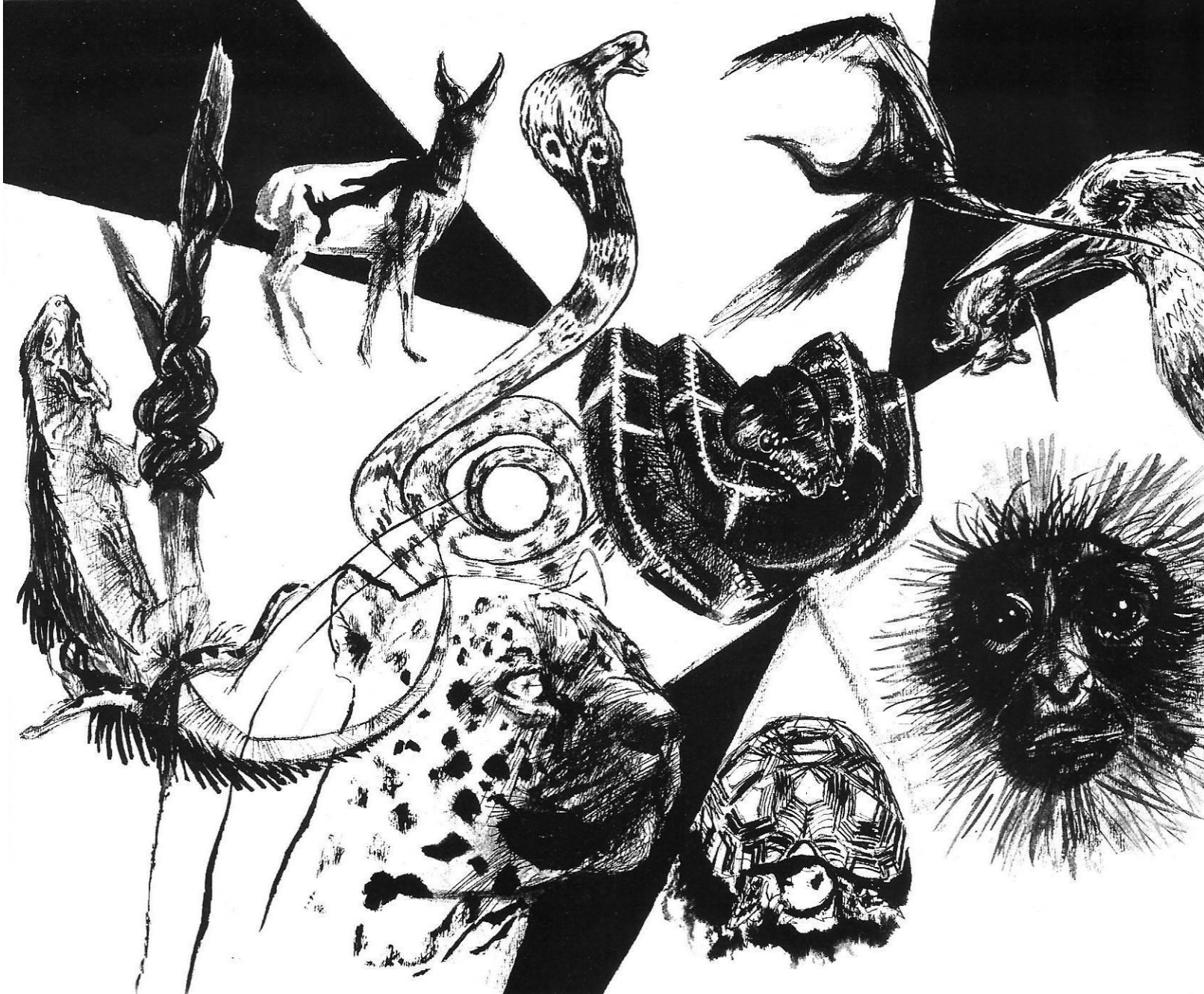
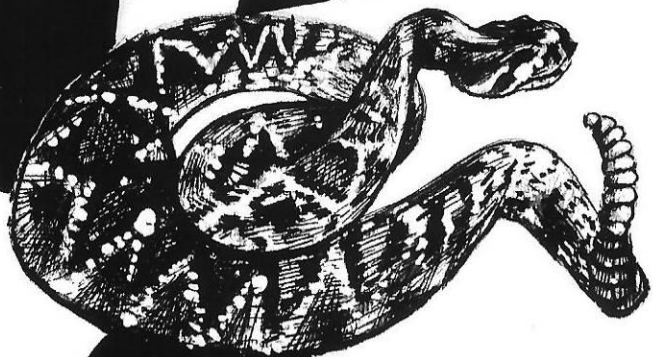


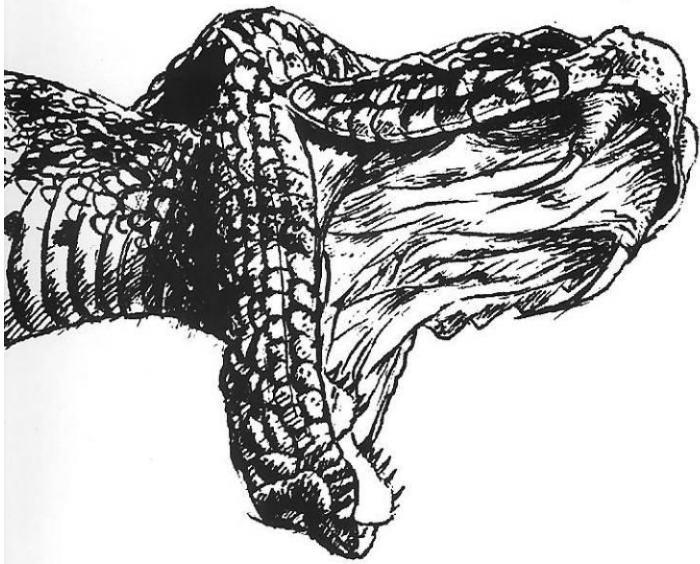


MAX ALLEN'S ZOO WORLD



Text related by
Max Allen Nickerson
Illustrated by
Leland Payton





INTRODUCTION

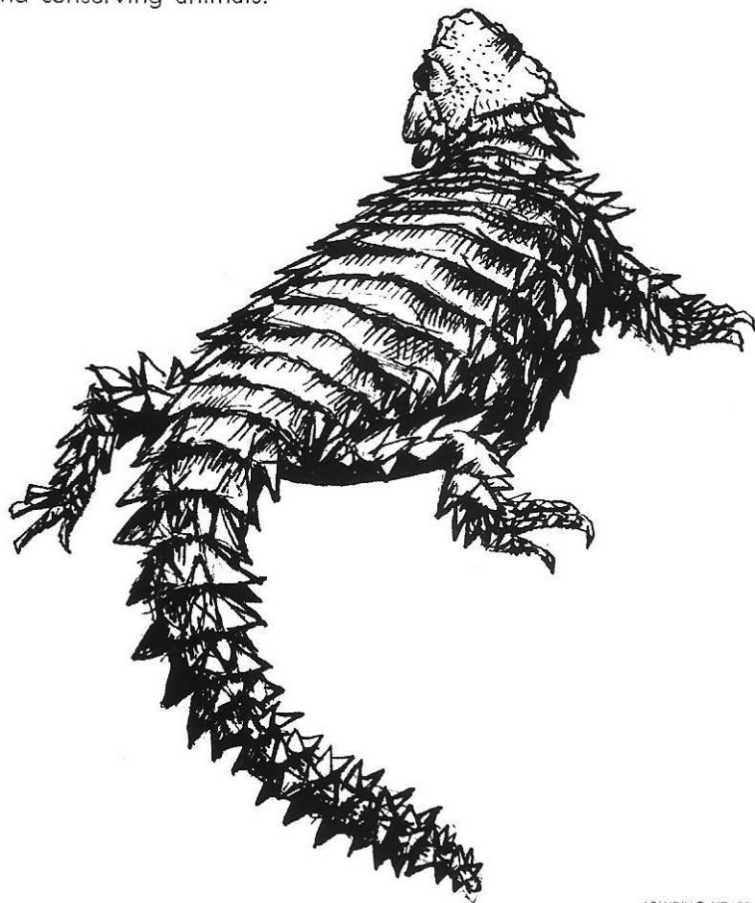
Max Allen's Zoological Gardens was founded during the fall of 1951 in the rolling Ozark foothills just eight miles from Bagnell Dam in the beautiful Lake of the Ozarks region of Missouri. It was the primary purpose of its founders to develop one of the finest collections of reptiles in the world. Early in 1955 Max Allen's began running their first television programs on a local scale, with young Max Allen Nickerson, still in high school, moderating. Another first occurred in 1958 when the zoological gardens organized its first collecting trip outside of the United States collecting as far south as Guatemala in Central America. By 1960 Max Allen's had developed one of the worlds best collections of reptiles and began work toward a full fledged zoological park incorporating birds and mammals. That year also saw Max

