KANSAS HERPETOLOGICAL SOCIETY

NEWSLETTER

NUMBER 36 APRIL 1980

FIRST FIELD TRIP FOR 1980 PLANNED FOR 2-4 MAY IN SOUTHERN KANSAS

The May meeting of the Kansas Herpetological Society will take place the first week-end of the month and will be held on private land in Sumner County. KHS members will join members of the Kansas Association of Biology Teachers and those participating in the Fourth Annual Chikaskia River Wildlife Study along the banks of the Chikaskia for the week-end.

The location of the meeting place will be about half way between the towns of South Haven and Caldwell. It will be just north of the point where highway 81 crosses the Chikaskia River. Signs will be up to help members find the camping area and information can also be obtained over channel 4 on CB radio.

The camping area will serve as a base for the group and at least one trip is planned to another area located just southwest of Caldwell. The area southwest of Caldwell is one of the few locations in Kansas where the checkered garter snake can be found. The field trip to this area is planned for Saturday afternoon and it is about a twelve mile drive from the camping area.

Another of the nearly fifty species of herps known to occur in south-central Kansas is the rare strecker's chorus frog. This frog has been found only in Harper County near Anthony. There is a good chance it may be found near the camping area also.

KHS members may arrive anytime the afternoon of Friday, 2 May. They may camp on the private land or they may choose to camp at the small park located about 1 1/2 miles south at the small town of Drury. There is a small store in Drury where members can buy snacks and drink. There is also a small camping fee for the use of the Drury Park. Other members may choose to spend the nights at the motel in Caldwell which is about six miles west of the camping area.

There are no planned activities for Friday evening, but members are encouraged to come and enjoy themselves as early as possible Friday afternoon.

The KHS Executive Council should plan to meet at 8:00 am Saturday at Troy's Cafe for breakfast and a meeting. The cafe is located at the east edge of Caldwell and it will be on the right just after crossing the railroad tracks when coming into town from the east. All KHS members are invited to attend this meeting.

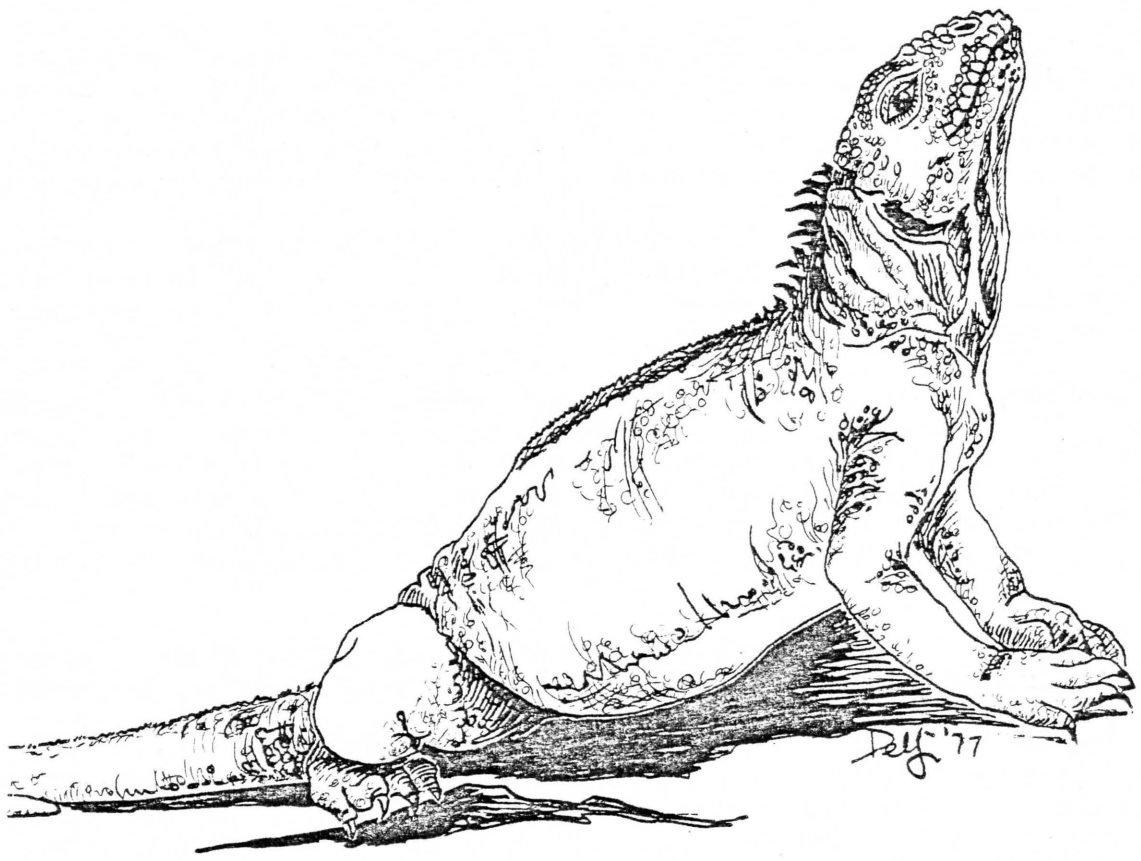
There will be field trips along the Chikaskia River later Saturday morning and other trips that afternoon. Sunday may be used for other collecting trips. KHS members may also wish to travel to the Chaplin Nature Center which is located near Arkansas City before leaving for home Sunday. It is operated by the Wichita Audubon Society and will be open Sunday afternoon for those wanting to visit. The nature center is along the banks of the Arkansas River and is located just west of Arkansas City. It is about twenty-five miles east of the camping area.

Mark the dates of 2-4 May on your calendar today! Plan to attend and bring a friend for an enjoyable spring week-end of herping. Don't forget food, walking shoes, a camera, and field glasses. Birding is great too! No alcoholic beverages should be brought to the private camping area.

This meeting is being organized by Larry Miller of Caldwell, Gene Trott of Wellington, and Joseph T. Collins of Lawrence. Camping will be on land owned by Freeman Dillard of Caldwell and most of the field trips will be to areas owned by residents of Sumner County.

SEE YOU IN MAY!

