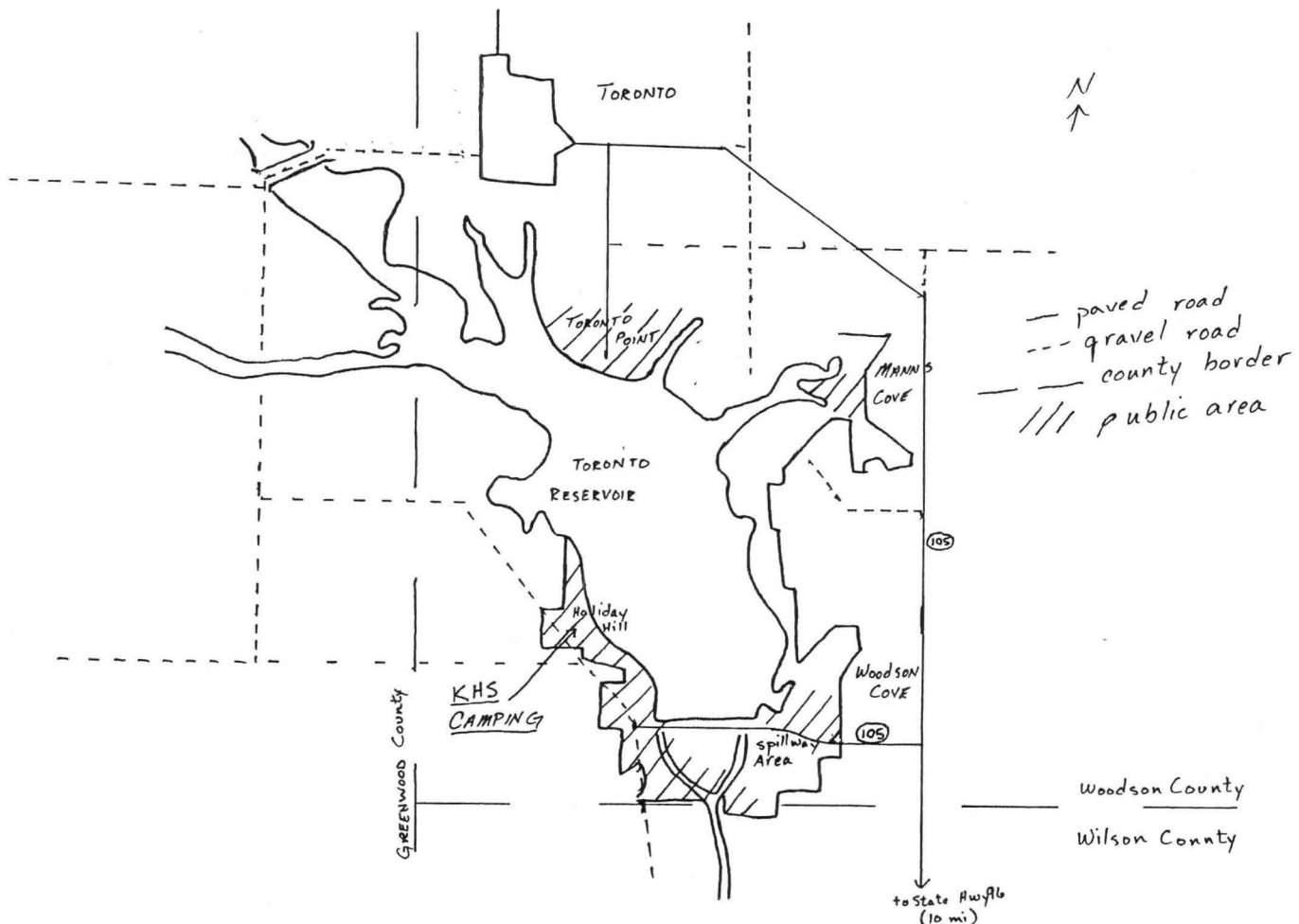


TORONTO RESERVOIR TO BE SITE OF FIRST 1983 KHS FIELD TRIP

The first spring field trip of the Kansas Herpetological Society will be held at Toronto Reservoir in Woodson County from 29 April to 1 May. This lake is situated on the edge of the scenic and beautiful Chautauqua Hills, a unique area of Kansas characterized by blackjack-scrub oak covered hills and woodlands, and numerous sandstone outcroppings and rock formations. One quarter of a mile south of the dam, you may enter Wilson County, one and one-half miles west of the dam you may venture into Greenwood County. The Chautauqua Hills continue south through these two counties into Oklahoma.

We will plan on camping at an area on the west side of the lake known as Holiday Hill. Signs will be posted to avoid too much confusion, and the Holiday Hill area is plainly marked by the park department. There are plenty of places in the three county area to explore and collect, so this should be a fantastic clash.

--John Fraser
Fredonia, Kansas



KHS GOES FURTHER AFIELD IN 1983

The second KHS field trip of 1983 will be held at Lake Meade State Park, from 27-29 May. The lake is 8 miles south and 5 miles west of Meade, Kansas. Camping costs are \$2.00 per day per vehicle, and \$2.00 per day per camping unit (i.e., group of tents), or one can forge a camp out in the non-fee camping area on the west end of the lake. Electrical hook-ups are available on a first-come, first-served basis. We plan on meeting on the north side of the lake on Friday evening. You should bring your own food to cook or plan on driving to the diner in Meade for meals.

Meade county has many southwestern U.S. herp species. Of particular interest is the possibility of finding the Texas Garter Snake, Thamnophis sirtalis annectens. Road cruising is profitable at this time of year, and with some luck Your Host may get permission to go herping in a canyon on private land.

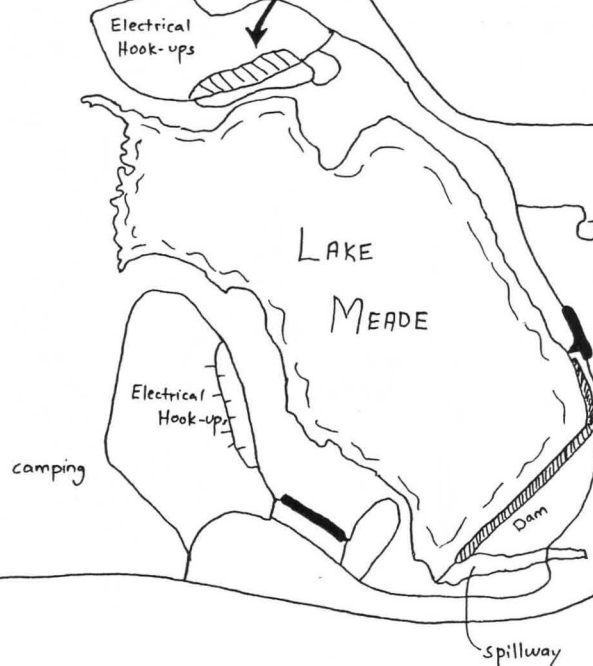
So, mark this trip on your calendar, it should be a good one.

