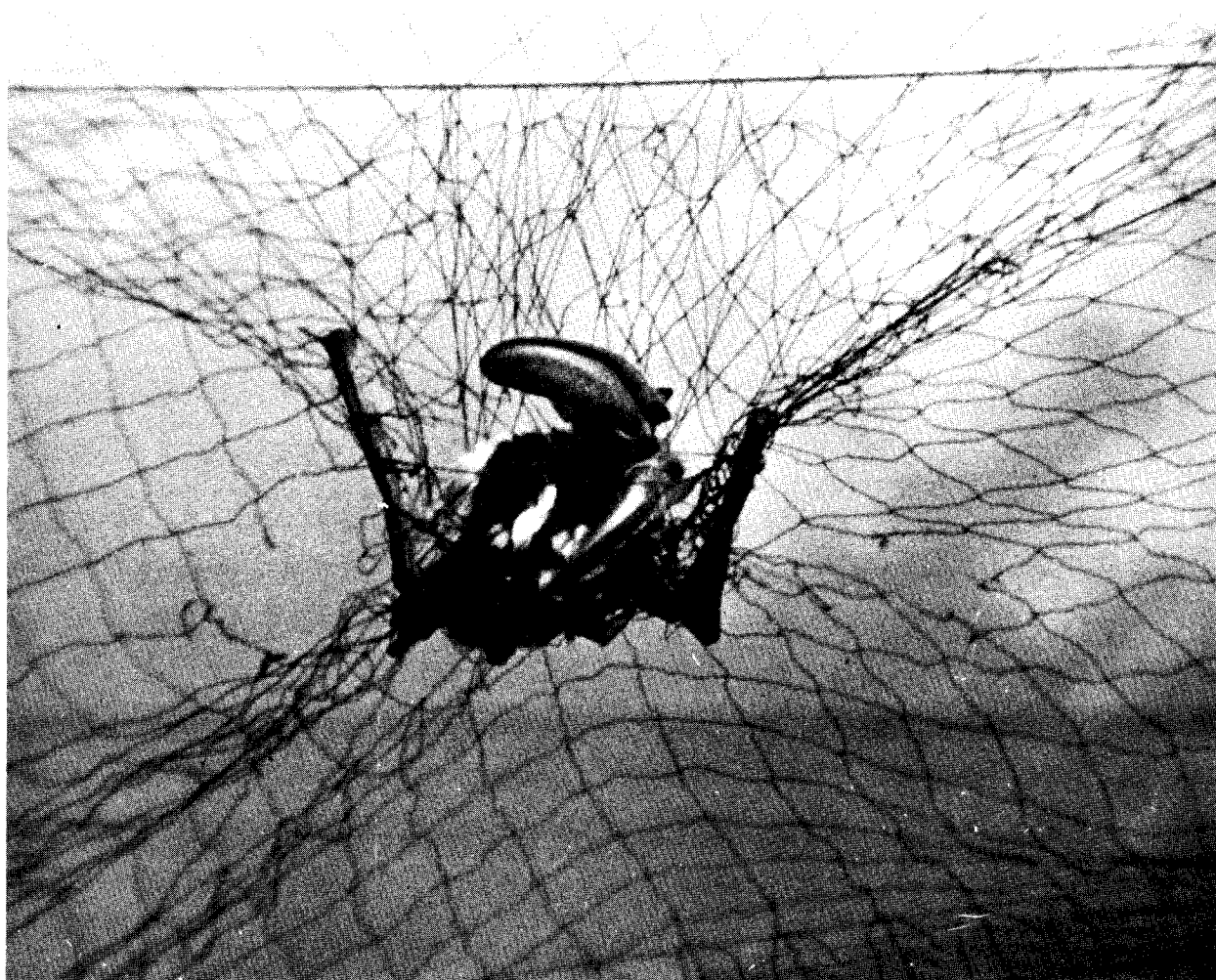


BAT RESEARCH NEWS

Vol. 7 No. 1

January, 1966



SPOTTED BAT, EUDERMA MACULATUM, IN NET

# BAT RESEARCH NEWS

Volume 7: Numbers 1–4

1966

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## THE COVER

This Euderma maculatum was netted in Garfield County, Utah in August, 1964, by David A. Easterla. He netted four that summer and several more last summer. Nets were left unattended after midnight and the spotted bats were found in the morning. Note where the bat chewed the net. Easterla took color photographs of this one and sent me a 2 x 2 slide for the cover. Roger Barbour took the slide and photographed it and enlarged it to get this picture.

Euderma is probably the rarest bat in the U. S. The first one ever captured by a collector was netted by Constantine 19 August, 1958 in northern New Mexico. The dozen or so previous records were animals taken accidentally, many in unusual situations. Since the publication of Constantine's records (SW Nat. 6:92-97, 1961), a dozen or so more Euderma have been taken in mist nets. Clyde Jones took 5 in one night in southwestern New Mexico 23 June, 1960 (J. Mamm. 43:538-539, 1961). In the latest issue of the Journal of Mammalogy both Jones and Easterla have articles on spotted bats.

## THE INDEX - 1960-1964

Thanks to Sgt. James Hedges the index to the first 5 volumes of Bat Research News is out. I mailed it to subscribers December 27. Sgt. Hedges did a magnificent job. If you did not get a copy and want one, let me know.

## HERE & THERE

Robert J. Baker is now a graduate student at the University of Arizona. He has sent us some live Tadarida femorosacca and Antrozous to photograph. We got some very nice pictures of these. He is working on the chromosomes of North American bats.

Roger Barbour and I got expense money from the University of Kentucky Research Fund to do the field work necessary to finish photographing U. S. bats this summer.

I have a letter from Paul Purdom of Paul Purdom & Co., Public Relations, Publicity and Sales Promotion, 41 Sutter St., San Francisco, Calif., 94104, who says he is engaged in publicizing in appropriate trade journals news of the Ultrasonis Translator detector for the Delcon Division of Hewlett-Packard Co. This instrument is, among other things, a bat detector.

From the Missouri Speleological Survey Liaison Vol. 5 p. 6, June, 1965: Last fall November 6, Dick Myers and students from Central Missouri State College and the University of Missouri banded 2000 bats from Rocheport Cave. The project had two purposes. They were supposed to remove the bats from the cave and turn them loose far away, hoping they wouldn't return. Cave owner Pete Christus was preparing the cave for commercialization, and he did not want any bats. Unfortunately getting rid of the winter colony doesn't get rid of the summer colony, and summer colonies are responsible for large guano deposits in caves. In addition to banding the bats they daubed them with red fluorescent paint. The bats were released near Warrensburg, in Iowa, near St. Louis, and in the boot heel of Missouri. So far very few recoveries have been made.

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Bat Research News appears quarterly: January, April, July and October. Subscription \$1.00 for 2 years. All back issues (Vol. 1-6) \$ 2.00. Single copy \$0.25. Wayne H. Davis, Dept. of Zoology, University of Kentucky, Lexington, Kentucky 40506, U. S. A.

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At last report the bats do not seem to be interfering with commercial operation of the cave. In early June there was a large maternity colony with babies about half way back in the cave. The males were said to be in a side passage.

In the last issue I missed getting the citation for the paper by Anderson & Nelson on a systematic revision of Macrotus. It is Amer. Mus. Novitates. No. 2212, March 17, 1965. Someone asked for Sydney Anderson's address. It is American Museum of Natural History, New York, N. Y. 10024.

M. M. Luckens and I got a 3 year grant from N.I.H. to work on pesticide toxicity in native mice. There is an assistantship open for someone to trap and care for the mice.

Art Greenhall says that the bat banding office expects to receive lipped-end bands especially designed for bats in January.

Several interesting items in the Australian Bat Research News, No. 4, October, 1965. John Nelson writes on hanging mist nets: A problem with mist nets is that one often needs poles to set them up, and this makes extra and inconvenient luggage for the already heavily-laden batter. My way out of this problem is to use a ball of string. I can use this more effectively, and in more diverse situations, than I can use poles. I use an ordinary ball of heavy string such as is used in older stores for tying parcels. I have found that I can throw the ball as high into the canopy as I want to place the net. I have considered using a large catapult for high rainforest trees but have not yet needed to do so. I unwind a little of the string, no more than 5 yards, and then throw the ball over or through the canopy. The ball unwinds as it falls. I then tie the top edge of one end of the net to the string and pull the net up. Before the net gets too high I tie another string to the bottom. The same is done for the other end. The net can be hauled up as high as the canopy, although it may not reach quite this height if the trees are far apart. It doesn't matter how far apart the trees are if you have lots of string. Another advantage of this method is that it can be used to hang nets over any mass of water narrow enough to throw a ball of string across. One end is supported by a tree on one side, the ball is thrown across, then over a tree on that side. The net is hauled across the water to whatever position is desired. It is an advantage to keep the strings as long as the distance from the net to the edge, as this will allow the net to be easily hauled to the bank when a bat has been snared. Long leads are also a similar advantage for nets strung from high trees. It is a good idea to take the bottom tie strings forward into the wind so that a trough is formed. Several species which tend to bounce off are caught in this way.