Allen Nickerson graduated with a B.A. in zoology from Central College of Fayette, Missouri, and entering graduate school at Arizona State University in Tempe, Arizona. During the summer of 1961 the current television series "Zoo World" with Max Allen originated at the University of Missouri, KOMU-TV, Columbia, Missouri. Programs were video taped for distribution to other channels in 1964 and 1965.

During the first one and one half decades of its existence, Max Allen's has financed eight expeditions to Mexico and Central America, employed college students representing more than a dozen colleges and universities, and supplied data and specimens which have led to the publication of numerous scientific articles and books.

Equally as important has been the distribution of accurate information to more than a million visitors at the zoological gardens and millions more who have watched "Zoo World" on television.

This book is an attempt to express Max Allen's philosophy concerning the purpose of zoological gardens and their probable future. It also entails problems and personal experiences of collecting, shipping, displaying and conserving animals.



COLLECTING

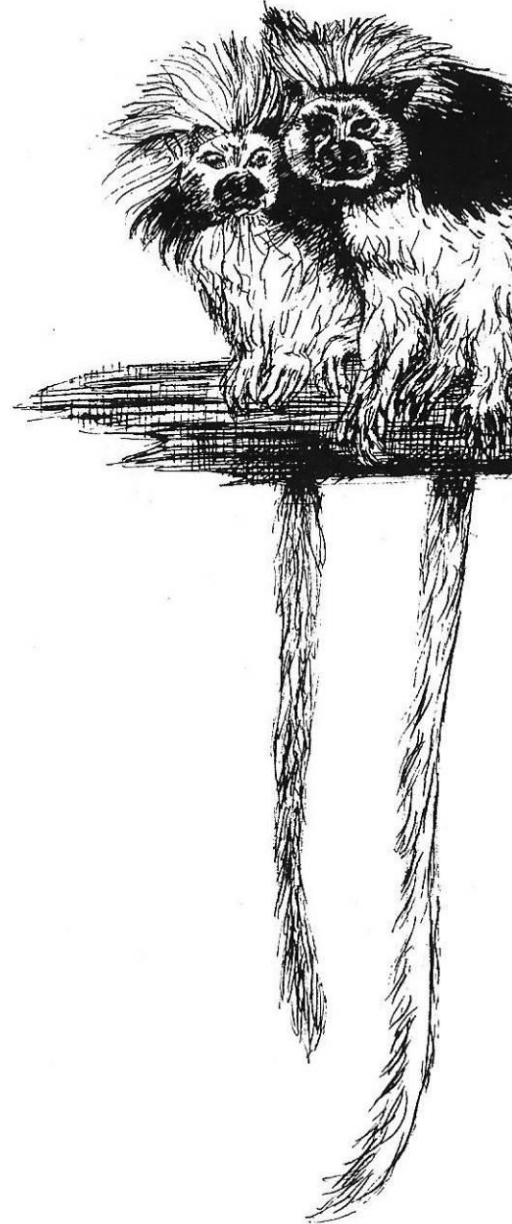


Needless to say, no sizeable zoological gardens featuring a wide variety of animals from different parts of the world can collect all of the specimens which it displays. The problems are both monetary and academic. Many of the specimens are donated, traded or purchased from collectors, dealers or other zoological parks. Thus finding reliable sources for obtaining various animals may present problems.

On the other hand collecting wild animals may be one of the most interesting and important parts of being a zoologist. In the field, whether collecting locally or some distant area, there are many things that should make a collecting trip worthwhile.

Granted, just collecting is enjoyable but too often one passes up opportunities to gain knowledge through obtaining data on the specimens collected. Such things as locale, time, temperature, types of vegetation and any other pertinent information should be recorded with the specimens if at all possible. In fact, it is often rewarding to have some individual in the collecting group responsible for this worthy task. Further data may be taken from the specimens upon their deposit in the zoological park and ideally a data card should be filled and maintained for each specimen.

The equipment and methods used in collecting varies greatly with the habitat and the animals desired. An illustration of the equipment which might be needed on a lengthy collecting trip through varied habitats occurs on the following pages.

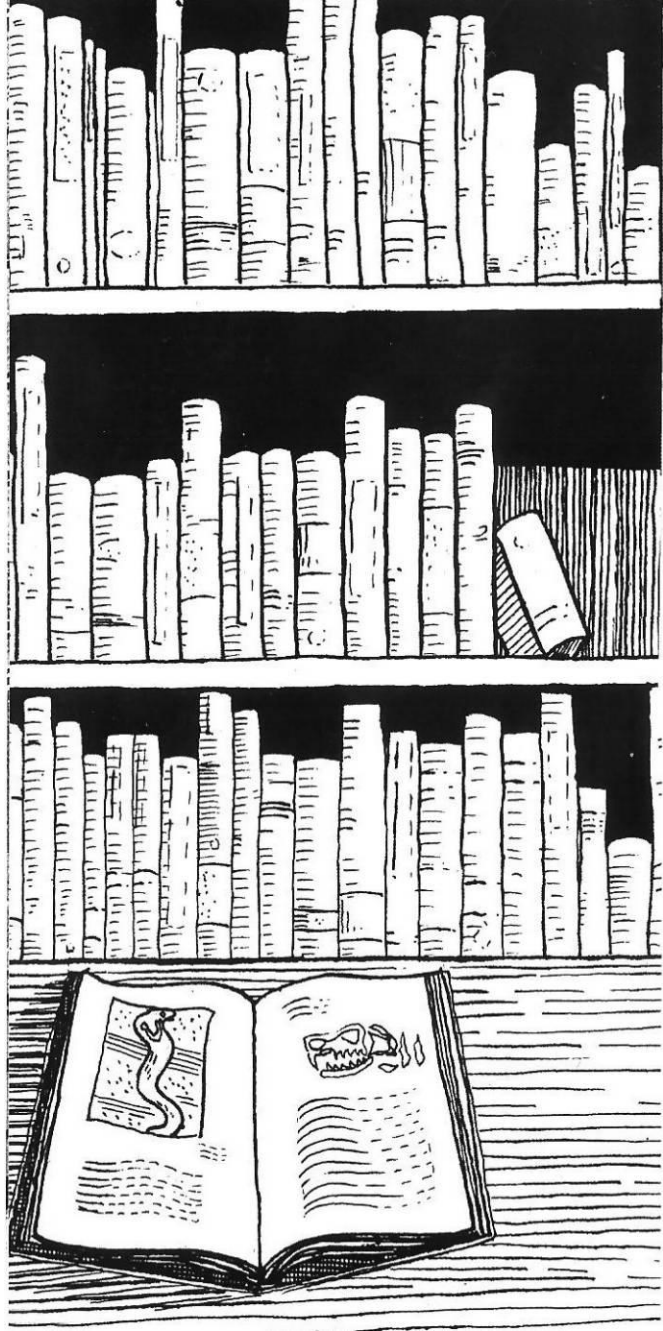




Beans

This represents some of the equipment which might be necessary for a lengthy collecting trip through diverse regions. Of note: a four wheel drive vehicle, self-contained trailer, still and moving picture cameras, first aid kit including antivenin, maps and reference books, snake-proof boots, preservation equipment, log and data file, caging and collecting tools and equipment.

