations at children's park and public relations at other facilities in Kelley Park (limited). Limited public relations budget. Salary \$11,850 per year. Opening available 1 December 1979. Send resume to: San Jose Baby Zoo, 1300 Senter Road, San Jose, CA 95112

DIRECTOR OF DEVELOPMENT... aggressive, knowledgeable and experienced person sought to initiate newly funded Development Department. Person should have experience in raising funds from corporate, foundation and governmental sources. Excellent salary range and fringe benefits. Contact: Edward J. Maruska, Director, Cincinnati Zoo, 3400 Vine Street, Cincinnati, OH 45220.

ANIMAL TRAINER/HANDLER... seeking experienced trainers for theatrical animal work, mostly stage and commercial work with some care, maintenance and breeding programs for captive stock. Salary commensurate with experience \$9,000 - \$12,000. Contact: Steven or Carol McAuliff, Animal Actors, Rd. #3, Box 221, Washington, NJ 07882. (201) 689-7539.

SENIOR CURATOR/MAMMALS... must have Ph.D. or equivalent in life sciences or related subject matter and have extensive experience in the management of captive mammal collections and their exhibition. Experience in the conduct of behavioral research within a zoological park setting is mandatory. Salary: \$29,375 - \$34,713. Application should be sent to: Ms. Janice Brambilla, Office of Personnel Administration, 900 Jefferson Drive, S.W., Smithsonian Institution, Washington, DC 20560. EQUAL OPPORTUNITY EMPLOYER.

ASSISTANT CURATOR/EXHIBITS... supervisory position involving design and maintenance of exhibits and related graphics. Must have thorough exhibit knowledge including fiberglass and resin. Aquarium experience preferred. Submit resumes to: John A. Dinga, Curator, Baltimore Aquarium, Inc., 10 South Street, Baltimore, MD 21202. AN EQUAL OPPORTUNITY EMPLOYER.

ASSISTANT CURATOR/HUSBANDRY... supervisory position involving acquisition and display of marine and aquatic fish, birds, plants and mammals. Must have extensive knowledge and experience in exhibiting and maintaining aquarium animals and plants. Submit resumes to: John A. Dinga, Curator, Baltimore Aquarium, Inc., 10 South Street, Baltimore, MD 21202. AN EQUAL OPPORTUNITY EMPLOYER.

AQUARIUM CURATOR... applicant must have experience in management of large aquarium water systems, fresh and saltwater animal husbandry and management of personnel. Responsible for aquatic exhibits and herpetarium. Salary negotiable. Position available 1 January 1980. Contact: John E. McCosker, Director, Steinhart Aquarium, California Academy of Sciences, San Francisco, CA 94118. AN EQUAL OPPORTUNITY EMPLOYER.

continued on next page

CURATOR/MAMMALS... supervisory and scientific position with responsibility and authority. Requires degree in zoology with emphasis on mammals and zoo experience with various mammal groups. Salary: \$13,707 - \$16,681. Contact: Bob Truett, Director, Birmingham Zoo, 2630 Cahaba Road, Birmingham, AL 35223. (205) 879-0409.

CURATOR/BIRDS & REPTILES... excellent opportunity to develop a quality division in a dynamic zoo. Requires a degree in zoology and zoo experience. Advanced expertise with either birds or reptiles, plus an avid interest in both classes is required. Salary: \$13,707 - \$16,681. Contact: Bob Truett, Director, Birmingham Zoo, 2630 Cahaba Road, Birmingham, AL 35223. (205) 879-0409.

PARKS & GROUNDS ADMINISTRATOR...minimum of four years' management experience with an undergraduate degree in parks and recreation administration or parks management or related field. Salary: \$15,288 - \$20,197 with excellent fringe benefits. Submit resume to: Personnel Department, City of Greenville, Greenville, SC 29602. AN EQUAL OPPORTUNITY EMPLOYER.

SENIOR ANIMAL TECHNICIAN...to perform as working supervisor of Bird Department. Supervisor experience and previous work with a variety of birds desirable. Salary \$11,839 - \$12,674. Good benefits. Contact Greg Toffic, Zoological Curator, Oklahoma City Zoo, 2101 N.E. 50th, Oklahoma City, OK 73111. (405) 424-3344. Apply before 20 Nov. 1979.

* * * COMING EVENTS * * *

World Conference on Breeding Endangered Species in Captivity
November 12-16, 1979 San Diego, California

World Conference on Sea Turtle Conservation
November 26-30, 1979 Washington, D.C.

Workshop on the Captive Management of Wild Animals
January 26-27, 1980 Adelaide Zoological Gardens,
Adelaide, South Australia

VIIIth International Congress of Primatology
July 7-12, 1980 Florence, Italy
Topics: Primate Evolutionary Biology and Primate Sociobiology

* * * *

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Elizabeth Glassco
Administrative Secretary
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National Zoological Park
Washington, D.C. 20008

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10" (15 cm. x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.



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Affiliate (full-time keepers)	\$10.00 annually
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The AAZK Headquarters has extra shoulder patches available for \$1.25 and back issues of the *Animal Keepers' Forum* for \$1.00.

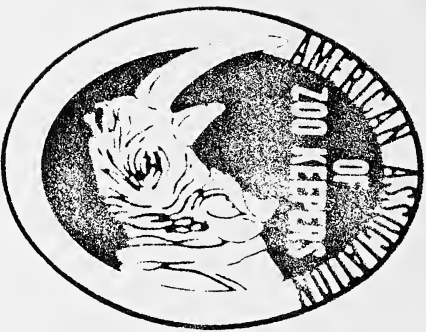
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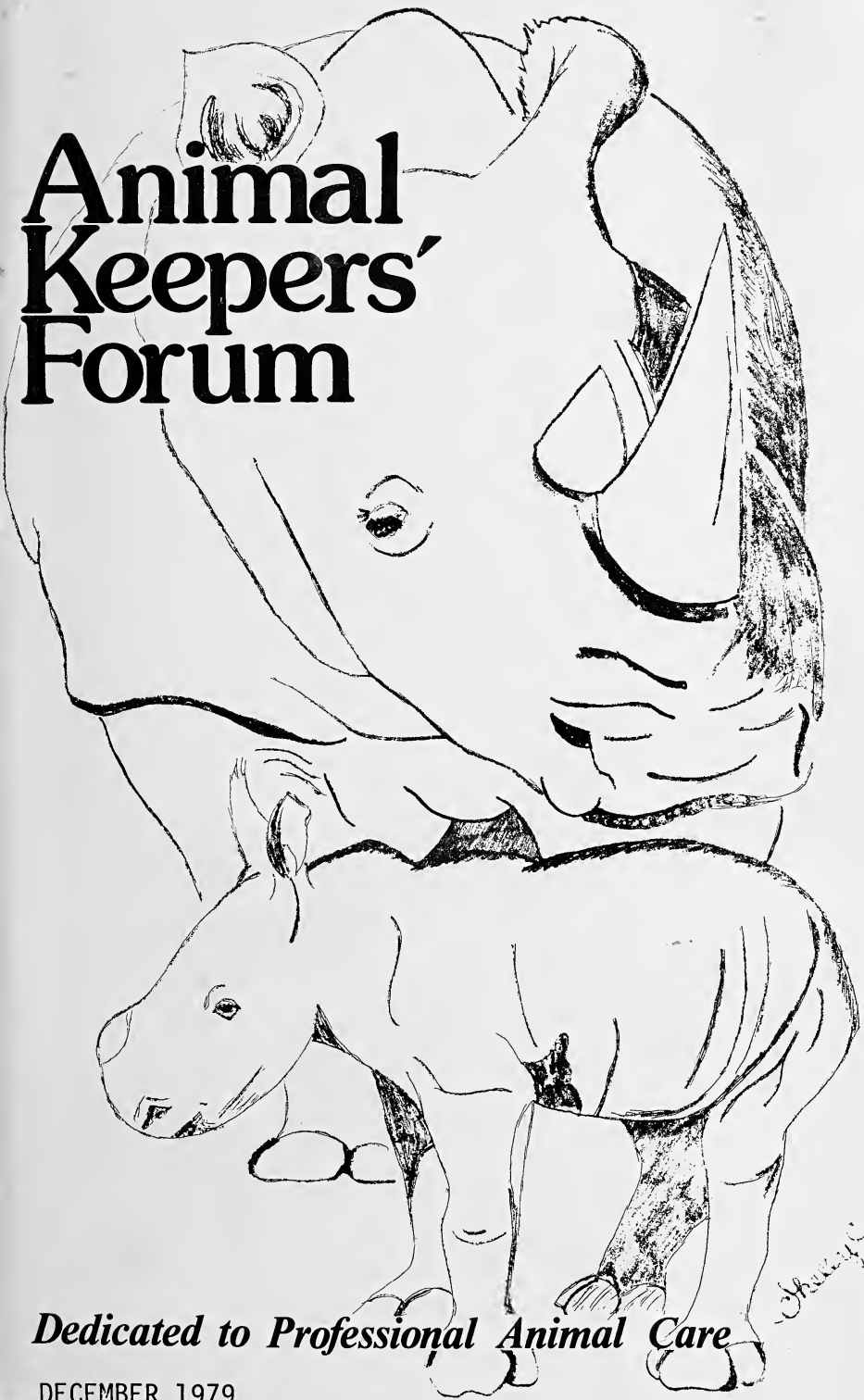
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Animal Keepers' Forum



Sherry L.

