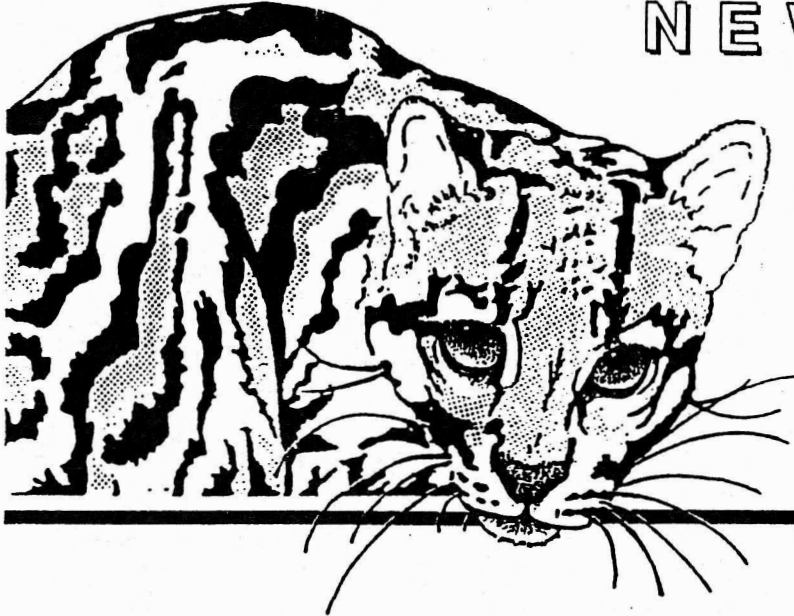


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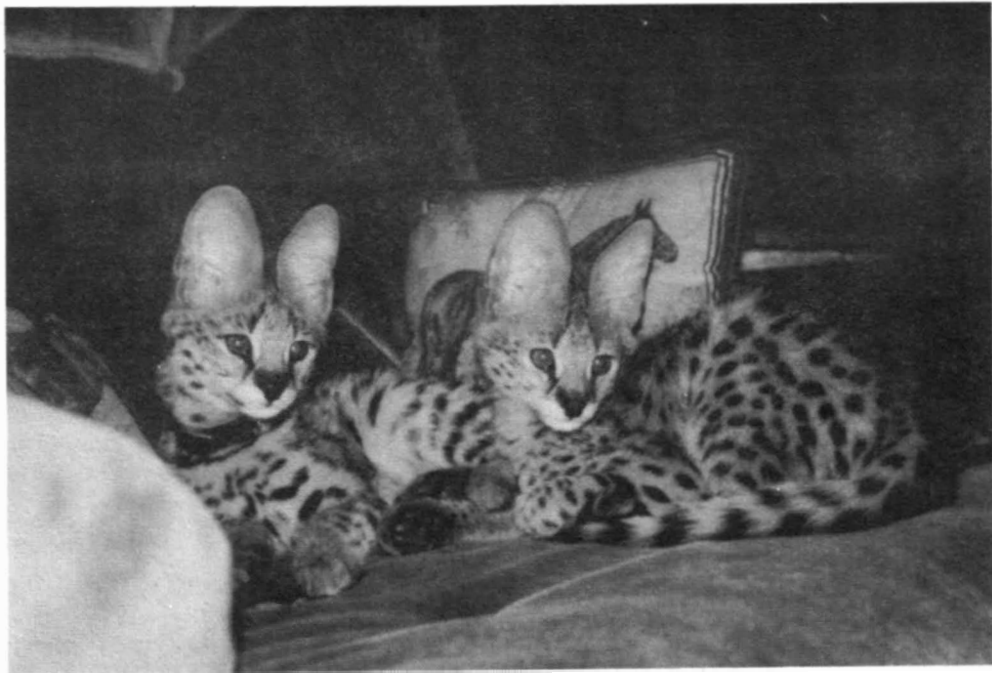
Volume 34, Number 6 - November/December 1990

# NEWSLETTER

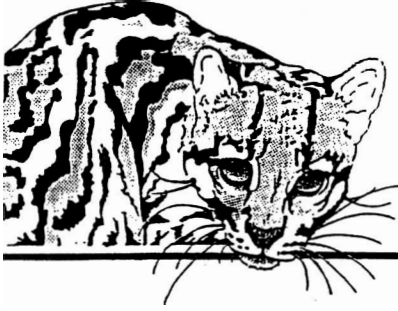


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Who wouldn't love to find these cute fellows under the tree? Hoepin and Brutis share their home with new member Niki Martin



## L.I.O.C. Endangered Species Conservation Federation Inc.

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This newsletter is published bi-monthly by the LIOC Endangered Species Conservation Federation, Inc. We are a non-profit (Federal I.D.# 58-9100616), non-commercial organization, international in membership, devoted to the welfare of exotic felines. The purpose of this newsletter is to present information about exotic feline conservation, management, and ownership to our members. **The material printed in this newsletter is contributed by our members and in many cases, reflects the point of view of the person whose name appears on the article, rather than the point of view of the organization.** The organization's statement of intent is contained in our by-laws; a copy of which can be requested from the Secretary/Treasurer. Reproduction of the material in this newsletter may not be made without written permission of the authors and/or copyright owner LIOC.

Since the newsletter consists of articles, photos and artwork contributed by our members, we depend on you for our material. We can only publish what you send us. Articles of all types concerning exotic felines are gladly accepted. We also have a Reader's Write column for letters or responses to articles. Please send all materials for contribution to the Newsletter editor.

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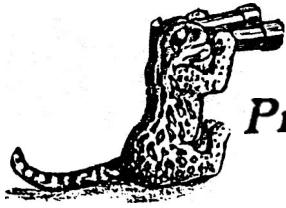
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## *President's Perspective*

I would like to welcome Lynn Culver as our new Secretary/Treasurer and Katie Knight-Montierro as our new board member in charge of Advertising. The organization's thanks are extended to outgoing board members Connie Hatfield and Jeff Bellingham. I would like to encourage you to advertise your business in the Newsletter. Rates are reasonable and I would expect that the membership would be willing to support each other's activities. I do not mean only cat activities, but things like service groups such as mail order or travel agencies, etc.

This summer's convention will be in Las Vegas. Be sure to book well ahead on the airlines to make sure you get a low fare. We will be staying at the Flamingo Hilton which is right across the street from the Mirage. For those who enjoy outdoor activities, remember that Las Vegas is only 100 miles from Death Valley National Park and 20 miles from Lake Mead.

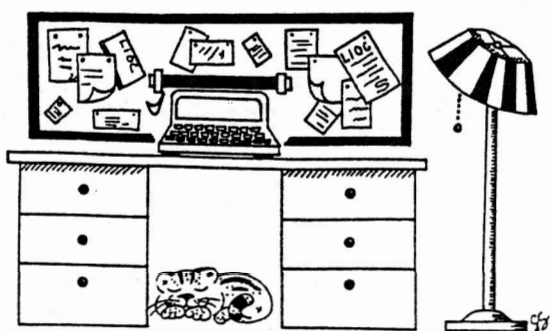
I would encourage you to write to the Ralson Purina Company to encourage them in their creation of the Big Cat Survival Fund. Their address is Ralston Purina Company, Checkerboard Square, St. Louis, MO 63164. I spoke to Pat Farrel in their public relations department. He gave me the information that they will be funneling funds through AAZPA to 104 zoos for breeding, education, habitat improvement and other projects related to both endangered big cats and smaller ones (ocelot, serval, and clouded leopards). I've requested more information, but, at this time, they're still getting the money in and haven't apparently decided on specific projects.



During the Holiday Season more than ever, our thoughts  
turn gratefully to those who have made our progress possible.  
And in this spirit we say, simply but sincerely

**Thank You and Best Wishes  
for the Holiday Season and a Happy New Year**

The Officers, Directors  
and Staff of LIOC



# FROM UNDER THE EDITOR'S DESK

A GUEST EDITORIAL

## PRIVATE OWNERSHIP: Upgrade from Threatened to Endangered Species

By Lynn Culver

The article about the undercover sting of a shooting ranch in Oklahoma prompts me to write this discussion. I spoke with Special Agent Tom McRae in Oklahoma about these cougars. They were, according to him, three males one unknown, and four females, two possible pregnant. All cougars were declawed. There were several more that had already been shot. The USDI caught the "hunters" posing with their dead trophies.