Elery Hamilton-Smith has constructed a modified Constantine trap using monofilament nylon thread instead of stainless steel wire. This works more effectively and appears to be a far easier unit to use in most situations than a mist net. He will prepare details of construction for the next issue of Australian Bat Research News.

Since 4 August, 1957, when the first bat was banded in Australia by Dr. G. M. Dunnet, about 35,000 have been tagged.

When I approached our Entomology Department last summer about getting insects for making glop, they told me that in addition to the bushels of insects they catch in their light traps they occasionally get bats. I asked them to let me know the next time they got one, and since then they have supplied us with half a dozen or more red bats. There is an interesting note in the latest J. Mammalogy by Nixon Wilson on catching red bats in these insect light traps

at Purdue.

Helmut Mueller says that they have techniques for mist-netting up to 20' height, and without wind up to 30'. The rig breaks down into 10' sections and is easily carried on a car-top carrier. Three experienced persons can set up a high 60' net in about 30 minutes.

Russ Mumford reports that the attempts to net bats in Florida (see last BRN) sound like his attempts to net Lasiurus at Pt. Pelee (the Ontario bird migration spot in Lake Erie) this last fall. He says he has not done much bat work lately but may do some banding this winter.

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#### CONFERENCE ON BATS AS THE OBJECT OF RESEARCH

In 1967 the Czechoslovakian mammalogists intend to organize an international conference that would reveal the present state of various investigations on bats (both Micro- and Megachiroptera). The conference would be concerned in any problems pertaining to bats (morphology, physiology, taxonomy, ecology, population dynamics, behavior, parasitology, epidemiology, etc.). The realization of the conference is conditioned on sufficient interest from the part of experts engaged in the above problems. Therefore all persons who could participate are requested to kindly submit a brief report to Dr. Jiri Gaisler, Institute of Vertebrate Zoology, Drobneho 28, Brno, Czechoslovakia. This should include: (1) Your preliminary application for membership in the Conference; (2) a preliminary announcement of the title of your paper (if any) to be read at the conference; and (3) your comments on this proposal.

Place: The Hluboka Castle, South Bohemia

Date: June, 1967

Duration: Sessions 2-3 days; excursions 1-2 days.

Excursions: (a) Visit to summer colonies of N. noctula, M. myotis, M. daubentoni, M. mystacinus, M. nattereri.

(b) Inspection of the collections of the Museum of Forestry and Gamekeeping, plus visit to the Ohrada Zoo near Hluboka

(c) Inspection of the Hluboka Castle; social evening in the Budvar Brewery at Ceske Budejovice.

Do you think any American Chiropterologists could come? I hope there will be opportunity to meet the eastern (Russian, Polish, Hungarian, Rumanian, Bulgarian and Yugoslavian) as well as western mammalogists. I spoke to colleagues in West Germany who are interested in participating. We hope to welcome Prof. M. Eisentraut and our friend Dr. A. Krzanowski. Dr. Jiri Gaisler.

#### CORRESPONDENCE

West Germany (3221 Hohenbuechen 31). I am writing an article on conservation of mammals. Do you know of any laws to protect any species of bats in the U.S.A. and other countries in the Western Hemisphere? Bats are protected by law in some European states. Gustav Kirk.

reply-. I do not know of any law protecting bats in the U.S., although I believe Texas once had such a law. Can anyone else help here?

Madison, Wisc. (212 Bacteriology Dept., U. of W.). In regard to your request for information on bat swarming, we believe we have observed this phenomenon at Eagle Cave, Wisc. The cave was recently purchased by a Milwaukee group, and was extensively revamped for handling tourists in large numbers. During this revamping the Wisconsin Grotto of the National Speleological Society was asked to map the cave. On many occasions our mapping crew



camped in the entrance room of the cave overnight. This room is large and has a steeply-sloping embankment leading into it. While camping during the past summer we frequently noticed large numbers of bats swarming about the entrance; they did not seem to enter the cave for any distance, nor did they readily fly away. We did not get a good count of these bats. We suspect they may have been Myotis. The swarming was noted continually until the weather became cool in early September. Swarming was first noticed in July, but especially in August; none was noted in May or June that we knew of. Richard J. Boyd.

England (34 Richmond Rd., Staines, Middlesex). I have been extremely interested in the papers published by yourself and W.M. Luckens in Science and Nature on the toxicity of DDT, dieldrin and endrin to bats. As someone who has been banding in the UK since 1948, I have been much concerned with the apparent decline of our bat population that is shown by our population studies. I endeavoured to see what information was available on the effect of organo-chlorides on bats - but, at that time, your paper in Science was my main bit of evidence. The Toxic Chemicals & Wildlife Section of the Monks Wood Experimental Station (Nature Conservancy) tell me that they have found DDT and its metabolites in bats they have analyzed - but they did not appear to have enough data to be able to comment on the amounts or their significance. John Hooper

Maryville, Mo. (Northwest State College). Last summer I captured some more Euderma in the West, and was planning to send you one, but they all suddenly died from the heat.

I have a student helping me band Eptesicus that are in the attic of our Biology and Administration Building. We have banded this October only 38 (about equal numbers of each sex), as apparently very few remain to hibernate in the building. Guano deposits indicate a summer colony of hundreds. In terms of location we have an ideal setup; the bats are up 2 flights of stairs from the laboratory. David A. Easteria.

Baton Rouge, La. (box 16211, LSU). We have discovered that we have a M. austroriparius from Mississippi in our collection which had been misidentified as M. grisescens. It was collected in the fall of 1952 by H. Shadowen from a cave 6 mi NW Waynesboro, Wayne Co. As you mentioned to me in Sept., we have a series of pipistrelles collected there by Shadowen on the same day. This specimen is grayer both above and below than our adult M. a. gatesi or M. a. austroriparius, but not as gray as the 7 gray phase (if that is what they are) specimens we have.

Gardner and I recently found a tree containing an estimated 100 Tadarida and 200 Nycticeius. We could only catch about 25 of the Tadarida, but 2 bore bands. They were bats I had banded 35 miles to the north. I have Tadarida at 3 more locations now. Also we have caught 4 more M. austroriparius gatesi, making a total of 6 this fall. Richard K. LaVal.

Kuala Lumpur, Malaysia (Institute for Medical Research). My bats choose Pooch presumably because of its taste. It was by far the most odoriferous of canned dog foods. I tried the more convenient partially dried pellets and patties, as well as all available brands of canned pet foods, but had to resign myself to the odor of Pooch. I always added live, paralyzed mealworms to the dog food.

The bats ate more and didn't develop deposits on their teeth, as they did with dog food alone.

I have shipped bats by mail and air express. The latter is far easier, though more expensive. Some tall talking and a special handling fee was necessary to get bats through the Davis post office. I air-expressed one parcel of live bats to Erwin Kulzer and got them there in less than 24 hours. An important point was that I maintained the bats under observation for 10-14 days before shipping them. Vespertilionids and molossids ship well - but this is not the case with many phyllostomids and rhinolophids. A wad of wet cotton supplies enough moisture for 1-2 days.

There are some excellent places for netting lasiurine bats in South Carolina. L. borealis and L. seminolus fly low along the roads in the area between Clemson and the federal fish hatchery on the S.C.-N.C. border. I hit one L. borealis with my car and watched others fly very low when I went back to pick up my prize. That cane pole trick is practiced in South Carolina. I saw young boys knock down Nycticeius and pipistrelles near Columbia.

The Lincoln Index is not very suitable for estimating bat populations. It will work if you have a large number of bats confined in a relatively small space, catch and band a hundred or so, and release them back as they are banded. After allowing the bats to settle a bit, a fast and furious collecting effort will obtain as good a sample as is possible. Anything other than an immediate release-recapture technique is too full of problems to be of any value, using the Lincoln Index. Transient populations may turn over completely in a single night, or hang around for several days. The effects of disturbance will cause most species to change to an alternate roost for a while. Phil Leitney and I found that attempts to trap an entire colony gave the most accurate results, with visual and auditory estimates added for the escaping or non-emerging portions of the population.

This country is really as full of bats as claimed by others. I have started a limited banding program, and will step things up for any species that looks promising. The great variations in the size of bats here and the difficulty in travel between roosts makes banding a bit more complicated than in California. Working with Lim Boo Liat has made adjustment to a new country and fauna quite pleasant, and saved me a lot of initial trouble in locating suitable colonies. Albert J. Beck.

Tucson, Arizona (Zool. Dept., U of A.). During the last 4 years Dr. Claud Ward at Arkansas A. & M. and I have been working on the bats of southeastern Arkansas. We have had some problems getting bats as there are no caves or rock outcroppings. Last August we had some luck netting over water and caught Lasiurus borealis, L. seminolus, L. cinereus, Pipistrellus, Eptesicus, Nycticeius, Myotis austroriparius, and that gray Myotis mentioned in BRN. We got some 300 bats in 6 nights of netting.

At present I am studying under the direction of Dr. Cockrum on the life history of Leptonycteris sanborni. We have banded nearly 3000 and plan to band several thousand more. It would be very helpful if any banded Leptonycteris found in Mexico were preserved in alcohol and mailed to us collect. Robert J. Baker.