Dedicated to Professional Animal Care

DECEMBER 1979

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Shelly Carpenter illustrates the December cover with a one-day old White Rhino and her mother from the Phoenix zoo. The father's name is Khetla and the mother's name is Tambile, so the baby is KT or Katie. Thanks, Shelly!

This is a special issue to finish out the 7th year. Karen Osman from the Rio Grande Zoo combined her interest in animals and in heraldry and her talents as an artist for a special article for our readers. It is on page 228. The proceedings from the 1979 conference are also in this issue, beginning on page 237.

SCOOPS and SCUTTLEBUTT

CORRECTION FOR "HAND-REARING THE SAIGA"

Marcia Rohrer wrote that the paper "Hand-rearing the Saiga" which was in the October issue of AKF contained a serious error. It was stated that "122 cc. of Bovine Anti-bacterial Serum" was given. This should be 12 cc. Our apologies for this, and our appreciation to her for correcting it.

WASHINGTON PARK ZOO RECEIVES ASIAN BULL ELEPHANT... Roger L. Henneous

On Thursday, October 25th, Washington Park Zoo, Portland, became the home of the 13 year old Asian Bull TUNGA; the oldest and largest of the elephants owned by the late H.M. Berry of Woodland, Washington. He comes to Washington Park Zoo as a back-up to Packy, Portland's first-born elephant and present herd sire. Tunga is a promising prospect for increasing the genetic diversity of our already successful breeding herd of Asian elephants.

PHILADELPHIA ZOO GETS RARE INDIAN RHINOS Jeanne Laura Segal

The Philadelphia Zoo has acquired a pair of rare Indian rhinoceroses from the Basel Zoo in Basel, Switzerland. The two animals have a combined weight of about 8,500 pounds (3,860 kg.) Their 400-mile journey was by jetliner, truck and finally, forklift. Fewer than 1200 individuals survive in the rhino's native habitat of Northern India.

TOPEKA ZOO APE HOUSE GROUND BREAKING

Ground breaking ceremonies for the new Discovering Apes Building took place at the Topeka Zoological Park on 7 October 1979. The Discovering Apes Building is a million dollar project. Designed for social family groups of great apes, this innovative facility will present Zoo visitors with an experience unparalleled in Zoo History. After crossing a bridge over a sunken jungle, visitors will step into an Indonesian tree house to view the orangutans at tree-top level. The gorillas will be shown in the world's first walk-thru gorilla exhibit. Visitors will stroll through a glass tunnel down the middle of a simulated jungle clearing complete with live plants. Gorillas will be on all sides and even across the top of the tunnel. How would you like to be nose to nose with a 400 pound gorilla?

BIRTHS HATCHINGS

ELEPHANT BIRTH AT PORTLAND TOO LATE FOR CONFERENCE...Roger L. Henneous

A week and a day after the 1979 AAZK Conference, Rosy Portland's first elephant gave birth for the 5th time. The birth, occurring at 2:19 p.m., October 5th, came exactly 21 months to the day from the last breeding date and produced a male calf weighing approximately 200 pounds (90 kg.) Named Thong Tri (third generation Thonglaw) he was on his feet in less than ten minutes and nursing in less than one hour.

This was Washington Park Zoo's 20th elephant birth in less than 18 years, and Packy's (Portland's first-born) 5th offspring.

Convention hold-overs who observed the birth were Phil Prewett of Memphis and Chris Mercer of the National Zoo.

WHITE RHINO BIRTH IN TORONTO, CANADA Steve Unwin

On Friday, October 12, 1979, at approximately 11:30 p.m. a female White Rhino was born at Metro Toronto Zoo. This is the first captive White Rhino *Ceratotherium simus* birth in Canada. The mother, born and hand-raised in San Diego, has been in our collection since 1974, making this event possibly a first in North America - a second generation White Rhino birth.

At the present time the mother is caring for the calf and both are doing well.

BLUE AND GOLD MACAW HATCHED AT FOLSOM CHILDRENS ZOO

On September 19th, a Blue and Gold Macaw chick hatched after 33 days incubation by the parents. They were allowed to feed the chick for 5 weeks until it just began feathering out, at which time the chick was pulled from the nest and hand-raised. This would allow the parents to recycle.

As of this time, the chick is about 50% feathered out and has begun eating on its own.

SERVAL KITTENS BORN AT FOLSOM CHILDRENS ZOO

September 29th marked a happy day at the Folsom Childrens Zoo. Patches, our female Serval, gave birth to twins. This will be her third litter in three years. The gestation period was 75 days from the first signs of heat.

To date, she is nursing and caring for the kittens extremely well.

HYBRID RATTLESNAKES BORN AND ISLAND CHUCKWALLAS HATCHED AT DESERT MUSEUM

Merritt S. Keasey, III, Arizona-Sonora Desert Museum

On August 30, 1979, our female black rattlesnake, *Crotalus viridis cerberus* gave birth to four babies sired by her cagemate, a male blacktailed rattlesnake, *Crotalus m. molossus*. This is the first recorded hybridization between these two species.

On September 26, 1979, thirteen baby San Esteban Island Chuckwallas, *Sauromalus varius*, hatched in our outdoor lizard enclosure. The incubation period was 102 days.

ENDANGERED SPECIES COALITION FORMED
TO INSURE REAUTHORIZATION OF ENDANGERED SPECIES ACT

by
Kevin Conway
Conservation Center, Front Royal, VA

Reauthorization of the Endangered Species Act is expected to begin in the House of Representatives by the middle of October. To insure passage of the Act, environmental and zoological organizations in Washington, D.C. have joined together in forming an Endangered Species Coalition.

Organizations lending their support to the coalition include: The Humane Society of the U.S., Friends of the Earth, Defenders of Wildlife, AAZPA and AAZK. The objective of the coalition is to insure that congress maintains the integrity and strength of the Endangered Species Act, without adding weakening amendments.

Following formation of the coalition, the Carter Administration held an Executive briefing on the Endangered Species Act on October 11th. Stuart Eisenstat and Kathy Fletcher represented the administration at the briefing, with Lynn Greenwalt present for the Interior Department Administration. Representatives stressed the need for close cooperation between the administration and the environmental community during debate on the bill. A final vote on reauthorization of the Act is expected in November.

CALL FOR PAPERS

AAZPA CENTRAL REGIONAL WORKSHOP

We would like to invite you to present a paper at the AAZPA Central Regional Workshop in Tulsa, March 9 through 11, in the areas of animal husbandry, education, research and exhibits. Even a preliminary plan for a paper or film would help! There will be an AAZK session during the co-workshop. Also, we are requesting that you forward to us ideas, suggestions concerning the program and "tips" on potential speakers.

Ken Kawata,
Program Coordinator
Tulsa Zoological Park
5701 E. 36th St. No.
Tulsa, OK 74115 918 835-8471

ELEPHANT CENSUS

Make sure your zoo is included!. This census will list elephants of zoos, safari parks, circuses--everywhere.

The information wanted is: name, specie, age, sex, place of origin whether zoo or animal dealer, distinguishing traits, training. Other information wanted is: name of institution, address, name of elephant act, and the number of staff who work with the elephants. Please include any remarks and a picture, if possible.

Thanks for your help.

Sabu
Elephant Historian
1807 18th Street
Niagara Falls, New York 14305

Animals in Heraldry

While they did not have as great a knowledge of animal nutrition and behavior as we do today, medieval people lived close to animals both domestic and wild. Many of their tame animals were close to their wild counterparts; medieval cattle were rangy beasts similar to a nineteenth-century longhorn; medieval pigs were much like a larger version of the peccary, and often had much the same temperament, for they were allowed to run wild most of the year in the woods and were only rounded up for slaughter in the fall. (Horses fared better, and several recognised breeds had been created by systematic breeding by the end of the period, including the Arabian, Shire, and Percheron.) Wild animals were also common throughout medieval Europe, even near major towns. Some of these, like aurochs, have been totally eliminated today, while most of the others, like the wolf, wildcat, red deer, and European bison, have been reduced to curiosities in zoos and parks.

It was natural when knights and noble families began to adopt symbols to identify themselves, that they would take some of these animals as emblems. The science of Heraldry evolved from the twelfth century onward into a vast, intricate and highly technical discipline, designed to make sure that each person's coat of arms was unique and followed the rules. The most important animals were assigned qualities such as courage, nobility, and majesty, and nobles used them to express their personal or family pride. Some animals, such as the lion or eagle, became identified with certain ranks and could not be used by ordinary people. Each of the types of animals also had a group of terms which described the way they were drawn, such as *rampant*, (rearing on hind legs), *passant* (walking), *statant* (standing), *sejant* (sitting on hindquarters), *couchant* (crouching), *dormant* (sleeping), *volant* (flying), *niant* (swimming), and so on. Different terms were used for fierce carnivorous animals, such as lions, and for herbivorous, harmless ones, such as stags. For example, two lions *rampant*

facing each other were called *combatant* (fighting), while two stags in the same position were called *regardant* (watching each other).

Both real animals and mythological ones were used in medieval heraldry, but I will mention only the real ones in this article.