The cougars were purchased at two auctions, one in Missouri and one in Kansas. The private owners' who's personal life changes prompted them to consign their lifelong responsibility to an auction I am sure, never dreamed that their cougar would end up at a shooting ranch.

I talked with LIOC member Ken Hetrick in Ohio, last October. He told me of an auction he attended, where you could buy all the baby cougars you wanted (up to 20) for \$130 each. I asked about breeding adults, he said they brought less.

The state of Michigan is cracking down on its illegal exotic population. Authorities claim that there are 25 legal cougar owners in their state, over 300 illegal ones. Currently they have 4 in custody now, all confiscated from drug dealers. It seems that cougars are developing the reputation of being the "guard dog" of choice for drug dealers.

Here in my state, Arkansas, I have been dealing with three homeless cougars. One spayed 5-year old female, has the misfortune of being owned by people who are moving to Arizona, and they will not take her with them. After calling the other owners they knew, and receiving a negative answer, she has been placed in the custody of Arkansas for Animals. They have agreed to assume this couple's responsibility. Arkansans for Animals and the Humane Society have raised enough money to build a cage for her. She will be flown to a Texas Exotic Animal Foundation south of Houston.

The other two cougars are personal friends of mine. I have watched them grow from kittens to the year-and-a-half they are now. Their owners divorced and the husband has decided that he can no longer care for them. We have agreed to take them, only because I know them personally, and feel they deserve a good home. Tonight, after transporting them to our facility, I feel a sadness

PRIVATE OWNERSHIP: cont.

that such well behaved, innocent cougars have to feel the pain of abandonment. We will do our best, though I know this means less time for our five cougars and more work and money to feed them.

What do these stories have in common? They portray a situation out of control. What is private ownership all about? Human organizations and conservation groups have a lot to criticize here. If we are to survive, and if private ownership is going to be a part of the answer and not part of the problem, then we must face the facts, educate, organize and plan for the future. We must spend more time educating ourselves and others, and less energy breeding. We need a next generation yes, but NOT EVERYONE IS SUITABLE FOR EXOTIC OWNERSHIP.

Zoos used to have a universally bad reputation. They took animals from the wild, didn't breed in captivity, displayed them in sterile cubicles and taught nothing about conservation. Look at them today. They breed their own endangered stock, and have even successfully reintroduced some captive bred wildlife. They developed the Species Survival Plan for over 50 species. SSP's for each endangered species is designed to maximize the diversity of the captive gene pool, carefully breeding each individual, based on a computerized schedule.

What has the private owner done? Very little self-policing. We still have among our ranks those who's care give the humane societies ammunition against us. We breed for profit and not with any universal plan for the species. And, when we're tired of the responsibility, we get out of our commitments. Not all of us, but you know the type. So what are we going to do about this?

In spite of these examples, I believe in private ownership. Experts are not born, they evolve from trial and error, applied studies, dedication and hard work. Those who adopt our offspring end up one of three types: some are a mistake and will prove to be unsuitable owners; others will take good care of their charges but keep their interest in exotics limited to their single (probably sterilized) "pet". Ideally though, the breeder tries to locate that special someone who's life takes a dramatic turn in direction. These people are why we need private owners. They become completely involved with conservation, the welfare of wildlife and captive animals. They develop the dedication of a professional. They care, they serve, they educate themselves and all who will listen. And, someday, after years of service, they may even be recognized as an "expert". And because some private owners end up like that, we must defend the right to private ownership, and encourage and foster this noble attitude with all our combined forces.

ED.NOTE: See referenced article on page 26

*Glad Tidings*



## Rusty-Spotted Cat Photographed in Gir Lion Sanctuary

The rusty spotted cat (*Felis rubiginosus*) has been found in the Gir Lion Sanctuary in western India. Photographs are thought to be the first taken of the species in the wild.

A.J.T. Johnsingh, Joint Director of Wildlife Institute of India and Senior Research Fellow Ravi Chellah, sighted a small cat while driving towards Kankai from Sasan in the Gir in early morning of November 18th, 1989.

"It was a rather small cat, less than half the size of an adult jungle cat. It was curled up and we could see it shivering in the cold. We managed to take four photographs and then the cat moved slowly into the tall grass by the roadside. We assumed it was a jungle cat kitten. On processing the film, we discovered that it was no jungle cat, but it was indeed the elusive rusty spotted cat. The stripes on the head, the color of the animal, the spots on the body and the unmarked tail made identification possible."

Johnsingh reports that J.B. Pathan, Deputy Conservator of Forests at Sasan also photographed a small cat at half past midnight in May of this year which also turned out to be a rusty spotted cat. He said it crossed the road and climbed a tree.

Commenting on these discoveries, Johnsingh said it was possible that the rusty spotted cat was widespread throughout the Gir sanctuary and had probably not been observed so far because of its solitary and nocturnal existence. He recommends a full-fledged survey to assess the status and ecology of the species.

The rusty spotted cat is one of the smallest felids and is said to be partly aboreal. Its range has been reported to be Sri Lanka and western India. The Indian population is on Appendix I of CITES to prevent international commerce. The Sri Lankan population is on Appendix II to ensure licensing and monitoring.

From CAT NEWS.

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# Improving the Feeding of Captive Felines Through Application of Field Data

D.G. Lindburg

*Research Department, Zoological Society of San Diego, San Diego*

## INTRODUCTION

In 1966, the International Zoo Yearbook published a special section on the nutrition of zoo animals. A frequently referenced paper in that section, by Richard Fiennes, pathologist at the Zoological Society in London, concluded with this statement: "Without adequate feeding there can be little breeding." The breeding of exotics is clearly a major concern of zoological institutions today, and leads us to a careful consideration of the diverse factors which impinge on fecundity, including its relationship to feeding behavior and diet composition. While Fiennes spoke of several aspects of captive feeding, it is clear when discussing "adequate" diets, his concern was primarily with nutrition.

Zoo personnel universally share this concern. The nutritional aspects of food dominate our thinking at virtually all levels of management, from the keeper who feeds, to the accountant who keeps a wary eye on costs. The extreme view is that which Hediger, in the symposium referred to above, called the "retort" theory of feeding. This theory holds that if nutritionally adequate food is provided, then good health, increased longevity, and improved breeding will ensue. Hediger himself stands at the other end of the continuum in arguing for a more naturalistic approach. Even he recognized, however that there is need for substitution and modification of diet regimes, given the constraints of a captive existence. Yet a current reading of the zoo literature leads inexorably to the conclusion that, in our practice of animal management, non-nutritional aspects remain poorly understood, are infrequently studied and stand as a footnote to concerns with the captive feeding of exotic species. Wackernagel's [1968] statement of nearly 20 years ago remains as the prevailing view: "We want to make it clear that, in planning diets, they physiological considerations should have priority."

An example for the captive breeding of cheetahs at the San Diego Wild Animal Park highlights the contention that there is more to food consumption than mere assimilation of balance quantities of protein, fat, carbohydrates, minerals and vitamins. A first indication of a broader problem was that individuals being carefully groomed for breeding would often have to be detoured to the hospital for treatment of infections of the mouth and nasal passages. A second indication arose from a study of activity budgets which revealed that cheetahs were virtually inactive day and night, despite having a 4 acre area at their disposal, and that activity consisted primarily of trips between food bowl and resting sites. A third observation was of markedly different reactions to minced, frozen meat as compared to occasional feeding of rabbit, chicken, or ungulate carcasses. In the latter case one sees improved appetites a greater tenacity about possession of food, and sometimes even bouts of play centered around the carcass.

These observations point to the importance of nonphysiological variables inherent in styles of provisioning and in the palatability of food to improved husbandry and breeding. Field data for this report are drawn from observations on the tiger, lion, leopard, and cheetah, since these are among the

## FEEDING OF CAPTIVE FELINES - cont.

better studied in the wild, though the findings for large felines probably apply in a general way to other cats as well.

### THE PREDATORY SEQUENCE

The feeding activity of large felines can be divided into four components: location of prey, capture tactics, the killing act, and behavior at the kill (fig 1). Each component entails a considerable expenditure of effort, and brings into use the appropriate foraging and feeding equipment, I.D., the sensory modalities, the limbs, claws, teeth, and jaws. **The total complex of activities** involved in food-getting are discussed in light of potential importance to physical and psychological health of felines maintained in captivity.