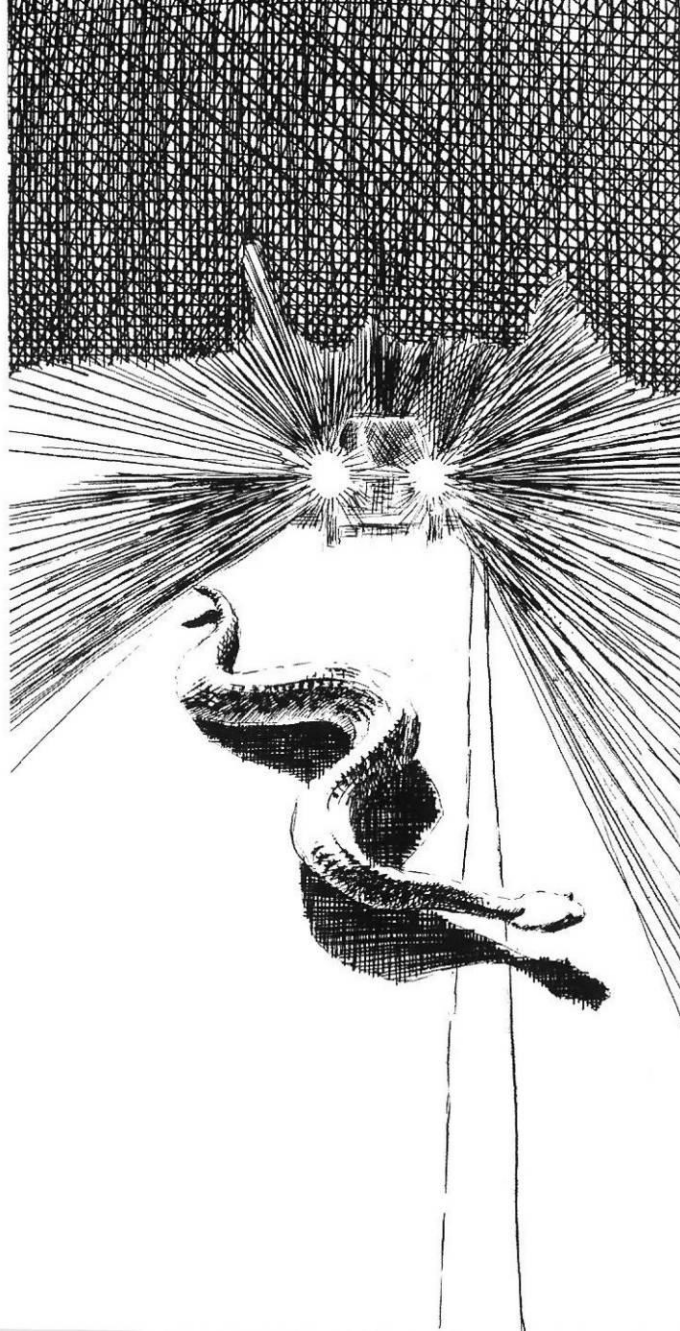




First, however, before collecting one should remember that others have probably collected these areas before and many articles may have been written concerning them. Every zoological park should have a library of technical books and journals dealing with all phases of animal life. Not only can it save the zoo thousands of dollars in maintenance and animal loss but thousands of man hours in the field collecting.

Recognizing this, if one has a list of the animals he is most interested in collecting, he can extract from the literature localities where they have been collected, ecological affinities, methods used in collection and in some cases even the collectors.

The methods and tools of collecting also vary greatly with geographic region, habitat, time, season and animal sought. Some examples should illustrate this: If one wanted to collect rattlesnakes in the arid southwest, one's best results in the early spring and late fall might be hunting by day the rugged ridges often used for denning sites. However, the intense desert sun forces these creatures into a nocturnal existence during the summer months. Collecting is best accomplished then by merely driving down a seldom traveled road at a low rate of speed taking specimens crossing the road.





Extreme weather conditions may also prove to be the answer to a collector's dreams. During prolonged dry periods aquatic animals and those linked to water are forced into smaller and smaller areas until aggregations are intense. Max Allen has taken as many as ninety-eight water snakes in a two-hour period during these conditions.

Devastating storms such as hurricanes or heavy thunderstorms which create flooding may also undulate low-

lands displacing marginal animals. In either case the increase of animal density or the decrease of optimal habitat increase the collector's chances of taking the animals.

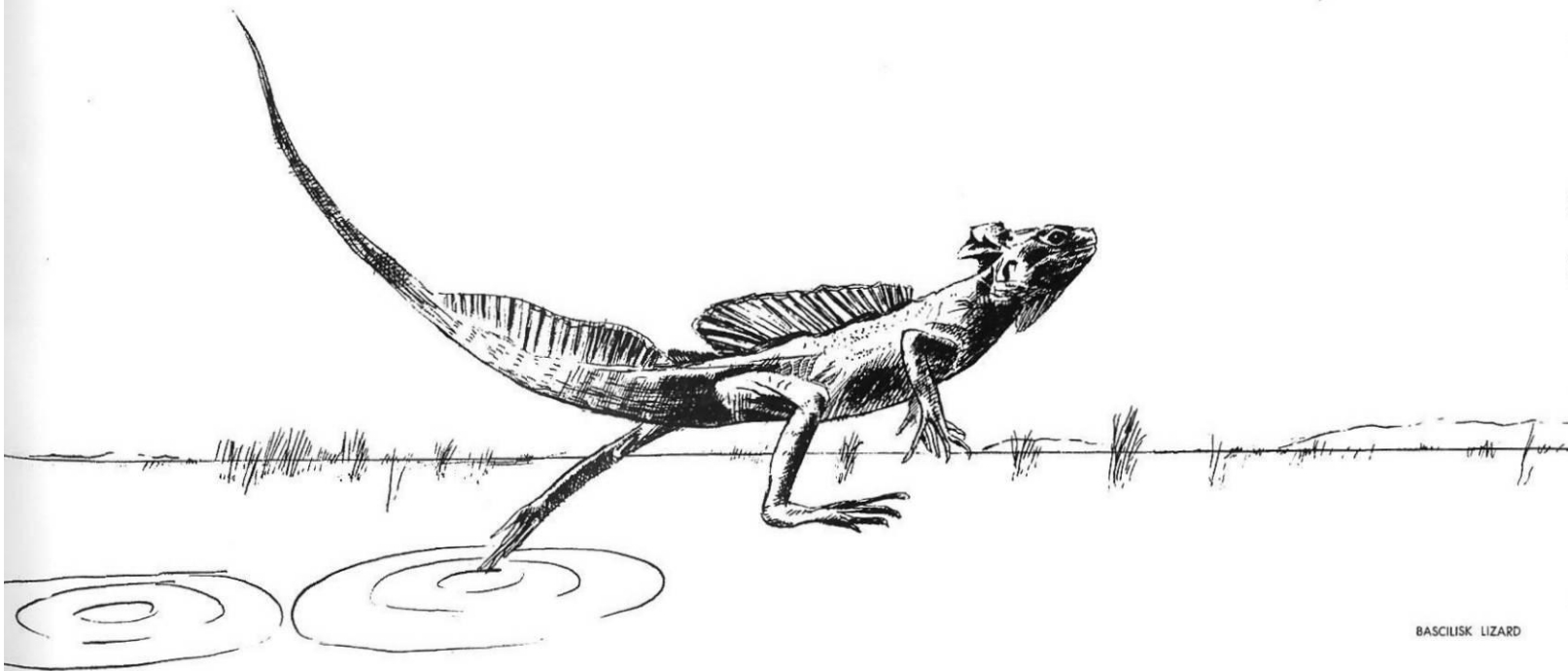
Many phases of collecting have evolved in the past twenty years. Instead of killing an adult bear to capture the young, drugs are introduced by means of a pellet gun or arrow tipped with a hypodermic syringe-like point to subdue the animal.