--Kelly J. Irwin, Scoutmaster
2218 W 2nd Street
Topeka, Kansas
(913) 354-1195

Lake Meade State Park

FAS 452

KHS
Meets Here



1982 KANSAS HERPETOLOGICAL SOCIETY FINANCIAL REPORT

INCOME:

Carried over from 1981	\$ 1883.27
Regular members - US	480.00
Regular members - non US	56.00
Contributing members	60.00
Sale of back issues	78.00
Sale of T-shirts	24.00
Annual Meeting auction	276.00
Donations	<u>2.00</u>

\$ 2859.27

EXPENSES:

KHS Newsletters 46-50	\$ 512.62
Newsletter covers	110.96
Postage	133.25
Printing dues envelopes	36.23
KHS color brochure	1319.00
Annual Meeting	<u>67.28</u>

\$ 2179.34

Balance as of 31 December 1982

\$ 679.93

Respectfully submitted,

Rose Etta Kurtz
1982 KHS Secretary-Treasurer

RECENT LITERATURE OF INTEREST

Bramble, D.M. 1982. Scaptochelys: Generic revision and evolution of gopher tortoises. Copeia 1982(4):852-867.

In this paper, the author proposes splitting the four living and several known fossil species of gopher tortoises into two separate genera, Gopherus and Scaptochelys. The new name comes from the Greek scaptos (digger) + chelys (tortoise). Bramble provides a lengthy discussion of the morphological differences between the two genera. He argues that Gopherus is better adapted for digging than is Scaptochelys, and that the latter is more nomadic in its habits.

Groves, J.D. 1982. Egg-eating behavior of brooding five-lined skinks, Eumeces fasciatus. Copeia 1982(4):969-971.

The author found several references in the literature to brooding skinks eating eggs from the clutches they were tending. To investigate this behavior, he collected five gravid female skinks, which he kept in plastic boxes on licorice root mulch with a piece of bark to lay eggs under. Each of the five lizards deposited eggs. Each clutch of eggs was left with the brooding female for the 30-35 days they took to hatch. The eggs were checked twice a day to note their position and appearance. Crickets were provided for the female skinks to feed on. Of the total of 38 eggs, 21 became discolored and shrank in size. Of these, 20 were eaten by the attending females between 1 and 5 days of showing signs of going bad. The author observed a female skink rolling one of the addled eggs about and licking it. She then bit it lengthwise and squeezed it repeatedly until she made a hole in it. She next emptied the fluid from the egg with her tongue. Once the fluid was gone, she swallowed the remainder of the egg. Since the skinks ate the same number of crickets whether or not they were eating eggs, the author concluded that the consumption of eggs seems to protect the good eggs in the clutch by removing odors which might attract predators, and by reducing the chance of fungus attacking the clutch.

Carpenter, C.C. 1982. The bullsnake as an excavator. Journal of Herpetology 16(4):394-401.

Excavation of dirt by bullsnakes was first recorded in 1893, but had never been studied in a controlled situation. Carpenter tested 15 specimens of Pituophis melanoleucus sayi of 111-163 cm in length. He first observed them in a glass-fronted cage containing sand. They would explore about the cage, then spade sand loose with the head, and scoop

the loose sand away with the neck and trunk of the body in an arc, leaving the pile 5-30 cm away from the excavation site. The spading of the sand was aided by their large rostral scale. He estimated that a bullsnake could move sand at the rate of 3400 cubic cm (207.5 cubic inches) per hour.

The next observations were made in a large outdoor cage, partially buried. He released a pocket gopher in the cage, and once there were obvious signs of its activity in the dirt, he released a bullsnake to see what it would do. The snake located the gopher burrows and attempted to crawl in them, presumably to consume the gopher.

Carpenter then decided to see if a gopher snake could tell the difference between a real pocket gopher mound and an artificial one. Did just any pile of dirt attract them, or only piles made by gophers? He took dirt from fresh mounds and old dirt to create artificial mounds, dumping the dirt from a 1-gallon can so it looked like the debris thrown up by a gopher. The snakes tended to excavate the fresh dirt as if searching for a pocket gopher burrow entrance.

Carpenter concluded that for bullsnakes, excavation is a stereotyped behavior. They respond to gopher activity by excavating the mounds, and can distinguish fresh gopher mounds from other piles of dirt. He also hypothesized that the bullsnakes may excavate for the purpose of laying eggs or to create hiding places.

Holman, J.D. 1982. Geringophis (Serpentes: Boidae) from the middle Oligocene of Nebraska. *Herpetologica* 38(4):489-492.

A boa from Nebraska? Well, once upon a time... The family Boidae was represented in the area we now know as Wyoming and Nebraska some 18-30 million years ago, during the Miocene. A field party from the University of Kansas Museum of Natural History recently found a vertebrae from one of these snakes in Sioux County, Nebraska. This fossil came from the middle Oligocene, and is thus some five million years older than the other specimens. This new fossil has been named Geringophis vetus (vetus means ancient, or old, in Latin).

Weldon, P.J. 1982. Responses to ophiophagous snakes by snakes of the genus Thamnophis. *Copeia* 1982(4):788-794.

Many snakes are known to display defensive behavior when confronting an ophiophagous (snake-eating) snake, such as the "body-bridging" of pit vipers. Body-bridging is when the middle part of the body is arched up in the air, with the head and back part of the body held flat on the substrate.

Weldon noticed that although garter snakes don't exhibit body-bridging when confronted with kingsnakes (which are ophiophagous), they do try to escape. How can they tell ophiophagous snakes from those which present no threat? Weldon suspected that it would be a chemical cue, and he could thus measure the garter snake's reaction by the rate of tongue flicking. Tongue flick rate has been shown by others to be a good index of the snake's interest in chemicals in the environment.

Two experiments were conducted on naive (captive born) litters of garter snakes, so the snakes had no previous exposure to kingsnakes. First, the snakes were exposed to cotton swabs rubbed on a kingsnake, a black racer, or a northern pine snake, or a blank cotton swab (the control in the experiment). In the second experiment, an olfactometer was used to present odors to the snakes. Air was passed through a jar containing a kingsnake, a black rat snake, or distilled water (as a control), and then into the enclosure where the naive snake waited.

The results showed that Thamnophis clearly detects the chemical cues from other species and that they react more to scents from ophiophagous species than from non-ophiophagous species. They can detect airborne chemical cues from their potential snake predators.

--John E. Simmons
Lawrence, Kansas

THE UNKNOWN PHOTO, OR: A CASE OF MISNAKEN IDENTITY

Every year it happens, dozens of times... An error committed by reasonably intelligent, supposedly authoritative persons trusted with the task of informing the public upon all manner of subjects, correctly. Well, everyone makes mistakes...even journalists. Unfortunately, among the casualties of misinformation (or more specifically, misidentification) are herps. Innocent, well-meaning reptiles and amphibians like we all know and love and share our humble abodes with. It happens when herps run afoul of newspaper men, nervous photographers and a credulous and generally unsuspecting public.