Larry Miller, 524 No. Osage St., Caldwell, Ks 67022



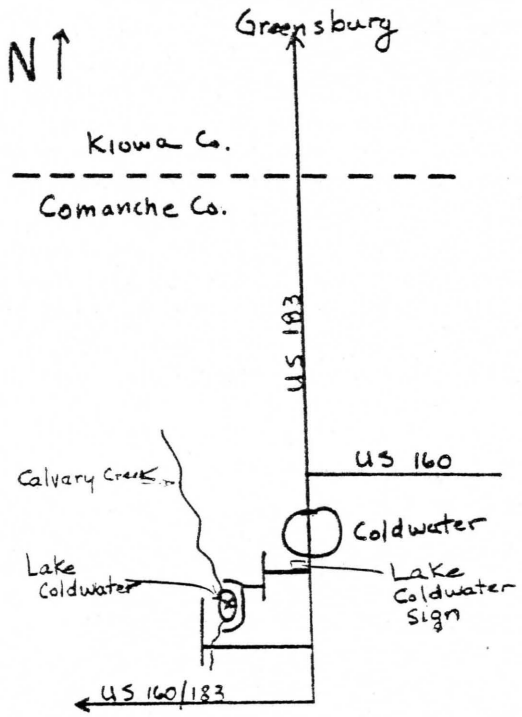
SECOND KHS SPRING FIELD TRIP: COMANCHE COUNTY, MAY 23-26

The second spring meeting of the Kansas Herpetological Society will be held over the Memorial Day weekend, May 23-26, in Comanche County. Base camp will be established at Coldwater Lake, located 1 mile southwest of the town of Coldwater.

Comanche County lies in the Red Hills physiographic province, an area particularly unique in Kansas. Many of the animals native to this region are more typical of the southwestern U.S. - the ranges of some species extending into two or three counties of the state. One of the more notable herps that may be encountered in this area is the western diamondback rattlesnake (Crotalus atrox). If one is uncovered, it would represent a state record. It would also be very valuable to discover individuals of the following species: western ribbon snake (Thamnophis proximus), the prairie skink (Eumeces septentrionalis), and, the massasauga (Sistrurus catenatus).

This field trip should be a good one, so plan to attend and bring friends.

Here is a map that will help guide you to the camping area.



---JEFFERY T. BURKHART, Dodge City, Kansas

MARCH KHS MEETING IN WICHITA A GREAT SUCCESS

After informal conversation over coffee and doughnuts, which was generously provided by the Sedgwick County Zoo, Dr. Frederic Frye began his fascinating slide presentation, which primarily dealt with herpetological husbandry. Calling upon his extensive experience in this area, Dr. Frye explained that many problems can be successfully diagnosed by taking x-ray pictures. Turtles and tortoises often have problems related to egg development. Sometimes one of the eggs is too large, or, one has been broken. Both of these conditions may result in difficulties when the turtle tries to lay the eggs. One x-ray showed a particularly rare condition in which one shell had been formed around three eggs! The treatment of the aforementioned problems consists of surgical removal. A small section of the plastron is cut out with a saw, and the eggs are taken out. Then the piece of shell is replaced, using fiberglass and epoxy. This is done making sure that the epoxy doesn't enter the space around the small piece of shell. Dr. Frye has had very good recovery rate with this procedure. Inducing hypothermia, i.e., cooling down an animal, before surgery is not recommended because it may catch a cold, possibly even pneumonia. Vomiting is a good indication that a turtle has a serious problem. In one case, vomiting was caused by pressure of an excessive number of developing eggs upon the turtle's digestive tract. Again, surgery corrected this condition. Sometimes, captive turtles may retain their eggs for an excessively long time. The eggs may then spoil, possibly killing the turtle. Injection of a small amount of oxytocin will usually induce egg deposition. (See February issue of newsletter for a discussion of this treatment). Some animals, such as the ball python (Python regius), normally have large eggs, making egg deposition quite an ordeal. We also had the opportunity of seeing slides of some unusual reptiles that had been born in captivity, such as baby gilamonsters (Heloderma suspectum), and, an albino California kingsnake (Lampropeltis getulus californiae) striped phase. Several pythons, including the Burmese (Python molurus bivittatus) and reticulated pythons (Python reticulatus), possess both physiological and behavior mechanisms enabling them to incubate their eggs. Small muscle contractions produce heat which flows from the female's body to the eggs. There were also a number of slides which depicted reptilian sexual dimorphism. Male box turtles (Terrapene sp.), for example, have a concave palstron. The males of several species of aquatic turtles possess longer claws than the females. The sex of Old World chamaeleons (Chamaeleo) can be distinguished even before birth. The male has prominent horns on its head.

Dr. Frye's refreshing presentation was followed by an interesting account of sea turtle farming on Grand Cayman by Barbara Paschke. As Barbara showed slides of the turtle holding pens, she explained that although some breeding adults of the green sea turtle (Chelonia mydas) are kept, most of the eggs are gathered from various sites throughout the Caribbean. This practice makes is much harder to convince the native inhabitants not to collect the endangered sea turtles and their eggs. The people realize that the turtle industry may legally collect eggs, but that they cannot. Although the market is small, this industry is trying to change certain laws which would enable their products to be legally sold in the United States. If this should happen

the already threatened turtles may be exterminated by increased collecting pressure.

Adult green sea turtles mate in the ocean off the coast of the nesting beaches. At night, the females come ashore, dragging their ponderous frames across the sand. They use their hind limbs to dig holes into which the eggs are deposited. Upon hatching, the young turtles dig away at the top and sides of the cavity, which eventually fills up with sand. The turtles on the bottom trample this sand. Finally, the entire group of young turtles reach the surface and head for the sea. Many are eaten by sea birds as they make this journey. Since they travel in one large group, however, more are likely to survive. If only a few of this group ran to the ocean at one time, many more would be eaten. The first year of life of the green sea turtle is still a mystery. Many may travel to the rich Sargasso Sea. During this time they are carnivores, but after one year the turtles are able to digest plant material (cellulose).

One slide of some turtles in a holding pen of the turtle farm on Grand Cayman revealed a number of problems. Dr. Frye noticed that the turtles had a herpes viral disease which as a mortality rate of 40%. Pneumonia may also become a serious problem in such facilities. Like any other attempted monoculture, i.e., raising many individuals of the same species in close proximity to each other, turtle farming increases the chance of a disease spreading rapidly through the confined population; resulting in many deaths.