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Fledermause in Bergwerkstollen. *Bonner Zool. Beit.* 1/2: 30-32, 1965.  
W. Egsbaek had come upon a dozen or so hibernating bats in a  
stonepile in a quarry in Denmark. At his suggestion we investigated  
similar systems. In one such we probed out 25 M. daubentonii and  
2 M. nattereri. They were found 15-60 cm deep. They were also  
found hibernating in rock piles in other quarries. A cage was  
built and filled half full of stones. Bats placed therein continued  
their hibernation among the stones. To test further, a part of  
a tunnel was enclosed to give bats choice of ceiling, walls,  
crevices or stonepile. Three species of Myotis and Plecotus  
auritus were introduced and observations carried over several days.  
Myotis moved back and forth from open walls to rock pile. Only  
the Plecotus never entered the rocks. In German, no summary.

KOWALSKI, KAZIMIERE. *Jaskinie Polskie*. Warszawa, 1965. This nice  
little booklet on the caves of Poland is written by a batman, and  
has sections on the flora and fauna as well as a section devoted  
to bats. I thank Bronislaw Woloszyn for sending it to me. He is  
credited for photographs, so I expect most of the fine pictures of  
cave animals are his. In Polish.

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BAT RESEARCH NEWS

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## THE COVER

This photo of the dead bats, probably Myotis lucifugus, entangled in a burdock (Arctium minus) was sent to me by David E. Davis. They were found in the wild in Pennsylvania and brought to

him. The dried fruit of this plant are remarkably tenacious when in contact with the membranes of a bat. I have previously mentioned the use of burdocks to catch bats (II:18). A single bur on the end of a thread is a rather efficient trap.

Ten years ago I was banding Myotis sodalis and releasing them at one of the exits to Blackball Mine in Illinois. After finishing we noticed that 8 bats had become entangled in a nearby burdock. They would surely have perished had we not noticed them. The cover photo is the only instance of a natural tragedy caused by this introduced weed that has come to my attention. Thanks to Dr. Davis for making the photo and sending me a copy.

## PESTICIDES AND BATS

Results of our insecticide studies now suggest a striking difference by season in susceptibility of bats to poisoning by the chlorinated hydrocarbons. They are very sensitive in spring, but can tolerate large doses in fall. This is likely a result of the change in metabolism. Since these pesticides are fat soluble they probably move right into the fat storage depots when taken in at the time the bat is storing fat for the winter. It is relatively non-toxic at this time even if the bat is not refrigerated.

Last fall we set up an experiment to test the effects of hibernation on toxicity of DDT. We put the bats and controls into cigar boxes which we lined with foil to retain humidity high. However we soon found that Eptesicus fuscus does not do well at saturation levels. Bats lost weight rapidly and many died. We set it up again with plain boxes, but this time our samples were too small. We had two bats which we fed 240 mg/kg and refrigerated through January. When brought out, activated and fed daily, they appeared normal for a month and a half. Then one got typical DDT poison symptoms and died. Within the next month the other followed the same pattern. Next year we need set this up again with a reasonable sample so as to show the weight loss during the active feeding period after the bats are removed from the refrigerator. They probably use most of their remaining fat during this period. Metabolism must be quite different from in autumn when fat is being deposited. Perhaps the most critical period for a bat loaded with insecticide is the first month after leaving hibernation. We need quantitative data on the distribution of pesticides within the body. Likely the amounts in the brain would be comparable in bats poisoned at any season. The amounts required to be lethal probably depend upon the rate at which the bat is utilizing or storing fat.

## QUOTE WITHOUT COMMENT

It seems the latest thing for which women are shouldering the blame is the increase in rabies in recent years.

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**Bat Research News** appears quarterly: January, April, July and October. Subscription \$1.00 for 2 years. All back issues (Vol. 1-6) \$2.00. Single copy \$0.25. Wayne H. Davis, Dept. of Zoology, University of Kentucky, Lexington, Kentucky 40506, U. S. A.

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At a conference of the Canadian Institute of Public Health, inspectors were told that when fox furs were no longer fashionable, trappers stopped hunting the animals and the fox population increased: A serious outbreak of rabies in foxes and other animals followed.

Foxes, timber wolves, and skunks are the main reservoir of rabies infection thus creating problems for health authorities. Farm animals are exposed to contact with wild animals carrying the disease, consequently humans are also unwittingly exposed to rabies.

Rabies cannot be entirely eliminated but good preventive measures can effectively control the disease. Is one of them the return of fox furs draping all feminine shoulders? - Reprinted from CDC Veterinary Public Health Notes, January 1966, p. 5-6.

#### ACCIDENTAL EXPOSURE OF INDIVIDUALS TO AIRBORNE RABIES

In Frio Cave, near Uvalde, Texas, airborne human rabies infections have occurred twice, once in 1956 and once in 1959. The Southwest Rabies Investigations Laboratory (SWRIL) of the Communicable Disease Center uses this cave for studies of bat rabies. Located on privately owned land, it is posted and fenced to keep out spelunkers, explorers, etc.

On July 28, 1965, a field investigation team from SWRIL arrived at the entrance and found a scoutmaster and 10 explorer scouts at the entrance. The scouts had not only been in the cave, but several had young bats in their possession, presumably taken from the nursery area. This is the part of the cave that has been used successfully in several recent studies to demonstrate airborne rabies transmission. The scouts were advised of the potential rabies hazard and admonished to stay away from the cave. The chief of the SWRIL notified officials of the Texas State Health Dept. of the incident; they recommended that antirabies treatment be given to all the scouts. ---

Spelunkers and others who spend much time in caves are becoming increasingly concerned about the potential rabies hazard. The two human deaths and results of animal studies in Frio Cave by the SWRIL indicate that a very real danger exists in this particular cave. While this hazard does not necessarily exist in all bat caves - no other cave explorers have died from airborne rabies - it seems wise to recommend that maximum safety precautions be taken by those exploring caves occupied by bats. Pre-exposure immunization against rabies appears indicated for individuals who may be subject to repeated exposure. - Reprinted from CDC Veterinary Public Health Notes February 1966.

#### HERE AND THERE

The CDC Zoonoses surveillance Quarterly Rabies Summary for July-September 1965 reports 1,206 laboratory confirmed rabies cases during the third quarter of 1965. Included were 894 wild animals (273 bats). Illinois had the highest total for the quarter, 294 cases. Only Hawaii and Delaware failed to report a case during the first 9 months of 1965. During the third quarter 35 states reported bat rabies; Mississippi was high with 36 cases.

More rabies was reported in the third quarter of 1965 than in

the same period of any of the previous 10 years.

TIM BERRA, Biology Dept. at Tulane is working on phototaxis in bats. He wrote to ask for a reprint of our paper on vision of Myotis sodalis. He says it is one of the very few papers he has found that even acknowledge the fact that bats can see. He finds very little in the literature on the vision of bats.

ROGER BARBOUR, M. D. HASSELL and I have completed an experiment on the need for vision in homing by bats. It should appear in the Journal of Mammalogy next month. DONALD R. GRIFFIN writes that he is doing experiments on the use of vision in homing by Phyllostomus hastatus in Trinidad. A preliminary paper of his on this subject should appear during April. Barbour and I have planned an experiment for next fall to find just how far a bat can home without the use of his eyes. Apparently they can navigate over familiar territory by memory of echolocation patterns.

S. EDWARD SULKIN supplied some information on the Texas law protecting bats. He says there is a law passed in March 1917 making it a misdemeanor to "willfully kill or in any manner injure any winged quadruped known as the common bat".

He says the law resulted almost directly from the unwarranted enthusiasm of a San Antonio physician who felt that insectivorous species could rid the country of mosquitos involved in the transmission of malaria. However, he had an ulterior motive since he had hoped that the bat roosts he had constructed would provide enough guano for a respectable financial return.

Sulkin notes that it is necessary that he obtain a permit each year to gather bats in Texas.

The new BAT BANDS are now available. They are number 2 size with small lips. I was disappointed that the bands are not open and strung on plastic tubing as were one series we got once. I was also disappointed in the quality of the workmanship. The numbers are still sloppy, and that flat topped 9, which looks like a 5 and has led to so many errors, particularly from the public who are not familiar with the thing, is still with us.

Volume III (1965) of MYOTIS, the annual newsletter for European bat workers is out. Among other things it contains summaries of winter populations (they seemed to hold up well last winter) and a key to European bats.

HAROLD B. HITCHCOCK visited Aeolus Cave three times last fall and found many of the same young bats in the entrance room each time but very few old ones. Each year many young bats winter too close the entrance in this Vermont cave and fail to survive. A bone pile accumulates beneath the cluster.

ROGER BARBOUR and I plan to spend a month or so in the field this summer trying to complete our set of color photos of the bats of the U. S. Most of the time will be spent at the AMNH station at Portal Arizona. Thanks to ROBERT J. BAKER we have been able to photograph several species during the past month. Baker has shipped them to us at Lexington. Baker plans to work with us some this summer, and we will be able to concentrate on a relatively few species. The only species we still need are: *Mormoops megalophylla*, *Macrotus waterhousei*, *Leptonycteris nivalis*, *L. sanborni*, *Myotis yumanensis*, *M. occultus*, *M. evotis*, *M. thysanodes*, *M. californicus*, *Lasiurus ega*, *L. intermedius*, *Euderma maculata*, *Tadarida molossa*, *sumops perotis*, *E. underwoodi*, and *E. glaucinus*.