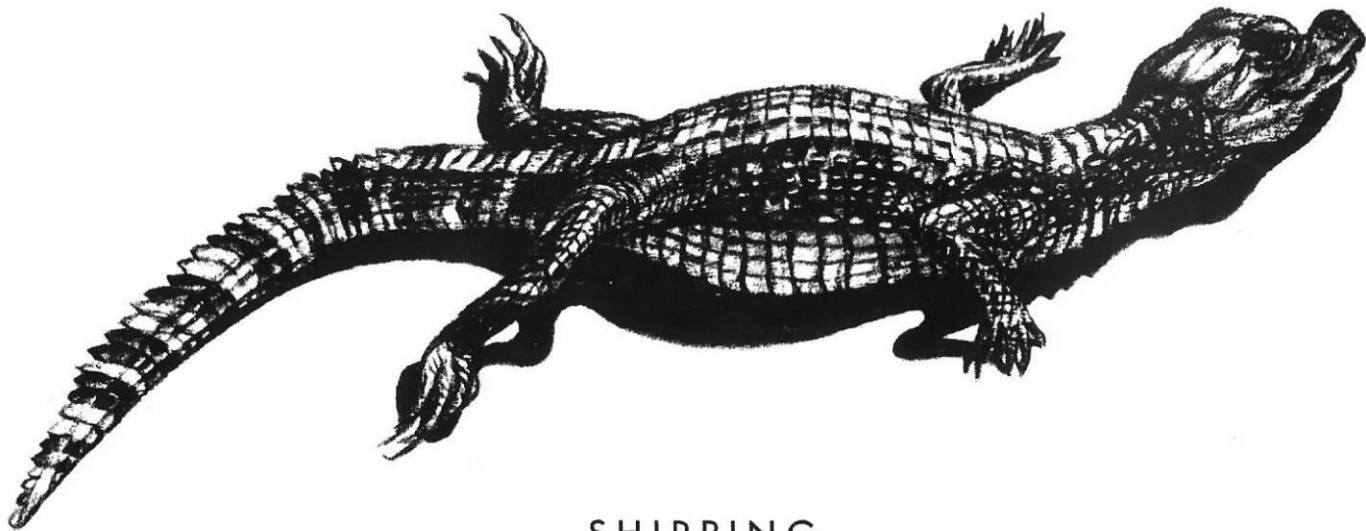
Nets have now been so sensitively and delicately constructed that they may catch bats leaving caves and they are powerful enough to hold whales. Large nets may now be propelled by explosives to collect hundreds of birds, monkeys or any other tribal animals at a time.

The use of animal scents and calls have been used for years but now almost anyone can put them into prac-

tice using packaged products and recordings of distress and mating calls.

New and better roads now enable one to collect regions not dreamed of in the past, and if there are no roads, the accessibility of certain areas is available by plane or helicopter.





SHIPPING

The increased speed and efficiency of today's transportation systems, especially air transport, mean less care enroute and fewer animal losses.

One of the most interesting and revolutionary advances in animal shipping in recent years has been the building of the S. H. Coleman Animalport at Kennedy International Airport. Originally built at a cost of \$300,000 the two story brick building covers over two acres. Inside cages, stalls and pens have been constructed to handle

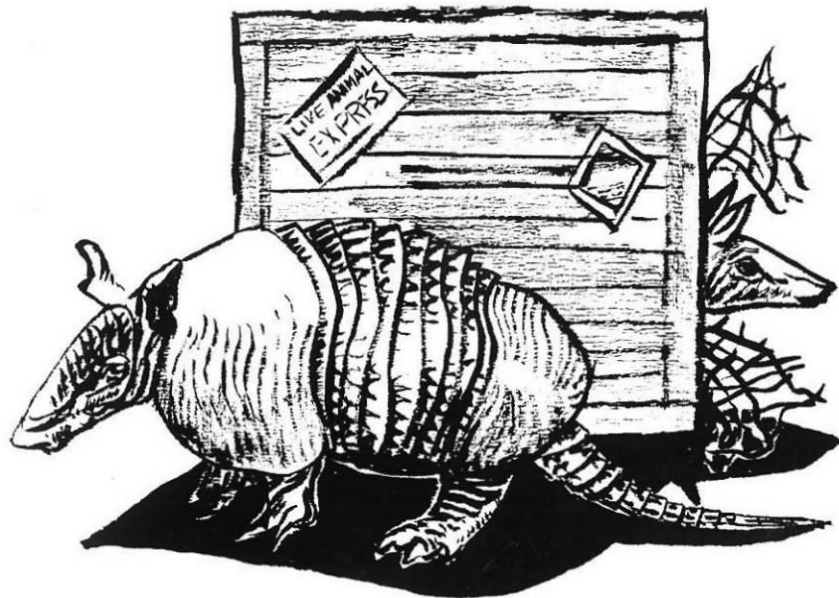
everything from mice to elephants under relatively sterile conditions. Also included, under the same roof, is a veterinarian hospital fully staffed and equipped with the latest equipment.

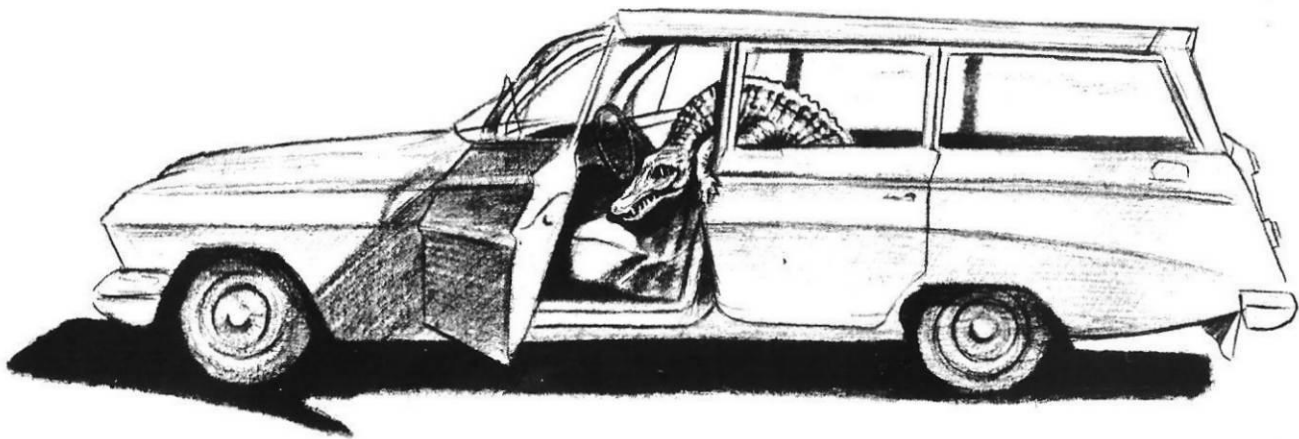
During the first six years this shelter served as an oasis for over 100,000 animals of 120 varieties with either the shipper or the airlines picking up the tab. Costs for maintenance may vary from one dollar a day for a bag of

snakes — no limit on numbers of specimens in the bag — to five dollars a day for gorillas. The costs are quite reasonable considering the overhead created by the varied diets required for some of the transients. Such things as orchids, bamboo shoots and beetles may be common food items at times.

There are, of course, many basic rules to observe when shipping animals. Almost all of them focus around the shipping container. The shipping container should be light, spacious, well ventilated and yet sturdily built, a combination sometimes difficult to produce. One of Max Allen's collectors, for instance, had to recatch and repack a shipment of armadillos three times before it successfully left the express office.