### SEARCHING FOR PREY

Schaller [1967] states that much of the Bengal tiger's daily activity revolves around its food supply, whether hunting, feeding, or resting satiated besides the remains of its kill. Its usual method of hunting is to walk through its range in search of prey. Hunting primarily at night, the tiger will cover an average distance of 10 to 20 miles during an unsuccessful night of searching. Total energy expended in the location of prey will depend on availability, luck, success rate in capturing, and frequency with which the species must feed. Success rates for tigers in Kanha Park in India were estimated by Schaller to be one kill every 20 attempts. Once a kill is made, a tiger may feed for 3 to 4 nights, the duration depending on the size of prey and number of feeding individuals.

Cheetahs in Nairobi Park, Kenya, averaged 8 km of travel per day according to Eaton[1974], most of this in search of food. Success rates for cheetahs are much higher than for tigers, estimated at from 50-70%. Cheetahs habitually stay with the carcass for a single feeding, if in fact it is not appropriated by other carnivores, as is frequently the case. Solitary cheetahs were estimated by McLaughlin[1970] to make 150 kills per year, on the average.

Being primarily a nocturnal hunter, and the most catholic in diet of the four species here considered,, it is less clear how much leopards must work at

## FOOD-GETTING TACTICS OF PREDATORS

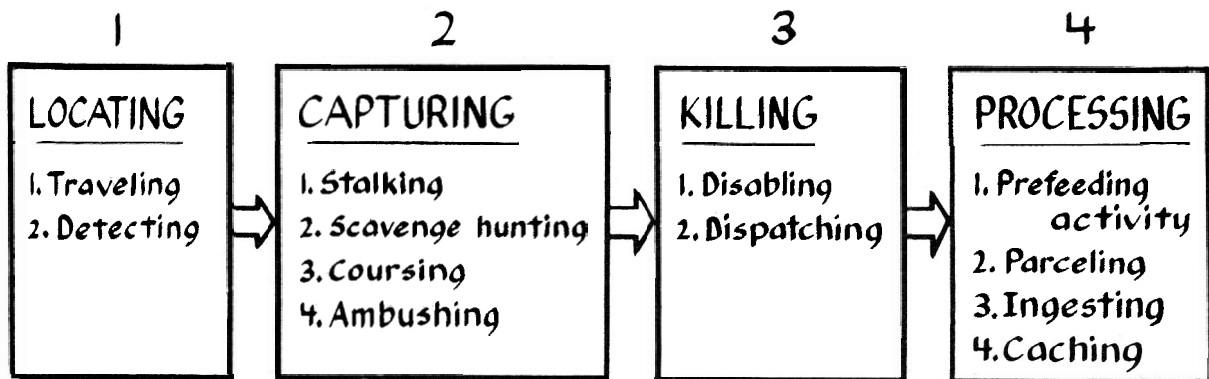


Fig. 1. The food quest for felines in the wild state entails a series of energy-demanding activities. The captive animal is deprived of all but the act of consumption.



## FEEDING OF CAPTIVE FELINES - cont.

locating prey. Kill rates for an 8 month period at Seronera were determined by Schaller [1972] to be about one gazelle per week, representing about two-thirds of the total diet.

Lions may key on vultures [Bartlett & Bartlett, 1972] or hyena behavior at a kill [Schaller, 1972] to locate food, thereby reducing search time. Schaller's detailed descriptions indicate that lions also are notable in the extent to which they wait for quarry to wander within stalking range, as opposed to searching over long distances. However, in areas such as the Kalahari, where prey may be seasonally scarce, searching for food is a major and sometimes fruitless activity [Owens and Owens, 1984]. At his Serengeti study site, Schaller [1972] observed that most kills were made by females, and nearly half of all hunts involved two or more lions. Between 17 and 30% of stalks were successful the higher rates pertaining when two or more lions hunted together.

According to Caro [cited in Lewin, 1987], a female cheetah with an average litter of 3 cubs spends 40% of her time searching for prey. Though comparable figures have not been published for the other species under review here, it is clear that the food quest requires a substantial expenditure of energy in all.

### METHODS OF CAPTURE

Once prey is located, several tactics may be used in the capture attempt. Those shown in Figure 1 are adapted from Hamilton [1973], and are intended to be all inclusive for predators. Stalking as the term applies, entails the use of stealth to approach the target to within striking distance. The ambush tactic [Hamilton's "sentinel"] is one in which the predator takes up a position and waits for the prey to approach. Stealth and camouflage are important to the success of this tactic. While scavenge predation commonly refers to feeding on carrion, Hamilton has in mind active predation, which does not rely on concealment and which is directed at prey which are small and often incapable of rapid flight. Prey in this instance are pursued upon being flushed from cover as the predator openly travels over its range. Cousing (Hamilton's "group hunting") is a pack activity such as that used by wild dogs, and depends on long-distance pursuit during which the prey is driven to exhaustion.

The first three tactics are used in varying degrees by large cats, though stalking is more common. Cautious stalks of up to a half-hour or more have been described, followed by a rapid sprint to close the distance on the surprised target. A major difference exists between the cheetah and other large cats in that it depends more on speed than on stealth. Cheetahs have in fact been observed to ignore prey which failed to show flight [Ammann & Ammann, 1985] Varaday [1964] clocked by auto a group of five cheetahs running along a dirt road in Bechuanaland at 60 mph, and cites other test indicating even greater speed. Because of its reliance on speed, the cheetah can begin its capture sprint from distances as great as 300 yards. Field observers consistently report that the cheetah, at the end of its sprint, must rest for about one-half hour before it can begin feeding. While other cats depend less on pure speed, capture by stalking usually entails a series of momentarily exhausting chases before success is obtained, and represents an expenditure of energy which must be added to that spent in locating food.

### KILLING TACTICS

The killing bout also differs between cheetahs and other large cats [Kruuk & Turner, 1967]. Using either the dewclaw for tripping or a glancing blow with

FEEDING OF CAPTIVE FELINES - cont.

its forepaw, the cheetah relies on the rapidly fleeing prey's loss of balance in closing in for the death-bite. Because its jaws are less powerful than those of large cats, [Ewer, 1973], its preferred mode of killing is the throat bite, which induces strangulation. This may require holding down a struggling animal for periods of 5 minutes or more in the case of larger prey. The larger cats use their weight to advantage in dragging down prey and may either suffocate by a throat hold or bite into the nape of the neck, thereby damaging the spinal cord.

All of the cats under consideration commonly drag or carry the carcass some distance before feeding. Suggested reasons are to seek shade or cover, to protect the kill from other predators, or to be near water or a litter of cubs. For the cheetah, this is a relatively easy matter, since its preference is for the smaller gazelles or other relatively lightweight prey. The other cats in our sample, on the other hand, may expend substantial effort in relocating before feeding. A tiger estimated to weigh 250 kg has been reported as dragging a 320 kg sambar a distance of 150 yards [Breedon, 1984]. Schaller [1972] reports adult lions dragging 275 kg zebras, and leopards routinely maneuver kills of up to 70 kg into the safety of trees. Again, it should be noted that the procurement of food is hard work.

THE CONSUMPTIVE PHASE

Several descriptions of consumption are reported in literature. As a rule, all the large cats begin at the rear or underbelly and work toward the ribcage and forequarters, neck and head. According to Schaller [1972], lions and leopards will sometimes eat the viscera first, perhaps to satisfy their fat and vitamin requirements. After opening the skin, the scissorlike action of the carnassial dentition is used to slice through muscle. In addition, the jaws and teeth are used in ripping, pulling and tearing actions as chunks of flesh are extracted and swallowed with minimum mastication. Estimates of consumption for large cats range as high as 24 kg of meat at one feeding, but a quantity of 10-20 kg is more common. **Processing the carcass into ingestible portions places a substantial workload on the jaws and teeth, as does the gnawing on and crushing of manageable morsels of bone and cartilage.**

Caching is most common in leopards, the kill being maneuvered into trees even before beginning to feed, or hidden in thickets in treeless areas. Tigers will on occasion cover remaining portions of a carcass with brush and leaves, but reports of caching by lions are doubted by Schaller [1972]. All observers agree that cheetahs make no attempt to retain unconsumed portions of a kill. Whether cached or simply guarded from other predators, vigilance from first to last meal constitutes an additional investment in food procurement.