The lion: the most important quadruped. As the King of Beasts, the lion stood for courage, high rank, and majesty. Most people are familiar with the arms of England, which are blazoned *gules, three lions passant guardant or*; meaning three lions vertically, looking at the viewer, gold on a red ground. This device was first borne by Henry II in the mid-twelfth century, and the style of the lion developed over the centuries until it looked almost nothing like a real lion. This royal English lion was often called a 'leopard'.



The eagle: the most important bird. Its symbolism was the same among birds as the lion's among beasts: "royal power, courage and magnanimity." It was the emblem of the Holy Roman Emperor, and became part of the national arms of Austria, Prussia, Russia, and Germany.

The wild boar: represented savage courage and fighting spirit, as anyone will understand who has ever hunted one. The white boar was a badge of Richard III.

The wolf: was symbolic of valour in Roman thought and of evil in the Fenris-wolf of Norse mythology, so its meaning was close to that of the boar.

The bear: usually was used in names with 'bear' as part of the meaning, as in the crest of the city of Berlin.

continued



Animals in Heraldry, continued



The dog: Many different kinds of symbols of dogs were used including mastiffs, greyhounds, foxhounds, and the Talbot, which was borne by the famous English family of that name.

The Falcon was very important as a noble bird used for hunting. Each species of falcon was assigned to a particular rank and anyone using one not appropriate was severely punished. Anne Boleyn had a falcon as her badge, and it was often used by her daughter, Queen Elisabeth I.



The pelican was believed to feed her chicks by drawing blood from her breast, and so was seen as a type of Christ, and represented self-sacrifice and Christian piety.



The Stag was also hunted by nobility, and was considered a symbol of beauty, grace and purity, and was associated with hermit saints like St. Hubert. Richard II used a white stag with a crown around its neck as a badge.

This only touches the surface of the heraldic use of animals and their symbolic meaning. References for anyone interested in learning more include: J.E. Cirlot, A Dictionary of Symbols, Arthur Charles Fox-Davies, The Art of Heraldry, and Herbert Norris, Costume and Fashion, Volume II.

Karen Osman
Keeper, Rio Grande Zoo



AMERICAN ASSOCIATION OF ZOO KEEPERS



SUMMARY OF MAJOR POINTS DISCUSSED DURING THE OPEN BOARD MEETINGS AT THE 1979 NATIONAL CONVENTION

CONVENTIONS

The Montgomery AAZK Chapter will host the 1980 AAZK National Convention at the Montgomery Zoo, Alabama. The dates are October 12-16.

The Audubon Park AAZK Chapter, New Orleans, has expressed interest in the 1981 site and the National Zoo AAZK Chapter in conjunction with the Baltimore AAZK chapter will consider either 1981 or 1982 as possible years to host a national convention.

Money generated from a national convention which is left after all costs have been paid is still to be equally divided between the AAZK National and the host chapter with the National's share being sent to Headquarters as soon as possible.

Discounts for delegates who are presenting a paper at a national convention will be considered. The host, after bid has been accepted, should submit a proposal for Board approval.

The 1979 AAZPA Regional Workshops were discussed. The AAZK representatives all expressed a very favorable response from AAZPA and host personnel. The Board still urges AAZK members to attend the AAZPA Regional Workshops if possible in the future, especially if they will not be present at the AAZK National Convention.

Jill Grade will attempt to line up AAZK Representatives for the 1980 AAZPA Regional Workshops as soon as the dates become available.

Possible revisions for the AAZK Theme Presentation should be submitted to Larry Sammarco before 1/1/80 for consideration. Suggestions regarding AAZK's role at these Regional Workshops are also encouraged.

The Board was impressed with the number of delegates at the 1979 convention who indicated they had received some sort of financial support from their zoo or supporting society. We feel those individuals who extended such support, financial or otherwise, to an AAZK member certainly deserve some recognition. The recipients of such support should present these individuals a formal letter of appreciation.

ANIMAL KEEPERS' FORUM

The Board feels that the AKF is generally of very high quality and steadily improving. Errors do occasionally occur though, especially regarding the AAZK administrative personnel list on the inside cover. This list must be kept as current as possible. The problems with AAZK members not receiving their AKF's seem to be greatly reduced since the mailing service in Topeka has been in effect and AAZK membership lists updates have been more accurately reflected in the AKF mailing list.

continued

Lois Bogia is now the administrative assistant and part-time editor on the AKF staff.

The Board was impressed with the number of papers that were presented at the 1978 AAZK National Convention in Gainesville, Florida, which have subsequently been published in the AKF during the last year. We sincerely hope that many of the papers presented at this year's convention will be published in future AKF's.

The Board extends its thanks on behalf of AAZK and the AKF staff to AAZPA for the courtesy of relaying current job listings for reprinting in the AKF.

There is presently no advertising in the AKF and no definite plans for it in the future.

CHAPTER AFFAIRS

Pat Sammarco reported on the current status of the AAZK Chapters and will submit an updated list of chapters for the AKF. Many chapters are still delinquent in paying their chapter charter fees and annual dues. More cooperation is requested from the chapters in this area.

Pat Sammarco will annually update her "Getting Coordinated on Chapter Affairs" guidelines with more current chapter projects.

Pat urges chapters to contact her on what they want the AAZK National to be doing and how the National can assist them on a local level.

AAZPA

Various AAZK and AAZPA personnel worked on the structure of the Animal Data Transfer Form over the summer and the form is now ready for use. AAZPA response so far for the form's usage has been very favorable.

The problems concerning keepers' mail not being forwarded to them if sent directly to their respective zoos seems to be greatly reduced. The Board appreciates any efforts by AAZPA personnel to help eliminate these problems.

The Technical Member in AAZPA (which would include primarily animal keepers) proposal was again discussed with general agreement on the basic ideas involved. Dennis Grimm brought the proposal to the attention of the AAZPA Board of Directors at the AAZPA National Conference (immediately preceding the AAZK National Convention) with an encouraging response. Hopefully the proposal can be enacted by next year's AAZPA National Conference once the language can be formulated.

The President of AAZK will deal directly with AAZPA in the future regarding mutual concerns to both associations. The AAZK/AAZPA Liaison Committee has been dissolved but Vern Kisling, Miami, the AAZPA representative involved in inter-association affairs, should be kept abreast of AAZK affairs.

ANIMAL KEEPERS DIRECTORY

The Directory should be available soon and henceforth on an annual basis. Pat Sammarco has access to more modern facilities which enables her to

produce a higher quality Directory more easily and with less expense. Lee Glassco sends monthly membership updates to Pat which allows the Directory to be very current. AAZK members who wish to submit information for use in the Directory should contact Pat Sammarco directly.

REGIONAL COORDINATOR SYSTEM

The current status of the Regional Coordinator System is stable, but several vacancies occur with suitable replacements needed. Jill Grade will be revising the Regional Coordinator guidelines and preparing a "package" to help direct Regional Coordinators in their functions and hopefully, both will be ready by early next year. Larry Sammarco will prepare an AAZK history and background sheet to also assist the Regional Coordinators.

The regional membership lists from the AKF mailing service have proven helpful to the Regional Coordinators and the practice should continue. The possibility of a monthly new membership list from Headquarters which can be added to the AKF was discussed.

The Board agreed to allow more than one Regional Coordinator per region, basically to act as assistants, and felt that an individual could be a Regional Coordinator for a region in which he/she did not live if a suitable replacement could not be found within that particular region. Also, Regional Coordinators are needed for Canada and foreign nations where foreign members are present. Anyone interested in working as a Regional Coordinator in some capacity should contact Jill Grade as soon as possible.

INTERNATIONAL AFFAIRS

Tom Goldsberry will retain his present non-elected post of International Affairs Coordinator, at least temporarily until a suitable replacement can be found if Tom does not re-enter the zoo field.

A joint council composed of AAZK and other foreign zoo keeper associations, primarily British, Australian, and probably Japanese in the near future, is planned with communication avenues open and data being transferred between keepers inter-nationally. Any newsworthy item concerning foreign zoos or members should be directed to the AKF staff. Foreign members, Canadian members too, are encouraged to send such information on to the AKF whenever possible.

MEMBERSHIP

Denise Bartenfelder developed a new constitution revision to include Honorary Members which was approved by the general membership. Debby Blackwell (Memphis Zoo) was officially declared an Honorary Member.

The membership categories have been revised and were approved by the general membership at the convention. The revisions are effective December 1, 1979.

MEMBERSHIP CATEGORIES

PROFESSIONAL: Permanent full-time zoo or aquarium keepers, lab technicians, and any other personnel directly connected with the care and feeding of captive wildlife in recognized zoological parks, aquariums, animal reserves, or any other animal care facility. Individuals qualifying for this category may vote and hold elected office (U.S. and Canadian members only) and receive the *Animal Keepers' Forum*, *Animal Keepers' Directory* and the AAZK shoulder patch free. Annual dues \$20.00

AFFILIATE: Professional and non-professional zoological or aquarium society members, conservation organization members, zoo and aquarium personnel other than full-time keepers or animal attendants; includes seasonal or part-time animal keepers and managerial or senior staff, non-keeper zoological park or aquarium personnel; zoo docents and students also. Affiliate members may not vote or hold elected office, but may be appointed to a non-elected position by the Board of Directors. Receives the *Animal Keepers' Forum*. Animal Keepers Directory is available for \$3.00. Annual dues: \$15.00

ASSOCIATE: Any interested individual who is not connected directly or indirectly with a recognized zoological park, aquarium, animal reserve or any other animal care facility. Cannot vote or hold any office; receives the *Animal Keepers' Forum*; Animal Keepers' Directory is available for \$3.00. Annual dues \$10.00.