The afternoon session began with a slide program of Australian herps by Marty Capron. Marty told us of his recent trip to Australia where he was guided through many parts of the continent by Anthony Sokal, a KHS member. One remarkable slide shows Marty holding a very deadly Tiger Snake (Notechis scutatus) by the tail!

Jeff Burkhart then showed slides of some herps from Kansas and Arizona. Eddie Stegall showed us some of his slides, including the hatching and growth of several green tree pythons (Chondropython viridis). The Sedgwick County Zoo received the Bean Award for successfully breeding this species. We were then taken on a guided tour of the zoo's herpetarium. One of the many remarkable animals that we were able to see was an albino western diamondback rattlesnake (Crotalus atrox). One breeding project at the zoo resulted in a batch of melanistic garter snakes (Thamnophis sirtalis sirtalis). Eddie explained that the melanistic trait (entirely black) is inherited as a simple recessive. In this respect, it is similar to albinism.

The tour ended a wonderful day.

---HANK GUARISCO, Museum of Natural History, Lawrence, KS 66045

MINUTES OF THE KHS EXECUTIVE COUNCIL --- 22 MARCH 1980

Officers Present: Kelly Irwin, Larry Miller, Hank Guarisco, Peter Gray

Officers Absent: Jeff Burkhart (Jeff was absent at the noon executive meeting, but arrived before the afternoon was over)

President Peter Gray called the Executive Council Meeting to order at 12:28 PM with all officers except Jeff Burkhart present. Several members were also present for the meeting. Larry Miller read the minutes from the 19 Jan. 1980 meeting and they were approved. Miller then gave the treasurer's report. It showed a balance of $310.78 (as of 21 March 1980). There was no old business, so the council went to the following items of new business. (1) The low attendance at January meetings was discussed and the council decided to discontinue the January meeting starting in 1981. (2) They then decided to add a spring meeting. Thus, there would be two spring meetings during good field trip weather. (3) The council decided to continue the March meeting. (4) Dates and locations for the two 1980 spring field trips were set and they will be as follows: 2-4 May will be a joint KHS-KABT meeting with the CHIKASKIA RIVER WILDLIFE STUDY in Sumner County; 23-26 May will be a field trip to Comanche County. (5) The possibility of dropping the July meeting and holding two fall meetings was also discussed, but no action was taken. (6) Hank Guarisco was asked by the council to check on a bulk mailing permit for the newsletter. (7) Hank Guarisco was also asked to check with the Postmaster about advertisements in the newsletter. Hank had received a request from a person that wanted to advertise in the newsletter. (8) The number of issues of the newsletter to be published each year was discussed. Hank Guarisco, Editor, said he could continue publishing six issues per year. The council decided to continue six issues per year. (9) President Peter Gray reported that the KHS proposal had been submitted once again this year to the SSAR. (1) President Gray adjourned the meeting at 12:55 PM and the council members returned to the education room for the afternoon session where President Gray announced that Dr. Frye would be made an honorary member of the KHS.

---LARRY MILLER, Secretary-Treasurer, Kansas Herpetological Society

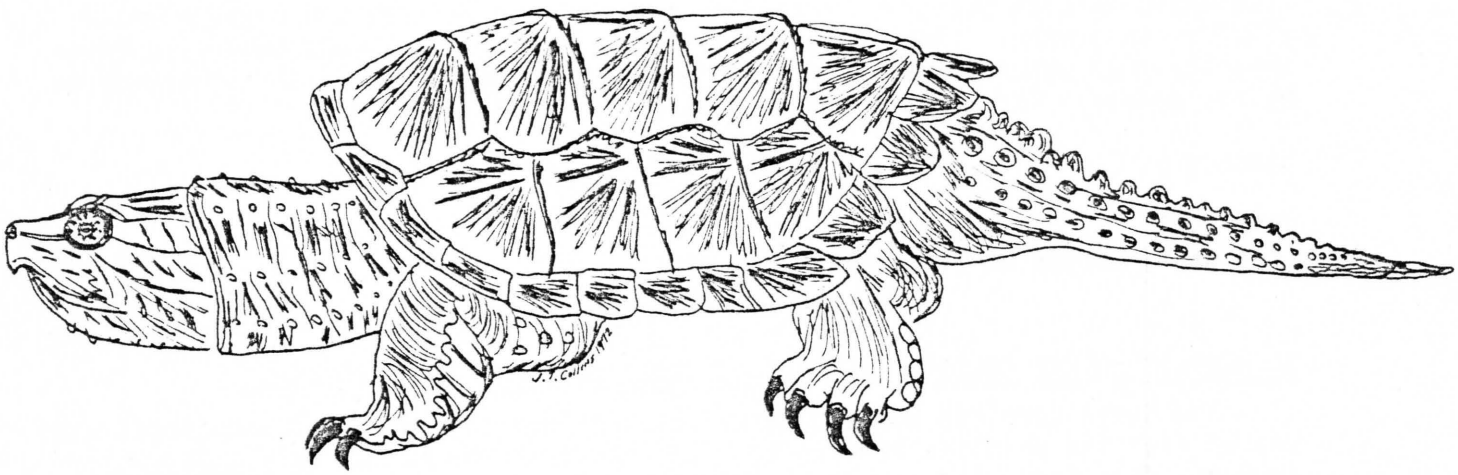
NEW KHS MEMBERS, WELCOME

Paul Martin, 555 Zoo Blvd., Sedgwick Co. Zoo, Wichita, KS 67212
Freeman Dillard, Rural Route, Caldwell, KS 67022
Sherry Graves, 295½ N. Arkansas, Apt. B, Wichita, KS 67204
Gordon Norris, 1208 W. Patterson, Wichita, KS 67217
Steven M. Royal, Dept. of Biology, Fort Hays St. University, Hays, KS 67601
Frederic L. Frye, D.V.M., 741 Plum Lane, Davis, CA 95616

JOSEPH T. COLLINS APPOINTED NEW SSAR SECRETARY

The days have become shorter for Joseph T. Collins since he has recently assumed the position of secretary of the SSAR (Society for the Study of Amphibians and Reptiles). Collins has replaced Steve Edwards, of the Association of Systematics Collections, who was the former secretary of this national organization. On behalf of the KHS I would like to extend to Collins my congratulations and best wishes.

