BAT BANDING NEWS

Volume 2: Numbers 1–4 **1961**

Original Issues Compiled by Dr. Wayne H. Davis, Editor, of *Bat Banding News*

The title *Bat Banding News* was published between 1960–1963 (Volumes 1 through 4). Beginning with Volume 5 in 1964, the title was changed to *Bat Research News.*

Bat Research News is ISSN # 0005-6227.

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BAT BANDING NEWS

VOL. 2 No. 1 January, 1961

Compiled by Wayne H. Davis, Editor, Biology Department, Middlebury College, Middlebury, Vermont

EDITOR'S COLUMN

Thanks for the many encouraging letters commenting on the first issue of the News. Judging from the enthusiasm displayed it certainly seems as if we got started on the right foot.

Several things of an encouraging nature have appeared between the time of the first issue and now. We welcome the addition of two new workers to the field of bat banding. Robert Martin, graduate student in Zoology at the University of Illinois, has worked with John Hall during the past few years and is now startin out as a bander on his own. He hails from Maine and got his masters degree from Kansas State. He plans to do most of his banding in Ill., Ind. & Ky.

Harlan D. Walley, Route 1, Sandwich, Ill., has just begun a banding program. He will be working with Dr. William E. Southern, Northern Illinois University, DeKalb, whom Walley has got interested in bat banding. Walley & Southern have the good fortune to be located quite close to the huge and famous bat mines near LaSalle, Ill. They plan to work these mines and also to do extensive exploring of the many mines in Kendall & DeKalb Counties which have never been investigated by bat workers.

Several non-banders have indicated an interest in the News and desire to receive future issues. Because of this I am trying to get announcements of the existence of the News in the Journal of Mammalogy and the National Speleological Society News. Since the mailing list has grown so rapidly (it is more than double the original) I have found it necessary to assess a subscription fee to cover cost of supplies and mailing. This fee will be 50¢ per year and is now payable.

The most exciting news of the day is the appearance of THE NEW BAT BAND. Because of the persistent work of Dr. Hitchcock in trying to develop a better band to eliminate injuries and chewing, we now have available for testing a band which clips on the wing and clenches upon itself like a paper staple. It certainly appears to be just the thing we are looking for. I had the priviledge of applying 85 of these one day in Nov. They go on just as easily as the old no. 1 bird band. They pierce the wing membrane about ¼ in. behind the forearm. It is not likely that they will be irritating to the bat. We hope to get th the new band tested rigorously as quickly as possible, and if it proves to be wht we need, we would try to get the F. & W. Service to adopt it. Myers and Cope are helping with the testing, and Fueller is trying it on captive Eptesicus. If you are interested in helping test the new bands they can be obtained from James Haas, Natl. Band and Tag Co., Newport, Ky. Of course they can not be obtained free.

Today's issue has the first listing of names and addresses of banders. It is not a large list. Although there are several banders in Ind., Ill. and N.H., many of our finest bat states such as Ky., W.Va., Va., Ga. and Ala. have no resident banders. Tennessee has only one. As I look to the future of BAT BANDING NEWS I see that we may be faced with a chronic problem. Our really active bat banders are mighty few, probably only about a dozen, and it will be absolutely necessary that the editor keep pretty well

informed on the activities of everyone if the NEWS is to succeed.

It seems likely that the rabies scare is the major factor in keeping the number of banders low. I would like to hear from readers how many of you have taken the new rabies vaccine. If and when we get a non-injurious band into production, to increase the number of active banders. I think such an increase is necessary if we are to begin getting any real information on migration of bats. Results with Tadarida brasiliensis show what can be done with mass banding efforts. What we need is more people with real interest in bat banding. We can do without those who are interested only for a year or two.

As this is written I have learned of two more new banders. Lyle Conrad has been interested in caves and bats since '55. He has taken work in mammalogy under Bill Hamilton at Cornell. He now teaches in Va., and plans to do extensive banding in the Virginias, and perhaps some in Md., Pa., N.Y., and Mass. He seems to be a prospect who will do good work, and we welcome him to the fold. Ben Thoma at Itasca State Park, Minn., is a new bander. I have not had opportunity to learn anything about his banding project as yet.