CONTRIBUTING/INSTITUTIONAL: Any person, business, organization or institution wishing to extend financial support to the Association. Receives *Animal Keepers' Forum*; Animal Keepers' Directory is available for \$3.00. Annual dues: \$50.00 or more.

Memberships are based annually from payment of dues.

The revisions were necessary to more fully solidify the basic nature of the association, i.e. animal keepers, to allow for more involvement for non-keeper zoo professionals, and to help alleviate the financial strain that the current rate of inflation has placed on AAZK.

The Board feels that although the dues increase for animal keepers is substantial, AAZK is providing its members with more benefits than ever before. Hopefully, the serious professional animal keeper will realize the beneficial services that AAZK is striving for and will willingly accept the increase in dues. AAZK can no longer cater to those individuals who are only partially interested in the association and will not beg anyone to join AAZK just for the sake of maintaining a large membership. We feel AAZK is an attractive organization to the serious animal keeper and hope for more input from its members, so that AAZK can provide more for those keepers who, indeed, are really concerned.

There will not be a special rate for husband and wife members and the extended "grace period" for renewals is two months. If dues are not sent to Headquarters after two months, the person is dropped as a member.

ADMINISTRATIVE CONCERNS

Canadian and foreign members are requested to pay their dues in American currency to avoid problems resulting in exchange rates if cash is used.

Lee Glassco, the AAZK Administrative Secretary, has become an invaluable person to the Association and the Board personally thanks her for the outstanding service she provides. The Board also extends its sincere gratitude to the Friends of the National Zoo for their financial support of Lee.

The feasibility of AAZK postcards will be looked into.

The following address changes for AAZK personnel should be noted:

Lincoln Park Zoo's new address is now 2200 N. Cannon Drive, Chicago, IL 60614. Correspondence concerning Pat or Larry Sammarco or the Lincoln Park AAZK Chapter ("Keepers Care" buttons included) should be sent there.

continued

The Overton Park Zoo is now officially recognized as the Memphis Zoo and Aquarium, 200 Galloway, Memphis, TN 38112. Mike Maybry may be contacted here.

Tim O'Brien, Regional Coordinator for Arkansas, Louisiana and Mississippi should be contacted at the Audubon Park Zoo, P.O. Box 4327, Audubon Park, New Orleans, LA 70118.

It should be remembered that AAZK is a non-profit organization with a tax exempt status. Professional members' dues are tax deductible, but donations to the Association are not. Expenses incurred for attending a convention may also be deducted when filing federal income tax.

Replacements for Board vacancies due to recent resignations will be selected through this year's election.

Professional members (animal keepers) compose the vast majority of all AAZK administrative personnel and this condition will be adhered to whenever possible in the future. Affiliate members will be used in non-elected, appointed positions where a suitable Professional member does not exist or when an Affiliate member is obviously best qualified for the position.

The Board hopes to increase AAZK publicity better nationally (and locally, too) including press releases. Presently, the AKF is the only press outlet for AAZK. Many suggestions have been brought to the Board's attention, but nothing definite has been decided upon as yet.

Communication and lack of necessary correspondence between administrative personnel still remains a problem. AAZK is a voluntary organization which cannot function properly if those members who accept positions in the administrative framework do not responsibly produce the correspondence and work necessary for that particular position. AAZK needs active, working members and cannot afford to carry along individuals any longer who do not complete the work involved.

A proposal was put forth to the Board to hire a business manager to handle the various administrative functions that the Association must deal with. The majority of AAZK administrative personnel are not trained administrators and must learn through experience. We are all animal keepers first, administrators second. The notion of a business manager is appealing, but there are also potential drawbacks. The cost would be expensive and AAZK might lose some of its "grass roots" base. We presently need more particular data before considering the feasibility. The Board will be dealing with this proposal more in the near future and a decision will be in order, probably before the next convention.

NOMINATION AND ELECTION COMMITTEE

After this year's election, the Nomination and Election Committee will disband with the exception of a Chairperson. The Nomination and Election Committee will reform again after next year's convention so as to handle the 1981 election. In future elections, the actual election will be completed before that year's convention and the new Board members will be announced at the convention.

The current NEC Chairperson, Jill Grade, will prepare a general information and procedures report to be handed down to the next NEC Chairperson. This should help maintain some continuity in our election. The next NEC Chairperson before the 1981 election will have to direct the NEC in establishing qualifications for nominees who are running for Board of Directors positions.

continued

The Board essentially approves (or disapproves) all NEC selections, recommendations, and rejections. The NEC will contact all nominees in the future on the NEC's decisions (and the Board's approval) regarding the nominees' status if they are qualified and have been accepted as a candidate to run for a Board position. The timetable is also determined by the Board through the NEC.

CONSTITUTIONAL MATTERS

The revised Constitutions will appear in the Animal Keepers' Directory from henceforth for better distribution and reduced costs.

CONSTITUTION CHANGES

Article VI

- Section 2, line 4
delete "active" and insert "voting"
- Section 4, line 2
delete "the vote of"
- Section 4, line 3
delete "active" and insert "voting"
- Section 5, line 1
delete "active" and insert "voting"
- Section 6, line 1
delete "active" and insert "voting"

Article IX

- line 2
delete "active" and insert "voting"

Article X

- line 2
delete "active" and insert "voting"

BY-LAWS

Article I

- Section 6, delete whole section
- New - Section 6
 - a) "Professional members of the US and Canada only shall be entitled to vote and hold elective office.
 - b) Affiliate members shall not be entitled to vote or hold elective office, but however, may hold appointed office.
 - c) Associate members shall not be entitled to vote or hold elective or appointed office"
- New - Section 9
"National Honorary members are those individuals that have, by actions and deeds, significantly contributed to the zoo keeping profession. National Honorary members shall be nominated by resolution of the Board of Directors and confirmed by the majority of the quorum of voting members at a National Convention."

Article II

- Section 2, line 4
Insert "and procedures, including timetable," between Nominations and determined.
- line 5
delete whole sentence starting with "The committee" and the next sentence through line 13. Retain last sentence.

continued

Article II, continued

Section 3, delete whole section

New - Section 3

"The committee chairperson shall cause to be published in the national bulletin a biographical sketch of each nominee, an official ballot and a balloting envelope pre-addressed to the Administrative Secretary. The voting members shall mark the official ballot, thereafter folding and either taping or stapling it to preserve his anonymity, and enclose it in the balloting envelope. Upon receiving the balloting envelopes, the Administrative Secretary shall note their number, thereafter forwarding them to the Committee Chairperson for counting of the ballots in the presence of a Notary Public."

Section 4, line 2

delete "three" (3)

AWARDS

The Award Committee Chairperson will prepare a guidelines sheet to be used as a reference for future Awards Committee personnel.

A proposal for an AKF art award was submitted and subsequently rejected by the Board.

PROJECTS AND AAZK ACCESSORIES

An AAZK Legislative Informational Committee has been formed to better coordinate AAZK efforts and concerns between Zoo Act, AAZK, and the AKF. The present committee is composed of Kevin Conway, Chairperson, Conservation and Research Center, Front Royal, Virginia, and Larry Sammarco, Lincoln Park Zoo, Chicago. If anyone would like to assist AAZK in this area or has information which AAZK should be aware of, contact Kevin or Larry.

The official AAZK decal is available through the Memphis AAZK Chapter for \$1.50. Contact Mike Maybry if you need some.

The AAZK shoulder patch is available through Headquarters for \$2.00. Professional members will be receiving one free as they renew their membership or become new members.

The "Keepers Care" buttons can be purchased from the Lincoln Park AAZK Chapter. The cost is still only 50¢ each.

The AAZK T-shirts will be reordered probably in the spring. There are still some available now though. Contact Carleton Bailie, Santa Fe Teaching Zoo, for more information and details.

Dennis Grimm has prepared an insert explaining the membership category revisions and new application for AAZK membership forms for use with the AAZK brochures. Should be available by December 1, 1979.

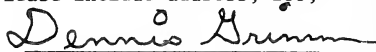
The Animal Data Transfer Forms which are to be used to assist keepers when animals are moved between zoos is now available and ready for immediate use. The form is in triplicate - one copy goes with the animal in transit, another for keeper records at place of origin, and another for the zoo hospital or administration records. The forms are provided free of charge to any interested individual or institution wishing to use them and may be obtained from Bernie Feldman at the Miller Park Zoo, Bloomington, Illinois.

The Keeper Data (and Education Survey) Project was discussed by the project coordinator, Mike Maybry. Mike will be updating the data

again for 1980. Any information regarding keepers' education, background, experience, salary, etc. from AAZK members' zoos should be forwarded to Mike Maybry at the Memphis Zoo.

Denise Bartenfelder of the Baltimore Zoo is collecting data for the AAZK Keeper Training Manual and hopes to have a preliminary outline ready in the near future. Denise is also investigating possible funding for the manual and feels we should be able to produce a training manual through AAZK by some time next year.