If the animals to be shipped are highly nervous, it is often advantageous to introduce them to the container before actual shipment is made. This acclimation may save many specimens from self-inflicted damage.





Extreme care should be taken when shipping dangerous animals. On one occasion while Max Allen was transporting an alligator the big reptile tore off the ropes and plummeted into the front seat. Fortunately the big alligator did not interfere with stopping the automobile and he was easily restrained. On yet another occasion a New York transit worker was blinded temporarily by a spitting cobra enroute to Max Allen's because an African shipper had not carefully checked the seams of the sack in which the reptile was packed. This situation was fur-

ther aggravated by the fact that the contents of the shipment were not labeled adequately. At first no one realized that the spray of liquid which issued through the screened vent was venom from the spitting cobra. The container was merely labeled "African reptiles".

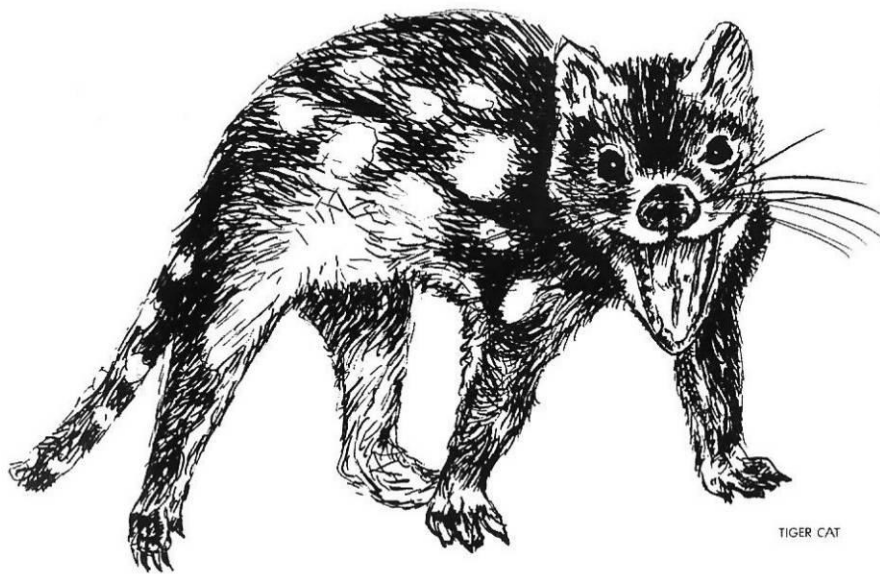
Mixing different varieties of animals in a common container may also be hazardous. Many forms of animals become antagonistic under the stress of shipping where

others are cannibalistic. One southeastern shipper recently lost five Indian cobras because he packed them with a large king cobra, a renowned snake eater.

The business of shipping animals is full of ambiguities. For instance, it is against the law to use the mail service for shipping harmless snakes in the United States but deadly scorpions may be mailed in proper containers. In many inland cities operating airline regulations may bar exportation of poisonous reptiles but the world's most deadly forms may be imported from foreign countries into those same cities.

Nevertheless the most efficient animal transportation in most cases is air transport. Unfortunately it cannot be

used to transport all forms of animals. Adult giraffes, for example, must still be transported by ship and rail. As in most cases this means higher shipment costs and a higher mortality rate during the shipment.



TIGER CAT



IN CAPTIVITY

When new specimens arrive at any zoological gardens excitement runs high. Everyone concerned is interested in seeing the size and quality of the new residents. This may also be a very dangerous time if caution is not

exercised. Max Allen has noted this to be the case particularly in the reptile house. On one occasion he opened a crate of fifty cobras expecting to find them neatly and safely sacked. Instead as the lid was pried off there was an eruption of the writhing deadly snakes in all directions. On yet another occasion one of the caretakers emptied a sack labeled "Mud Snake, Harmless" only to find himself confronted with a very deadly fer de lance. Fortunately the snake was only interested in escape from the confines of the bag and showed no interest in the startled curator's presence.

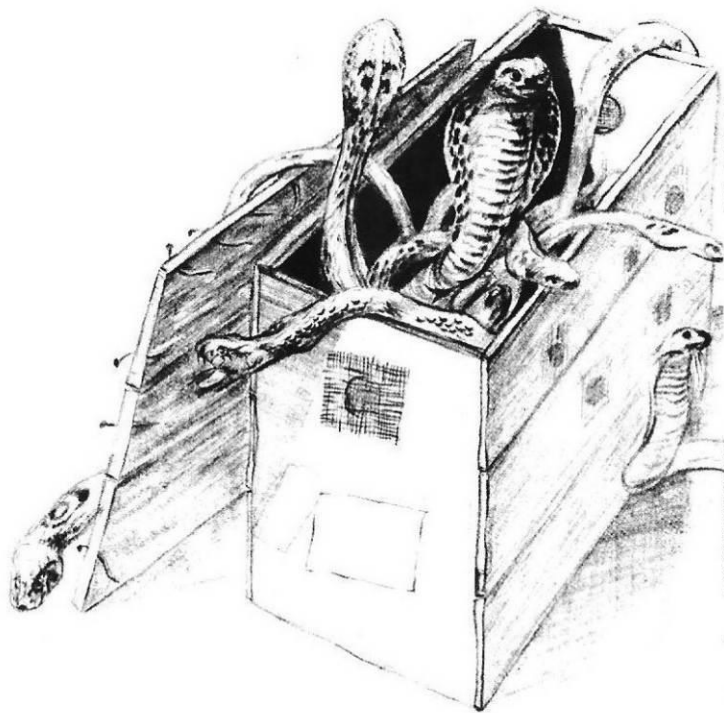
Upon deposition in new surroundings the animal has many adjustments to make. The nearer the new quarters resemble its native habitat the better. But animals must be well displayed to be enjoyed and many of them

have habits that do not lend well to this. To cite generalized examples — a relatively large portion of the world's animals are nocturnal, fossorial or secretive for some other reason.

Nocturnal animals, being active at night, make poor displays by day unless a little ingenuity is used. By using a darkened building with white lights during the night and red light throughout the day they may be actively displayed during the day. This enables visitors to view the animals under optimal conditions without any deleterious consequences to the animals.

Just how well one is able to approximate a given animal's habitat depends on the zoo's location, physical facilities, methods of cleaning and the amount of funds available.

If the animals are to be housed indoors, conditions of temperature and humidity may be controlled but cleaning and feeding problems often multiply. If they are housed inside part of the time and outside the remainder,





the problems are additive. It is important to note here that it is better to display a few animals well than a large number of animals poorly.

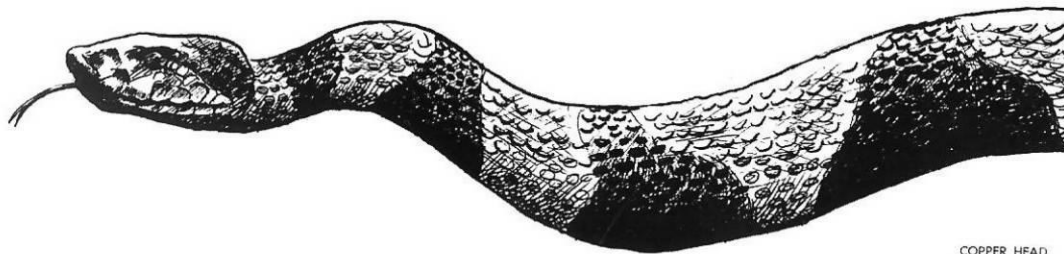
Assuming that one has the new animals in a proper enclosure that has sufficient space and an area designed similar to its natural habitat, the shock of being displayed in an enclosure almost constantly in front of people may still make the animal unstable. Sometimes this may be eliminated partially by the use of one way glass. People can then see the cage but the animal cannot see out. Other methods used to combat this are alternation of animals on display and cageless displays such as pits. Animals may react to confinement in varying ways. Some adjust

rapidly and lead normal healthy lives to ages far older than they could approximate in the wild. Others may react violently, smashing themselves into their enclosures and walls, fence or window, causing great damage to themselves if they are not tranquilized. One of the most common reactions is to go into a starvation diet. This many times represents one of the keeper's greatest challenges.