It has been dommonly thought that band injury is a problem not encountered in Europe because of a superior band which they use. However in a new paper Sluiter and colleagues in Holland speak of "ring mortality" as affecting their survival estimates for Myotis myotis and M. dasycneme. They say they use the same type bands as Eisentraut and they believe that he must have also encountered ring mortality.

With this issue we initiate a new column to include excerpts of correspondence which I think will be of general interest. So just write and tell us about your recent activities and discoveries and it will get into the NEWS.

Increased spelunker pressure may well be a major factor in reducing bat populations in many of our caves. Spelunkers seldom visit mines, however, and many a good bat population is found in old mines. Although there are several books on the caves of different states, the mines remain unknown. Perhaps this is good. I have been considering making lists of known bat mines for the benefit of banders, and would do so if I thought such a list would be kept out of the hands of physiologists. Some of the mines and quarries which I know of are Hibernia, N.J., Chester, Mass., Soudan, Minn., Hurley and Beetown, Wisc., Sarpy, Nebr., Utica, Ill., Marysville, Kans., Galena, Ill., Roxbury, Ct. Most mines are marked on topography maps whereas most caves are not. Very few of the marked mine are suitable for bats though.

BANDER'S DIRECTORY

Following are those who have received bands since Jan. 1, '58. Asterisk * marks those who did not respond to questionaire. Of those marked if you know whether or not any are active please let me know.

Albright, Ray. Rte. 1, Box 277, Dayton, Ore.

Bell, Dr. J. F. Medical Director Natl. Microbiological Lab. Hamilton, Mont.

Beschel, Roland E. Biol. Dept., Queens Univ., Kingston, Ontario.

Butterworth, Dr. Bernard B. Biol. Dept., Univ. of Wichita, Witchi 14, Kans.

Cantor, Roger. Oregon Caves Natl Monument, Cave Jct., Ore.

Cockrum, Dr. E. Lendell. Zool. Dept., Univ. of Ariz., Tucson.

Commissaris, Larry R. 225 East Pennsylvania Drive, Tucson, Arizona

*Constantine, Dr. Denny G. Box 552 State College, N.M.

Conrad, Lyle. 3628 Merchant Lane McLean, Va.

Cope, James B. Joseph Moore Museum Earlham College, Richmond, Ind.

Davis, Dr. Wayne H. Biology Dept. Middlebury College, Middlebury, Vt.

*Elems, Stan W. Box 262, Mankato, Minn.

Findley, Dr. James S. Biol. Dept., Univ. of New Mexico, Albuquerque.

Glass, Dr. Bryan P. Zool. Dept., Okla. State Univ., Stillwater.

Goehring, Dr. Harry H. Biol. Dept., St. Cloud State College, St. Cloud, Minn.

Greenhall, Arthur M. Branch of Rodent & Predator Control, Trinadad & Tobago Dept. of Agriculture, Port of Spain, Trinidad, B. W. I.

Griffin, Dr. Donald R. Biological Laboratories, Harvard Univ., Cambridge 38, Mass.

Hart, Richard, Park Naturalist Wind Cave Natl. Park, Hot Springs, S. Dak.

Hall, Dr. John S. Biol. Dept., Albright College, Reading, Pa.

Herreid, Clyde F. Zool. Dept., Penn State Univ., University Park.

Hitchcock, Dr. Harold B., Biol. Dept., Middlebury College, Middlebury, Vt.

Hoffmeister, Dr. Donald F., Museum of Natural History, Univ. of Ill., Urbana.

Johnston, Dr. Richard F. Biol. Dept., New Mexico A & M College, State College, N. M.

Martin, Robert. Zool. Dept., Univ. of Illinois, Urbana.

*Mohr, Charles. Swiss Pines Park Rt. 1, Malvern, Pa.

Moisan, Gaston. Wildlife Biologist, Canadian Wildlife Service P.O. Box 35, Gillery(Quebec)P.Q. Canada

Mumford, Dr. R.E. Dept. of Forestry and Conservation, Purdue Univ. W. Lafayette, Indiana

Mueller, Helmut. Zool. Dept. Univ of Misc. Madison, Misc.