A case of tragic confusion may sometimes have deeper, more serious implications than you might thus far have imagined. Take the newspapers, for instance. Since I myself work for a newspaper, I will sling less mud at them and make more excuses for them than for the other forms of media I'll be getting to. However, newspapers do have to shoulder their share of the guilt. I have a scrap book of herp news clippings that I keep around the house just for laughs. One clip from a central Missouri newspaper shows a large, very dead bull snake, Pituophis melanoleucus sayi, with the caption, "Joe Blow of Clinton, Mo. killed this four and one-half foot copperhead on his fathers farm last Wednesday," etc. I had to laugh. Another tells of a collection of jewels guarded by snakes in Stockholm, the chief guard being an "Argentine Horned Viper, Cerastes cornuta". Funny, I never heard of any

Cerastes in South America. Oh well, maybe I overlooked them. But a newspaper doesn't employ any zoologists, and for 25 cents, what can you expect?

Headlines sell papers, too, and another clipping in my collection is sure to catch your eye. "JAKARTA, Indonesia (AP)- PYTHON SWALLOWS FARMER WHOLE IN INDONESIA." Sounds like a Scoop Jackson story to me.

And it gets worse from here on, yes indeed. I picked up a copy of the June 1982 issue of Sports Afield, brandishing a large Crotalus atrox on the cover and I thought, hey, these guys are hip...outdoor writers and all, they won't hand me no jive. But noooooooooooooo!!!!!!!!!!!!!! On page 58 there is a beautiful, well-photographed Northern water snake, Nerodia sipedon, up close bearing the caption "Cottonmouth". I will, for lack of a better term, call this gross neglect on the part of the editors. It is quite conceivable that some outdoorsman might tangle with a harmless water snake under some inconceivable circumstances and turn to this picture (or memory of it) and begin dangerous and unnecessary first aid measures. A cottonmouth does appear, correctly identified, on page 72 of the same magazine in a separate article, however.

Well, that about did it for this ol' cat. I mean, when Sports Afield lets you down, where can you go? I was soon to find out. I dropped thirty-six greenbacks for a subscription to GEO magazine, thinking I'd get sort of a liberated National Geographic, with all the latter magazine's expertise and professionalism. Unfortunately a similarity in names was all I got. Volume 3, January 1981, page 90. Two large and beautiful Indian Pythons, Python molurus, are being shown by a couple of India's street performers and captioned "...a Huge Boa Constrictor." A bit too general for most of us, I believe. I was crushed, if you'll pardon the pun. My subscription ran out along with my faith in that magazine. These two magazine articles were produced by big-time organizations, people supposedly in-the-know, and it shot gaping holes in the credibility of both.

But the periodical business is a fickle one at best so I let it go with little more than a sigh of dismay. Three or four instances of gross neglect still wouldn't let me sleep. First, there was our high school biology text books at good old Oxford High, Oxford (where else?) Kansas. On the single page that dealt with herps was a good old Northern Water snake again, close up, rough scales and all. It was captioned, "Black Racer, Coluber constrictor." This was a biology text book now! The teacher called me a know-it-all and made me write a five thousand word theme on zygophytes or something for calling this to his attention, even though I was backed up by copies of Conant and Collins, in hand. But then again, being an Oxford High grad doesn't mean much anyway.

Some time later I found myself thumbing through a friends college zoology text book, looking for trouble. I found it. A splendid close-up of our old friend the Cottonmouth, this time a brightly patterned youngster, this time labeled as a Copperhead! Understandable confusion in anything except a college text! Now I was really poisoned on the matter. Mother always told me not to believe everything I saw or read in a book..."They're wrote by jerks that don't know sheep from Shine-O-la," or something like that she'd say. I was beginning to

believe her.

So last, but definitely not least, I have to take a slap at what some would loosely call a herp book itself. Not a biology text, not the daily mail, not even the bass angler's bible. Reptiles and Amphibians in Your Home, by John F. Breen. I must have bought this book during one of those young and impressionable times of my youth, that's my only explanation if you rule out temporary insanity.

Oh, the pictures were good and the information, though general, was basically correct. However, the photo captions can variously be described as hilarious, tragic, corny or just plain ignorant. Page 128 is the evidence upon which I rest my case. The caption says, quite simply, The Sand Rattlesnake. That's funny, I thought, looking at the picture when I was 14, I never heard of a Sand Rattler. And it was, after all, a good clear close-up of some sort of snake with very rough scales...it's tail suspiciously out of the picture. I looked closer. Funny, I never heard of a rattlesnake without facial pits. The snake turned out to be a Saw-scaled Viper, Echis carinatus, a small Old World viper with so highly toxic a venom as to make any rattler of any size pale in comparison. Give me half a dozen Diamondback bites, but keep your Saw-scaled vipers away!

Still, the annual accumulation of misidentified herps in the news bespeaks a deplorable lack of professionalism in nearly all forms of written media. It is sadly unfortunate that many of these mistakes, particularly those in popular, highly read magazines, undermine the efforts of educational groups and individuals who are trying desperately (and often vainly) to clear up confusions like that of the water snake and the cottonmouth. So, if the Hopping Hemipenis of Horror is still around, I propose it be bestowed upon those who through neglect, ignorance or merely convenience misidentify herps before a credulous and unknowing public. Such mistakes can serve no good to either herp or human.

--Martin B. Capron
Box 542
Oxford, Kansas 67119

REPRODUCTION OF CAPTIVE GLIDING GECKOS, PTYCHOZOOM KUHLI AND PTYCHOZOOM LIONATUM

Gliding geckos are small, arboreal lizards with thin bodies and unusual folds of skin along their side and tail. When these lizards jump from treetop perches, the lateral folds enable the animals to make a gradual aerial descent from one tree limb to another. Both species (Ptychozoon kuhli and P. lionatum) reach an adult length of about six to seven inches. According to Taylor (1963), they inhabit regions of Thailand and Malaysia.

A pair each of P. kuhli and P. lionatum were housed in our collection. The terrariums were both five-gallon aquariums containing approximately one-half inch of gravel and two inches of potting medium into which philodendrons, moss, and stalks of bamboo were placed. Between 29-31 August 1982, each female laid a pair of eggs. The eggs were removed and after 51 days of incubation, three of the four hatched.