EUROPHAGY

A final point of relevance to this topic is the diversity of prey consumed in the wild. Preferring prey of not more than 20 kg in body weight, the cheetah specializes in one or two regionally abundant species. Thompson's gazelles accounted for 90% of the diet on the Serengeti [Schaller, 1972], while at Kruger National Park 68% of kills were impala [Pienaar, 1969]. Even so, at the latter site, 24 different kinds of prey in a sample of 2,527 kills were recorded.

At Kanha Park the chital deer made up about 50% of the diet of tigers, but Schaller [1967] mentions also birds, langurs, porcupines, even occasional reptiles, amphibians, and fish. In his words, the tiger will eat whatever **it can catch**.

The leopard is said by both Schaller [1972] and Myers [1976] to be more catholic in diet than any other large cat, and Schaller notes that the food list

### FEEDING OF CAPTIVE FELINES - cont.

in the Serengeti included hare, hyrax, various small and medium-sized antelopes, python, several kinds of birds and several carnivores.

Diversity in prey consumed is probably dictated by regional availability and by opportunity. Whether large felids seek certain kinds of prey out of preference or need is unknown, but all evidence is consistent with the notion that choice is based solely on the possibility of capture.

To summarize, large cats in the wild feed primarily on one or a few species but opportunistically include up to 20-30 different kinds of prey for a given region, indicating that they are anything but monophagous. They often travel many miles in search of food, make numerous unsuccessful attempts at capture, drag carcasses to feeding sites when successful, and with the jaws and teeth parcel up prodigious amounts of flesh at any one feeding.

### ISSUES IN CAPTIVE FEEDING

The application of knowledge derived from nature has great potential for improving the quality of life for captive exotics [Marowitz et al., 1978; Hancocks, 1980; Hutchins et al., 1983] While nature cannot be entirely simulated in zoos, if management regimes meet the objectively measurable criteria of good health, display of ecologically valid behavior, and successful reproduction [Quick, 1984,] they will have used field data to good cause. As regards the feeding of felines, nature informs us on several issues for which the substitutions constrained by captivity can be modified to meet these criteria, viz., food packaging, and pleasure in food consumption.

### ACTIVITY

The first three components in the acquisition of food, (locating, capturing and killing) have to do with considerable activity, hence energy expenditure and body conditioning. These are the most radically altered aspects of captive existence, and zoos have few choices in the matter. But one should recognize that a tremendous void results from their removal, leading to boredom, the appearance of stereotyped behaviors, and generally poor condition. Substitute activities are a partial solution, and notable strides in this direction have been developed by Markowitz [1982]. Though cost is often perceived as a deterrent to "engineered" approaches, in the long run they may be good investments in improved health and vitality.

### FOOD PACKAGING

The last component of the predatory sequence, behavior at the kill, provides information which is more readily applicable to the captive situation. Field reports of the last two decades contain information on what animals eat, and how they go about it. From nature's packaging of food items one can extract information about such attributes as texture, taste, temperature, smell, color and shape. The most convincing evidence of the importance of the non-nutritive properties of carnivore food is in the findings on oral health. In response to recurring nasal and mouth infections of cheetahs at the San Diego Wild Animal Park, Fitch and Fagan [1982] conducted a survey which revealed that of 20 cheetahs in U.S. collections which were fed formulated diets, 15 (75%) had focal palatine erosion, i.e., perforation of the palate by the penetrating action of the lower molars. By contrast, 39 individuals fed animal carcasses lacked the condition. Of 22 museum skulls, none of 14 wild caught had focal palatine erosion, whereas 4 of 8 zoo-raised did (diet unknown). The authors proposed that dental malocclusion as a result of feeding a soft texture diet led to a self-inflicted wounding of the palatine mucosa and bone.

FEEDING CAPTIVE FELINES - cont.

Two additional studies address this issue. The first, by Vosburgh et al [1982], entailed experimental feeding of soft and hard diets to timber wolves and found that texture of food was a significant factor in the development of dental plaque, i.e., 50% less in those fed a hard diet. A second study, by Haberstroh et al [1984], measured effects of providing beef femurs to Amur tigers which, when offered twice weekly, clearly improved gingival health and reduced plaque formation. Though still in its early stages, the testing of non-nutritive variables in the matter of carnivore diets favors hard-texture diets as a way of improving oral health, and thus reproductive success and longevity.

PLEASURES IN FEEDING

The contrasting reactions of cheetahs to naturalistic (carcass) and to commercially prepared foods, as noted in the Introduction, suggest issues in palatability and thus in the psychological aspects of feeding which have rarely been objectively examined. Lacking hard data, we address the issue here by analogy. There are several parallels between the ways in which human and zoo animals forage. Procurement and preparation is in neither case an individual activity, but the task of specialists. For humans an entire industry exists to take care of nutritional balance, packaging, sterilizing, precooking, preserving, flavoring, etc., all of which greatly reduces forage time at the supermarket, as well as time spent in preparation of food for consumption. In a similar vein, grass for herbivores is pelleted; fruits and leaves for monkeys are chowed, and meat for carnivores is minced, packaged and frozen, all for similar reasons of nutritional value, cost and convenience. Like the human, the zoo animal invests little effort in foraging or in the processing of food items for ingestion.

The attention humans give to taste, texture, smell, color, and temperature of food, as well as to the time and place of ingesting, is a measure of the enjoyment derived from feeding. Food that is nutritionally balanced, but lacking in those attributes which please the palate is disdained. Caution must be exercised in inferring the gustatory proclivities of animals, but field data do strongly suggest that they find "pleasure" in feeding. While psychological well-being remains an elusive concept, the difficulties encountered in its measurement do not render it unimportant. Until more refined techniques for assessing the mental state of animals in feeding are developed, we may be guided by the fact that the behaviors commonly associated with feeding in nature lead to the conclusion that much of their pleasure centers around food.

It would be impractical to advocate the abandonment of formulated foods. One may question, however, if it is wise to regard them as a complete and adequate solution to captive feeding. Testing with regard to oral health, though just beginning, points to the need for suitable supplementation, and there is reason to believe that as we examine the psychology of feeding with proper experimentation, we will find here as well significant relationships to health and breeding.

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FEEDING CAPTIVE FELINES - cont.

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Reprinted from ZOO BIOLOGY





Our October meeting was held at the home of Addie & Jerry Boyle on a rainy Sunday afternoon.

We were greeted by Tara, Siberian lynx as well as Sassie and Cajun bobcats. Of course our first order of business was to greet both members and guests in which we had only 34 present due to the bad weather. But we did have fun.

We were all very sorry to hear of the passing of Cheryl's chaus, Cimmon and Shirley's serval. It is truly sad to lose an animal.

We talked about different problems with the animals and had several good ideas to try which hopefully will work.

Three new couples from Washington were welcomed with young servals and other exotics living with them.

Five copies of Exotica were sold and the LIOC convention in Las Vegas was discussed.

Jackie Vanderwall brought her two chaus/domestic kittens for folks to see and gave a little talk on them.

We had our usual raffle and dollar pool was won by one of the new folks from Washington. The rest of the day was spent snacking, visiting and having fun.

#### November Meeting.

We held our last meeting of the year at the Redland Grange hosted by Linda Hobson. Bill had to work.

We had a total of 49 members and guests attending along with two chaus/domestic hybrids, a three-month old bobcat, two bobcat/lynx kittens, Tara, Kisa Siberian lynx, a young adult serval and a five-month-old cougar cub.

We again discussed different problems with lots of help to the new cat owners. We asked for more articles for our booklet and one was turned in. We hope to have a nice booklet to take to convention.

The National convention was discussed and it was decided to take it on as a branch project. Another 5 copies of Exotica were sold, these will be available at each meeting. The dollar pool was won by Nick Boyle - his first in 2 years. →



## NORTHWEST EXOTIC FELINE SOCIETY

### MEETING REPORT

Northwest Exotic Feline Society met on September 22nd at Northwest Trek in Washington. This is a large park of free-roaming wildlife. Everything from wild turkeys to Bison, elk, wolves and bear. Some of the areas were fenced to prevent free-roaming predators from mingling, or mangling, as the case may be, other free roamers.

We enjoyed a tram ride which stopped frequently to allow picture taking. After the motor tour, we walked the trails to observe the smaller creatures in burrows, creeks, etc. Naturally, the highlight for us was the cougar and bobcat habitats. We all wished we had the room and facilities to give our exotics this freedom yet have the repaire we have with them now.

We were delighted to meet our newest member, 3 month old Caitlin Maraih, daughter of Carole Braaten-Aldrich.