Myers, Dr. Richard F. Dept. of Biol. Central Missouri State College, Warrensburg, Missouri

Orr, Dr. Robert T. Calif. Academy of Sciences, San Francisco, California

Poole, Bryan, RR 1, Burlington, Ontario

*Raun, G.G. Welder Wildlife Found. Box 1396, Sinton, Texas

*Roth, Charles E. Cox Ave., Armonk New York

*Sealander Jr. Dr. John A. Univ. of Arkansas, Dept. of Zool. Fayetteville, Arkansas

Smith, Dr. Elizabeth W., Smithville, Ohio

Stallworthy, W.B., Dept. of Biol. and Bacteriology, Mt. Allison Univ., Sackville, New Brunswick

Talitha, Sister M. Queen of the Rosary Convent, Albany Ave., Amityville, N. Y.

Thoma, Ben. Park Naturalist Itasca State Park, Lake Itasca, Minn.

Tinkle, Dr. Donald. Biol. Dept., Texas Tech, Lubbock, Tex.

*Trapido, Dr. Harold. Rockefeller Foundation; 49 West 49th St., New York 20, N.Y.

Tuttle, Merlin D. Little Creek School, Rt. 1, Concord, Tenn.

Villa, Dr. Bernardo. Instituto de Biologia, Seccion de Mastozoologica, Universidad Nacional de Mexico, C.U.Villa Obregon, Mexico, D. F.

Walley, Harlan. Rt. 1, Sandwich, Ill.

Wilson, Nixon. Dept. of Entomology Purdue University, Lafayette, Ind.

Wilson, Howard E. Dept. of Zoology, Univ. of Maryland, College of Arts and Sciences, College Park, Md.

So far as I know this list includes all banders active today. Among those who have recently quit banding are James. R. Beer, Dept. of Entomology & Economic Zool., U. of Minn., St. Paul; and Dale W. Rice, U. S. Fish & Wildlife Service Sand Pt. Naval Air Station, Seattle 15, Wash. Both have banded several thousand bats, Beer in Minn, and Wisc., Rice in northern Fla.

Dr. Butterworth, Univ. of Wichita, is a new bander whose name came in as this stencil was being prepared. He makes the total five new banders since the last issue of the News.

CORRESPONDENCE

LAFAYETTE, IND.- Just received Vol. 1 No.1 of Bat Banding News and wish to congratulate you on this project. I think this is a splendid idea and am sure it will be eagerly accepted by other bat banders. It seems a real valuable clearing house for current information and I have long wished that there was more contact with other banders. - During Sept. the first rabid bats known from Ind. were detected. They brought the animals to me for identification. Two were Lasiurus borealis and one was Lasionycteris. - Bat banding this summer has been slow. I did not have the opportunity to band many red bats. Hope to spend more time on this next spring and summer. It seems that June, July and Aug. are the best months to get them in numbers. - Have 13 students in my Nat. Hit. of Vert. course. Wish I had a good cave close by to take the class bat banding. - The Nov. J. of Lamm. will have a note on the gravid Myotis sodalis taken in Ind. We have found no more. I am convinced that they breed in the northern half of Ind. and probably in S. Mich. as well. Russ Mumford.

MADISON, WISC. Congratulations! Your efforts in establishing a Bat-Banding News fills a real void. I trust that in its growth and differentiation it will remain as informal as it is presently. When the question of finances arises, you may put me on record as being quite willing to pay for this service. - I am very much interested in the problem of band injuries. My concern is such that I have severely limited my banding activities in the past few years. This past spring I banded 8 Eptesicus with the lipped band. The bats were kept captive in a flight room for a period of from 6 weeks to several months (I still have one). Several developed band injuries. In two cases the injuries were severe enough to prevent flight. Thes bats would not have survived in the wild. One hesitates to comment on so small a sample, but it appears that band-caused mortality can seriously affect studies of Eptesicus I plan to do further work with captive Eptesicus this winter and will be glad to test the new band. Helmut C. Mueller.