It may be that the proper food is not being presented to the animal e.g., the three-toed sloth is fond of cecropia leaves and the koala apparently feeds only on eucalyptus leaves, while the giant panda eats bamboo



shoots. Many animals do not have narrow ranging diets. In fact, although preferences are certain, many animals eat whatever they can obtain that is not too dangerous or obnoxious. Needless to say this diet varies in their natural habitat because of the population fluctuations in prey animals. In captivity, although the diet may be varied, it is based on what the animal is known to need — that is the fat, carbohydrate, vitamin and mineral content.





It is interesting to point out that a vitamin in one animal may not be needed by another because it may be able to synthesize it. Also the types and amounts of fats, carbohydrates and minerals vary from animal to animal.

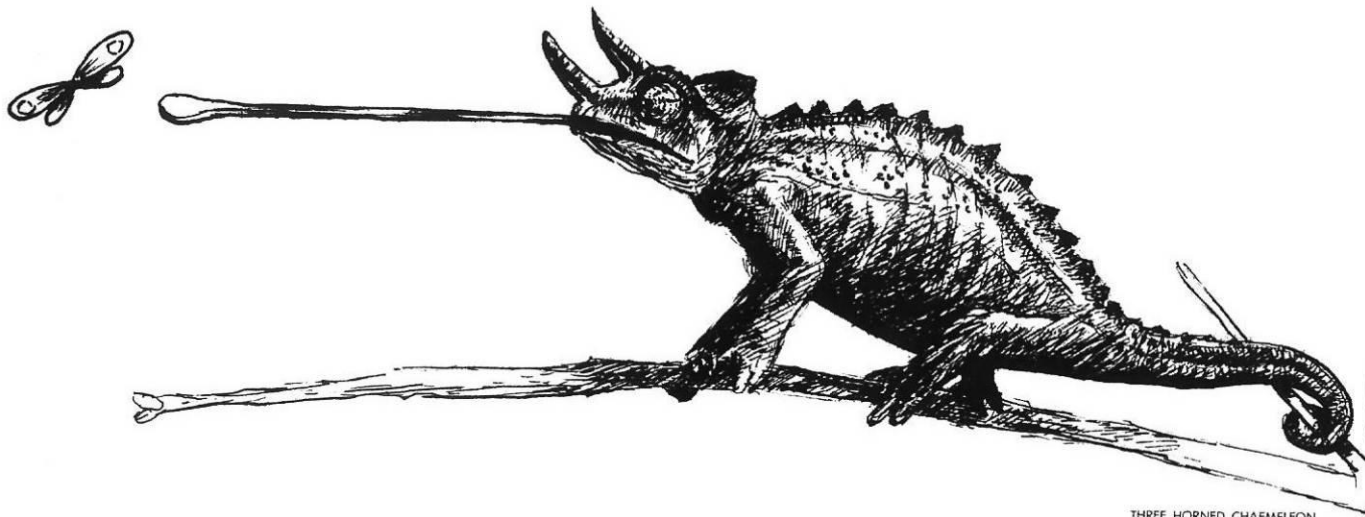
If there is any doubt concerning any requirement, it should definitely be included in the diet. There are thousands of animals whose specific dietary requirements are not known. A zoological park then needs a nutritionist on its staff or advisory council.

The amount of food needed also stretches the imagination. An adult sea lion will eat twenty-five pounds of fish a day and an African lion ten pounds or more of meat plus the bones attached. In fact a large zoo in a year may buy one hundred tons of meat and fish, two hundred tons of hay and hundreds of bushels of fruits and vegetables.

Sometimes even if the food is one preferred by the animal, there must be an added stimulus to start the ani-

mal feeding e.g., bushmasters are one of the most difficult snakes to maintain in captivity. For years both live and freshly killed animals have been used by numerous zoos in an effort to entice the huge pit vipers to feed. One of the reptile keepers at the Bronx Zoo struck upon the idea of forcing an atomized mist of water into the cage while introducing food. The idea proved successful and the bushmaster fed on freshly killed rats, an item offered many times before unsuccessfully. Evidently the mist combined with a temperature in the seventies pro-

vided the stimulus. One might deduce from this that the bushmaster, which lives in regions of high humidity and slight temperature changes, feeds typically late in the evening when humidity nears one hundred per cent. This occurs almost nightly in many parts of the tropics. Such a deduction however should be viewed only as a simple hypothesis for many reactions of animals in captivity are not typical of these animals in their native haunts. Lizards from extreme arid regions may spend a great amount



THREE HORNED CHAMELEON

of time leisurely soaking in their water basins. Desert rodents keep their water containers empty and yet may have never sampled free water before since they obtain most of their moisture through metabolic water — water obtained by the chemical breakdown of foods.



One of the biggest problems zoos encounter is the compelling urge of their visitors to feed the animals. Policies on this have varied from an absolute one of no feeding to the more liberal view of allowing specially prepared food to be sold for the feeding of specific animals.

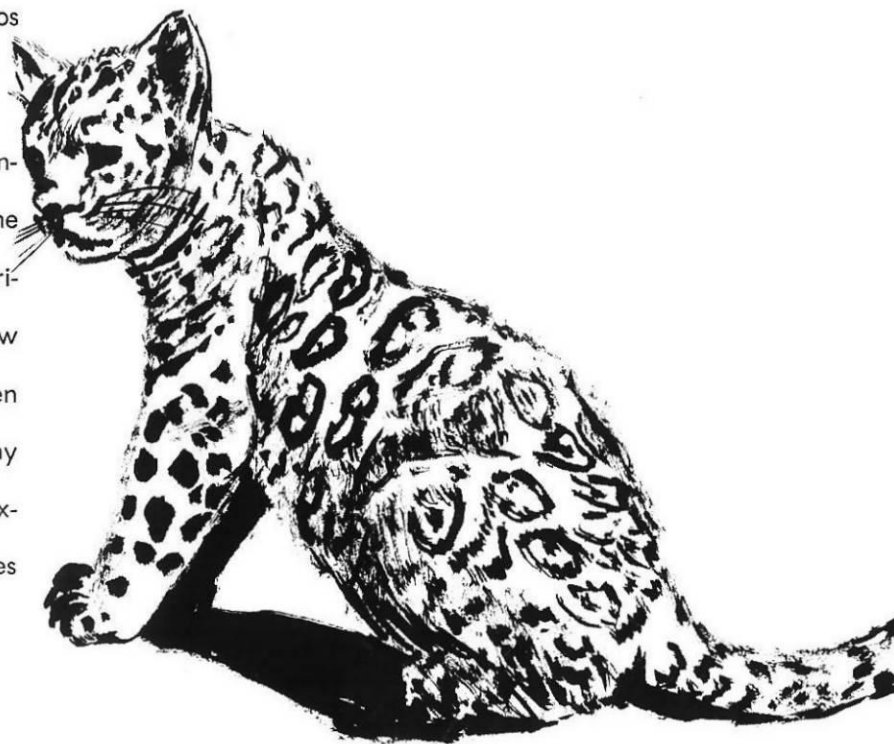
Many animals eat almost everything presented to them. Alligators have been known to swallow pop bottles; elephants consume gloves and purses; while monkeys often ingest candy wrappers and cigarettes. This has led to numerous cases of extreme illness and even loss of valuable specimens. Another problem is the fact that man carries many diseases which may be transferred easily by merely handling the animal's food. Many val-

uable animals, such as apes, have a low resistance to many viruses and bacteria carried by man and apes especially are susceptible to tuberculosis.