During lunch and afterwards, we had a short business meeting. Our main topic was getting ideas and input from members as to what goals and directions our club will take in the coming year.

We decided not to continue on to Wolfhaven for the evening "howl-in". It was still a long drive home for some of us.

Submitted by  
Barbara Wilton  
Secretary.

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### PACIFIC N.W. Meeting Report - cont.

While everyone was eating, visiting and playing with kittens, we had an invited guest going around taking pictures and making keychain buttons for those who wanted them.....see you all next year

WE, THE MEMBERSHIP OF THE PACIFIC N.W. EXOTIC"S WISH EACH AND EVERYONE A VERY MERRY, HAPPY AND HEALTHY HOLIDAY SEASON!

Submitted by Gayle Schaecher

## KUWAIT ZOO ANIMALS ENDANGERED BY OCCUPATION

According to reports from World Society for the Protection of Animals (WSPA) field officers and from animal protection societies in the Middle East, numerous animals have been abandoned, mistreated and killed as conditions in Kuwait have deteriorated.

The entire population of animals in Kuwait National Zoo, including 208 mammals, 493 birds and 34 reptiles, has been deprived of food and water during the occupation by Iraq. An undetermined number of these were endangered species. Iraqi soldiers stationed at the zoo are said to have killed and eaten the "edible" animals. The staff of approximately 40 attendants, mostly Asian nationals, have fled Kuwait. Gardeners from the nearby botanical gardens have tried to provide some water for the animals but food is unavailable. WSPA has received reports of gunshots inside the zoo compound.

Further, soldiers have prevented the use of any pet food that could be consumed by humans. WSPA has received reports that some pets, including cats and dogs were shot in the presence of their owners as a means of intimidation.

According to a recent WSPA bulletin, the situation of the animals in Kuwait is as desperate as that of the people with one difference - the animals are wholly dependent for their well-being on people who are struggling now for their own survival.

WSPA has written to Iraq's Ambassador to the U.N. asking for assurance that the animal population will be protected. WSPA also has offered to assist with any animal relief efforts that may be required and has been working with a veterinarian in Saudi Arabia who is prepared to go to the Kuwait Zoo if they are given safe passage by the Iraq government.

YOU CAN HELP BY WRITING :

Ambassador Abdul Amir Alambari  
Ambassador of Iraq  
The Permanent Mission to the United Nations  
New York, N.Y. 10021

Whereas in most instances, barriers to animal relief are primarily physical or financial, in the case of Kuwait, it is an insurmountable political barrier. Please write showing Iraq that innocent animals who pose no threat to anyone, have support worldwide.

From a WSPA Bulletin

## Moving?



Don't miss any issues - notify Member Services (see page 2 for address).

Our special 3rd class rate does not allow for returned mail - you MUST notify us promptly of any change of address to insure uninterrupted receipt of your Newsletter.



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**CATS IN PRINT: A CRITICAL REVIEW**

by Francis A. Kornegay, Jr.

For those not fortunate enough to enjoy direct contact with the wild cats, books about them are, perhaps the best source of vicariously experiencing these impressive creatures. I happen to be one such admirer of 'exotics' who not only does not own one, but whose profession as an African affairs specialist has little to do with an obvious interest in or preoccupation with wildlife except remotely from a standpoint of concern with ecological issues of environmental preservation (which, indeed has become a major African developmental issue). Rather, my interest in the wild cats reflects what has been a life-long avocation of self-education, manifesting itself in a growing collection of books about wildlife in general, mammalian carnivores -- especially the cats -- in particular.

Yet, for those who do not own or interact directly with a wild cat species or are laymen as opposed to being zoologists or naturalists, there exist no accessible outlets to adequately satisfy a thirst for knowledge and information on the cats. Nor are there such outlets that consistently review books, essays and articles about mammalian predators, cats in particular or that provide a diversity of different articles and reports about them. Periodicals like Cat Fancy or Cats Magazine, with their overriding focus on the domestic breeds, are woefully inadequate. There appear to be, in fact, great gaps in what is published about the wild cats relative to other members of the animal kingdom (i.e. bird, primates, dinosaurs). Yet, the preservation of endangered cat species could be greatly enhanced by an increased focus on the cats among wildlife publishers, especially the lesser known species.

Having said all that, by way of introduction, there are several books that have appeared in bookstores over the past few years, which merit discussion. Except for the impressive The Big Cats: Paintings by Guy Coheleach (H.N. Abrams, Inc., 1982), the most important recent works on cats, in my opinion, are to be found in general works on mammals and mammalian carnivores. These are: Carnivore Behavior, Ecology and Evolution edited by John L. Gittleman (Comstock Publishing Associates/Cornell Univ. Press, 1989); and Volumes 3 and 4 of the massive Grzimek's Encyclopedia of Mammals series (McGraw-Hill, 1990). The first addresses a more specialist audience, exploring the comparative morphology, behavioral ecology and evolution of the carnivores while the latter is aimed at a wider reading public. Contributors to both publications comprise leading carnivore biologists embracing expertise in areas ranging from the study of animal behavior to paleontology and the taxonomic classification of mammalian carnivores. Both books also cover a wide range of differing and sometimes conflicting perspectives and approaches that have an important bearing on deciphering the feline past and present.

Carnivore Behavior, Ecology and Evolution is billed as a "critical summary and an evaluation of current research on carnivores" inspired by R.F. Ewer's seminal study, The Carnivores

## CATS IN PRINT - cont.

(Cornell Univ. Press, 1973), assembling "comparative data on the basic anatomical, behavioral, ecological, physiological, reproductive, and evolutionary characteristics of this group." The book is in three parts in keeping with its title. Given my own interest in studies on feline evolution and contemporary inter-specific relationships, I found the chapters of Part III, "Evolution" to be among the most stimulating, especially: "The Molecular and Biochemical Evolution of the Carnivora" by Robert K. Wayne et al.; "The Phylogeny of the Recent Carnivora," by W.C. Wozencraft who also contributes in the appendix, a "Classification of the Recent Carnivora"; and a "Fossil History of the Terrestrial Carnivora," by Larry D. Martin.

The chapter by Robert K. Wayne et al on molecular/biochemical methodologies challenges traditional approaches to understanding cat evolution and inter-species relationships. By reconstructing evolutionary trees based on a synthesis of several molecular techniques (DNA hybridization, protein electrophoresis, measurement of albumin immunological distance, and high-resolution G-banding of karyotypes), conventional distinctions between the roaring panther-like 'great' cats and the non-roaring 'lesser' cats gives way to recognition of three distinct subfamily lineages: (1) the **Leopardus (Ocelot) lineage** of small/medium-sized South American spotted cats (Ocelot, Margay, Oncilla), the most ancient lineage in terms of divergence from other cats; (2) the **Felis (Domestic cat) lineage** of "small cats that were generally derived from ancestors that inhabited the Mediterranean basin"; and (3) the **Panthera lineage**, including all of the 'great' cats, roaring and non-roaring including cheetah and puma as well as a motley crew of small 'lesser' species. What's more, Wayne et al recognizes a core "Panthera Group," combining the lynxes and the extremely rare marbled cat (*Pardofelis*) with the lion, tiger, leopard, jaguar and snow leopard.

Not everything is explained by molecular/biochemical techniques. Nowhere is there discussion of skeletal, anatomical and physiological factors or what weight these should hold relative to molecular/biochemical approaches in determining inter-specific relationships. Thus, while the caracal, African and Asian golden cats, serval, cheetah, and puma "form an older monophyletic group," current genetic data is judged inconclusive in determining their actual interrelationships (within the panthera lineage) although Paul Leyhausen, who is skeptical of molecular/biochemical methods, puts forth an imaginative 'golden cat hypothesis' to explain some of the points of connection in this heterogeneous group in Grzimek's Encyclopedia. Wayne et al also acknowledge that other small cats within the panthera lineage (mainly the Prionailurus/Asian leopard cat group) remain "the focus of future genetic study."