READING, PA. - I am enjoying my first year of teaching. The best feeling is that I am no longer a graduate student. I have banded a few bats here in Berks County. There are a number of mine tunnels close by which I hope to get to soon. I would meet you at either the New Jersey mine or the Durham. I think I would like to see the Hibernia mine, so why dont we meet there and then come over to Durham? I can make it any weekend. - I havent seen the Chester (Mass) mines since 1956. The colony of lucifugus then was about 4,000, most of which were in the lower levels of the

mine. - Congratulations on Bat Banding News, Vol. 1, No. 1. I think this is a fine idea. It seems to me that bat workers should support it financially with some type of dues. - I am going over my thesis for possible publication in the Illinois Biological Monographs. I want to keep it as a unit instead of breaking it up.- Maybe the bat banders could have a symposium or something at the mammal meetings in June. Cope has a lot of good information on lucifugus movements in Ind. & Ky. I have uncovered a guano deposit of Tadarida in Mammoth Cave. It is like T. brasiliensis but a little larger. It has been C14 dated at over 40,000 years. I have a wild idea that many saltpeter caves may have been Tadarida caves. I want to sift through some of the saltpeter caves in W.Va. I would like to help you with your work in W.Va. this winter. Perhaps we can get together between semesters the first week in Feb. - John Hall.

HAMILTON, MONTANA. Thank you very much for your letter and for the No. 1 issue of Bat Banding News. - We have been banding a few hundred bats each year but have become rather discouraged because of injuries to the wings by the flat-lipped bands. The sharp-edged bird bands are even worse, of course, and we have obtained several thousand of them inadvertantly. J. F. Bell.

WASHINGTON, D. C. - I am happy to hear that the first issue of Bat Banding News was received enthusiastically. I thought you did a fine job with it, and am looking forward to the second issue. We would appreciate receiving an extra copy of the first issue, if still available, and two copies of future issues as they appear. Let us know if and when a subscription fee is assessed. - Notice of the News would appear appropriate for comment in the Journal of Mammalogy. If you will send me a brief statement of what you would like included, I will plan to run it in the February issue.- R. H. Manville.

SANDWICH, ILL. - I received 2,000 bands, sizes 1 & 1B from the Fish & Wildlife Service yesterday, and plan on banding over the weekend. I'll also explore several unexplored mines. I'll write to Robert Martin at Urbana and also to John Hall. Perhaps Mr. Martin and I could get together some weekend. - Harlan D. Valley

COOKEVILLE, TENN.- I would appreciate getting the Bat Banding newsletter, though I do not expect to be excessively active in vertebrate zoology any more. There are a couple of students who want to do a special problem on the ecology of bat hibernation in the area, so I will very likely run a pilot banding project on our few local hibernating colonies. They are much less frequent than the colonies of Mammoth Cave and vicinity, and are primarily sodalis with some grisescens mixed in. Tom Barr

WARRENSBURG, MO.- The new band sounds mighty good and I would certainly like to run some tests on them. I have a bat trip planned for 11-13 Nov. There are about 3,000 sodalis there and I'll put some new bands on them. There will be about 500-600 banded bats there hence an excellent place to run comparative studies. - There are so many good caves in Mo. that the only way I can decide what cave to visit is to draw numbers from a hat. Want to buy a cave! Dick Myers.

TIPS ON TECHNIQUES

Dr. J. F. Bell, Hamilton, Mont. reports a device for collecting large numbers of bats in attics. A sheet metal sleeve, 4" in diameter and 12" long, is suspended at waist level by a leather strap around the neck. At the lower end a cloth bag is attached by a rubber band. It is only necessary to drop bats into the open upper end of the sleeve until a sufficient number are in the bag and a new bag is easily substituted.

Ed. note.- Dr. Bell's device sounds like a real improvement over the cages I lugged around in many a Vermont attic last summer. However, I found that an opening 8" in diameter was most efficient for capturing large numbers of active bats. More escaped when I would grab a mess of twenty or so and try to put them into a 6" cage.