## CORRESPONDENCE

FT. SAM HOUSTON, TEX. In December I went to Tobacco Port Cave in Stewart Co., Tenn. to band bats with David Snyder and Don Harker. We banded 845 and recaptured 428 we had banded about this time last winter. Most were in good condition but a few had part of the band obscured by overgrown membrane. Bats banded included M. grisescens 351 males, 213 females; M. sodalis 38 males, 26 females; M. lucifugus 145 males, 55 females; E. fuscus 8 males, 2 females; M. keenii 1 female; and P. subflavus 6 males. I think we banded a lot more than this last year. There seems to be a lot of traffic in the cave which will have a definite effect upon the population. James R. Heltsley.

HIGGINSVILLE, MO. I have been studying Lasiurus borealis and hope to band some this summer. I live in the country not far from a large truck stop at the jct of I-70 and highway 13. Last year I spent several nights there collecting L. borealis. About two hours after dark we would turn on the floodlights at the corners of a building and within a few minutes the bats would appear from all directions. I have seen 10-20 at one time. When we would turn off the lights most bats would disappear within a few minutes. This could be repeated several times during the night. Wilbur Guhier.

MONTMORENCY, VICTORIA, AUSTRALIA. I am considering compiling a world list of bat workers. A group of persons, e. g., yourself, Krzanowski, Hanak, Cranbrook, etc., from various parts of the world might each be willing to get details on local workers. I would be willing to do the job of putting it together. The question is payment for publication. I doubt if I could get it done here. Perhaps Hanak's forthcoming symposium could discuss the idea.

Have just returned from leading a 10 man team to New Hebrides and New Calédonia - emphasis on cave biology. We returned with a mountain of specimens, miles of cave survey, geological data, etc. Most worth while bat was Notopterus. As you may know, this peculiar little animal has been very little studied and even specimens are a rarity. We were lucky enough to encounter a couple of large colonies. Brought back a good series of specimens and a lot of general information, including details on orientation which has always been a puzzle. But we have no idea why the thing has a tail. Plan to dissect a few and look for a clue on the reasons for development of a long tail. John Nelson and I will publish on this soon.

I am working with several series of New Guinea bats sent in for identification by various friends there and am also working on about 50 skulls one of our museums sent in- all from cave breccias. I am also working on setting up sets of thermometers and ultrasonic detectors in various parts of a cave here, with all instruments feeding data onto a series of recording charts on the surface to get a year round picture of cave temperatures, bat populations and movements. Elery Hamilton-Smith.

BATON ROUGE, LA. I hope to spend the coming summer working on Myotis austroriparius gatesi. The total specimens of this species from La. and Miss. now is 29, of which 7 are totally gray. All but 13 show some gray. There are now specimens from every month

except April, May, and June. I believe some of Glass' Oklahoma specimens are from that period.

During 1965 I banded my first bats, about 694 Tadarida, 107 Nycticeius, and 3 Plecotus. Workers at Tulane banded 100 Plecotus and a number of pipistrelles. Two Tadarida and 2 Nycticeius were recovered at distant sites.

In the January BRN Albert J. Beck pointed out that the Lincoln index is not suitable for estimating bat populations. I have found it useful for Tadarida colonies. Normally only a portion can be counted at any one time, the rest being inaccessible. Banding and periodic recounting of banded and unbanded individuals indicated the colonies are sedentary, making possible the application of the Lincoln index. In one case we found only about 1000 of 6000 bats in a colony were in the open at any one time. I think a similar method would work when applied to an entirely inaccessible but sedentary colony at which emerging bats could be trapped or netted for counting and banding. Richard K. LaVal.

RICHMOND, IND. Congratulations to James Hedges for the index to BRN. I was glad to see there are plans for another one in 1970.

Some students and I were in Jamaica for an independent study project over Christmas vacation and found some bat colonies. We spent 3 days at Newcastle, 20 mi N of Kingston, at about 3800 feet elevation, and 14 days on the east coast near Hector's River. We found the first colony near Newcastle. The bats were heard squeaking about 4:30 PM at a limestone ledge which formed one edge of a roadway. About 8 feet above the ground was a crack about 2 inches wide and 6 feet long. With flashlight we could see about 25 bats ready to fly. Being so close to the equator, we had only a short period of twilight, with darkness at about 6:30 PM, so we put a mist net on 2 bamboo poles and placed it over the crack as soon as possible. Bats started out about 5:45, and we counted 250. We removed the net after 36 were caught, and collected 4 of each sex. They are Tadarida brasiliensis murina Gray. We later found the same species living in 2 buildings at a school near Hector's River. We collected 3 females as they emerged from between the layers of roofing at 6PM. Gertrude L. Ward.

#### BATS BANDED BY U OF KY PEOPLE DURING 1965

<i>Myotis lucifugus</i>	251	<i>Eptesicus fuscus</i>	41
<i>M. keenii</i>	5	<i>Plecotus rafinesquii</i>	105
<i>M. grisescens</i>	2	<i>P. townsendii</i>	1
<i>M. sodalis</i>	3983	<i>Lasiurus borealis</i>	11
<i>Pipistrellus subflavus</i>	359		

#### LITERATURE

I try to list all bat literature which I get except that in the Journal of Mammalogy. I assume all who are interested in bats take this journal. I shall give an address for an author if it is available to me and if he is not a subscriber to BRN and whose address is not given in the January issue. So much literature is coming in that I shall try to comment on only a few papers.

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BAT RESEARCH NEWS

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## THE COVER

Male red bat (Lasiurus borealis), showing position taken as temperature is lowered to freezing and below. This is a most efficient position for retarding heat loss.

Note that the furred interfemoral membrane functions as a blanket. The feet are furred to the toes, there is fur between the metacarpals near the wrist, and the only unfurred surfaces exposed are the wrists and the short rounded ears. The animal's body approaches the shape of a sphere. As ambient temperatures fall below 0°C the bat does not arouse, but regulates its temperature at a level slightly above ambient by increasing its heart rate and breathing rate (see Thermoregulation in bats exposed to low ambient temperatures by O. B. Reite & W. H. Davis, Proc. Soc. Exptl. Biol. & Med. 121: 1212-1215, 1966). Because of its special adaptations of anatomy and behavior the red bat is a more efficient regulator than other species studied. It has to be since it winters in regions where it is commonly exposed to low temperatures (see Winter range of the red bat, Lasiurus borealis, by W. H. Davis & W. Z. Lidicker, Jr., J. Mammal., 37: 280-281, 1956). A report on the behavior of several species of bats and its ecological significance is to be published soon.

The cover photo was made by Roger W. Barbour.

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## AN INTERESTING RECOVERY

Bat number 652-79032 male, which M. D. Hassell and I banded at Short Cave, Park City, Ky., 26 August, 1964, was reported as found dead on 7 June, 1966, by Larry Oberle, Supt., Producers Grain Corp., Plainview, Texas, in the yard of the grain corp. I am now checking into the possibility that it may have been imported on a train or truck. Until I have checked into this I do not want to name the species. However, it is one that we would expect to make a long journey.

I wonder about the possibility that a digit may have been misread (the numbers stamped on bands in the U. S. are so sloppy!) and that the bat may have been banded by someone at Texas Tech. Plainview is a few miles from Lubbock in the northern panhandle.

## ARIZONA EXPEDITION

On 1 June, 1966, Roger W. Barbour, James Barbour, James Hardin and I took off for the West to photograph bats and to go to the meetings of the American Society of Mammalogists in Long Beach. The trip was an excellent success. With the help of Robert Baker, Russell Davis and E. L. Cockrum at the University of Arizona we were able to get and photograph every western species except Euderma maculatum.

We arrived at the Southwestern Research Station at Portal Arizona late in the afternoon of June 4. That evening we put <sup>net</sup> across the swimming pool, which has been made a famous collecting locality by the work of Cockrum and his students in recent years. The first bat we caught was Lasiurus ega, a species that had never before been reported from the Chiricahua Mountains. We never got

another although an individual of this species was in the net momentarily one night at South Fork Cave Creek. We lost one the same way at John Hands Pond on Cave Creek one night. Apparently the species has moved into the area recently since the intensive netting programs of Commissaris and others a few years ago.

The bat that gave us most difficulty was Mormoops megalophylla. There are only two records for Arizona. Cockrum and Baker suggested that the best place to get one was in Sonora. Baker said that if the cave at Carbo didn't harbor any we could go on to a mine near Alamos where they can be netted at night. The cave at Carbo is the most isolated collecting locality I have ever visited; fortunately Baker volunteered to lead the way. When Vincent Roth, Director of the SW Research Station, heard where we were going he decided to go along, as he wanted to search these caves for spiders. At 2:00 AM the 4 of us got into Barbour's truck and went to Tucson; there we met Baker and headed south. We were delayed a couple of hours at the border trying to prove to the Mexicans that Barbour really owned the truck and that it was not stolen. The primitive state of Kentucky doesn't have an auto title law - but try to get someone to believe that story.