Thus far, the debate between molecular/biochemical evolutionists and traditional paleontologists among carnivore specialists seems tame in comparison to that currently raging in the debate over human evolution. Nevertheless, as becomes apparent in the massive Grzimek volumes, this debate does extend into the ranks of mammalian carnivore specialists, making for sharp differences in approach between contributors to those volumes and

CATS IN PRINT - cont.

those contributing to Carnivore Behavior, Ecology and Evolution. Where broad consensus is reflected is in their discussions of the feline fossil record. It is generally accepted that this record reflects two -- instead of one -- more or less distantly related cat families: the extinct **Paleofelids** comprising the **Nimravidae** or 'false saber-teeths' and the **Neofelids** comprising both living and extinct genera and subfamilies among what are considered the true **Felidae**, a distinction first prominently featured by Nancy Neff in her introduction to The Big Cats: Paintings by Guy Cooleach. Although Martin's suggested phylogeny of the superfamily, **Feloidae** (including civets, mongoose and hyenas as well as cats) emphasizes a close relationship between the families **nimravidae** and **felidae**, there is little clarity or even plausible speculation regarding their common ancestry on the evolutionary tree. The true felids are generally assumed to have derived from **Proailurus**, an extinct lineage of cat-like civets. Does the same hold for the paleofelids as well?

A note of confusion is also introduced in Martin's discussion of saber-toothed neofelids. Whereas the **Homotherini** or **scimitar cats** are often depicted from the fossil record as having developed bearlike, plantigrade hind feet, Martin describes his scimitar cats as having been digitigrade "pursuit predators" of "cheetah-like skeletal proportions." Furthermore, from his survey, it is not clear whether these traits are to be found among the paleofelids as well. Thus, there appears to remain much work to be done in providing a clearer and more comprehensive picture of the feline past.

The Grzimek's Encyclopedia of Mammals series is the successor of an earlier series of volumes, Grzimek's Animal Life Encyclopedia (Van Nostrand Reinhold Co., 1975). It represents an impressive integration of data into a readable text for laymen and specialists alike. The text is organized into general information sections, introductory essays and discussions of phylogeny for each mammalian order followed by more focused introductions and species descriptions on different families within each order. These, in turn, are concluded with comparative species charts summarizing basic data on the families discussed. Accompanying the text are ample color photos and illustrations along with maps that are particularly instructive in depicting the biogeography of given families, species and their possible inter-specific relationships. The encyclopedia's coverage of the cats takes up parts of volumes 3 and 4. The famed animal behavioral psychologist and feline specialist, Paul Leyhausen is featured as the lead author. He is accompanied by paleontologist, Erich Thenius who discusses different mammalian phylogenies throughout the series, the late Bernhard Grzimek, the overall editor and inspiration of the series, and Soviet predator specialist, Victor Zhivotschenko.

Leyhausen and Thenius are skeptical of the molecular/biochemical findings featured in Carnivore Behavior, Ecology and Evolution as constituting the single most decisive determinants of the evolution of extant cat species and of their inter-specific relationships. In his introductory essay, Leyhausen pointedly states that "the authors conclude quite the opposite from the results of...immunological studies. That is, the various species

## CATS IN PRINT - cont.

of cats evolved during rather different periods, which would mean that the small South American felids would be the oldest forms and the so-called large cats would be the youngest branch of the family tree. Based on other investigations however, one may support a variety of different classifications. The uniformity or similarity of **proteins**, the fine structure of chromosomes, the structure of the skull, and the behavioral features can be looked at individually and present us with an entirely different picture as to the sequence and span of time in which various cat species developed, and also how they related with each other. Hence, we cannot be satisfied with following only one of these approaches and declaring the result as the only valid one. One must instead try to compare all avenues of investigation and consider the significance these features might have in an individual case." Thus, "any attempt to classify the living cat species in a way that would do justice to their true lines of descent and degrees of relationship must unavoidably be encumbered with a substantial amount of subjectivity." Having said all that, Leyhausen fails to follow his own advice. He completely ignores findings from immunological studies in arriving at his own tentative conclusions and speculative hypotheses even when these may compliment the molecular/biochemical record.

The more conservative overall approach adopted by Leyhausen et al to felid taxonomy by no means inhibits Leyhausen from offering one eccentric conclusion regarding the tiger. He assigns the tiger to the same genus (*Neofelis*) as the clouded leopard. So now we have two instead of one species of clouded leopard, with the tiger being dubbed by Leyhausen as *Neofelis tigris*! This is going too far for co-author, Erich Thenius: "Assigning the tiger to the genus *Neofelis*, as is felt to be appropriate by P. Leyhausen, is, in my opinion, not in conformity with the facts."

Leyhausen may be on more solid ground in speculating on the prionailurus/leopard cat group as the basal stock of all living felidae, and in his offering what I have termed the 'golden cat hypothesis' to explain inter-specific relationships between the caracal, the African and Asian golden cats, the puma and the snow leopard. The prionailurus group are considered "OLD CATS" by Leyhausen since "we find among them those forms which, in my opinion, seem to have most of the primitive features, and which, therefore are still closest to the common origin of all cats." The highly endangered Iriomote cat of Japan is considered the most primitive, with skull features suggesting "some relationship with the golden and marbled cats" whereas the *Profelis*/Golden cat group -- to which Leyhausen assigns the caracal and the puma along with the African and Asian golden cats -- "were most likely an adaptation of Prionailurus ancestors to arid terrains which only later conquered the rainforests with new forms." Some forms migrated through Siberia to America evolving into the puma, and "seem to have split off the snow leopard as a special form in the course of evolution," one "suited to a high mountain habitat."

Leyhausen points to physical similarities between the Togolese subspecies of the African golden cat and the caracal, and to the strikingly similar facial and body markings among the young of the *profelis* group with the prionailurus group to establish the basis

## CATS IN PRINT - cont.

for a 'golden cat hypothesis' that may make room for explaining the evolution of the lynxes as well as the snow leopard. Thus, he observes that the "heavily spotted Siberian and northern European lynxes, and also the bobcats of the southwestern United States, have the same patterning" as the heavily spotted and blotched subspecies of Asiatic golden cat found in China's Szichuan province and in Tibet (*Profelis temnicki tristis*, a subspecies which apparently exist in no zoological collections outside of China and of which there is no known photograph), thereby suggesting "some relationship between the golden cats and lynxes..."

What is interesting about Leyhausen's observations is that, at least speculatively, they compliment rather than contradict the molecular/biochemical findings offered by Robert K. Wayne et al and W.C. Wozencraft in Carnivore Behavior, Ecology and Evolution. After all, the leopard cats, golden cats and lynxes share the same pantherine lineage, according to their findings. Moreover, the close affinities of such diverse species may be underlined by the extent of their compatibility in interbreeding or in the selective breeding of particular strains within a species accentuating certain salient characteristics as coat pattern. (See: "LIOC Spotlight: Justin Tanner" re selective breeding of vividly spotted bobcats, in LIOC Newsletter, July/Aug. 1990) Here, the observations of feline specialist Nancy Neff writing in her introduction to Guy Coheleach's The Big Cats may also be pertinent.

Neff points out that "the ability to hybridize may seem to contradict the status of...cats as separate species, since species are usually defined as populations of animals who interbreed among themselves but who are unable to interbreed under natural conditions with other such groups." Thus, she viewed with "extreme interest," instances of captive cross-breeding between the "more distantly related puma and leopard" (as opposed to lion-tiger, lion-leopard and leopard-jaguar pairings) since -- at the time she wrote this introduction -- the puma was not considered a pantherine. Thus, referring to the puma, "the ability to hybridize with the leopard is quite unexpected." However, if molecular/biochemical findings are to be afforded any weight, the ability of pumas and leopards to interbreed is explained by immunological findings placing them both in the pantherine lineage. These same techniques and findings would likewise appear to make plausible, Leyhausen's 'golden cat hypothesis' though he resist attaching decisive importance to the immunological record and ignores factoring them into his hypotheses. Perhaps a program of selective cross-breeding among certain species that Leyhausen places in the golden cat group (or on the fringes of it such as the snow leopard and the lynxes) might shed valueable light on the validity of the 'golden cat hypothesis' and, in the process, fill in some gaps in the molecular/biochemical record regarding inter-specific relationships among the heterogenous pantherines.