This of course brings about another major problem facing the zoo keeper — the fight against disease. Pathogens have reaped a grim harvest of specimens from zoos in the past.

Now there is almost always a rigorous vigil maintained, starting from the moment the animal enters the zoo. Sometimes the animal undergoes a quarantine period. This brief period is necessary because when a new animal is introduced into an enclosure with others, even if they are the same species, there is some risk. This may be particularly true in wide ranging species. Such an example would be the common boa constrictor which ranges

from near the United State's border southward well into South America. If the old residents were from Mexico and the new arrivals from South America, the parasites and pathogens tolerated by one might well prove fatal



to the others. After a period of observation if deemed healthy, the animal is placed on display. From then on it is watched by the keeper, who should report any unusual change in the animal's patterns to his superior or zoo veterinarian. If medication is necessary it may be applied directly in the food or water or in the case of large dangerous animals, it may be applied with the help of a propelled hypodermic syringe.

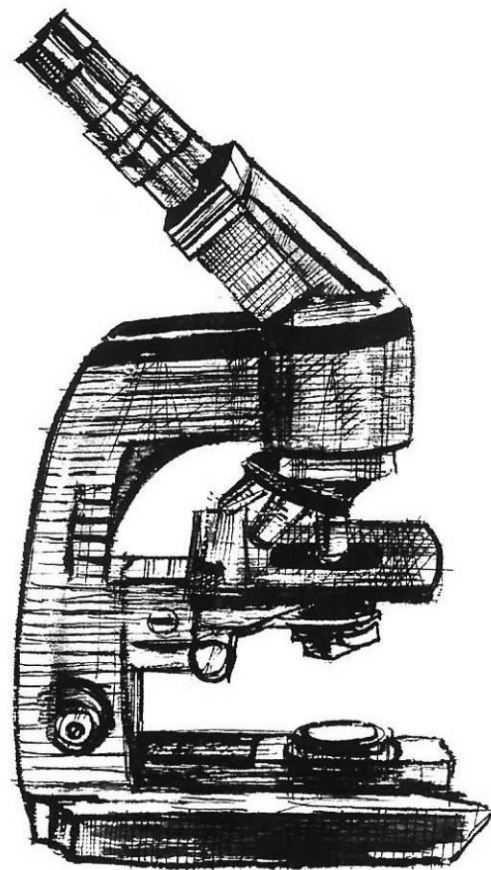


It is easiest to control disease by not allowing it to start. Merely supplying the animals with fresh high quality food and pure water is not enough. Regular sterilization of the feeding and watering areas especially and the entire enclosure in general is needed. This is accomplished with the use of steam spray units, chemical spray units, high pressure hoses, and the time trusted mop, bucket and broom. The types of disinfectants used are especially important. They must have a wide spectra in the variety of pathogens which they kill and yet not leave a harm-

ful residue. No appreciable residue should be left especially in the feeding and watering containers. This often leads to regurgitation of food. It may be caustic to some animals or even fatal to amphibians whose skins absorb these chemicals readily. Cleanliness should be upmost in the eyes of a zoo director.

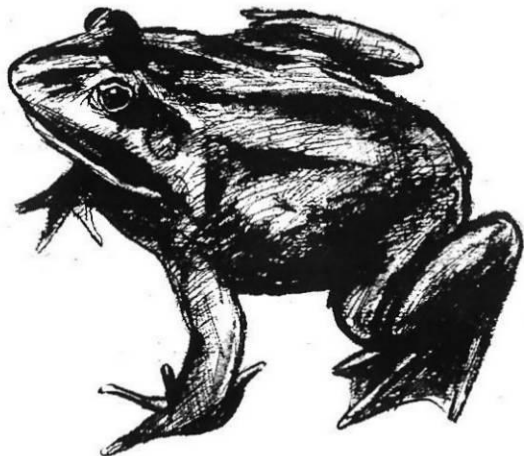
The microscope is a most important tool in keeping track of microbes which may plague animals. Such things as checking scat for worm eggs periodically nip infestations in an early state and will reduce animal loss. This is particularly important in fresh specimens. Even specimens which die may not be entirely lost. Some may be autopsied to determine cause of death; while others may be preserved for later studies.

Thus operating a zoological gardens correctly and efficiently requires not only a great diversity in staff but also dedication and teamwork.



ZOOS - PAST PRESENT AND FUTURE

It appears that man has always expressed a great interest in animals. At first perhaps because he was so tied to them for his existence. Some of the earliest illustrations made by man were of animals and they have received noteworthy interest in almost every culture. The first recorded menageries was that of Wen, the first king of the Chou Dynasty, sometime around 1100 B.C. From



BULL FROG

then until the eighteenth century A.D. most of the zoos were maintained by royalty and world travelers. The first zoo in the United States was the Philadelphia Zoological Park which began admitting visitors in July, 1874. Since then most of the major cities in the United States have developed zoos. Interestingly enough almost any large zoo has some specialty which makes it unique and worthwhile.

The purpose of zoos has also become more involved. At first they were solely for the pleasure of monarchs. Now zoos serve not only to entertain and educate but also as centers for research.

Many zoos now have summer educational courses for young people. These may be instructed by members of the staff and or with the aid of students and faculty members of neighboring universities. Local libraries may sponsor joint programs with reading being supplemented by observation at the zoo.



Research is often carried on at a limited scale at a zoological gardens. It is however a logical place to study many forms of animals where it might otherwise be impossible. Several research institutes have working agreements with zoos allowing them access to the animals under certain stipulations. Often the specimens must be retained on display but in some instances they may be transferred to the laboratories of the research institute. This is usually beneficial to both parties since much of the research concerns nutritional requirements or some other aspect which may prolong these and future animals' stay in captivity.

There are many trends in present day zoos which

will probably continue. There will be an increase in college trained personnel which should lead to an increase in research and the size of zoo libraries. Rare animals will be displayed in nearly germ free, environment controlled quarters. The caging of animals will continue toward the barless types and more nocturnal, fossorial and aquatic displays will be realized. Region zoos featuring animals of given zoogeographic areas will become more common. Data processing with the help of well programmed computers will supply information storage with instant recall to quickly answer problems such as diets, symptoms and treatments for disease. Children's zoos will become more sophisticated. Perhaps most important will be the increased role played by zoos in the conservation movement.

ZOOS AND CONSERVATION

While moving down a line of cages in Max Allen's a visitor suddenly finds himself staring at his likeness reflected by a mirror instead of through a window pane. Above the cage is a sign stating that he is observing the most dangerous animal on earth. Under this appears the following caption:

"Because it can think but often acts without reason or logic this is the most dangerous animal on earth. It has caused the extinction of many species of organisms and has modified the genetics of others to its liking. It has an affinity for modifying its immediate environment with concrete, steel, plastic and poisonous chemicals. Its growth in terms of population is amazing. In fact within the next few hundred years it and its domesticated organisms may essentially be the only life on this planet — if it does not destroy all life on this planet."



Unfortunately this may not be exaggerated. The list of species which have become extinct in historic times is huge and the list of those varieties in danger of extinction is even more impressive when one considers the time element. Even animals whose populations number in the billions are not safe as evidenced by the passing of the passenger pigeon.