After many miles of dirt road and a hike across the hot desert we arrived at the cave. We made 4 quick sallies into the cave (the ammonia is so concentrated that one cannot stay in there long). We saw several hundred thousand Tadarida brasiliensis, several thousand Leptonycteris sanborni and smaller groups of Natalus mexicanus, Pteronotus davyi, and Macrotus waterhousei, but no Mormoops. We got back to the car in early afternoon and started the 450 mile trip to Alamos in southern Sonora. Baker planned to go continuously until we got our bat and return to Tucson, but we old men got too tired and had to get a motel at Guymas. Next morning we drove into Alamos and visited some mines. Several species of bats but no Mormoops. We then went into the village of Alamos, checked the hotels by the plaza to find a room where we could photograph Mormoops (the bat is extremely fragile, and it was said we could not expect to get it back to the states alive) finding none suitable, looked at some Tadarida colonies in the buildings around the plaza, and had a nice lunch at Ramons. Then while walking across the plaza we heard bats squeaking from two of the palms. Baker got a net on the end of a long pole and captured some. I did not recognize them, but he spotted them at once as Myotis fortidens, a species that has never been reported from Sonora although it is widespread in that state. We were especially glad to get photographs of it because this species will surely turn up in the U. S. soon.

That night we divided the party to net two stations: the Rio Cuchijaqui and Mina Aduana. We netted 20 species including several not yet reported from Sonora. At the mine Baker suggested we block off the passage to prevent the large numbers of Natalus and Glossophaga which inhabit the mine from getting into our nets. We then put two snort nets over the pool in the entrance of the mine and were soon catching quite a variety of interesting bats. An hour and a half of good netting went by with no Mormoops. Then at 9:30 one entered the mine, struck the bottom tier of the net, and fell into the water. I pounced on him just as he was rising from the surface and forced him into the net.

We were afraid that our bat might die before we could get to where we could photograph it, so we hoped to catch a couple more.

However, after another half hour went by and we saw no more Mormoops, we closed up and left. At midnight we found a motel room in Navajoa. We spent two hours there getting pictures and at 2:00 AM left for Tucson. Crazy gringos.

At the border we were delayed again because Baker had the wrong import permit. It was outdated. Fortunately the border officials had a copy of Cockrum's current permit, and they let us bring in our bats.

Not only did we get our Mormoops back to Tucson alive, but we took him back to Portal and kept him alive another night. I think the secret to transporting bats out there is to wet down the bag frequently enough. I cared for the bats continuously and wet the bags every 15 minutes. It is remarkable how fast a bat can dehydrate in the desert.

Eumops underwoodi is a bat that you don't see every day. It is known from only one locality in the U. S., a tank at Sasabe, Arizona, a few miles from the Mexican border. The Southwest Rabies Investigation Station at Las Cruces, N. M., has a pet E. underwoodi which we intended to photograph, so we were not planning a trip to Sasabe. However, Baker and Glass went down there one day, put up some nets and caught 20 adult E. underwoodi. They quit at midnight. Baker called me from Tucson next day and I went over and picked up a couple of these great beasts. Like most molossids they were very cooperative about getting their pictures taken.

Eumops perotis proved to be a difficult bat for us to get. Since we did not know of any place in Arizona where one could be caught easily, we planned to get one in California. When I talked to Luther Little at the meetings, however, I learned that all the colonies he had known in buildings in southern California had been destroyed. We talked to several other local people and found no one who knew where one could be obtained now. The only colony mentioned was the one Krutzsch found in a crevice on a high cliff in San Diego County, and no one knew if it was still active. Roy Johnson told us about the ones he has reported on at Tonto National Monument in Arizona. We stopped there and spent the night under the cliff with a net up but did not see or hear Eumops. We next decided to try Cockrum's locality on Eagle Creek. Here the bats are in a crack in the top of a rock shelter 50 feet above the ground. Since they are said to drop 10 feet in launching themselves into flight, we figured we should get the nets up 40' to catch them. We bought 20 lengths of conduit and Barbour set out to build a bat pole. He made two poles each of which would go up 28'. When we tried them longer they bend.

The rock shelter was about 60' across, just right for our 60' nets. One could climb the cliff on both sides far enough easily to get the nets up to 40'. We put 2 nets together to make a wider surface and set it up. It was very successful. I believe we could have caught nearly every bat. Soon after dusk we had caught 3, so we folded our nets and headed back for the station.

We kept the Eumops perotis through the next night when we went out to net a pipistrel so we could get pictures of our largest and our smallest bats. Then late the following afternoon we banded and released two. We took them one at a time and put them on the ground in the open. The first one tried 6-8 times to launch himself, all the while walking toward a large oak tree 100' away.



He reached the tree and climbed it. The second bat was released in the same spot as the first. It at once came to me and climbed my trouser leg. I put it back on the ground and it started at once for someone else's leg. When he moved away, it started for someone else. After we all moved away it headed straight for the oak tree. I caught it just before it reached the tree. I threw it into the air and it flew. It made a wide half-circle and lit in the foliage of a tree. Perhaps if these bats had not been in captivity without eating for 2 days they would have been able to launch themselves from the ground.

We had an interesting time getting Macrotus. Russ Davis told us that there were some in the old Mormon Church in Eden. We visited the attic of this church one day. I was amazed that these bats could survive in such a hot dry place. They are mine and cave dwellers. It was apparent that the church is used primarily as a night roost (by the bats anyway), and night netting might turn up some interesting traffic. We found several skeletons among the midden pile and moth wings, including a Tadarida femorosacca. There were two live Macrotus in the attic, and Jim Hardin and I spent an uncomfortable  $\frac{1}{2}$  hour chasing them.

We then went to the famous bridge at Glenbar to get Myotis yumanensis. There were several thousand bats there including hundreds of Myotis velifer. People at a store near Glenbar, where we inquired about the bridge told us about a shallow cave in a peculiar badlands-like formation that emerged from the flat desert just about a mile across the highway. They said bats swarmed out of it in the evening and that many sacks of guano had been removed.

We expected Leptonycteris nivalis to be about the most difficult species to get. In the U. S. it is known only from a cave on Emory Peak in Big Bend National Park, Texas, and the few known summer colonies in Mexico are remote. It and the spotted bat were the last species we needed in the West, and we thought it might be harder to get the Leptonycteris than the Euderma. We had tried for the latter twice at Clyde Jones's locality, and we decided that rather than try again we would go to Big Bend and then on home. We left at 3:00 AM in order to get to the Park before it closed, so that we could get permits to try to catch our bat. If the cave were easily accessible we might get to it before dark. When we got to park headquarters we learned that the cave was a long way up the mountain via horse trail and was not easily located. If we went up we could not get back before dark and might not even find the cave. We decided to net the closest known water hole to the cave. When we asked the naturalist and superintendent where there was a water hole they thought a while. First they said the Rio Grande, which is about 15 miles away. Then they thought of the sewage settling ponds below the campground which is just beneath Emory Peak. So we visited the sewage ponds. They were much too large to put a net across. We put a 60' net across one end and waited for dusk. Western pipistrels appeared in large numbers. If one could see in all directions at once he could probably count them in the dozens. Next to appear were the male Tadarida brasiliensis of which we caught 25. Then came the antrozous; we caught 22 of these. Two Leptonycteris nivalis and a very pale Myotis subulatus completed the catch. We closed up the net at 10:00. If we had known we could get our Leptonycteris so easily we would have tried again for Euderma.

Our first venture into the Euderma country was on June 9. Main purpose of this trip was to locate the tank, find how far we were from groceries and gasoline, etc., so that we could make plans for an extended visit later. We stopped at Silver City on the way up and fortunately found Bruce Hayward in town; we would have probably not have found the tank without his directions. Bruce told us that it was too early in the season to get Euderma up there. One might expect it to be too early for any bats up there; at 8400' it gets extremely cold at night in early June. But several species don't seem to mind. Baker had been up a month earlier and had caught over 100 bats, mostly transients such as Lasiurus cinereus and Lasionycteris. We spent two nights, caught few bats, and did not see or hear Euderma. On June 25 we returned and met Baker there. We were prepared to spend a week if necessary. The weather had been perfect. It had been dry for so long that the bats would have to concentrate at the waterholes. The date Jones caught his 5 Euderma was 23 June. We really expected to get one. Then at 1:30PM the Forest Service started seeding the clouds. Planes went back and forth through the clouds for half an hour, and half an hour after they quit it started to rain. It rained very hard for two hours. Bats would not even need come to the pond to drink tonight. We put up nets anyway. Baker put his 100' x 20' net and 8 others over the tank, and we stretched several over the trout ponds at Willow Creek Ranch. After the rain it got cold and windy. Very little bat activity that night. Baker said that if it rained the next day we might as well give up.