One of the unexpected, pleasant surprises of volume 3 which is devoted to the smaller cats (and the cheetah and puma), is its treatment of the marbled cat. This is one of the few books on the wild cats with a decent photograph of this beautiful and intriguing feline, one of the most neglected by cat specialists and fanciers of 'exotics.' But even this is more than can be said for another

## CATS IN PRINT - cont.

species this volume groups with the marbled cat, the Bornean Bay cat, a species that has never been photographed, filmed or found its way into a zoological collection. Placed with the golden cats by Bernhard Grzimek in his earlier series (Grzimek's Animal Life Encyclopedia), in this series, Leyhausen assigns the bay cat to *pardofelis* with the marbled cat. But, until live specimen of this cat are studied, its actual relationship to the marbled and golden cats must remain a mystery. For while Robert K. Wayne et al, in constructing their immunological family tree of the cats, places the marbled cat close to the core panthera group -- closer than any other species or group (including the lynxes) -- they situate the bay cat more distantly in the pantherine lineage from the marbled cat. Hopefully we will not have to wait too long to find these answers. To its credit, the **International Society of Endangered Cats (ISEC)** has made the capture and study of the bay cat one of its top priorities (along with the capture and study of another mysterious species, the Andean Mountain cat).

One of the useful, and interesting features of the old Grzimek series not repeated to the same extent in the new one, are relatively detailed discussions of distinct subspecies among several of the smaller and larger cats. This feature enhances the level of interest in many of the better known cats such as the lion, tiger and leopard which include certain subspecies that are in special danger of extinction or that are the focus of efforts at subspecies reconstruction as in the case of the Atlas or North African Berber lion (*Panthera leo leo*).

Among books devoted exclusively to the wild cats, none surpasses The Big Cats featuring the paintings of Guy Coheleach and the extensive introduction and text by zoologist and paleontologist Nancy Neff, a leading feline expert. Between Coheleach's naturalist realism in his exquisite depiction of the big cats, and Neff's expert and exhaustive but readable text, this book combines the best of the picture book that everyone would enjoy having on their living room coffee-table with a serious work covering various aspects of the feline past and present. Guy Coheleach's reproduced paintings and sketches of each of the big cats covered in this book (lion, tiger, leopard, jaguar, snow leopard, clouded leopard, puma and cheetah) speak for themselves. Neff's accompanying text gives thorough treatment of the fossil and contemporary history of the cats in general followed by more focused treatments of each of the big cats depicted in Coheleach's paintings. Drawing upon the full range of source material available up to 1982, Neff's introduction summarizes the fossil history of the cats in their two paleo and neofelid families followed by a discussion of the anatomical, physiological and behavioral aspects of contemporary felidae. She also touches on the rarely explored areas of hybridization among the big cats and the genetics of feline coat patterns, areas which, if explored further in light of recent molecular/biochemical findings, may add further to our understanding of extant cat species.

In the remainder of the book, Neff builds on her introduction with more detailed comment on the fossil and contemporary history of each of the big cats with reference to possible inter-specific relationships based on this record, and on their morphologic

## CATS IN PRINT - cont.

characteristics. Further, every section devoted to each of the big cats enumerates their subspecies accompanied by maps depicting the estimated biogeography of each species and their fossil relatives. Neff concludes this volume with a useful discussion of nomenclature, explaining issues confronting feline systematists in assigning generic, species and subspecific names in classifying the different cat species. This section is followed by an equally useful bibliography of relevant books and periodical articles.

If The Big Cats is at the apex in terms of books about wild cats published during the 1980s, the massive Audubon Society Book of Wild Cats coauthored by Audubon Magazine editor Les Line and former New York Zoological Society Curator of Publications, Edward R. Ricciuti (Harry Abrams, Inc., 1985) is a good example of a big book about which there is a lot less than meets the eye. For a massive book in the gift/picture genre, one would think that by the late 1980s, there would be considerably more coverage in a work of this size (251 pages) of the lesser known cats. In this regard, Ricciuti's earlier work, The Wild Cats (Ridge Press/Newsweek, 1979) is by far the superior work. To its credit, the Audubon Society book offers some splendid color photos of some of more commonly known greater and lesser cats. Yet the seldom photographed marbled cat is presented in a curled up posture that so obscures the beauty of this cat as to make the photo -- which takes up two pages -- irrelevant. What a waste of page space!

Using Ricciuti's 1979 work as a benchmark for judging books on wild cats aimed at a general readership, the National Wildlife Federation's Kingdom of Cats (1987) is, in my opinion, a far more satisfying work than the Audubon Society book. A gift/picture book with a general, largely descriptive text, it includes several original color photos of some of the small, lesser-known cats. These include the Rusty-spotted, Flat-headed and Iriomoti cats of south and southeast Asia, the Sand cat and Pallas' cat of western and north-central Asia respectively. As with many such books, there are reprints of photographs from earlier books. Thus, the excellent black and white photo of the marbled cat in Ricciuti's 1979 book is reproduced in a colorized version in Kingdom of Cats. Why not an original? Even some of the originals can be said to amount to little more than teasers, causing one to wish for a publication that provided the viewer with photographic studies including several different shots and poses of the little-known lesser cats.

Kingdom of Cats concludes with a useful, but very brief chapter on international efforts to preserve rare cat species, including mention of the Federation's establishment of a computerized data base to monitor all cat research which was to have become operational in 1988. Also mentioned is the in vitro fertilization technique which has produced the successful birth of domestic cats and recently of the Siberian tiger, and which holds out promise for enhancing the survival prospects of endangered cat species that are not easily bred in captivity. The Federation's sustained interest in the living cats is also reflected in its co-sponsorship of symposia such as the Second International Cat Symposium it collaborated with the Kleberg Wildlife Research Institute on in 1982. The papers from the symposium were published under the title, Cats of the World: Biology, Conservation and

Management, edited by S. Douglas Miller and Daniel D. Everett (1986). The efforts of NWF and other organizations to expand our knowledge and appreciation of the cat family as well as to save it from extinction open up other vistas for publishing on the wild cats in the 1990s.

A more varied menu of publications about the wild cats, their fossil and natural history, their current status and future prospects, could do much to generate expanded support for their preservation during the 1990s. From the forgoing survey, based on existing gaps in the literature, there are several publications on the feline past, present and future just waiting to be born. Considering the past, the publishing proliferation of books on dinosaurs, over the past few years, suggest that there is a market for books on extinct animals. If that is the case, there is no reason why the great sabertooth cats, the Cave lion and other extinct carnivora should not equally stimulate the imagination of a reading public apparently endlessly fascinated with animals, extinct and living. Hence, a volume that might be titled, Fossil Felines: An Illustrated Fossil History of the Cats and Their Relatives could combine realistic sketches and/or paintings reconstructing the rich paleofelid and neofelid past accompanied by an extensive, readable text elaborating on the summary of the fossil record presented in Carnivore Behavior, Ecology and Evolution.

This book could discuss, in more depth, feline evolutionary scenarios based on the fossil record, focusing not simply on the cats, but on their civet, mongoose and hyenid relatives, including exploration of the transitional ancestral ties that bind these groups within the superfamily, feloidae. Then, more focused examinations of paleo and neofelid fossil history building up to the 'golden age' of the cats throughout the Pleistocene would be in order. Here, there could be special sections and/or chapters devoted to the different stabbing, biting and running cat subfamilies; a survey of the fabulous felids of Pleistocene Africa, Eurasia and the Americas; followed by a general discussion of the implications of molecular/biochemical findings for updating evolutionary scenarios to include the modern living cats. Once, we get this far, a more comprehensive and substantial work suggests itself. Namely, the need for a one or two volume feline natural history -- A Natural History of the Cat Family and Their Relatives, which would include a fossil history of the feloid superfamily as a jumping off point for focusing more fully on the living subfamilies and genera among the cats. Here, the text could reflect differing perspectives on cat evolution and inter-specific relationships based on molecular/biochemical versus more traditional morphologic techniques as well as an attempt to reconcile or synthesize findings from the various approaches. Once these issues have been explored, the remainder of the volume(s) would be devoted to a comprehensive survey of the living feloidae, with photographic emphasis on lesser-known species, and an extensive concluding section on the endangered cats and various survival/preservation options being employed to combat their extinction.

The survey of the living cats and their relatives would

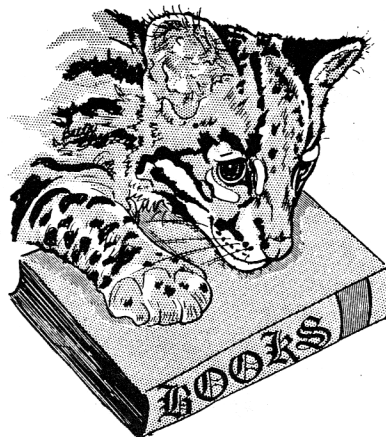


## CATS IN PRINT - cont.

feature, among the more distantly related feloidae, the Madagascarn fossa, a little-known 'living fossil' combining cat, civet and mongoose traits. The cats, themselves, would be surveyed within the context of ocelot, domestic cat and pantherine lineages based on the immunological record, and would include discussion of their ecology and behavior. A comprehensive, natural history of this scope could serve as a point of departure for any number of follow-on publishing series on the cats. A regional/geographically defined book series on "Cats of the World," with separate volumes on the cats of Asia, Africa, Europe, the Americas would be one possibility. Another might be a series broken down according to specific cat groupings (i.e. 'Panthers: The Great Cats - Big & Small,' The Lynxes).