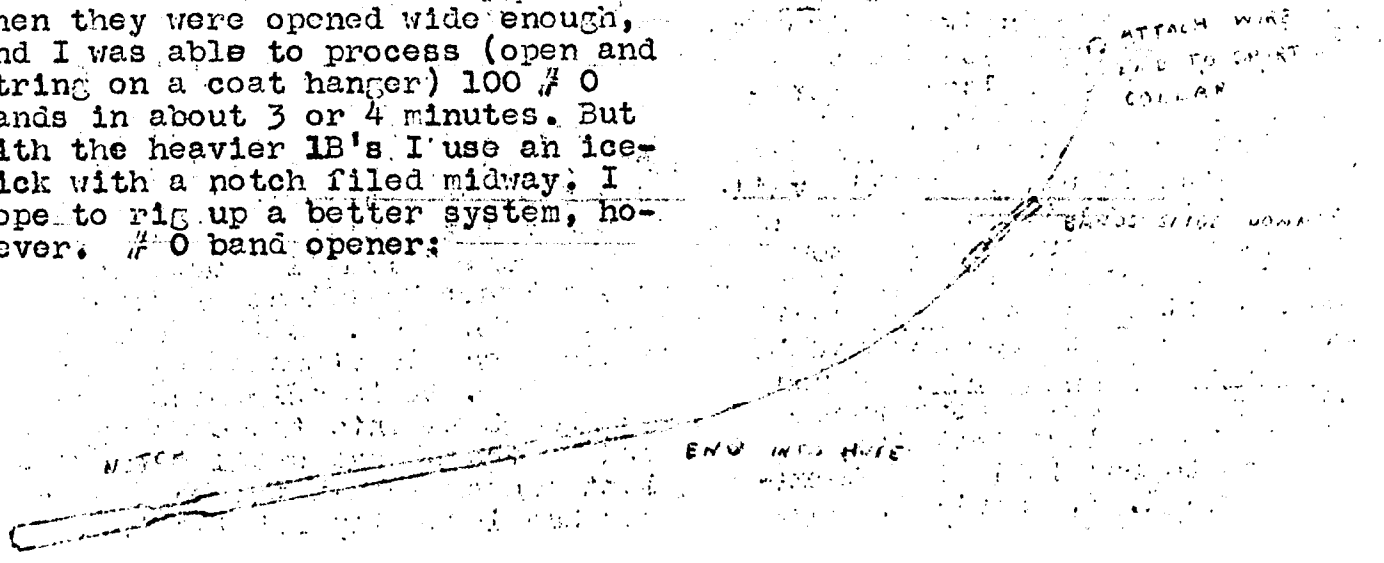
A letter is now at hand describing the methods by which Myers has been able to handle many thousands of active M. grisescens in the caves of Mo. It also includes drawings which I shall try to reproduce. I quote from Myers:

I have gone over completely to 1B bands for Myotis lucifugus, M. sodalis, M. grisescens and Lasiurus borealis. The reason--they fit better, they are easier to read, the bats dont mutilate them as badly (the European bands we used a couple of years ago were so soft I feel many of the bats actually pinched them shut by biting), and I feel injuries are fewer although I have no data to back this up, just observations. The 1B's are much more difficult to work with; consequently the mass banding I have done in the past is "past". But I am doing selective banding anyway.