The Euderma pond is on a flat mountain top in pure ponderosa pine. Next day we went exploring looking for similar places to net. Adam Hogue Lake looked good, but was too large to net effectively. Inquiry turned up Iron Mesa Lake up a trail from Willow Creek. Description sounded good so we went up to check it. It is  $1\frac{1}{2}$  mi. by trail from the ranger station on Willow Creek. It looked so good that we decided to net it. At 1:00 Jim Hardin and I started putting up nets. It was a beautiful day. Then at 1:30 the airplanes appeared and started seeding the clouds. I would have shot them down if I could. by 3:00 it was raining hard. At bat emergence time there was a steady rain, but bats appeared in good numbers. We started catching lots of Myotis: volans, evotis, occultus and a thysanodes. Then at 9:00 the Plecotus phyllotis began to appear. They got more numerous as the night went on. They could be heard clearly. They make loud sounds that reminded me of a flying squirrel. The sounds are evenly spaced at about a second apart. They sound similar to Tadarida molossa except the latter changes the frequency during a series of cheeps so that they become much closer together at the end. We quit tending nets before midnight but left them up. Next morning there were 15 bats in the nets, including 6 P. phyllotis, more than any other species.

If we do not get a Euderma before next summer we plan to return to the West and have another try at it.

We saved specimens of up to 4 of each species taken and all of the 9 Myotis occultus taken. All other bats captured during the summer were banded and released, except those taken in Mexico. The latter were released unbanded unless wanted for specimens. Bats banded during the summer in Arizona, New Mexico and Texas included:

<i>Lasiurus cinereus</i>	201	<i>Lasionycteris noctivagans</i>	19
<i>Myotis volans</i>	131	<i>Plecotus phyllotis</i>	11
<i>Eptesicus fuscus</i>	94	<i>Plecotus townsendii</i>	5
<i>Tadarida brasiliensis</i>	36	<i>Lasiurus borealis</i>	5
<i>Myotis keenii</i>	29	<i>Myotis evotis</i>	4
<i>M. thysanodes</i>	22	<i>Eumops perotis</i>	2
<i>M. californicus</i>	20	<i>Choeronycteris mexicana</i>	1
<i>Antrozous pallidus</i>	27		
<i>Pipistrellus hesperus</i>	25	Total	632

## HERE &amp; THERE

DR. ROBERT E. LEWIS, American University, Beirut, Lebanon, is working on a taxonomic study of the fleas of the United States. He would very much like to obtain material from bats. Fleas are easily preserved in 70% alcohol. Anyone interested in collecting fleas for Dr. Lewis should write him. He will send you vials and preservative.

DR. MILTON WILSON, Bernice P. Bishop Museum, Honolulu, Hawaii, is interested in obtaining specimens of ectoparasites from bats.

LUTHER LITTLE writes to correct a statement made to me several years ago that he and A. B. Howell were the first to band bats. Arthur A. Allen's 4 pipistrels banded in 1916 were the first; Lu got started in June 1923. Donald Griffin and Charles Mohr began banding in 1932.

DICK LAYL was busy with school work this spring but one night during spring vacation netted, among other things, 2 *Lasiurus internaeus* and 2 *Myotis austroriparius*. He says yellow bats are rather common. There is a new parking lot at LSU where they can be seen flying about the lights every night.

C. STANLEY ROUK at Oklahoma State University is working on the histology of bat stomachs and wants to know if others are working in this field.

DR. ROBERT S. TESH, Dept. of Pediatrics, Tulane Medical School, is surveying pathogens in bats in the southeastern states. He wants to capture 40-50 bats from each of 20-25 localities and culture for microorganisms pathogenic to man.

DR. RICHARD MILLS reports that populations of bats in the more popular Missouri caves continue to decline or have disappeared, but in one very remote cave where he bands each year the population of *M. sodalis* was up 750 from last years estimate of 5000. And Inca Cave which the bats had left since 1958 has been closed by the owner to all spelunkers, and the *M. sodalis* have come back in numbers, including some old banded ones.

DR. ADAM KRZEMOWSKI asks that I mention that he wants to contact someone who is interested in helping him introduce *Lasiurus* into Europe. His address is Polish Academy of Science, Institute of Systematic Zoology, Slawcowska 17, Krakow, Poland.

DAVID A. EASTERLA, Northwest Missouri State College, Maryville, wants to try radios on *Euderma* to find where they roost by day. I suggest he contact Griffin, who has been having considerable success with radios on bats in Trinidad.

The CDC Zoonoses surveillance for May 1966 is the annual rabies summary for 1965. Paragraphs of interest include:

More rabid bats were reported in 1965 than in any other year since the first case was diagnosed in a bat in the U. S. in 1953.

Of the 484 rabid bats in 1965, California reported 71, the largest number of any state. Forty-two states reported bat rabies, the most widely distributed type of animal rabies in the U. S. during 1965. Idaho, Massachusetts, Mississippi, New Jersey and Washington reported rabies in bats only- each for the second consecutive year. No "spill over" from bats to other species has been observed in any of these states.

"Regional programs for controlling fox rabies in Appalachia and New England should be considered in the near future. Similar efforts would be desirable in the Ohio Valley and Midwest to control skunk rabies.

"At the present procedures to control rabies in wildlife involve the reduction of selected wildlife populations at risk. The federal agency responsible for controlling rabies in wildlife is the Fish & Wildlife Service, Department of the Interior. State game and fish commissions are also charged with this responsibility. Unfortunately, the cost of operating a sizable population-reduction program almost precludes such a practice in a large area. In recent years New York, Virginia, and Tennessee have conducted fox-population reduction programs. The cost over a five-year period in New York was estimated at \$26 per fox. Virginia's cost per fox was considerably lower, but estimates ran as high as \$207 per fox trapped in Tennessee."

#### BAT INVASION OF SOUTHWEST CITY AREA BRINGS FEAR TO PARENTS

The above is a headline in the Bakersfield Californian for June 6, 1966. It was brought to my attention by Cockrum, and Baker gave me a copy of the story. It reads as follows:

A new invasion has hit Kern County - bats. From the Stockdale area where they have been reported rampant to the Civic Center where one was captured Friday morning to the mountain sections of Greenhorn the bats are numerous and potentially dangerous.

The bat captured in the Civic Center was flopping around and seemed ill, Dr. Owen Kearns, county health officer, said, and the night-flying creature, caught in daylight, is being diagnosed to determine if it carried rabies.

More serious than this lone invader are the families of bats making life uneasy for residents in the Stockdale area near McDonald Way. Mrs. Jim Easter, 216 Curran Street, said the bats have made it impossible to sit outdoors on warm evenings and have driven them out of their swimming pool. The bats swoop down to drink the water from the pool, she said.

"They have wings 12 to 18 inches across in flight", Mrs. Easter said. "We are scared to death their saliva will contaminate our pool with rabies. We understand saliva is one way rabies is transmitted.

"We can't go out in the evening and sit in the yard."

"They come out about dusk when it is warm. When it is cool like the past weekend we don't see them.

"We have complained to the health department but we can't get anybody to do anything about them."

Not so, said Dr. Kearns, "we sent a man out and he spent the whole evening trying to trace where the bats came from but was unsuccessful. We thought the bats were coming from an unused barn, but a search failed to turn up any bats."

Mrs. Easter's theory is they hibernate in hollow trees in the Stockdale area.

Dr. Kearns said: "There are many bats in the county at this time, because they are making their annual northward migration, presumably from Mexico, according to information given us by the State Department of Public Health.

"Since these bats are the species which carry rabies, it is only natural many of them are infected and should be avoided entirely by people.

"Since neither the local health department nor the state health department is equipped or authorized to carry on a bat eradication program, there is little health authorities can do to keep these warm blooded mammals from becoming nuisances to some residents of the county. Of course, if the problem becomes much more serious remedial steps would be taken."

"Said Mrs. Easter, It is a serious problem now, and for the past four years the bats have been getting more numerous. In fact one swooped down and knocked the hat off my son while he was walking along the sidewalk in the next block."

Mrs. Robert Koch, 3912 Marina Street who said she has lived in the neighborhood 11½ years, said the bats have been increasing in number every year.

"The first bats we saw were the small species and there weren't many until about three years ago.

"These bats are so large and swoop so low they terrify the children, and the health officer has told us it is a species that carries rabies.

"The children cannot play out after dusk and all last summer we had to call them into the house. It seems a shame with vacation now that they can't play outdoors after dark.

"We parents have warned the children not to pick up any bat and to keep away from them.

"We would like to find some way to eradicate them but we haven't had much help up to now."

Dr. Kearns said "Undoubtedly some of the bats are migrating. He said it is difficult to track them down.

His advice to householders is "not to keep any doors, windows or other unscreened entrances open for bats to make an unwelcome entrance into your home, especially the attic.

"Don't leave any food outside which would invite bats for a meal.

"If there are bats on your property kill them or otherwise chase them away (He didn't say how).

"Don't try to capture or handle them, especially if they are sick or dead.