---HANK GUARISCO, Museum of Natural History, University of Kansas, Lawrence, KS



KHS SUPPORTS THE "TOPEKA SHINER" AS OFFICIAL STATE FISH

Recently a committee consisting of several KHS officers (Kelly Irwin, Peter Gray and Hank Guarisco) and the membership chairperson (Joseph T. Collins) voted to support the designation of the Topeka Shiner (Notropis topeka) as the official state fish. The following is a copy of the letter sent to the Kansas Senate by the KHS:

Honorable Ross Doyen
President, Kansas Senate
State House - 359-E
Topeka, KS 66612

25 March 1980

Dear Senator Doyen:

The Kansas Herpetological Society wishes to express its support for the designation of the Topeka Shiner (Notropis topeka) as the official state fish. We feel that the Topeka Shiner would be a more appropriate representative than the Channel Catfish which is widespread and certainly not unique to our state. The Topeka Shiner, however, is a distinct prairie animal with a limited distribution being most abundant in Kansas. The form was first described from Kansas and is of course named after our capital. In addition, the Topeka Shiner is a threatened species in the state and we feel that designation of this animal as the state fish would enhance awareness regarding conservation efforts and protection of wildlife in general. For these reasons we urge that the Topeka Shiner be given priority over other forms if official recognition of a state fish is considered by the senate. Thank you for your consideration of our opinion.

Sincerely,

Peter Gray
President, Kansas Herpetological Society

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NC HERPETOLOGICAL SOCIETY RECEIVES CONTRACT TO STUDY HYLA ANDERSONI

The North Carolina Herpetological Society has signed a $3,000 contract with the US Fish and Wildlife Service to study the distribution of Hyla andersoni in North Carolina. The research will be conducted under the guidance of society advisor Ray Ashton, North Carolina State Museum. The three primary purposes of the study are to check the 43 historic site records, (10 years or older). These sites will be visited to determine if the habitat will still support pine barrens treefrogs and, hopefully, to locate frogs at these locations; secondly, new sites will be located and habitat type and size will be determined; and data will be shared with a similar project being headed up by Larry Wilson at Clemson Univ.

Several teams will be mobilized to cover various assigned regions of the coastal plain on nights when H. andersoni should be active. Each team will collect voucher specimens, calling population data, habitat information, and exact localities of each call site.

The NC Herp Society is involved in a similar study on the distribution of Clemmys muhlenburgi in the western part of North Carolina. This study is being headed by Ray Johnson of Durham, NC. The conservation committee of the society, headed by John Wiley and Wilson Laney of NC State Univ., is collecting information on Laurinburg Pond, a site where numerous coastal plains herps breed. This data is being turned over to the NC Heritage Program and the Nature Conservancy with the hope that these institutions can save the area.

ILLINOIS SNAKES GET RIGHT OF WAY ON FOOTHILL ROAD (Topeka Capital-Journal 27 March, 1980)

Wolf Lake, ILL. (AP). - If you should find yourself driving in a remote area of Southern Illinois' Mississippi foothills next month, be warned: The snakes have the right of way.

In fact, the U.S. Forest Service closes a two-mile stretch of road at the bottom of a 350-foot bluff twice a year for the annual snake migration in the LaRue Pine Hills Ecological Area - a 2,000 acre pocket of natural history tucked in the scenic Shawnee National Forest in Southwestern Illinois.

"The snakes have to travel 500 feet from their winter in the craggy bluffs to one of the several swamps which have been created by the backwaters of the Mississippi and Big Muddy Rivers," said ranger Jay Wittak.

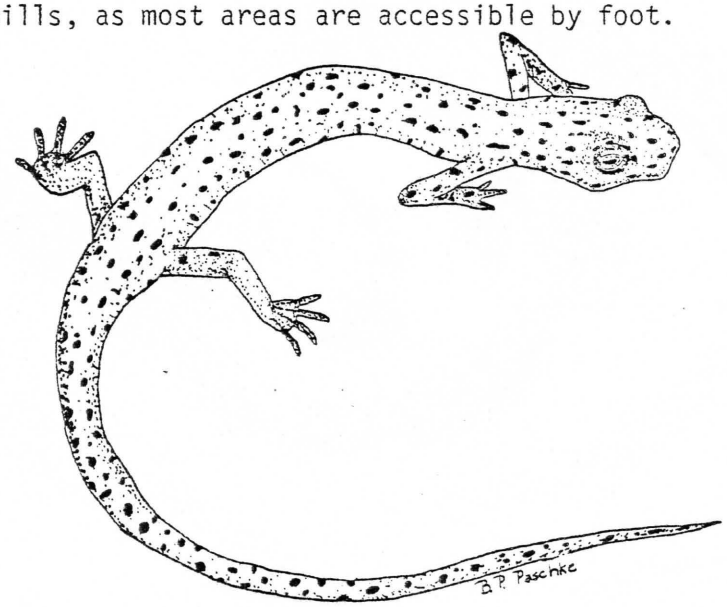
"Several years ago we decided it would be easier to restrict traffic in the area than it would be to merely caution motorists," said Wittak.

The road closing is set for April 4 to April 25. The rangers extend the same courtesy again in the fall, closing the road from September 24 to October 15 to give the reptiles a change to head for the hills to hibernate.

"On a hot day, one could walk along the road and see as many as 12 snakes crossing the two-mile stretch" at any one time, Wittak said. Not that many persons would want to take a chance with the likes of rattlesnakes, copperheads and water moccasins - among the poisonous species which slither the 500 feet.

Wittak said he doesn't know how many snakes make the trip, because no one has ever made a count.

The road closing is only a slight inconvenience to people who want to explore the hills, as most areas are accessible by foot.