Given the broad, varied universe of interest in the wild cats, ongoing cat research and species preservation efforts, and activities of organizations -- to name just a few -- like LIOC, ISEC, the National (and International) Wildlife Federation, and the International Conservation Union (IUCN), an international wild cats 'trade magazine' is also something to be considered. The existence of the LIOC and -- more recent -- ISEC newsletters point in this direction and represent spheres of interest in the wild cats that could be encompassed in a magazine of this nature. Many of the issues mentioned in this review regarding the wild cats could be explored on an ongoing basis in such a periodical which could also be tailored to attract a wide readership rather a narrowly specialist audience. A magazine of this type as well as some of the other possible publishing options mentioned above would also provide opportunities for more coordinated collaborative efforts among organizations in generating an ever expanding support constituency for wild cat preservation efforts. In the process, new publishing initiatives would bring the wild cats closer to those of us who must appreciate them vicariously. Most of all, such efforts would expand awareness of the urgency of saving endangered cats from extinction. What is at stake is not just the fate of certain endangered animal species, but the fate of an entire mammalian family.

ED NOTE: We hope to have more from Francis in the future. For more about him and his interests see "LETTER BOX".



CONFISCATED COUGARS LOOKING FOR HOME

Oklahoma game rangers are having a hard time finding homes for eight cougars and two black bears seized from a southern Oklahoma hunting range.

Game Ranger Rome Ingle said rangers have calls out all over the U.S. trying to find potential owners who have the proper licenses and facilities to take the animals, according to an Associated Press story.

The animals were seized from the Texoma Hunting Club south of Bennington, Ok. during a raid in October that culminated a two year investigation. Investigators said hunters paid up to \$4,000 to shoot tame exotic animals confined to an area about the size of a football field.

Ingle, who is a district supervisor for game ranger in southeastern Oklahoma said eight cougars and two black bears were found in cramped cages at the range. "These are big, beautiful, magnificent animals, and it's just a shame to me that anyone would cage them up and then let them loose to kill them," Ingle said. He said one of the cougars has an eye injury and another has a hurt foot. Most of the cats have been declawed, Ingle said, so they cannot be released in wilderness areas.

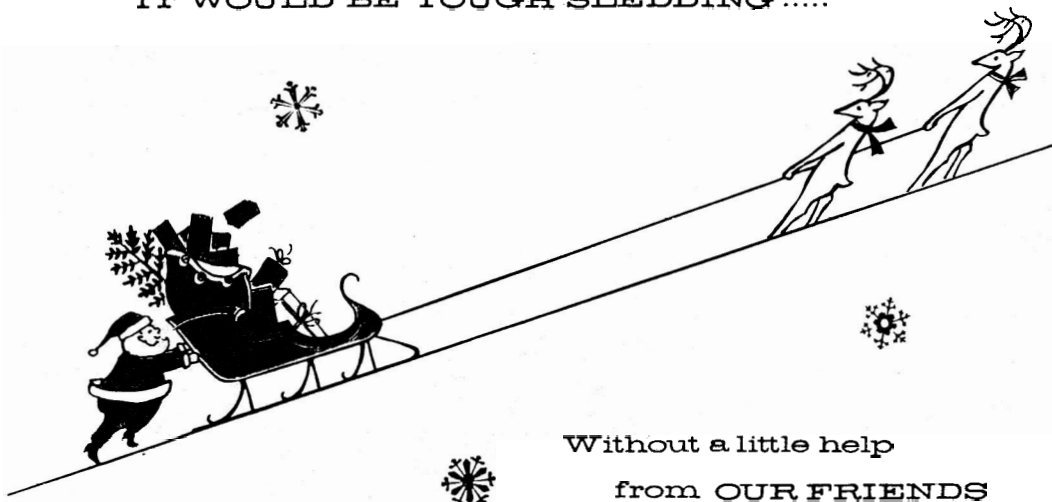
"Right now, most of the animals are in what I would describe as deplorable condition," he said. "Their cages have dirt floors that are so muddy the cats don't even have a place to lie down. They just pace up and down shaking their paws."

Other animals, including goats, sheep and pigs are roaming the wooded 160 acre range, Ingle said. He asked that anyone qualified to own a cougar or bear call the law-enforcement office at the state Department of Wildlife.

ALSO SEE: Under the Editor's Desk on page 4

Reprinted from the Poteau Daily News  
Contributed by Lynn Culver

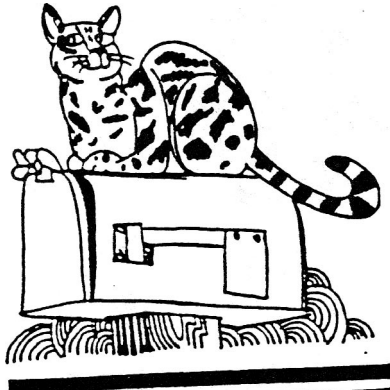
IT WOULD BE TOUGH SLEDDING .....



Without a little help

from **OUR FRIENDS**

Our warmest gratitude to all who contributed to  
the Newsletter - Thank You.



## Litter Box

Dear Shirley,

I am delighted that you will include my article in the next issue of the LIOC Newsletter. The appreciation and encouragement expressed is indeed incentive to make future contributions - time willing. I have been looking for an opportunity to write on cats for quite sometime. I can see that I properly gauged the LIOC Newsletter as a medium in which individuals of diverse backgrounds who are fascinated by endangered cats, as well as genuine specialists, can find an outlet for expressing their interest. I think this is absolutely essential in generating support for saving endangered cats and wildlife preservation generally.

As I state in the introductory paragraph of my article, my interest in the wild cats is an avocation. While I write and publish often in my field as a political observer of Africa and U.S.-African relations, I have never ventured into the world of endangered cats as a topical area for writing. However, though I don't pretend to be an expert on the cats given my lack of academic and professional background fields related to their study, and do not own one as do most of LIOC's members, I have read and collected enough books and articles on wild cats over the years to have acquired more than the average knowledge about them. In doing so, and partly because of my hunger to find out more about those species which are focused on the least, I have been struck by the infrequency of quality literature on endangered cats and by the lack of any literature reviews regarding published materials about them.

Besides being a member of LIOC, I am also a member of ISEC, The National Wildlife Federation, the World Wildlife Fund, the National Geographic Society, and Friends of the National Zoo (FONZ). In the summer of 1985 I attended a course on the cats sponsored by and held at the National Zoo.

The main area of assistance that I can think of essentially boils down to information. As you can tell from my article, I have a fixation on the marbled cat and a general interest in the lesser cats of Asia. Any information I can get on them will be appreciated. I am also very interested in any information available on special zoological collections and programs regarding the cats, especially if they are or have in the past generated useful written material. For example, the Cincinnati Zoo has become renowned for its cat collection and research program, including experimentation in the application of invitro fertilization techniques for rare cat preservation. Are you aware of any publications put out by the Cincinnati Zoo on its cat collection and research program, or who I might contact there to make an inquiry? Another request -- and this one is a long shot -- regards the San Diego Zoo's 'Year of the Cat' a few years back (I believe 1985-86). If you or other LIOC members have any information on that program and/or any literature generated by it, I would appreciate having such material shared with me.

*Francis*

Francis A. Kornegay, Jr.  
1884 Columbia Rd. N.W., #119  
Washington, D.C. 20009

# *this Christmas...*



*This Christmas, mend a quarrel.*

*Seek out a forgotten friend.*

*Dismiss suspicion and replace it with trust.*

*Write a love letter.*

*Share some treasure.*

*Give a soft answer.*

*Encourage youth.*

*Manifest your loyalty in word or deed.*

*Keep a promise.*

*Find the time.*

*Forego a grudge.*

*Forgive an enemy.*

*Listen.*

*Apologize if you were wrong.*

*Try to understand.*

*Speak your love.*

*Speak it again.*

*Speak it still once more.*