On 29 August, the female P. kuhli laid two small eggs on the underside of a piece of bark that leaned against the side of the terrarium. The eggs were white, almost spherical, and slightly cream colored in places. They measured approximately one-quarter by three-eighths inches. The shells, which seemed well calcified, adhered tightly to each other and to the bark. The eggs and bark were removed and placed in an upright position in a plywood incubator. On 31 August, the female P. lionatum deposited her two eggs on the back glass of the terrarium. The eggs were approximately the same size as the P. kuhli eggs and similar in appearance. Inasmuch as these eggs could not be detached from the glass without damaging them, the terrarium was stripped of its furnishings and transferred along with the eggs to the incubator. After a layer of moist Perlite was placed on the bottom of the terrarium, the bark with the P. kuhli eggs was also added. Water was poured onto the floor of the incubator and sprayed on its inside surfaces. Both sets of eggs were incubated in the 83-85 degree F range although on a couple of occasions the temperature dipped to just below 80 degrees and then climbed slowly to 86 degrees. Relative humidity was not measured, however, it probably was always near 90 %.

After about a week of incubation, the eggs started to become slightly darker in color, and on 17 October, a large, circular opaque region was noticed on one of the P. kuhli eggs. On the night of 18 October, two little geckos were observed scampering up the sides of the terrarium. A single large hole was present in one P. kuhli egg and in one P. lionatum egg. On the morning of 19 October, the second P. lionatum egg was seen to be empty and to have a gaping hole in its side. A dead juvenile P. lionatum with a large yolk sac still attached to its underside was found on its back on top of the Perlite; it had a snout-vent length of 3 cm and a total length of 5.5 cm.

The remaining egg was left inside the incubator, and on 25 October, after no signs of hatching had been observed and the egg had turned a shade darker, the egg was candled and then opened. A tiny dead embryo was found at the edge of a putrefying yolk mass.

The young geckos resembled miniature versions of their parents except for the tails, which were banded black and white and had deeper serrations along their edges.

The two living geckos were transferred to another terrarium maintained with high humidity at a temperature in the 80-85 degree F range. The young geckos began to eat cricket nymphs on the third day. The P. kuhli youngster was found drowned in the water dish on the eighth day. The animal was measured and found to have a snout-vent length of 3.2 cm. Unfortunately, the remaining gecko was found dead on 6 December.

Since information on the care and feeding of both adult and juvenile gliding geckos is scarce, we wish to correspond with anyone who can contribute such information. Any information or inquiries may be

addressed to the senior author.

LITERATURE CITED

Taylor, E.H. 1963. The lizards of Thailand. University of Kansas Science Bulletin 44(14):687-1077.

--Jeffrey Hubbard and
Keith Coleman
1926 Buchanan Street
Topeka, Kansas 66604

BOOK REVIEW

Mit Gespaltener Zunge, by W.E. Engleman and Fritz Obst, Herder Freiburg Publ., 217 pp., 72 black and white and 84 color photographs. DM 54 (about US \$30) from Ziegler OHG, Potsdamer Strasse 180, 1000 Berlin 30, West Germany.

Those familiar with the German herpetological literature probably often ask, "Why can't we get this kind of quality in English herp books?" The Germans have pulled even further ahead with the publication of Mit Gespaltener Zunge ("With Split Tongue"). Even the Germans themselves refer to this 1981 volume as "das schlangenbuch!" Rather than publish yet another catalogue of species, Mit Gespaltener Zunge puts emphasis on the biology of snakes; how they evolved, special adaptations, reproduction and physiology. I am aware of no other book that so clearly and elegantly closes the gap between the serious hobbyist and the failings of college biology.

For example: have you ever wondered HOW a neurotoxin works? Of course, we all know it affects the nervous system, but how? What is being done, at the molecular level, that causes such swift and effective death? As a high school biology student, I thought of toxins as something like miniature Pac-men, squeezing the life out of poor, helpless neurons. Even after twelve years of further biological studies, I have seen no better explanation than is presented on page 55 of this book--truly one picture worth thousands of words.

There are detailed chapters covering locomotion, feeding mechanics, senses, venoms, mythology, anatomy, physiology, development, behavior, and so on. The best description of this book would be to liken it to a college biology text using snakes (rather than cells, paramecia and plants) as examples of general biology. The only setback to many potential readers will be the fact that it is printed in German, with no English summaries. Books like this (and there are many of such quality in German) are perhaps the best argument for German as a high school or college language for herpetologists.

The printing quality, including illustrations, is superb, and the color photographs (how do the Germans get such perfect looking American

snakes?) are outstanding. The color spread of milksnakes (pages 92-93) is especially good, as are the photos of red, yellow and brown Chondropython young (pages 88-89), Trimeresurus kanburiensis (page 97) and Corallus caninus (cover and page 141). The text is clear and readable with some basic German (not nearly as bad as going through Merten's papers) and is aimed at the general reading audience. Page size is large (27 x 24 cm), and the book is hardbound. Anyone interested in snakes will find something of value. This is unquestionably a five-star book!

Incidentally, a complete catalog of herp titles, many in English, can be had for the price of a stamp and stationary by writing to Ziegen OHG. Their catalog is excellent, and most prices are reasonable. Many good books, well printed and loaded with color photographs, can be had for less than US \$12, airmail included.

--Robert George Sprackland
Central State University
100 University Drive
Edmond, Oklahoma 73034

BIG WIND IN THE HERP ROOM

A tornado just hit the herp room, what a disaster
I'm lookin' through the rubble for a big Bothrops asper
The glass is shattered and the cages are broken
And somewhere beneath it all, I hear a treefrog croakin'

My every bone is shaking and the situation's dire
I'm lookin' eye to eye with a Trimeresurus, danglin' from a wire
I don't know where he is, but I hear a rattler buzz'n
And all over the floor there're copperheads by the dozen

I know there's got to be a gravid Vipera russelli
But all I see's a 25 foot python, staring with a hungry eye
An eight foot water monitor just sauntered out the door
And damn these pesky anoles, running by the score

I've got myself a snake-hook and I'm squat'n on a table
Beneath is my mom's Black Mamba, she lovingly calls "Mable"
There goes my herd of 'gators, ya know it'll be a trial
When we get around to catch'n that 15-foot crocodile

I guess this will teach me, how to build a zoo
These blasted pre-fab barns will never ever do
Now I best get back, to scout'n round the room
Cause somewhere in the storm, I've lost my best Gaboon!

--Martinez Capronio
Macaroni, Kansas

EDITOR'S NOTE: With the following article, we will start another new series of columns. These will present biographical sketches of some famous and infamous figures in the history of herpetology, written for the Kansas Herpetological Society Newsletter by Robert G. Sprackland. The series begins with one of the more colorful and influential of American herpetologists, E.D. Cope.

EDWARD DRINKER COPE: ONE OF THE BEST. PART I

Introduction

For a single individual to produce over 1300 scientific titles is no small accomplishment, made more impressive if they cover the realms of ichthyology, geology, mammology, ornithology, entomology and especially herpetology and paleontology. Yet, over the course of his thirty-eight year career, Edward Drinker Cope did exactly that, publishing more titles than any other naturalist. His was an intense quest for answers about the unknown animals from prehistory, and about their relationships to living animals. Much of his work has stood the test of time, and is basic to our current understanding of zoology. When Cope began searching for fossil vertebrates, there were few dinosaurs known, most of these from Europe. Cope named about 50 dinosaurs, along with scores of reptiles and amphibians, fishes and other animals.