HOUSTON TOAD PROPAGATION PROJECT (Endangered Species Technical Bulletin Jan.'80)

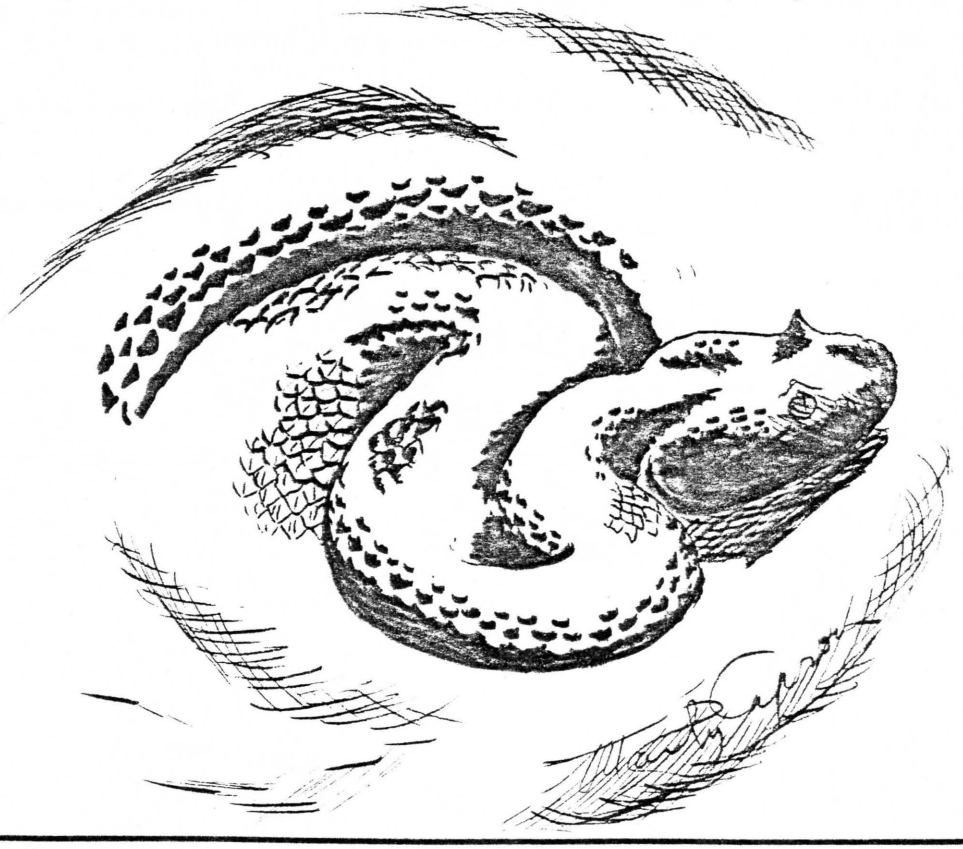
Under contract to the Service, researchers at the Houston Zoological Gardens have been working to perfect methods for raising Endangered Houston toads (Bufo houstonensis) in captivity. It is hoped that successful propagation will help boost the recovery of this small, secretive toad, whose total numbers are estimated at less than 1,500.

Of 3,600 eggs collected from Bastrop County, Texas, in March 1978, and maintained at 24°C, 91 percent survived to metamorphose. Of 4,875 eggs laid by two pairs of B. houstonensis collected in amplexus in February 1979 (and maintained at 27°C), 95 percent of the tadpoles survived. Experiments with tadpole diets were conducted, and data on growth, thermal preference, and ultraviolet treatment were gathered.

Toadlets were more difficult to maintain in captivity, however, with only 2 percent and 5 percent survival rates reported for 1978 and 1979, respectively.

Five hundred sixty-four metamorphosing toads were released into the wild in 1978, and a stepwise release plan for adults has been devised.

The researchers will intensify their propagation efforts over the next two years, under contract to the Service, and plan to monitor the survival of sexually mature toads upon their release in the spring of 1981.



HITCHHIKE HERPING IN DECEMBER

A brief introduction is in order before I relate to you my journey of December 23-24, 1979. The previous week, Joseph T. Collins of the University of Kansas Museum of Natural History, received a telephone call from Patrick H. Ireland (Dept. Biology, Radford College, Radford, VA 24141). Ireland had plans of visiting Schermerhorn Park enroute to his parents home for the holidays. Schermerhorn is located on the southern outskirts of Galena, Kansas in the extreme southeastern corner of the state. He had intentions of entering a cave in the park to look specifically for graybelly salamander larvae (Eurycea multiplicata griseogaster) which he had recorded for the first time in the state.

I wandered into Collins' office the following day for a chat. During the course of our conversation he sighed when he mentioned how he'd sure like to photograph a true Kansas graybelly salamander, but couldn't arrange to meet Ireland due to previous plans. Having heard this, visions of my first and only visit to the park in 1977 came to mind. It was at that time that I got my first introduction to the cave salamander (Eurycea lucifuga) and the dark-sided salamander (Eurycea longicauda melanopleura). Since Collins couldn't make it I thought it would be great to observe the rare salamanders again, and with luck, find the even rarer graybelly. I decided then that I was going to Schermerhorn Park to see these creatures again. My next thoughts were how to get there; my old truck was totally uneconomical for my limited resources. I checked with the bus station and tickets were $33 roundtrip but I didn't have that kind of money! There was one more possibility, I would ask Hank Guarisco if he would be interested in going. He had a new GLC Mazda that gets good mileage. I presented him with the idea and he thought it was excellent, since he had not seen these rare Kansas animals.

We made plans to leave early Sunday morning December 23 and return Monday the 24th. All was ready Saturday evening when I got a phone call from Hank at 11:30; he was sick and was not up to traveling the following day. As I hung up the phone, I felt a twinge of regret of not being able to see the salamanders. I had really set my heart on observing these delicate and unique creatures in the only habitat suitable for their existence in Kansas. With that, I came to the abrupt conclusion that the only way to get there would be to hitchhike.

I set about assembling and packing the bare essentials in my day pack, and tied by bedroll underneath. With thumb in air, I stook on Iowa Street at 12:30 in the morning. My first ride was with a Japanese student attending KU, who got me as far as the edge of town, headed south on Hwy 59. It wasn't long before two guys stopped in a pickup. They gave me a beer for the road and dropped me off about 8 miles south of Lawrence. I walked for one or two miles before I got a lift to the junction of highways 56 and 59. From there I walked on, and with another ride was deposited in downtown Ottawa, Kansas at 2:00 AM.