A Keeper Accomodation List is presently being formulated by Chris Parker and the Metro Toronto AAZK Chapter. The list will include AAZK members throughout the country (internationally,too) who are willing to house visiting AAZK people from other zoos. Contact Chris Parker if you are willing to add your name to the list. Please include address, zoo, and home phone number.


Dennis Grimm



THE HERPETOLOGIST AND THE RATTLESNAKE APPETIZER

by
Kevin Conway

Washington was following closely the C. Kenneth Dodd story during October. Dodd, an endangered species herpetologist at the Interior Department, was fired and rehired in the space of three weeks all for the sake of the Pennsylvania Timber rattler. The situation revolved around Dodd's protesting the offering of rattlesnake meat at one of Interior Secretary Cecil D. Andrus's favorite Washington restaurants.

Dodd's mistake in the matter was writing a letter of protest on U.S. Fish and Wildlife Service stationery to the owner of the restaurant. In his letter Dodd stated that the snake in question was in danger of becoming extinct and asked "respectfully" that it be taken off the menu.

The firing of Dodd by Secretary Andrus occurred after the letter from Dodd to the restaurant owner was leaked to the Washington Star's gossip column "Ear". Andrus not only apologized in person to owner Dominique D'Ermo but later sent a written apology letter.

Dodd was handed a letter of dismissal on October 11 that included a four page list of offenses all derived from his letter. Among the charges was that the gossip column presented a serious matter as trivial and frivolous to the public. Dodd's use of official stationery led to the charge that it "could and did mislead the recipient into believing that your letter represented the official position of the department."

Andrus stated in his letter to the owner that the snake was not listed as either threatened or endangered; consequently, he knew of nothing to prohibit serving it.

Dodd, for his part, is happy to have his job back and concedes he might have been overzealous in his actions. The quick reversal on the part of the Interior Department is in part due to pressure both from congress and the public. Representatives Patricia Schroeder (D.-Col.) and John D. Dingell (D.-Mich.) threatened House inquiries and hearings into possible Civil Service Reform Act violations if the firing was not rescinded.

from the President

The 1979 AAZK National Convention hosted by the Washington Park Chapter in Portland, Oregon was one of the most productive and best managed conferences to date. The papers, which were presented in the mornings, were of outstanding quality and scope. The presentations were highlighted by George "Slim" Lewis' emotional remembrances of elephants he has known from a bygone era. Gary Clarke, Director of the World Famous Topeka Zoo, was the keynote speaker at the banquet who enlivened the last night's activities with some memorable anecdotes.

The afternoons were occupied by various tours at the Washington Park Zoo which included the elephant compound, chimp enrichment program, feline building, and others. A post-conference trip to the Woodland Park Zoo in Seattle was also very well attended. The weather was excellent all week which made the outdoor activities most enjoyable.

A considerable amount of business was discussed at the open Board meetings. I was impressed by the number of delegates who attended the general membership meeting in which I elaborated on the Board discussions and everyone voted on the issues that required members' approval. The general attitude at the Convention's functions of those in attendance was concerned and highly professional.

The Board noted the exceptional number of AAZK members who had received some sort of aid, financial or otherwise, from their respective zoo or supporting society to attend the Convention. I would like to take the opportunity at this time to personally thank those persons involved who assisted AAZK members, to whatever extent, by easing the burdens, particularly financial, that can restrict animal keepers from attending a national AAZK convention. The support shown the AAZK members has not gone unnoticed or unappreciated.

Immediately following the AAZK National Convention, I also attended the AAZPA National Conference held in St. Louis. At an open Board of Directors meeting, I brought forth many items of mutual concern to AAZK and AAZPA, with my efforts being very well received. I was encouraged by the amount of support that was expressed by AAZPA personnel and hope the trend genuinely continues for the mutual benefit of both associations.

Many informative papers on virtually all aspects of zoo management were presented and well attended by everyone present. Ample opportunities for informal discussions also occurred. The tours were highlighted by an afternoon at the St. Louis Zoo where numerous new exhibits were the main focal points for the delegates.

The conference concluded with a banquet and awards ceremony where I announced the individuals, primarily animal keepers, who were recipients of the prestigious Bean Awards for their role in the notable birth or hatching of a rare or hard-to-breed animal in captivity.

At both conventions, the hosts, Washington Park Zoo for AAZK and St. Louis Zoo for AAZPA, did an outstanding job to make their respective conferences a memorable, worthwhile, and enjoyable occasion for those in attendance. Both staffs really deserve a hearty "thanks" for their unselfish efforts.

Next year the Montgomery Zoo will host the 1980 AAZK National Convention and Chicago will be the site of AAZPA's Annual Conference. Start making plans to attend - you won't want to miss them.

Dennis M. ...

ANIMAL DATA TRANSFER FORMS

The shipment of animals from Zoo to Zoo has prompted the development of the Animal Data Transfer Form. Several Keepers from the Lincoln Park Zoo, Chicago, are primarily responsible for its beginning. Bravo!

At the AAZK Conference of 1978 held in Gainesville, Fla., the Animal Data Transfer Form was given thrust and soon further work was done on it to present a convenient and concise Form to the AAZPA for their comments. The AAZPA's overwhelming response was positive and encouraging. The Form is made in triplicate form. Bulk mailings are already being delivered to several Zoos which have commented on the Form.

If and when the opportunity arises to fill out an Animal Data Transfer Form, thoughtfully complete the Form to demonstrate our desire to make this Form successful.

To All Keepers: Please review the Animal Data Transfer Form as seen here and address comments about the Form to:

Bernard C. Feldman
Miller Park Zoo
1020 S. Morris Ave.
Bloomington, IL 61701

The following is an abbreviated form. The full form is on AAZK letter-head and contains more space for the Keeper to add information.

ANIMAL DATA TRANSFER FORM

A supplement to medical records pertaining to information which would be directly useful to animal keepers.

Species: _____
Individual Name _____
Sex _____ Age at transfer _____ Actual _____ Est. _____
ISIS ID # _____

Diet: Present diet and supplements, favored items, problem foods, feeding procedures.

Brief Reproduction Record: Relative data, introduction techniques, behavior toward young, specific concerns.

General Medical History and Physical Condition: Usual response to medicine, including immobilizing agents and their successful mode of administration, recurring physical problems and symptoms.

Enclosure, Maintenance Data: General exhibit description, cage mates, considerations to avoid abnormal behavior, cleaning and disinfection procedures.

Form completed by: _____ Title _____
Institution _____ Telephone _____

NEW RULES PROPOSED FOR LISTING, DELISTING ENDANGERED SPECIES

New, comprehensive regulations for amending the U.S. List of Endangered and Threatened Wildlife and Plants have been proposed by the Departments of the Interior and Commerce.

"These proposed rules are virtually a 'how-to' manual that the public and other agencies can follow in either petitioning the Departments to list a species or in participating in our decision making process," Lynn A. Greenwalt, Director of the Interior's U.S. Fish and Wildlife Service, said.

The proposed regulations formalize the process the Interior agency has followed in the past in listing species and their critical habitats and also increase opportunities for public participation.

EGYPT TO SET UP FIRST WILDLIFE RESERVES

Egypt is setting up two wildlife reserves in parts of the Sinai which revert to Egypt from Israel under the 1979 peace treaty. The reserves--one at Lake Bardawil in Northern Sinai, and the other at Mt. St. Catherine, near the area historically known as Mt. Sinai--will protect migratory birds and endangered species.

The Lake Bardawil wetlands zone supports flamingo colonies and is a major stop-over for Central European birds migrating to other points in Africa. Caspian terns nest there. On one occasion, 40,000 garganey teal were sighted. The Mt. St. Catherine reserve has habitat for the endangered slender horned gazelle. The extremely rare Sinai leopard may also inhabit the reserve. Both areas were formerly managed by the Israelis as nature reserves.

Two Egyptian Wildlife Service biologists visited the U.S. to study wildlife management techniques. These reserves are the first natural, protected areas set aside for wildlife in Egypt.

TWO CROCODILES PROPOSED FOR ENDANGERED STATUS

After a status review of two crocodylian species, the Service has issued a proposed rulemaking to list, as Endangered, the American crocodile *Crocodylus acutus* outside of Florida, and the saltwater or estuarine crocodile *Crocodylus porosus* exclusive of the Papua New Guinea population. The Florida population of American crocodile is already listed as Endangered and Critical Habitat designated.

This rule would provide additional protection to both species, which are already listed on the appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, by further restricting commercial trade in their parts and products.

Alternatives...Education and P.R.

...a brief glimpse at what some other zoos are doing in this field.

SACRAMENTO ZOO ORIGINATES ZOOLYMPICS FOR FUNDRAISER

At the annual fundraiser for the Sacramento Zoo, The Zoofari, a new feature was introduced--the Zoolympics. Four main events, based on the daily routine of the keepers, kept the guests running, sweeping, chasing and going bananas over balloons, "eggs", and ping pong balls.

ORANA PARK, NEW ZEALAND, CONDUCTS VISITOR SURVEYS

A market survey of Orana Park, using a random sampling of visitors responding to a questionnaire, investigated the guests reasons for going to the Park, the sources of information about it, the types of facilities expected, impressions of the facilities provided, ages of visitors, where they lived, and how they thought the Park was funded. An initial survey was conducted in 1977, a follow-up in 1979, and plans are made to repeat it on a regular basis.