In Cope's time, scientists were explorers who found and named new species as a primary activity. Evolution was a new idea, and men like Cope helped provide the evidence which made it a respectable concept of biology. In this scientifically active period of the twentieth century, it is a good idea to re-examine the pioneers who helped shape science as we see it now, and for herpetologists, there is no better scientist to begin with than Cope.

Early Years

Born 28 July 1840, Edward Cope was raised in a Quaker family in the vicinity of Philadelphia. His father was prosperous and interested in the education of his son. At the age of six, his father took him to visit the Peale Museum in Philadelphia (perhaps the first "modern" natural history exhibition). Here, he drew in great detail the fossils of Ichthyosaurus and the extinct whale, Zeuglodon. His sketches soon became diaries. At age seven, his father took him along by sea to visit Boston. Cope kept a complete, illustrated record of the voyage, observing sea life and birds in detail.

By the time he was ten, his drawings were technically accurate, and his interest in biology was beyond the point of no return. This same year allowed him to take a trip to the West Indies, where he was further seduced by the beauty of life around him.

Fortunately for young Cope, the nearby Philadelphia Academy of Natural Sciences was the professional home of the man regarded as the father of American paleontology, Joseph Leidy. For years, Cope had brought local specimens of reptiles and amphibians to the Academy, and

became known to Leidy, under whom he would study comparative anatomy. Thus, in 1858, Cope entered the University of Pennsylvania to study geology (Lanham, 1973; Howard, 1975). At this time, there was no formal training in zoology or biology in colleges; geology was the epitome of Natural Science, and in the United States, Leidy was the man to study with.

Professional Life

Before he left for school, Cope's father gave him a choice piece of farmland, McShag's Pennacle, and a house. The elder Cope hoped his son would get an education, then take up the quiet life of a Quaker farmer. Fortunately, this was not to be his future.

The year 1859 presented the world several historically important events, two in particular having great impact on science and society. One, in November of that year, was the publication of a book by Charles Darwin, Origin of Species. This book would forever influence Cope, as it did the rest of the scientific community (Moorehead, 1969). As a college freshman, Cope read Darwin, and was initially quite upset with the decidedly non-Quaker views it contained. However, Leidy had regarded Darwin's concepts highly, and his influence inspired Cope to fill the gaps in the fossil record which even Darwin considered a weak link in his arguments. Thus, Cope came to study fossils (Wendt, 1968).

The second event of that year was the beginning of the Civil War. From late 1859 until 1863, Cope was studying as a "special researcher" (Howard, 1975) at the Smithsonian Institution under the noted zoologist, Spencer Fullerton Baird. During this time, in close proximity to the war, he heard tales from soldiers and wrote home about the deterioration of life in Washington in general.

Resolved to prevent his spirited, pro-Union son from betraying the pacifist tendencies of the Society of Friends, the elder Cope sent his son to Europe to continue his studies. Armed with letters of introduction from Baird and Leidy, he made a spectacular tour of Berlin, Paris, and London, impressing his new colleagues with his skill as a diagnostician. It was here in Europe, too, that Cope heard from the front line advocates of evolution and the ideas of Darwin. The arguments of those defending the principles won him over, though he always favored a more Lamarkian explanation of the mechanisms by which changes in organisms occur.

It was while working at the University of Berlin that Cope made the acquaintance of Othniel Charles Marsh (Lanham, 1973). Marsh was also interested in paleontology. In Europe to augment his geological studies at the then-fledgling Yale College, Marsh was the nephew of millionaire George Peabody. Before returning to the United States, Marsh visited Uncle George in London and convinced him to donate \$150,000 to Yale to establish a museum, and to provide money to pay Marsh for his own position as chairman of paleontology. This was the first paid paleontological position at a university. Ironically, Marsh would soon become and remain Cope's greatest adversary, and help spark what would become known as the Battle of the Bones.

In 1864, Cope returned to Philadelphia, and with the help of Leidy, secured a position as professor of zoology at the Quaker Haverford

College. The following year he married his cousin, Annie Pim and became, at the age of 25, the unpaid curator at the Philadelphia Academy of Natural Sciences. By 1866, he felt the need to be closer to the fossil fields, so he purchased a house at Haddonfield, New Jersey (it was here, some years earlier, that Leidy had found the duck-billed dinosaur, Hadrosaurus). This would be an important year for Cope. Based upon notes he had kept from his tenure at the Smithsonian, he obtained and exhibited a lizard at a meeting of the Academy on 9 March 1866. Noting differences from a similar species, he described the new species as Heloderma suspectum, the Gila monster.

More important to Cope, however, was his discovery of a new dinosaur, from the Haddonfield marls. It was the first large, bipedal carnivorous dinosaur. Ancient reptiles were no longer merely huge vegetarians, now they could also be Holy Terrors. Cope quickly named this dinosaur Laelaps aquilungis. Laelaps, according to Greek legend, was a fleet footed dog given by the goddess Diana to Cephalus. While giving chase on a hunt one day, the gods turned Laelaps into stone while on the verge of leaping. Cope's dinosaur, therefore, became the prototypical "leaping lizard", and this is how he depicted the live dinosaur (Desmond, 1975). Cope also noted in Laelaps the numerous similarities to living birds, and anticipated Huxley's later suggestions of common ancestry between the two groups.

By now the bug was a passion. Cope, claiming ill health, resigned his position at Haverford in 1867, sold McShag's Pinnacle, and "retired" to Haddonfield to explore for fossils. After hearing of Marsh's remarkable finds in 1870 in western Kansas, Cope knew that he, too, must go West. Armed with capital from the sale of the farm, Cope headed to Fort Wallace, Kansas and hired seven assistants, two wagons, and 14 mules (Wendt, 1968). The following year, Cope returned and made numerous discoveries, including a mosasaur, pleisiosaur, and pterosaur. His collections also included reptiles and amphibians he encountered while digging fossils. Marsh had considered the whole West his private fossil grounds, and to him Cope was an unwanted intruder. In those early days, each man would bid for bones and equipment, Marsh with the great Peabody resources, Cope with his personal fortune. Paleontology was now an avocation for the rich.

Another factor which kept many people away from paleontology in the 1870's was an incredible feud between Cope and Marsh -- the Battle of the Bones.

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HERPER HELPER: HUSBANDRY TIPS, PART II

This second article in our series of herper helpers on husbandry will cover aspects of perhaps the second most important health problem in captive amphibians and reptiles: parasites. One should be reminded that parasitism is the single most successful mode of life known in biology. However, the thought of one being host to tens of thousands of squirming, pale little creatures feeding off one's body and bodily products is distasteful to most and is rarely covered in any basic biology course and thus is usually ignored. This can be a fatal mistake with captive herps, and usually is.