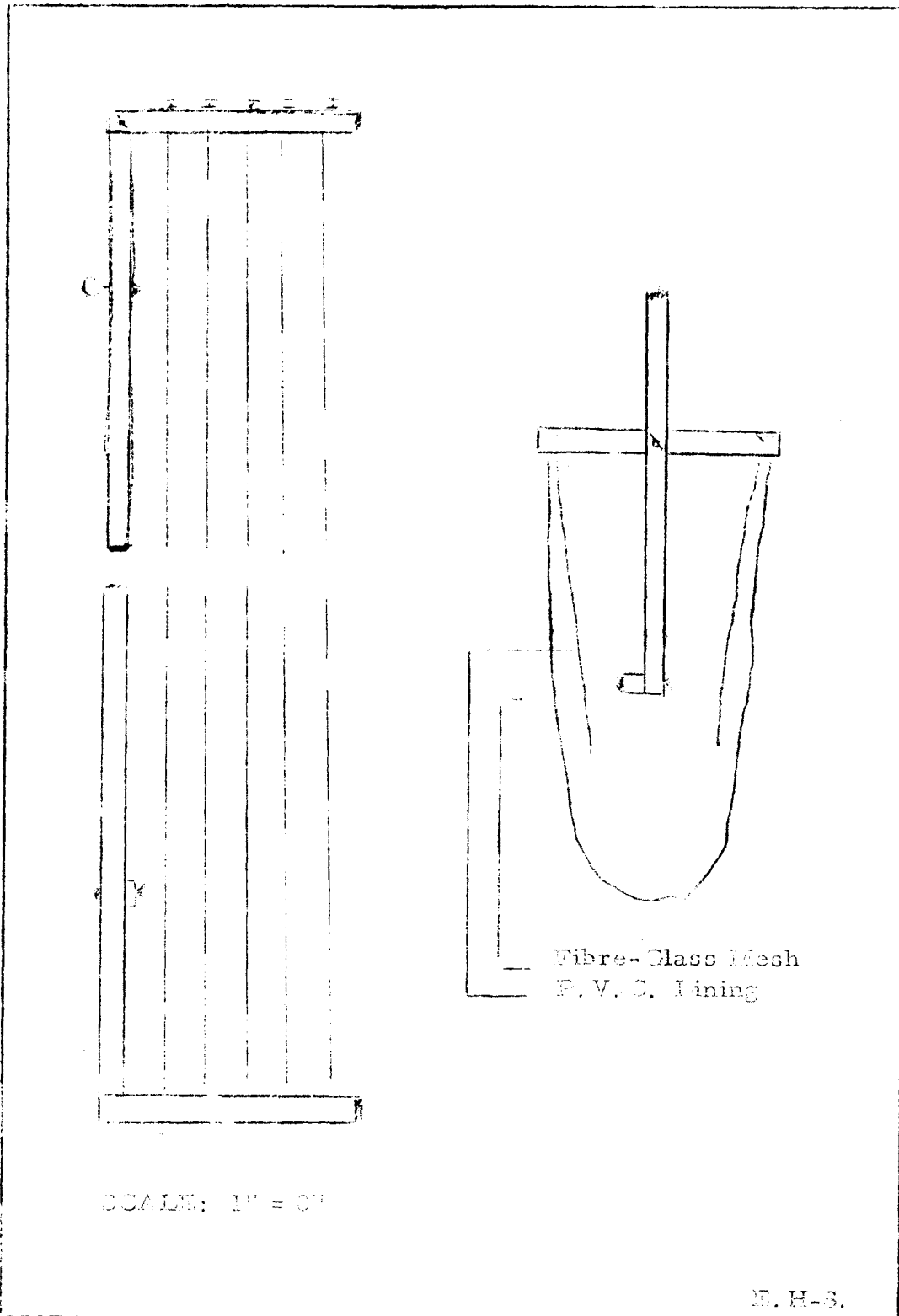
"Telephone the Kern County Health Department, 325-5051, and we will send someone to pick up dead or sick ones for laboratory examination."

Mountain folk in the Greenhorn district report bats nest in the eaves of their cabins and fly around at night, but they seem to be a small variety.

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## TECHNIQUES &amp; EQUIPMENT

Portable Constantine Trap. I have recently built such a trap using monofilament nylon; this has been used with considerable success both here and during a recent trip to New Caledonia.



For those not familiar with the original (see Constantine 1958, J. Wildl. Mgmt. 22: 17-22), the principle of the trap is to set up a series of wires sufficiently fine to be undetected by the bat's echo-location mechanism and all running vertically. The bats strike these while in flight and slide down to a cage below. Constantine used stainless steel wire tensioned by coil springs.

In my own trap, the frame consists of four 6-foot lengths of 1-in. square section aluminum tube. These are drilled at the ends and held together by  $\frac{1}{4}$  in. bolts with wing nuts. Each horizontal member has a  $\frac{3}{16}$  in. bolt inserted every two inches with a second nut just below the head of the bolt. These provide the points on which the nylon is strung. Each vertical member has an eye-bolt some 9 in. from the top, which is used to suspend the trap when in use. One foot from the lower end, a cross-bar consisting of a foot of 1-in. x  $\frac{1}{2}$ -in. aluminum strip is fixed with a bolt and wing nut, and is used to suspend the catching cage. This cage is supported on two 6-ft. lengths of  $\frac{3}{8}$ -in. aluminum rod and is made from fibreglass mesh lined with PVC sheeting in the upper section. The diagram may help in understanding the above description.

In use, the frame is assembled and hung in place (or a little below for ease of stringing) and then strung with a continuous length of 4-lb breaking strain nylon fishing line. The natural tension of the nylon is sufficient if strung tightly. The catching cage is then placed upon its supports and the completed trap lifted into the desired position.

I have found this extremely valuable as an aid to banding in caves. It catches a far better random sample than is possible with hand netting, but does not take the time and trouble involved in removing animals from mist nets. Of the hundreds of bats caught so far, none has shown any sign of injury. One matter requiring further experiment is the size of nylon used. I find the 4-lb line quite adequate with Miniopterus schreibersii and smaller bats. If working with larger bats, a stronger line might prove necessary; it would be useful to know how far one can go before the line reaches a diameter which can be detected. ---Reprinted from Australian Bat Research News Number 5, March 1966, p. 2-3, by Elery Hamilton-Smith. -----

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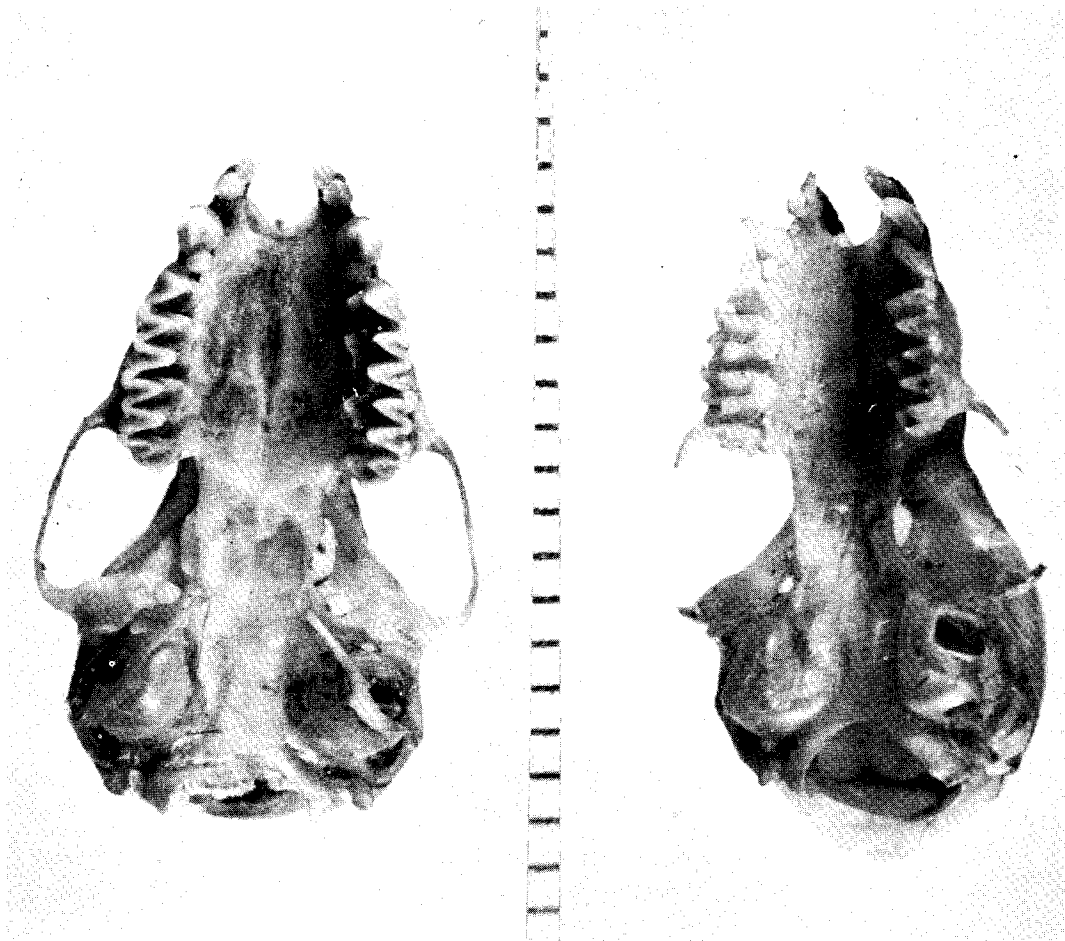
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BAT RESEACH NEWS

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## THE COVER

The skull on the left is from a Myotis occultus we netted last summer at Clyde Jones' Euderna pond in the ponderosas high in the mountains of Catron Co, New Mexico. The skull on the right is one of the most famous specimens of Myotis ever taken in the U. S. It was taken at Ft. Hancock, Texas, June 24, 1893, by Edgar A. Mearns. Collector's original no. 2362, it is now U. S. National Museum no. 36121/21083, skin and skull. Measurements on the original label are: length 88, tail 38, ear 12 and alar expanse 253. This specimen has been examined by many Chiropteran taxonomists over the years, and various opinions as to its identity have been expressed. It forms the basis for the inclusion of western Texas within the range of M. lucifugus in several published works.