I was still in Ottawa thumbing at the occasional car, when an El Camino

cruised by and locked up all four wheels. It slammed into reverse and pulled up alongside me, "Where ya going?" a young man riding shotgun yelled. "As far south on 59 as you'll take me", I replied. "Hop in", he said. We cruised Main as I told them of my plans to meet up with a fellow herpetologist to look for these little known caudates in Kansas. They dropped me off about 9 miles from Ottawa on the dark, deserted highway. I started walking again with no success with the 4 or 5 cars that went by. I didn't think any of the drivers would consider picking up an odd looking fellow at that time of morning. I had been walking for some time, and, no vehicle had driven by for what seemed like ages, when out of the balmy night gloom appeared several large corrugated steel tubes. (They were lying in a field next to the highway, and were about four feet in diameter and about twenty feet long.) These would be a perfect place to rest some weary bones and get out of the persistent south wind. I bedded down and dozed off feeling quite comfortable, only to awaken with chattering teeth and a shivering body. It was still dark, the weather had changed and there were low clouds racing overhead. I packed up and hit the highway once again; it wasn't long before the old juices began circulating and warmth returned to my body. My poncho and coat were definitely not good enough insulators for sleeping outside. I walked on for sometime, one car and two semi-trucks passed me in the wee hours of the morning. The only sounds were the wind, my footsteps, and the continual hum of the powerlines running parallel to the highway. The temperature had been in the upper 30's earlier but was fast approaching freezing as the morning chill frosted the gray countryside.

I arrived in the hamlet of Richmond, which is about 7 miles north of Garnett, at 6:00 AM. I sat down on the step of the building and ate the orange I had packed. Then I proceeded down the highway. There were many birds becoming active in the forests along the highway as the day dawned cold and gray. I was still walking when I got a lift two miles north of Garnett. The gentleman who picked me up deposited me at the local restaurant at 9:00 AM. I had a substantial breakfast of coffee and pancakes for a quarter less than the usual prince. Therefore, I wondered if the waitress was feeling sorry for me. Nevertheless, it was a good breakfast. Once again, I trudged on. About two miles south of town, a station wagon full of people pulled over. It was a family which I had seen earlier in the restaurant. They were headed for Chanute, so I took them up on their offer of a ride. It wasn't long before I was walking again headed south out of Chanute, wondering where I was, and, how far west I had gone out of my way, when a Mustang pulled over. It was a young guy and his sister. They were headed for Erie, a town south and east of Chanute. Erie is east of Hwy 59 so it was just the ride I needed to get me back on a more direct route. They dropped me off 3 miles south of Erie. Luck with with me. From there, I thumbed a couple of miles before an old beat-up Chevy Impala pulled over, with a long-haired man at the wheel. As it turned out, he lived in Topeka, my home town, and was headed for Columbus for Christmas. This was fantastic for that would put me within 21 miles of my destination. It was about noon when he drove away leaving me standing in the rain, on the road headed east to Crestline. I hadn't thumbed for 10 minutes before a couple of "good ole boys" picked me up and dropped me off at by great aunt and uncle's home just south of Crestline. During the ride we had a pleasant conversation about the Spring River and its riffles which might harbor the hellbender (Cryptobranchus a. alleganiensis) in Kansas. I knocked on the door but no one was home, so I

stowed my pack and prepared my gear in the barn.

I walked about 7 of the 13 wet miles to the park, with only two short lifts as far as Galena. I had to walk the rest of the way to the park. It was getting late in the afternoon by the time I got there and things were pretty dismal in the rain. The gates to the park were locked so I jumped the wall and trotted towards the cave. The closer I got the more appalled I became of the surroundings - someone had burned off the understory of the park and cut down the trees at the mouth of the cave. Why, I don't know.

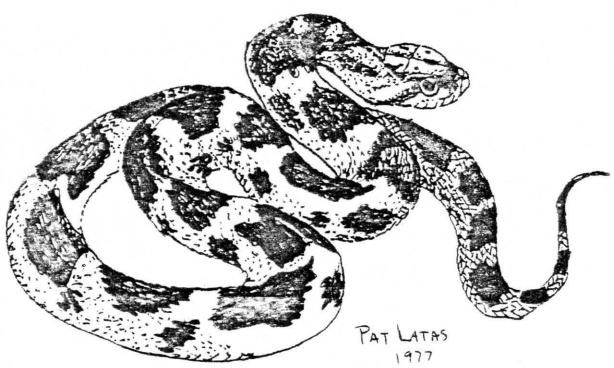
Once at the cave I proceeded into the twilight zone - the great limestone overhang - peeled off my soaked poncho and readied my headlamp. I then carefully worked my way through the small opening into the cave proper. I had barely gotten my torso through the opening when the beam of my headlamp caught a movement in a crack. It was an adult cave salamander. It was a beautiful sight and this is what I had traveled so far to see. It was in such a narrow space that I couldn't pick it up to examine it. Therefore, I was content to watch it retreat into the darkness away from my light. I proceeded further, carefully lifting each rock as I went and placing it back as it was. I felt chilly in the twilight zone but once inside the cave, the air seemed warmer and it didn't have a chilling effect. I finally made it 15 or 20 feet from the opening and was lying in a crawl space about two and a half feet in height. I could perceive that the cave extended for quite some distance further back, with an entirely mud covered floor, which didn't look very suitable for salamanders. It was at this point that I began looking under rocks in the clear, shallow, pool which prevented further exploration since I didn't feel like getting completely soaked. I found an adult dark sided salamander under a rock at the edge of the pool. I observed it for a while then left it alone to go hide after its disturbance.

I peered intently into two deep pools but could discern no larvae in my beam. With that, I slowly turned around on my belly and made my way back to the entrance, where I got one final look at a big adult lucifuga which seemed to be guarding the entrance of its domain. Once back outside I began turning rocks in the leaf litter and peering into crevices in the wall blocking the original cave entrance. I turned up 4 sub-adult lucifuga in the leaf litter and observed a total of 8 sub-adult longicauda along a 15-foot length of the wall, either under rocks or in cracks.