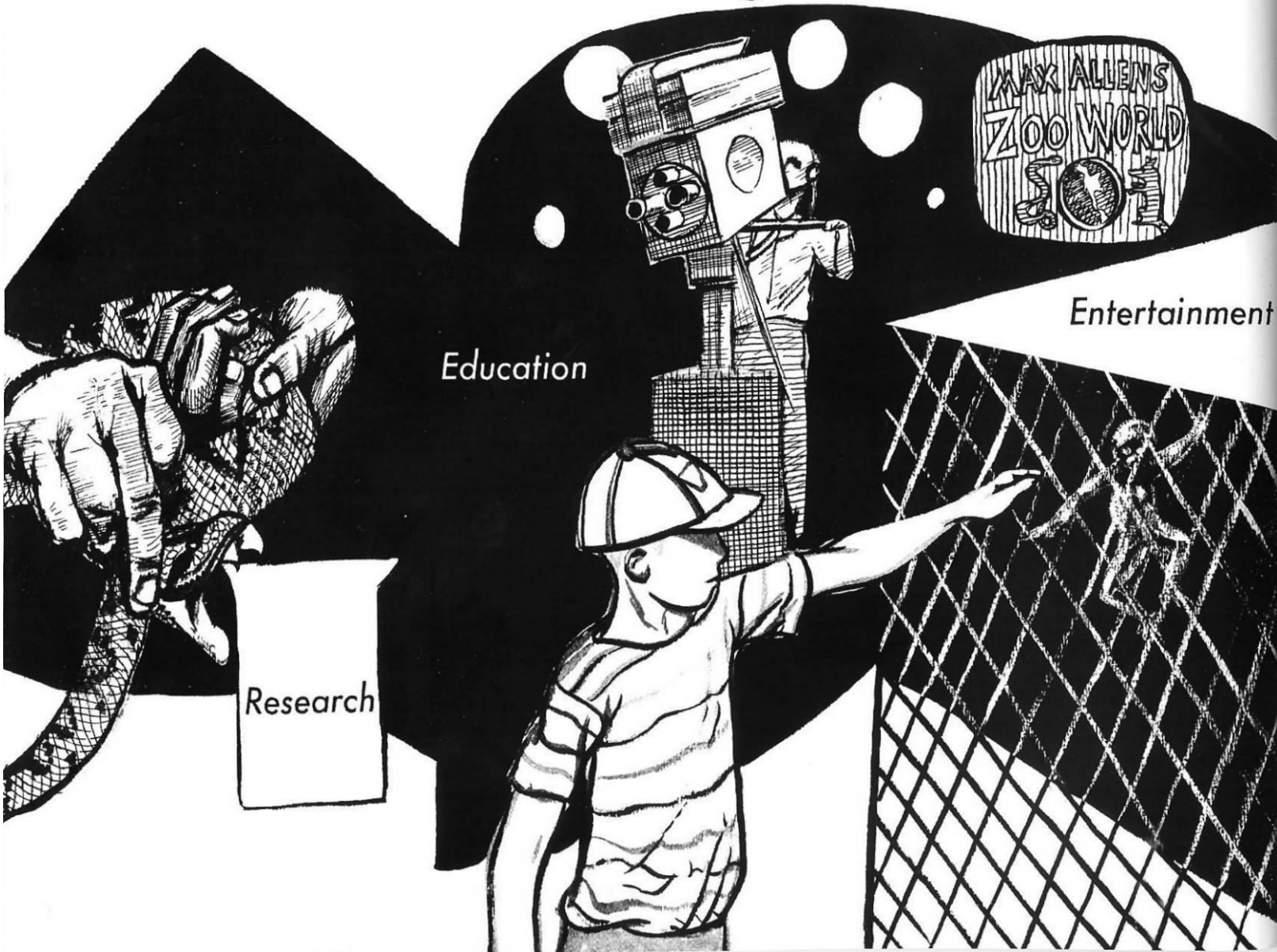
The basic problems concerned with the extinction of species are the disruption of habitat, our ignorance in understanding the complexities of exactly what a given population needs to survive and how to convey the constructive thought of conservation to the peoples of the world. Legislation alone is not the answer.

There are several varieties of animals in captivity today that are extinct or believed extinct in their native habitats. If these animals can thrive under the more constant conditions of captivity their populations may be increased until they can successfully be restocked in reserves and eventually be capable of maintaining a population in its natural state.

Let us hope there will never be a time when man has domesticated most of the world's animals and is forced to live only with himself and his genetically controlled toys.



Max Allen's Zoological World

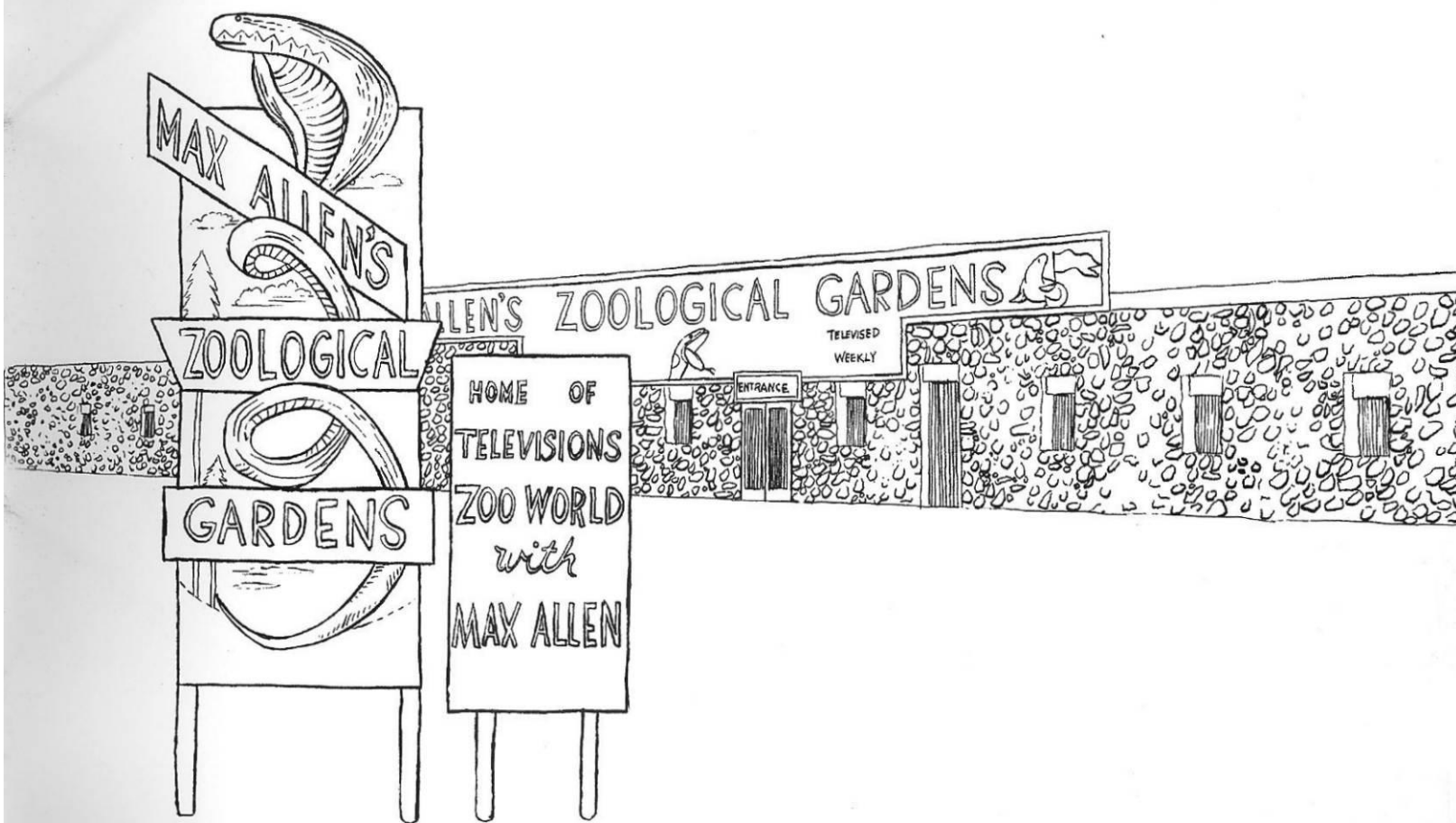


Research

Education

Entertainment

MAX ALLENS
ZOO WORLD



Located on U. S. 54, 8 miles North of Bagnell Dam in the Lake of the Ozarks region of Missouri