"TURNABOUT IS FOWL PLAY" AT THE PHILADELPHIA ZOO FOR THANKSGIVING DAY

Philadelphia Zoo will treat its resident turkeys to a special holiday dinner served by a tuxedo-clad waiter. The main course will be a large mound of their favorite food shaped like a pilgrim.

BALTIMORE DISPLAYS INSECT ZOO

Baltimore opened an insect zoo to acquaint the Zoo public with some of the 900,000 specimens which share the planet with people. It includes such crowd-impressers as a working beehive with 10,000 bees, Hercules Beetles, Bird Eating Spiders and Red Legged Tarantulas.

NATIVITY NIGHT AT MONTGOMERY ZOO

The Montgomery, Alabama, zoo held a Nativity Night featuring live animals, community carol singing, and a cast of approximately 100 enacting the nativity scene.

SHEDD AQUARIUM PROGRAM INCLUDES CHILDREN AND PARENTS

A Saturday morning "Story Hour" for ages six and seven introduced an aquatic animal through stories or poems, followed by a related craft or activity. Plenty of touchable materials were included to further illustrate themes. While their children were enjoying this activity, parents were treated to a guided tour of the galleries focusing on the particular animal being featured.

The Shedd Aquarium received a federal grant from the National Endowment for the Humanities to develop and study a humanities-based approach to understanding an aquatic environment. Aquarium staff and outside consultants planned and developed in-Aquarium guidebooks, labels and graphics and in-school material to use after a trip to the Aquarium.

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chapter

WELCOME to the Tulsa Chapter
of AAZK.

Tulsa Zoological Park
5701 E. 36th St. N.
Tulsa, OK 74115

President....Beth Mathews
Vice Pres....Steve Stivers
Secretary....Linda Putnam
Treasurer....Carol Eames
Program/Projects
Director...Betsy Anderson
Newsletter Editor
....Stephen D. Walker

news

The Tulsa chapter issues an open invitation to all AAZK members to visit the zoo and attend the bi-weekly meetings on the first Thursday and third Sunday of each month.

The newsletter is named the *Newsletter* and is very impressive.

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MetroToronto Zoo Chapter announces its new executive board:

President....Chris Parker
1st Vice Pres....Oliver Claffey
2nd Vice Pres...Kathy Rettie
Secretary....Steve Unwin
Treasurer....Neville Pike

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INFORMATION PLEASE!

Tulsa's AAZK Chapter is eager to become involved in the keeper exchange program. Anyone actively participating in such a program is encouraged to send us information regarding the details of setting up the exchanges. As a municipally funded zoo we need to know how other zoos have dealt with insurance, paying arrangements, paperwork, etc. Any information will be greatly appreciated!

Please send any information to: Beth Mathews
Tulsa Zoo AAZK
5701 E. 36th St. N.
Tulsa, OK 74115

ANIMAL KEEPERS DIRECTORY AVAILABLE SOON

Pat Sammarco reports that the Animal Keepers Directory is now at the printer. It will be mailed free to Professional members. All others may obtain a copy for \$3.00 from Pat Sammarco, Lincoln Park Zoo, 2200 N. Cannon Dri., Chicago, IL 60614

INDEX FOR VOLUME VI, NUMBERS 1-12, 1979

AAZK

1978 AAZK Awards	Ja 3
1978 Bean Awards, AAZPA	Ja 3
Note from the President of AAZK	Ja 3, Fe 23, J1 135
International Coordinator's Report	Ja 12
Proceedings of the Board of Directors	Mr 58, Dec 231
1979 Conference News	My 81, Jn 102, J1 124, Au 143, Se 163
1978 Financial Statement	My 83
AAZK Directory	My 87
Election News	Ap 64, Au 143, Oc 192
1980 Annual Conference	Oc 192
AAZPA Regional Workshop Reports	Ap 63, My 87, Jn 101, Au 150, Se 167
Keeper Accomodation List	No 210
1979 AAZK Awards	No 211
1979 AAZPA Bean Awards	No 211
Endangered Species Coalition Formed	De 227
Call for Papers for AAZPA Regional 1980	De 227
Animal Data Transfer Forms	De 240

AAZK CONFERENCE PAPERS

Physical Exams for Great Apes	Ja 14
The Unknown Zoo, a Design for Conservation	Ja 17
Hand-Rearing Golden Lion Marmo- sets	Fe 33
Preventive Medicine as Related to the Zoo Keeper	Mr 52
Captivating the Captive Ape	Mr 54
Public Relations and Zoological Organizations	Ap 78
Burrowing Owls in Captivity	My 97
The Miller Park Zoo: Here and Now	Jn 116
The Keeper Education Course at the Baltimore Zoo	J1 133
Elephant Control	J1 137
Infant Mortality Among Giant Red Kangaroos	Au 123
The Captive Birth of a California Sea Lion	Au 156
Free-flight Macaws in a Planted Exhibit	Se 164
So You Want to be a Zoo Keeper?	Se 168
Hydroponics	Se 170

FIRST ANNUAL SYMPOSIUM ON
CAPTIVE WILDLIFE PAPERS

Problems Associated with Hand- Rearing Ostriches	My 92
Hand Raising a Rose- Breasted Cockatoo	My 95
Problems associated with Pet Rehabilitation Among Captive WoollyMonkeys	Jn 112
Raptor Rehabilitation Report	Jn 115

PAPERS

Bloating in an Eastern Collared Lizard	Ja 9
Some Statistics on Lion Births in Captivity	Fe 24
The Development of a Pregnant Lioness and the Maturation of the Cub	Mr 44
Incubation Periods..How Accurate	Ap 66
The Business Side of a Zoo	Ap 73
The Use of Telmin for Roundworms in <i>Panthero leo</i>	Jn 105
The Menagerie Cycle	Jn 107
Hand Feeding Baby Parrots	J1 125
She Did It, She Finally Did It	Au 147
The Professional Zoo Keeper	Au 148
Breeding Snow Leopards	Se 176
Reversible Vasectomies Tried on Lions	Oc 190
Hand-Rearing the Saiga and correction	Oc 200, De 225
Elephant Training and Management	Oc 202
The Keepers Role In Zoo Animal Health	Oc 184, No 216
"What Makes Sammy Run?"	No 208
The Keepers' Role in the Success- ful Treatment and Movement of Animals	No 212
Animals in Heraldry	De 228

*Items in "Struggle to Survive",
"Chapter News", "Opportunitu
Knocks", and "Alternatives in
Education & P.R." are not
indexed.*

PAPERS INDEXED BY SUBJECT

MAMMAL DIVISION

- Physical Exams for Great Apes
Ja 14
- Hand Rearing Golden Lion Marmosets
Fe 33
- Some Statistics on Lion Births in Captivity
Fe 24
- The Development of a Pregnant Lioness and the Maturation of the Cub
Mr 44
- Captivating the Captive Ape
Mr 54
- Elephant Interest Group Formed
My 88
- The Use of Telmin for Roundworms in *Panthero leo*
Jn 105
- Problems Associated with Pet Rehabilitation Among Captive Woolly Monkeys
Jn 112
- Elephant Control
Jl 137
- She Did It, She Finally Did It
Au 147
- Infant Mortality Among Giant Red Kangaroos
Au 153
- Captive Birth of a California Sea Lion
Au 156
- Breeding Snow Leopards
Se 176
- Reversible Vasectomies Tried on Lions
Oc 190
- Hand-rearing the Saiga and a correction,
Oc 200, De 225
- Elephant Training and Management
Oc 202
- "What Makes Sammy Run?"
No 208

BIRD DIVISION

- Introduction to the International Crane Foundation
Ja 13
- Incubation Periods...How Accurate
Ap 66
- Problems Associated with Hand-Rearing Ostriches
My 92
- Hand-raising a Rose-breasted Cockatoo
My 95
- Raptor Rehabilitation Report
Jn 115
- Hand Feeding Baby Parrots
Jl 125
- Free-flight Macaws in a Planted Exhibit
Se 164

INSECT, FISH, PLANTS DIVISION

- Hydroponics
Se 170
- Dramatic Pest Control Achieved by Tampa Theme Park: The Dark Continent
Ja 10
- The Use of Bacteria for Mosquito Control
Jl 131

HERP DIVISION

- Bloating in an Eastern Collared Lizard
Ja 9

EDUCATION

- The Business Side of a Zoo
Ap 73
- The Keeper Education Course at the Baltimore Zoo
Jl 133
- The Professional Zoo Keeper
Au 148
- The Keepers Role in Zoo Animal Health
Oc 184, No 216
- Animals in Heraldry
De 228

RESEARCH DIVISION

- Fellowship Winner Wants Your Suggestions
Fe 30
- Attention...Polar Bear Keepers
Fe 28
- The Use of Bacteria for Mosquito Control
Jl 131
- Breeding Snow Leopards at the OKC Zoo: The Application of Records-keeping to Husbandry and Management
Se 176
- The Keeper's Role in Zoo Animal Health
Oc 184, No 216

CONSERVATION

- The Unknown Zoo, a Design for Conservation
Ja 17
- The Menagerie Cycle: Thoughts on Population Management in Zoos
Jn 107

PUBLICATIONS AVAILABLE

- AAZK Directory
My 87
- Animals and Their Legal Rights
Au 144
- Bat Research News
Fe 27
- Bear Biology Association News Letter
Fe 22
- Migration of Birds
Se 161
- Monotreme Symposium Proceedings
Fe 29
- Naturalists Directory
Oc 189
- Symposium of Association of British Wild Animal Keepers
My 91