There was a small trickle of water flowing from the pipe which continually drains the cave spring. I poked around it but turned up nothing. It was dark by now. I put my poncho back on and stepped out from under the overhand into the rain. I followed the course of the stone-lined drainage ditch from the cave to a pool. It was here amongst the oak leaves on the bottom that I observed two plump, light-colored grotto salamander larva (Typholotriton spealeus). As I looked up from the pool a movement along the edge caught my eye; and, there in the cold rain, sat a lone cricket frog Acris crepitans blanchardi. With this final observation, I turned off my head lamp and made my way back to the highway. I was very tired and hungry, yet I felt quite happy and elated with my observations as I walked towards Galena on Hwy 26. In Galena I had one hell of a time finding a phone to call my uncle. When I

did, it looked like it had been in use since the 50's. It ate $.25 before I finally got through to central and they connected me to my uncle's number. Uncle Tom pulled up in front of the greasy spoon cafe from where I had called at 7:00 PM. It was a cold rainy night to be hitchhiking and it felt great to be riding in my uncle's big warm car. I told him of my trip on the way to his home. Aunt Beryl was waiting for me with a number of chicken sandwiches and incredibly delicious canned tomatoes, and, a hot bath. After supper and a bath, I was feeling quite comfortable in my change of clothes and cozy surroundings, and was evidently quite sleepy, for I was in bed by 8:30. I fell asleep immediately. The next thing I realized was Uncle Tom calling me for breakfast. I arose and got dressed, feeling slightly stiff, but refreshed. As I descended the stairs, that classic, early morning, the smell of fried bacon and eggs brought me to life. Just out of curiosity I asked Uncle Tom what time it was. "5:30", he casually replied. If I were to catch a bus home, I had to be in Joplin, Missouri by 7:30. I said goodbye to Aunt Beryl with much gratitude for her thoughtfulness and care, then hopped into Uncle Tom's car. We had an early morning drive through the dark, then graying countryside, as a wet snow swirled around us. I bid adieu to Uncle Tom at the bus station in Joplin and boarded the bus. If it weren't for the kindness extended to me by my Aunt and Uncle upon my imposition, I wouldn't have made it home for Christmas; and, I express my deepest thanks to them. As it turned out, I sat right through my 1:00 departure from Kansas City to Topeka, so I had to wait until 6:00 PM when the next bus left. I finally set foot in Topeka at 8:00 PM December 24th, 1979, 43 hours after leaving Lawrence. It was well-worth the time to have seen these most beautiful and unique creatures of Kansas.

---KELLY J. IRWIN, 746 Arkansas, Lawrence, KS 66044



HATCHING SNAKE EGGS

For the reptile enthusiast, breeding a snake, turtle, or lizard and hatching its eggs can be a fascinating and gratifying experience. If the breeder is consistently successful with a rare or valuable species, he can remove collection pressure from the wild populations of reptiles by giving away the offspring, and in the process will find himself winning friends and influencing other herpers to try breeding. (Or, one could sell the offspring to cover expenses involved in maintaining and breeding the reptiles--if local and

federal laws allow such sales. Some successful breeders find themselves in legal "gray areas" and/or are squeezed by laws designed to quash commercial collection and habitat destruction.)

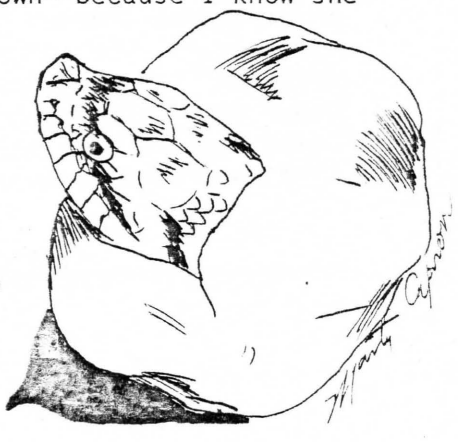
Everything I have written below is "rule of thumb" information based on the combined experiences of me and my acquaintances. None of the below is based on rigorously controlled scientific studies. All of the below is based on kingsnakes (Lampropeltis) but much will apply to other common colubrids such as rat snakes.

First, a few general comments: A good egg won't go bad if its minimum temperature and humidity requirements are met. A few "borderline" eggs will survive to develop normally if the breeder is ready for them (cleanliness and acute observation are important in "saving" such eggs). And the most important general comment is: be prepared. Advance preparation for egg deposition and incubation are crucial if the breeder wants plump, healthy eggs instead of deflated eggs discovered in the corner of a dusty cage, or drowned eggs found in the waterbowl.

IDENTIFYING GRAVID SNAKES:

If one does not recognize that a snake is gravid, and has no idea when the eggs might be laid, then advance preparation becomes difficult if not impossible. The following are indications and/or "obvious" signs that a snake may be gravid: 1) The snake was seen mating. Kingsnakes, and many other colubrid snakes, usually lay eggs 35 to 45 days after mating. 2) Gravid snakes often refuse to feed. 3) The snake's neck may appear thin while the mid-body to cloaca appears very fat, even bloated. In extreme cases, the snake's entire spinal column is raised and the tail is emaciated, as with a very starved snake, yet the mid-body to cloacal region is very heavy. The cloacal region may even bulge, with the snake's skinny tail dangling like a string from a sausage. Usually the signs are more subtle.

Kingsnakes shed their skins about 7 to 13 days (usually 10) before laying their eggs. A few days after my gravid females have shed, I half-fill a clean ½ or 1 gallon container with damp sphagnum moss. I first wet the moss, then squeeze as much water from it as possible. I place a plastic bag over the container's mouth, secure it tightly with a rubber band, and cut a one- or two-inch diameter hole in the plastic cover so the snake can crawl in and out. I put the container on its side in the cage, and remove all other snakes and the water bowl from the cage. Snakes often lay and destroy their eggs in water bowls. With an egg-laying jar in the cage, I don't have to worry about the snake laying her eggs while I am asleep, at the office, or out-of-town--because I know she will drop them in the jar.



HATCHING MEDIUM AND EGG COLLECTION

Because of their availability, I generally hold eggs in plastic ½ gallon ice cream containers. (Even a very large Lampropeltis getulus clutch will usually fit in one.) If I am feeling paranoid, I clean the prospective egg container with a bleach cleanser followed by an alcohol rinse. When the alcohol has evaporated, I fill the container about one-third full with fine-grain vermiculite which I have "sterilized" in a 350°F oven for a couple of hours. If I'm feeling both compulsive and paranoid, I add only boiled water to the vermiculite: 58 grams of water to 100 grams of vermiculite. I imagine that rounding 58 to 60 won't hurt anything, but the commonly used weight ratio of 1 to 1 is, in my opinion, a ratio which only the completely healthy egg can tolerate.