A look at the skull and it is obvious why the identity of this bat is troublesome. Gene Frum once told me that the thing is such a freak that one should not attempt to name it. It is the most unusual bat skull I have ever seen. Note the large third premolar projecting anteriorly and the wierd formation on its anteriormost border. Note also the ragged projections on the lateral margins of the molars.

Last summer when we went through Ft. Hancock we thought we would stop and check the bridges for M. fortidens, which can live in the most desolate of deserts. When we saw the place we marveled not so much that a bat once could have lived there, but that Mearns could have lived long enough there to have got it out.

I think the bat is probably M. occultus. The photos are by Roger W. Barbour. The scale is in mm.

Interesting photos for future issues of the News would be welcome. I have prevailed upon Roger Barbour for nearly all the cover photos.

## THAT RECOVERY

Last time I mentioned the recovery of a bat we banded at Park City, Ky., being reported from Plainview Texas. I have now received a reply to my questions to the finder. He reports that it most likely was imported by truck, but that nearly all their trucking is from coastal Texas and from California. The bat was a male Lasiurus borealis.

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Bat Research News appears quarterly: January, April, July and October. Subscription \$1.00 for 2 years. Back issues (Vol. 1-7) \$ 2.00. Single copy .25. Wayne H. Davis, Dept. of Zoology, University of Kentucky, Lexington, Ky., 40506, U. S. A.

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#### THE NEW BAT BANDS

We banders asked for a lipped band to prevent injury. So the new bat band is lipped, but to make the lip they had to use a soft alloy. The result is that the band we asked for is too soft to be used on bats. The banding office would like to supply the type of bands we need, so let's try again. Harold Hitchcock, who has probably worked more on the band problems than anyone else, is collecting opinions from banders as to what is needed. Likely we would not all agree as to the best type of band, but we would surely all agree on some of the most important things. The numbers should be clearly legible, and the edges of the band should be rounded, not cut sharp. If you have any comments on the problem, write to Dr. Hitchcock.

#### CORRESPONDENCE

FAYETTEVILLE, ARK. I am contemplating starting some research dealing with cardiovascular performance and various blood parameters in bats in which I would plan to maintain bats for extended periods in the laboratory in both active and hibernating states. Since I have never kept bats for any great length of time in the laboratory, I thought that perhaps you might be willing to pass along a few tips. I am particularly concerned with the water balance problem because of their high humidity requirements. Active bats will replace water by drinking, but I expect body water loss during hibernation can become critical unless high humidities can be maintained. Environmental chamber set-ups for maintaining controlled high humidity can be quite expensive, and I am wondering if you have been able to circumvent this problem in any way. I suppose different species vary considerably in their humidity tolerance also. In the past I have noted that hibernating pipistrelles tend to select areas in caves where the humidity is almost 100% and quite often are beaded with condensate from the surrounding air. The hardier species, such as Eptesicus, I am sure will also tolerate lower humidities. John A. Sealander.

Reply: I have had success keeping bats refrigerated in a cigar box with a dish of water - a method I learned from Gene Frum years ago. Put up to 8-10 bats to a box and close it fairly tightly with a rubber band or stack the boxes with a heavy object on the top one. The bats will not smother. After an hour or so to settle the bats are ready for their water (if put in while they are active they will soak themselves and the box). Check every few days to see that they have water. Bats can be kept for several weeks this way. Humidity can be raised to 100% by lining the box with foil. We tried this with Eptesicus but it seemed the humidity was too much for them. The inside of the box got covered with water droplets and the bats died. It might be just the right arrangement for pipistrelles. We haven't tried it. I sent Dr. Sealander reference to Kallen's paper on water metabolism in hibernating bats.

TORONTO, ONTARIO. Here is a brief list of bats banded in southeastern Ontario and adjacent New York since December 1963. By May 1965 only 900 had been banded, so most have been since then.

Myotis lucifugus	8692	Pipistrellus subflavus	38
M. keenii	46	Lasiurus borealis	1
M. sodalis	520	L. cinerues	1
M. subulatus	102		
Eptesicus fuscus	255	Total	9655

You might be interested to know that the M. sodalis were recognized as a result of the photograph on the cover of the January 1965 BRN. They were located in a cave near Watertown, N. Y. The L. borealis was taken in a mist net at the entrance to a mine near Renfrew, Ontario (this mine is the hibernation site for over 5,000 M. lucifugus, as well as M. subulatus and three other species).

I should like to suggest a very useful method of storing mist nets which was developed by my assistant, Mr. J. Allan Graham. We have found this device very handy, allowing us to store the nets without getting them tangled. The nets are stored on a board 10" long and 4" wide. Five holes are cut in the board, and nails placed in these holes to allow the five ties of the net to be hooked there. The net is then wrapped about the board, and the ties at the other end, after having been joined by cord, are fastened using elastic bands. The board, with net in position, can be stored in a plastic bag to prevent it from getting tangled in other equipment.

Not only does this make setting up nets much quicker and more efficient, but it prolongs net life by preventing annoying, and often damaging tangles. Perhaps other banders will find this method useful.

Has anyone besides myself found the BAT 5 series of bands now being issued by the Fish & Wildlife Service too soft for use on bats? I find that these lip bands are being chewed into illegibility within just a matter of weeks after they are put on. M. Brock Fenton.

Ed. note: We store our nets by folding them up and putting them back in the small plastic bags in which they come. We don't have

trouble with them tangling unless we fail to get the debris such as weeds and insects out of them before folding them up.

#### HERE AND THERE

JAMES C. LEWIS, Research Supervisor, Game Management Division, Tennessee Game & Fish Commission, Nashville, reports that a rabies study project has been approved, and that they have positions available for work on this. Work can begin January 1, 1967. They need a biologist with B.S. or M.S. and experience in field work. Salary \$7,500. Work involves trapping carnivores and collecting bats in the caves of central and eastern Tennessee. A second position is for an assistant at \$5,500.

DICK LAVAL spent last summer netting bats in the Deep South. He got a number of new state records and range extensions and caught large numbers of the common bats such as L. borealis and Nycticeius. He recently sent us a live Lasiurus intermedius to photograph. That leaves us only two species (Eumops glaucinus & Euderma maculatum) to go.

BOB STONES asks for references to bats mating in the fall. He has been observing mating in a mine in Michigan and wonders if this is unusual.

HARLAN WALLEY is still working with two summer colonies of Eptesicus and one of M. lucifugus. He plans some bat work for this fall.

CARLETON PHILLIPS is working on the bats of Asia and the southwestern Pacific. He is completing a study of the bats of the Solomon Islands, and has in press a paper with Nixon Wilson on the bats of Hong Kong. He is going to New Guinea to do some collecting. He is now at the University of Kansas Museum.

STEVE HUMPHREY is now a graduate student at Southern Illinois University with the Wildlife Research Unit. He sent the following list of bats banded by Jim Cope and his students in Indiana in 1965:

Myotis lucifugus	3558	Pipistrellus subflavus	50
M. keenii	10	Eptesicus fuscus	165
M. sodalis	100	Nycticeius humeralis	239
Lasionycteris noctivagans	1	Total	4123

ROBERT BAKER did some netting over ponds in SE Arkansas in . . . He got about 350 bats in 10 nights. Of note were 9 hoaries and 9 M. austroriparius. He still needs Plecotus rafinesquii, Eumops glaucinus, Lasiurus intermedius and L. seminolus from the East to complete his work on karyotypes of North American bats. He also needed Euderma but planned to net one in August.

HELMUT MUELLER is now at the University of North Carolina. He plans to do more work with bats if he can find some in that state.

GEORGE DECOURSEY is now at the University of South Carolina. He wonders if there are any subscribers in his part of the country.

CHARLES RIPPY and I are working on a nomenclature problem with Myotis in the Southeast. We are checking the published reports of M. lucifugus from the coastal Deep South to see if any of them really are the species that we now know by that name. Unfortunately we have been unable to locate Harvey B. Morlan who published records of it from 4 counties in southwestern Georgia. Letters sent to 3 addresses were returned. He is a public health sanitarian. If you know his address, I would appreciate hearing from you.

ED SULKIN was in town last month and we talked briefly. I apologize to him for lousing up the citations to a couple of his papers last time. I transposed a couple of letters in St. Louis

M. D. HASSELL has finished his work at Kentucky and taken a job at Murray State University. He has been doing some fall netting out there in the western tip of Kentucky.

MICHAEL J. HARVEY has also finished and he has gone to Memphis State University where there is another bat bander, ALFRED PERRY. They have been doing some cave work in Tennessee.

ROGER BARBOUR and I have some more work going with vision in bats. We find they apparently have little difficulty in homing from 40 miles without the use of the eyes. We are putting in for a grant to study the significance of vision in the everyday life of Myotis and Eptesicus.

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