BIRTHS AND HATCHINGS

Antelope, African Bongo Stone	Oc 182	Leopard Cat Philadelphia	Se 162
Antelope, Duiker Bronx	Jl 122	Lories, Blue San Diego	Oc 183
Barasingha Philadelphia	Jn 104	Loris, Slow Arkansas	Jl 123
Bears, Sloth Gladys Porter	Ap 62	Marmosets Arkansas	No 207
Bear, Sloth Washington Park	Mr 42	Monkey, Owl, Douroucoli Bronx	Jl 122
Cantil, Taylors Gladys Porter	Ap 62	Monkey, Patas Philadelphia	My 82
Capybara Baltimore	Oc 183	Monkeys, Snow Minnesota	My 82
Chimpanzees Manhattan	My 85	Okapi Brookfield	Jl 122
Chimpanzee, Montgomery	Ap 62	Orang-utan Atlanta	Oc 182
Chuckwallas, San Esteban Arizona-Sonora Desert Museum	De 226	Orang-utan Philadelphia	Se 162
Crane, Brolga International Crane Fdn	Oc 182	Penguin, Humboldt Washington Park	Fe 22
Crane, Whooping San Antonio	Jn 104	Rattlesnakes, Hybrid Arizona-Sonora Desert Museum	De 226
Elephant Washington Park	Fe 22 & De 226	Rhino, Southern White Memphis	No 206
Elephant, African Gladys Porter	Oc 182	Saki, Silver-backed Oklahoma City	Fe 22
Ferret, Domestic Cincinnati	Mr 42	Seal, Grey, Twins Louisville	My 82
Gibbon Stone	Oc 182	Tapir Minnesota	My 82
Giraffe Brookfield	Mr 42	Tapir, Brazilian Brookfield	Mr 42
Giraffe, Rothschilds Oklahoma City	Se 162	Tenrecs, Pygmy Hedgehog Topeka	Se 162
Goose, Hawaiian Ne Ne Boston	My 82	Tiger, Siberian Minnesota	Se 162
Gorilla, Lowland Oklahoma City	My 85	Tortoise, Hood Island San Diego	Au 142
Gorilla, Lowland Oklahoma City	Au 147	Macaw, Folsom	De 226
Guenons, Spot-nosed Atlanta	Oc 183	Rhino, White, Toronto	De 226
Hippo, Nile Baltimore	Oc 183	Serval, Folsom	De 226
Hippo, Pygmy Memphis	Ap 62	VETERINARY MEDICINE	
Hornbill, Concave-casque Bronx	Se 162	Veterinarian's Report on Hippo Death	My 89
Kerodon Philadelphia	Se 162	Press Invited to Bear Surgery	Jl 132
Kudu, Greater Memphis	No 206	Protein Deficiency Possible Cause of Giraffe Death	Jl 132
Langur, Spectacled Philadelphia	My 82	Animal Restraint	Au 151
Leopard Cat Bronx	Jl 122	The Keepers' Role in the Successful Treatment and Movement of Animals	No 212

SCOOPS & SCUTTLEBUTT

World's Oldest Gorilla Celebrates 48th Birthday	Ja 2
Kiwis enroute to San Diego Zoo	Ja 2
It's Zooski Time at Metro Zoo	Ja 1
Colorful Squirrels Make Debut At Philadelphia Zoo	Ja 5
Philadelphia Zoo Gives Membership to New Year's Babies	Fe 27
Need for Oil Blinds Government to Plight of Bird	Fe 23
Fire at Omaha Zoo	Fe 21
Fire at Kansas City Zoo	Fe 21
Fire at Kings Island	Fe 21
Gorilla to Arrive at San Diego Zoo	Fe 28
Fire at Topeka Zoo	Mr 41
Tribute to Keepers	Mr 41
Israel to Get American Buffalo	Mr 43
DDT Residues in Birds	Mr 47
Monkeys Aid Handicapped People	Mr 47
Chicago Zoological Society Sponsors Trip	Mr 57
Zoo Walk 79 at Minnesota	Mr 59
Wildlife Expo	Ap 61
Portland Wolf Symposium	Ap 61
Zoo Worker Survives Mauling by Bear	Jn 101
Remodeled Nursery Woodland Park	Jl 121
San Diego Wild Animal Park Displays Hanuman Langurs	Au 141
Elephant Trainers Death	Au 141
Bonus for Elephant Keepers	Au 141
Kaufman Resigns AAZK Board	Se 161
Stolen Animal Found	Se 161
Philadelphia Displays Asiatic Lion	Oc 181
Pygmy Chimps To Yerkes	Oc 181
Armadillo an Ambassador to Russia	Oc 181
Living Fossils to St Louis	No 205
International Effort Saves Rare Arabian Oryx	No 205
Philadelphia Zoo Gets Rare Indian Rhino	De 225
Topeka Zoo Ape House Ground Breaking	De 225
Washington Park Receives Asian Bull Elephant	De 225

INFORMATION REQUESTS

African Crested Porcupines <i>Hystrix cristata</i>	Fe 29
Banded Sea Snakes, <i>Laticauda colubrina</i> and <i>L. laticauda</i>	Ap 70
Bushdogs	Au 154
Chilean Flamingos	Mr 46
Early Pregnancy Tests on Primates	Jl 128
Elephant Census	De 229
Guenons, <i>Cerocopithecus</i>	Jl 130
Hyanas	Jn 120
Keeper Education Manual	Fe 29
Kestrel, <i>Falco sparverius</i>	Fe 29
Polar Bears	Fe 28
River Otters, <i>Lutra canadensis</i>	Se 180
Serval	Jn 120
Sign Language and Orangutan	Au 150
Sloth Bear, <i>Melursus ursinus</i>	Mr 47
Spider Monkey, <i>Ateles</i>	Jl 130
Striped Hyena, <i>Hyaena hyaena</i>	Mr 41
Wobblers Syndrome in Zebras	Se 178

KEEPER NEWS/ZOO NEWS

Endangered Species Scientific Authority (ESSA)	Ja 16
Attention: Polar Bear Keepers	Fe 28
Animal Welfare Progress in the 95th Congress	Fe 32
National Zoological Foundation Proposed	Mr 47, My 90
Internation Marine Trainers Association	Mr 47
Elephant Interest Group	My 88
Asian Domain at New Orleans	Jn 104
Animal Babies Stolen	Au 142
Animal Babies Found	Se 161
Blanket Permit to Ease Intrntl Exchange of Collectors Specimens	Au 144
New Federal Regulation Encourages Captive Breeding of Endangered Species	No 214
Endangered Species Coalition Formed	De 227

Back issues are available from the National Headquarters, see back cover.

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listings. This is a monthly service to us, for you.

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ZOOKEEPERS-HOOFSTOCK/CARNIVORES... responsible for the animal care and management in an expanding and progressive zoological garden. Requires two year's experience in a recognized zoo and references. Starting salary \$9,387 - 10,911; excellent benefits. Contact: Dale Stastny, Personnel Director, Audubon Park and Zoological Garden, P.O. Box 4327, New Orleans, Louisiana 70178.

RANGER/ANIMAL KEEPER... seeking a responsible individual for wild animal park (a division of large amusement/theme park operation). Applicant should have at least two years' experience working with a variety of large animals, including large cats, elephants and hoofed stock. Starting salary: \$10,000-\$11,000 plus excellent benefits. Submit resume with references to Robert Reece, Director, Kings Island Wild Animal Safari, Kings Island OH 45034.

LINGULATE KEEPER... to participate in husbandry program with large collection of hoofed animals and birds. Previous zoo or other large animal experience preferred. Salary: \$10,046-\$10,608. Excellent fringe benefits. Contact Tom Foose, Curator of Pachyderms and Ungulates, Oklahoma City Zoo, 2101 N. 50th, Oklahoma City, OK 73111.

ELEPHANT TRAINER... applicant must function on day-to-day basis in implementation of a comprehensive elephant husbandry program; perform routine maintenance tasks on elephant collection such as feeding, cleaning, skin and foot care, etc. Should have high school education and broad and varied background in working with elephants. Salary: \$614.32 biweekly, plus excellent fringe benefits. Contact: Greg Tarry, Curator Calgary Zoo, St. George's Island, Calgary, Alberta, Canada T2G 3H4.

ANIMAL ATTENDANT... opening for a mammal keeper will be available in Feb. 1980. Interested persons should request an information and referral card in order to be notified on how and when to apply. Contact: Dudley Brown, Assistant Director, Fort Worth Zoological Park, 2727 Zoological Park Drive, Fort Worth, TX 76110

EDUCATION COORDINATOR... to direct tour and presentation programs and develop new areas of public education. Prefer background in biology (ornithology) and education. Ability to write newsletters and design pamphlets. Must be willing to accept occasional weekend, holiday and after-hour assignments and limited travel. Salary: \$10,000 or based on experience. Position starts 1 March 1980. Send resume by 10 January to: Joan Fordham, International Crane Foundation, City View Rd, Baraboo, WI 53913.