To begin, you must understand that amphibians and reptiles, particularly the former, are ideal intermediate, secondary and primary hosts for a vast, almost unfathomable array of parasites, both external and internal. A quick survey of any parasitology journal will usually reveal an article or two describing a new type of ecto- or endoparasite from some kind of frog, snake, lizard, or turtle. Virtually every specimen of these herps can be demonstrated to host some manner of parasite. This includes your captive critters, particularly if they are wild caught specimens.

How do you avoid this problem? To be honest, it is very difficult to do so. The best way to not have to deal with parasites is to obtain captive-born and bred livestock, preferably second generation or better, from a reputable source. However, for the sake of practicality, I'll assume that your beast is crawling with little mites, worms, and other small horrors. Now, what do you do? Read on, McDuff...

First, you must determine what form of bloodsucker your captive is infected with. The easiest parasites to diagnose are external. These include mites and ticks most commonly, and occasionally fly larvae. Aquatic and marine turtles should be examined for leeches.

Removal procedures are as follows:

1. TICKS-remove gently with tweezers. Be sure to get mouth and head parts of ticks. Treat the wound with a topical ointment (Panalog or Furacin ointment are good).
2. FLY LARVAE-remove with a hooked needle or tweezers. These buggers can be tough to remove as they don't like to be poked, prodded, or

stabbed and will withdraw deeply into the wound they have created. Application of light anesthetic ointment directly into the wound will "freeze" the beast and allow it to be removed easily. After removing the parasite, an anti-bacterial ointment (Panalog) should be liberally injected into the wound. Monitor healing regularly and apply ointment as needed.

3. LEECHES-treat as for ticks.

4. REPTILIAN MITES-this is one of the more easily treated reptilian afflictions. Mites can be detected by examining the eyes, ears, and arm and leg pockets (that is, if it has arms and legs) for tiny (about 0.5 mm), glossy brown or black globs zipping across the surface of scales. If the infection is particularly heavy, your animal (particularly snakes) will appear to have been lightly dusted with flour. Remove the animal and any cagemates from the unit and place it in a clean unit. Into the affected unit, place a 1-inch square piece of Shell No-Pest Strip, inside a jar covered with a screen top. After 3 days, take all substrate (gravel, paper, wood chips or what have you) and dump it as far away from your residence as you can (or burn it if possible). Completely disinfect the cage (inside and out), water bowl, and all props with a quaternary ammonia disinfectant. Disinfect your hands and cleaning utensils (this is good routine practice for anyone keeping herps). Put new substrate in the unit and tastefully rearrange your props and other cage accoutrements, if you have them.

But what about my poor snake, you say, swarming with these nasty little creatures? Take another piece of Shell No-Pest Strip (same size in a similar container) and put it in your hospital unit with your beast for no more than three days. Do not water the animal during treatment. Voila, the nasty, filthy little mites have withered and died. Wasn't that easy?

A word of caution: Shell No-Pest Strip contains an extremely volatile and toxic insecticide. It is not particularly good for you or your reptile. Do not use it around amphibians. Do not use it in direct contact with your animals and do not use it longer than three days in a row. One thing that galls me more than anything else is seeing a large chunk of the stuff thrown in a cage with a reptile in it for two or three weeks, the keeper figuring that if a little does a little bit of good, a lot more must be better. It is not and that No-Pest Strip will kill your captive just as well as a shot of formalin (and just about as painfully). When you are through with the treatment, keep the No-Pest Strip pieces in a tightly sealed jar.

One last note: the presence of mites in a collection usually indicates very poor husbandry practices on the part of the keeper. If you regularly service and clean your units, you will have very little, if any, problem with mites. If your animal has had a particularly heavy mite infestation, examine the oral cavity of the animal for signs of ulcerative or necrotic stomatitis ("mouth rot"). Mites were determined to be a major vector of Aeromonas or Pseudomonas hydrophila by the late Joseph Camin of the University of Kansas (1948). This organism is the major bacteria associated with mouth rot and may cause a fatal septicemia (blood poisoning). See

your vet for treatment for these diseases.

5. AMPHIBIAN MITES-certain ranid frogs and many plethodontid (woodland) salamanders are susceptible to infection by trombiculid mites. These parasites are usually found on the digits and legs but may occur anywhere on the body of a frog or salamander. They appear as small (less than 1.0 mm), bright red bumps (on light-colored body surfaces) or small protuberances with a reddish center (on darker body surfaces). The pathogenicity of these creatures is not too well known and certain amphibian taxa are more susceptible to them than others (such as the Rich Mountain Salamander)(Brown and Hishton, 1979). Treatment can be tricky.

If you are dealing with frogs, the standard treatment is immersion for 12 hours in a tetracycline solution (with just enough tetracycline powder in water to give the color of light lager beer. For those of you unacquainted with the ways of beer, the color should be about that of normal human urine. We're all acquainted with that, aren't we?).

Treatment of salamanders is more tedious and delicate. Salamanders as a rule do not deal well with any aqueous solution other than water. Do not dunk them in tetracycline or you will eliminate both parasite and host in short order. You must remove these mites manually with a pair of very fine, sharp-pointed forceps. Remove only 4 or 5 mites at a time (every other day) or your captive will be stressed out and probably croak in your hand. This defeats your purpose. The use of some sort of magnifying device will help location and removal of the mites tremendously. Continue your treatment as necessary until all mites have been removed.

Alternatively, you may choose not to attempt to eliminate these creatures. Many people do so and their animals appear to be none the worse for the wear. In fact, I have observed the complete disappearance of trombiculids on untreated salamanders in captivity over a period of several weeks (when I was caring for 150 of the critters and could not possibly treat all of them). However, the presence of trombiculids is associated with digit, and even limb loss in wild specimens and I doubt that this is healthy or contributes to long life spans. Anyway, the choice is yours. If your animal is very small, delicate, unstable, sick, or hard to replace, then immediate treatment is probably not advisable. If the specimen is large, stable, healthy, and hard to replace, removal of the mites is a viable option.

Occasionally, amphibian keepers will confuse the disease called "red-leg" with mite infestation. This can be rapidly fatal to a colony of frogs as red-leg is a highly pathogenic illness. Mites are not. Red bumps do not necessarily correlate with red-leg. Red-leg is a catch-all term for a stress-related bacterial septicemia caused by an astounding variety of bacterial organisms, even the so-called non-pathogenic Escherichia coli so loved by bacteriologists and carried by every single human on the face of this planet. Red-leg is caused most frequently by overcrowding, inadequate diet, dirty cages (and water), poor lighting, inadequate temperatures, or a combination of all these. If you suspect your

anuran charges have either of these diseases, examine them very closely. Red-leg is characterized by discrete red or reddish pimples with little attendant blood vessel dilation. Both illnesses can be effectively treated with tetracycline. However, red-leg will return if you have not taken steps to eliminate the aforementioned stresses.