I try to stay at home during the period that I think a snake will lay her eggs because I like to collect each one separately as it is laid. I pick up each egg (with very clean hands) only after it has "firmed up" enough to be easily handled; i.e., about 10 or 15 minutes after deposition. When first laid, an egg will appear wet, flexible, slimy. As it "firms up" it takes on a dry appearance and often changes color slightly. If an egg firms up while touching another firm egg, it will adhere to it very strongly. I never attempt to separate such eggs. One generally has plenty of time between eggs to wait for each to firm up without having to worry about another landing on top of it and both firming up, and thus adhering, together. Kingsnakes rarely lake eggs more rapidly than one per half-hour (usually every 40 to 55 minutes).

Before placing the egg onto the incubating medium, I examine it closely for "windows" - clear, gray, or blue (or otherwise unusual) spots on an otherwise yellowish-to-white shell. I place the egg on top of the medium, pressing it in just enough to keep it from rolling around when I handle the container, making sure to keep any "windows" as far from the medium as possible--generally facing upward where I can keep an eye on them. (Because eggs change shade slightly while firming up, some oddly-shaded areas may prove to be spots that are simply firming up a bit more slowly, and will look normal after a few more minutes.). I never bury eggs in the medium, nor place them against the sides of the container, nor against another egg. Place a clean, tight-fitting lid with a few pin holes on top of the egg container. You should never have to add water to the medium.

CARE OF EGGS

Temperature: I try to keep my eggs at 80-85°F. If I have a trustworthy temperature control system (I never do) I try for a constant 84°F. Higher temperatures shorten development time - kingsnake eggs may hatch in as little as 51 days -- but higher temperatures also increase the chances of the eggs dying and the embryos deforming. (Sometimes interesting color patterns result). Lower temperatures increase incubation time and may kill the eggs. If a kingsnake egg takes 70 days to hatch, keep them warmer next time. Normal incubation time is around 56-66 days.

Light: Light and dark make little difference to developing eggs. (But be sensible and keep them out of direct sunlight).

Mold: When you deal with mold, you're entering the land of the unknown. When mold starts on my eggs (it rarely does with vermiculite), I remove the eggs, add about an inch of dry vermiculite to the surface of the damp medium, wipe the mold gently from the egg (don't smear the spores all over the egg's surface), and then gently place the egg on top of the new, dry vermiculite. This procedure always seems to take care of a long-filamented, feathery, white mold (I don't know any common or scientific name for it). Good luck with the more persistent and tenacious molds. I've tried everything: regular cleansing, swabbing with alcohol, antibiotics, and simply leaving them alone. I leave the choice of treatment to the breeder.

If the eggs of a clutch have been collected separately, and one becomes a problem molder or turns green, I remove it from the rest of the eggs and set it up in its own container. Peeling a rotting egg from a good one is tricky business - definitely a last resort. Very moldy eggs can hatch perfectly healthy snakes. Quite frequently, however, they go through all the colors of the rainbow, collapse, and turn into stinking slime - not the kind of thing one would want in the same container with the rest of the good eggs.

HATCHING

Shortly before hatching - anywhere from a few hours to a few days - the eggs may dimple slightly. When the snakes are ready, they will slit their eggs one or more times, stick their snouts through a slit, and then rest for periods ranging from a few hours to two days before emerging. On occasion I have very carefully slit eggs that had not slit by the time that all the others of the same clutch had slit. Sometimes the snakes seemed perfectly normal, sometimes their hatching had apparently been delyaed by an oversized yolk sac (larger eggs seem to hatch later than small eggs in the same clutch, but I have no hard figures to back this statement up), sometimes the hatchlings were badly deformed or very underdeveloped (almost embryonic).

A final word: if you find yourself crying because your eggs are molding or deflating, or because you just discovered a deflated clutch of eggs in a dry corner of the cage, then hold onto the eggs until they dissolve. Don't throw them away. Severely dehydrated eggs sometimes develop normally, as do the most sickly, moldy eggs. I've seen healthy hatchlings emerge from eggs that had been deflated from the moment of deposition, and from eggs that had been fuzzy balls of mold for weeks. You can get lucky.

Following the above methods, my hatching success rate with three species of kingsnakes over the past four breeding seasons has been around 95% - not including deformed monstrosities and the occasional egg that is obviously bad from the moment it is deposited by the female (one gets a few of those once in a while if the nutritional or health status of the female is bad or if one of the parents has fertility problems, but that is another story).

--RANDALL N. JOHNSON, 8342 E. Keim Drive, Scottsdale, Arizona

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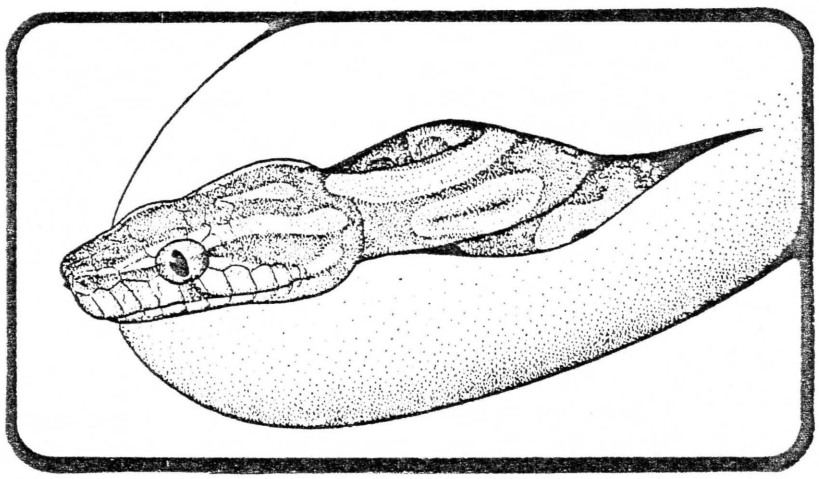

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