CURATORS... two positions available through Peace Corps for zoos in Colombia, South America. Applicants should have experience in all phases of zoo operations for most classes of vertebrates. Knowledge of the Spanish language desirable but not mandatory. These are one-year positions, with a possibility of a one-year extension. Salary: \$300 per month approximately for living expenses, plus \$175 per month saved for the volunteer by Peace Corps until termination and medical coverage. Screening of applicants begins immediately with positions becoming available in February 1980. Send resume to: Ernesto Barriga, Peace Corps, c/o The American Embassy, Bogotá, Colombia.

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs, and tables should be clearly marked, in final form, and should fit in a page size of no more than 6"x10" (15 cm. x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages will be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Articles printed do not necessarily reflect the opinions of the *Animal Keepers' Forum* editorial staff or of the American Association of Zoo Keepers.

Telephoned contributions on late-breaking news or last minute insertions are acceptable. However, phone-in contributions of long articles will not be accepted. The phone number is 913 272-5821.

DEADLINE FOR EACH EDITION IS THE 20th OF THE PRECEDING MONTH.



MEMBERSHIP INFORMATION

- Professional (full-time personnel) \$20.00 annually
- Affiliate (part-time keepers, managerial personnel) . . \$15.00 annually
- Associate (interested individuals) \$10.00 annually
- Contributing/Institutional \$50.00 annually

All memberships include subscriptions to the *Animal Keepers' Forum*. 50% of the member's dues are budgeted for the publication.

All new members receive a membership card good for free admission to many zoos and aquariums in the U.S. and Canada.

The AAZK Headquarters has shoulder patches available for \$2.00 and back issues of the *Animal Keepers' Forum* for \$1.00.

Send name and address and a check or money order, payable to American Association of Zoo Keepers to

AAZK HEADQUARTERS
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WASHINGTON, D.C. 20008

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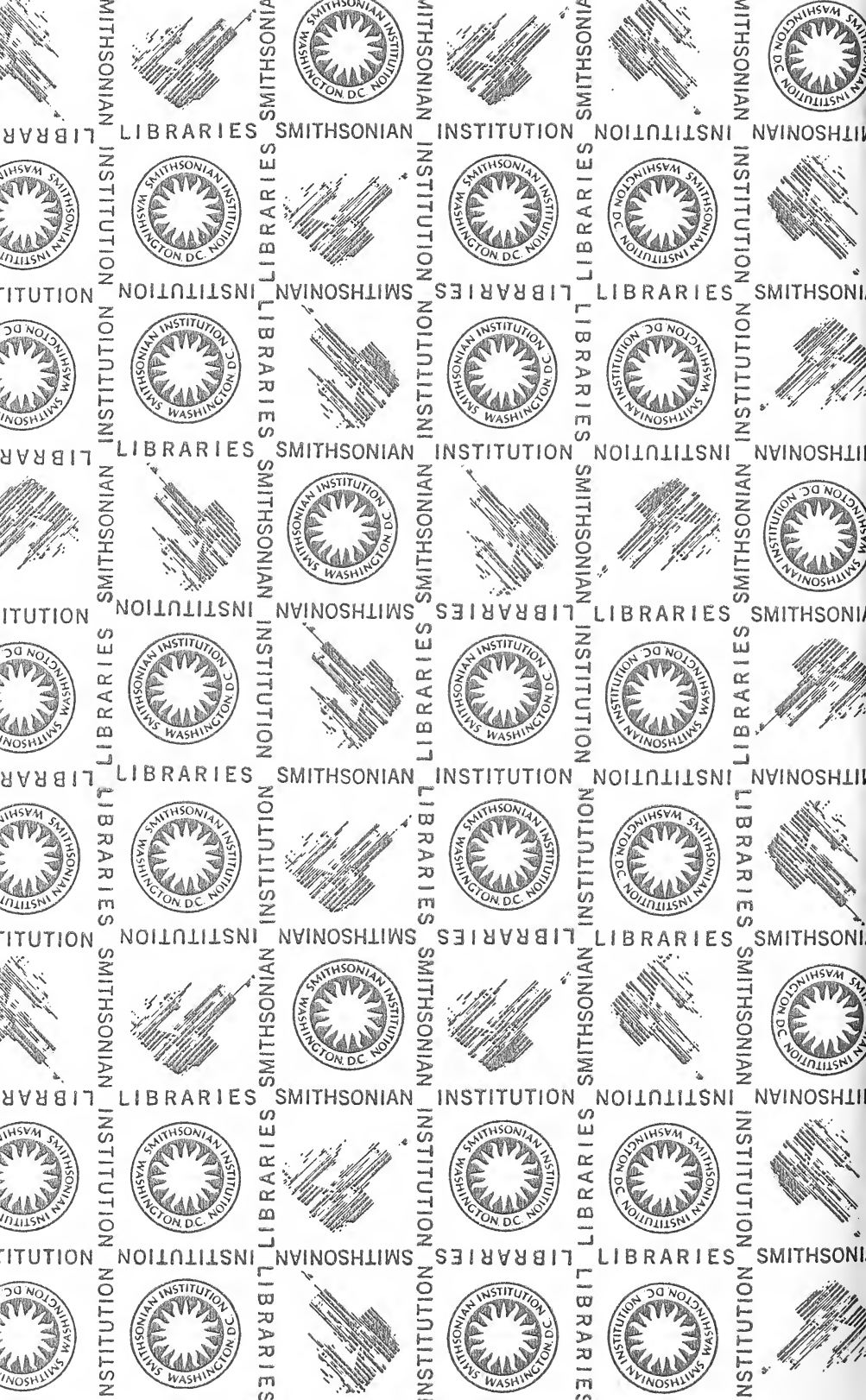
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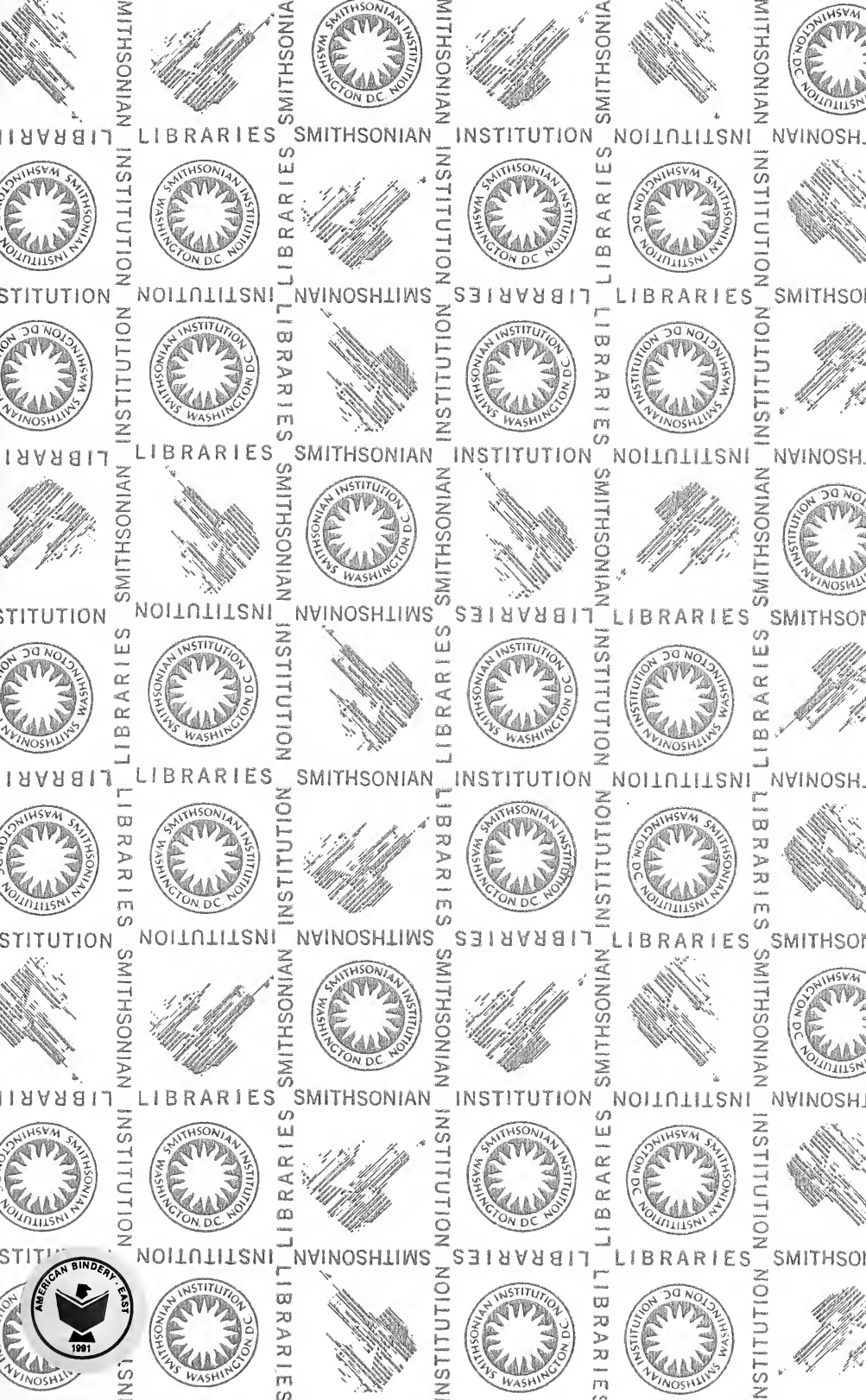
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