Ectoparasites are a small fraction of the total known parasites in herps. They are among the most easily diagnosed and treated of all herp diseases. However, they are not to be ignored and should be treated as quickly as possible for they open avenues of infections for a whole host of other ailments. Always keep in mind that regardless of the reputation of herps, particularly reptiles, as being some of the more resilient creatures in our environment, in reality they are extremely delicate creatures with few defences against illness. That point will be stressed repeatedly in this series and is something you all (particularly veterinarians) should heed, if you learn nothing else from these ramblings.

Next Issue: The Wonders of Worms

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KHS BRINGS YOU NEWS OF THE WORLD AND BEYOND

Book Fills Void in Turtle Treatment Literature

It may happen in the course of being a parent that a child returns home with a pet turtle and explains: "He followed me home."

That may clear up any questions about what the child has been up to, but the problem of caring for the turtle has just begun.

Until recently, information on the care and feeding of a turtle - whether as a pet, for research or in a zoo - has been scattered hither and yon, mainly buried in technical journals. Even veterinarians have trouble finding advice on how to care for a turtle brought to their office suffering from one of a variety of turtle maladies.

That oversight has been rectified with the publication of "A Review of the Diseases and Treatments of Captive Turtles," written by Joseph T. Collins and James B. Murphy.

Collins is a vertebrate zoologist at Kansas University's Museum of Natural History, and research associate at the Dallas, Tex., Zoo, where Murphy is curator of reptiles. Their book was published recently by AMS Publishing, a division of Meseraull Printing, Inc., Lawrence.

The book, Collins explained, is an attempt to fill that void in literature about the treatment of captive turtles.

"Most people who get a vet degree learn how to heal cats, dogs, pigs, cows horses and things of that nature," he said.

There is a wealth of information about those animals.

Murphy and Collins have attempted to publish a book intended mainly for vets and zookeepers, and one that provides not only information on turtle care, but also is a source of other references. The book includes more than 900 other references where information on turtles can be found.

The book, does, indeed, fit a need, according to Dr. John Mulder, KU's veterinarian.

"There's very little information pulled together on turtles," he said. "As a vet, especially a vet in the field, it's especially hard to find information to treat turtles that come in as pets."

Mulder, who proofed an early manuscript of the book, said turtles are housed at the university's Animal Care Unit for use in physiology classes and cardiovascular research.

Collins said, "We're finding out that reptiles in general are quite useful in experimentation."

He said the value of turtles in research is their slow metabolism rate, which allows researchers to watch more carefully the effect of drugs on their system.

That fact has also stymied vets in the past who weren't accustomed to the relatively sluggish metabolic system of the turtle, Collins said. For example, dosages for turtles will be different than dosages for dogs or cats, Collins said, and the book deals with that point.

The book is also useful for turtle owners. Information about proper feeding and environment is included.

Collins explained how most turtles brought into the home as pets meet their doom.

One reason is maladaptation syndrome, meaning a shock to the turtle's system after being taken in from the wild. That can be overcome through gentle handling, Collins said.

Also, temperature and light requirements are tantamount to the animal's survival. Since turtles feed in the summer, it is necessary to re-create the summer environment for them while indoors, in both light and temperature.

"You don't feed them dried insects from the local pet store," he continued. "Turtles require fresh meat and vegetables."

Since turtles in the wild will eat an entire fish or small animal, bones and everything, it isn't sufficient to toss them bits of hamburger. Vitamin supplements must be added to the diet.

Collins also cautioned about keeping water turtles as pets.

"I would not bring any turtle home," he said. "We know now that virtually all water turtles can transmit salmonella to humans. Even if you completely change the water every day, there's a chance of salmonella infection."

The pet turtle industry fought a Food and Drug Administration ban on the sale of small pet water turtles in 1975 by suggesting that the turtle be kept out of the water except for a 30-minute daily swim. There is a problem with this, Collins said.

"Water turtles died when kept out of the water almost all day," he said.

Collins doesn't suggest turtles - or any animal - be taken from the wild for use as a pet, but, he said, the reality is that it is done with great frequency. The book was written, he said, in hopes of preventing such instances from ending in disaster for the animal.

(J-W Plus, Lawrence Daily Journal-World, 2 February 1983, p. 2)

Old-Style Dime-Store Turtles Return in Germ-Free Plastic

Hammond, La. (AP)--Remember dime-store turtles? Those half-dollar-sized critters you picked from a crowded tank for a child's pet or party favor?

Outlawed in 1975 because they carried salmonella bacteria, the little turtles may be coming back, complete with individual, space-age plastic domes.

Turtle farmers are pushing slowly but steadily to get baby red-eared terrapins back onto variety- and pet-store shelves. They may satisfy federal requirements by housing each turtle in its own germ-free bubble.

"Pet stores classically have salmonella in them. The dogs have it. The cats have it. The birds have it. The fish have it. Everybody has it," said Dr. Henry Ziller, a Southeastern Louisiana University physiologists who designed the turtle bubble.

"But you don't take your bird out and play with it. If the bird defecates on your hand, you wash it. If you have a turtle bowl, you're not always real careful how you clean it."

The Food and Drug Administration's 1975 ruling hurt Louisiana's turtle farmers, who provided most of the 10 million or so "streak-necked baby greens" that were bought each year in this country.

Ziller estimates that 60 to 70 percent of them came from Louisiana. T.J. Seal III, the attorney hired to plead the National Turtle Farmers and Shippers Association's cause with the federal government, puts the figure at 99 percent.

Seal began the campaign to lift the domestic ban by working with Dr. Ron Siebeling, a Louisiana State University biologist, to find a way to sterilize the turtle egg before it hatches. Siebeling adapted a device that was used to wash turkey eggs in an antibiotic.

But the FDA challenged the idea, asking how turtle farmers could guarantee the turtles would not become recontaminated in the trips from farmer to wholesaler to retailer to customer.

"This was very depressing to the turtle farmers. It was what they considered almost an insurmountable obstacle," said Ziller. "So I went and sat down and designed a package that we could put this turtle in that would allow absolutely nothing to pass through the package except the gases that the turtle needs to survive."

Ziller said the bubbles are made of membranes with openings so small that molecules of gas can get through, but anything larger - such as germs and viruses - is stopped.

(Lawrence Daily Journal-World, 6 February 1983)

Frogged In

In a town in Greece, it actually rained frogs, thousands of tiny green ones.

Scientists at the Meteorological Institute at Athens believe the frogs, which weighed no more than a few ounces each, were sucked up from the marshes in North America by a whirlwind. They were carried by a fast air stream over 500 miles across the Mediterranean Sea to Greece where they showered to the earth. Many of them have escaped injury and have adapted to their new environment.

(The Ponca City News, 26 December 1982).

KU Receives Grant for Wildlife Book

The Kansas University Natural History Museum has received a \$2,000 grant from the World Wildlife Fund to assist in the publication of a book about the effects foreign animals have on domestic wildlife in southern Florida.

The book, "The Ecological Impact of Man on the South Florida Herpetofauna," was written by Larry D. Wilson, a professor at Miami-Dade Community College, and Louis Porras, who was formerly involved in the animal trade in Florida.

The book examines what happens when domestic wildlife in southern Florida must compete with creatures not native to the environment. Many animals have been introduced to the environment either through accidental escape or intended - and illegal - release.

The book, which may be available in August, will be part of the museum's special publication series. The remainder of the publishing costs will be paid for out of that series' fund.

(Lawrence Daily Journal-World, 17 February 1983, page 6)

K Mart Has a Little Trouble Killing Those Phantom Snakes From Asia

DETROIT-Not long ago, the story goes, a woman shopper at a K mart store tried on a coat. As she put an arm through a sleeve, she felt a prickling sting. Thinking nothing of it, she went home. Then her arm began to swell, so badly that she had to be rushed to a hospital, where her arm was amputated.

Just what happened? Practically everybody in Detroit can tell you.

Somehow, a poisonous Asian snake had laid its eggs in a carton of Taiwan-made coats; they hatched inside the coat the woman tried on, and one of the baby snakes bit her.

'Hard to Kill'

The only trouble with the story - like the one about the spider eggs in a well-known bubble gum and ground worms in a well-known hamburger - is that not a word of it is true. That hasn't stopped it from becoming the talk of the town in Detroit's beauty parlors, offices, and lunchrooms. It has become "a traditional urban legend," says Phillip LaRange, an assistant in the folklore archives at Wayne State University. Such legends, he says, "are hard to kill."

K mart's Troy, Mich., headquarters, north of Detroit, has received about 20 calls from people, mainly newsmen, who actually bothered to try to track the story down. Susan McKelvey, the chain's publicity director, says she doesn't know how the story started. "Nobody has produced a victim," she observes. "Nobody has come forward and said, 'I was bitten by a snake'". Miss McKelvey called a herpetologist to learn whether venomous snakes live on Taiwan. They do, but she said she was told it was highly unlikely one could survive the long trip to Detroit.

Worries about Asia

Thomas McIntyre, a reporter for WWJ radio, spent a day digging through hospital and police records in search of a victim. "I got to play detective," he says, but found no victim.

Tales of spider eggs in gum, worms in hamburger, and exotic snakes in women's coats tell "more about what people are thinking than the objects of the story," says Alan L. Wilkins, a professor at Brigham Young University's graduate school of management. He studies corporations as subcultures with their own lore and legends. He thinks the K mart tale could have an origin in Detroit's worries about Asian automobile imports and their blow to the area's economy. The story could also reflect residents' "concern about the quality of products from Taiwan and the ruthlessness in the world," Prof. Wilkins says.

(Wall Street Journal, December 1982)

Researchers Strive to Preserve Rare Snake

GULF SHORES-Gulf State Park is serving as a re-stocking area for snakes, but they're not the kind to get rattled about.

In fact, diamondback rattlesnakes that sparsely populate the park serve as a food source for the rare indigo snakes that were introduced to the park's wilds in 1978 and 1979.

Earlier this month, staff and students of Auburn University's Alabama Cooperative Wildlife Research Unit, assisted by park naturalists, visited remote areas of the park to check on some 37 indigo hatchlings released here during those years.

Researchers at the Auburn unit, one of 20 such wildlife study units funded nationwide by the U.S. Fish and Wildlife Service, have been working with the indigo snake since 1976, said Dr. Dan Speake, unit leader.

Presently on the threatened species list, the non-poisonous black indigo, which with a length of up to 8.5 feet is North America's largest snake, had been extinct in Alabama since 1954, Speake said.

The Auburn unit is conducting breeding and restocking research on the indigo at 11 sites scattered throughout Alabama, Georgia, Mississippi and Florida, Speake said, with the main research area contained in a 7,000-acre sanctuary near Tipton, Ga.

Some 370 indigo hatchlings have been released at those 11 sites in recent years, Speake said.

And while none of the 37 snakes released at Gulf State Park were spotted during this winter's visit, Speake said it's too early to write the park off as a possible restocking area. He said the indigo is rarely seen before it reaches its fourth year, at which time it becomes reproductively active.

"We have a lot to learn about the indigo's early years and mortality," Speake said. "Part of our study is to evaluate the snake's captive propagation here at the university, where we have a hatchery.

"The indigo is a highly desirable animal which feeds on snakes and small rodents, and it is truly threatened. The indigo is the only natural predator of the diamondback rattlesnake."

Speake said the indigo's popularity with people in the pet trade - where black market sales can bring as much as \$200 per snake - and deaths attributed to cars and the use of poisonous gas to kill rattlesnakes, have led to the indigo's threatened status.

Researchers have used radio transmitters on adult indigos to follow movement, and just recently perfected a one-gram transmitter that will be used on some hatchlings released in the future, Speake said.

Also being used to look for the snakes is a television camera on a flexible cable that can get into underground burrows. The camera was originally developed to explore inaccessible areas of nuclear reactors, Speake said.

The indigo snake can usually be found in burrows dug by gopher tortoises during winter months, Speake said, adding that the gopher tortoise often shares its burrow during hibernation with rattlesnakes, indigos, rats, mice and other small rodents.

Several suspected indigos have been spotted in the Orange Beach area, and along Fort Morgan Road, Speake said. "We think they were

ours, and we've marked our snakes by cutting a scale on the tail." He asked that anyone who spots an indigo call the Auburn unit, or park naturalists.

Meanwhile, those interested in learning more about the unit's indigo project can look for a segment of television's "Wild Kingdom" in late March or early April that will feature the Auburn studies.

"We're just a small part of the total program," Speake said, noting that cougar research in Utah, moose research in Maine, and wild goose research in Wisconsin and Missouri will also be shown during the program.

(The Pensacola Journal, 23 December 1982)

A FINAL WORD FROM THE EDITOR

The KHS Editorial Office, high atop majestic Mt. Oread, has received thousands of telegrams, cards, and phone calls asking why the Newsletter has been so late in coming out this quarter. Following an extensive investigation, your Editor has concluded that it is all entirely his fault. You see, fellow KHS members, Your Loyal Editor took it upon himself to enter into the Computer Age with a bold step forward. How was I supposed to see that cliff edge in all the fog, anyway? The result of these many adventures in computerland is the stunning new format displayed now before you even as you read these lines. I am sure you will agree it was well worth the wait.

I would also like to thank some people for their help with this issue. Without these people, the new format would have never come to be, and this newsletter would be even later in coming than it is. We owe a depth of gratitude to Dr. William E. Duellman, David C. Cannatella, and especially Linda S. Ford. Their suggestions, assistance, and patience have been invaluable.