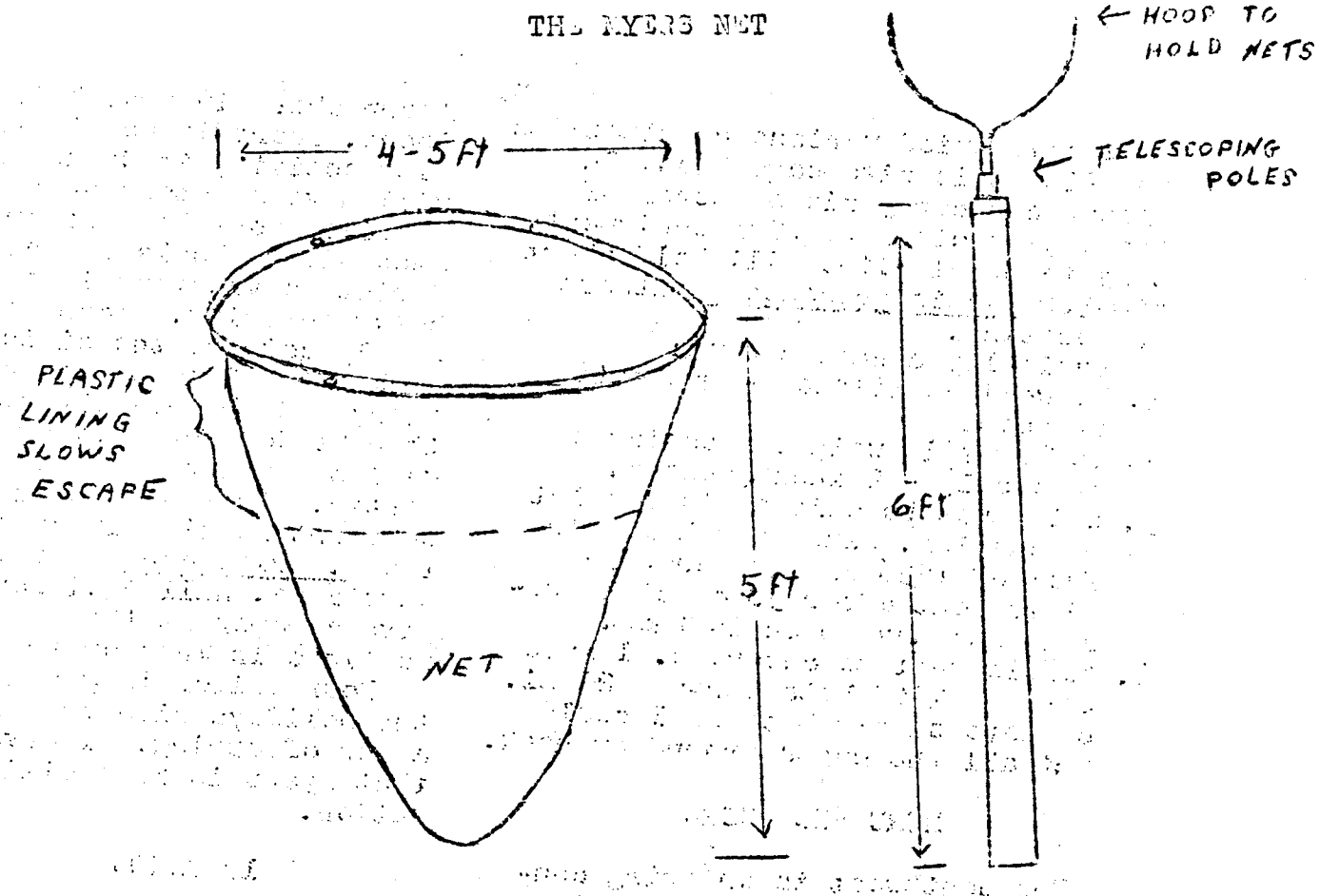
For opening bands I removed the wire from an ear and nose probe, pinched the hole on the end of the tapered rod to the point where it would accomodate a bat band wire, filed a groove on the shank of the rod so the bands would drop off when they were opened wide enough, and I was able to process (open and string on a coat hanger) 100 # 0 bands in about 3 or 4 minutes. But with the heavier 1B's I use an ice-pick with a notch filed midway. I hope to rig up a better system, however. # 0 band opener:

I have a metal pole (constructed from conduit pipe) which telescopes out to 21 feet. I use two oblong nets on the end of this and can take about 3,000 Myotis grisescens in one haul with it. The bats must be removed quickly! This is the only way in which I can get active gray bats from a high ceiling. The pole also works well under hibernating colonies on 25 ft. ceilings. One person holds the pole-net, another rakes the bats off the ceiling with a bamboo outfit like the one you described and the bats are spared the long fall down, particularly the big clusters which fall like a crippled goose.

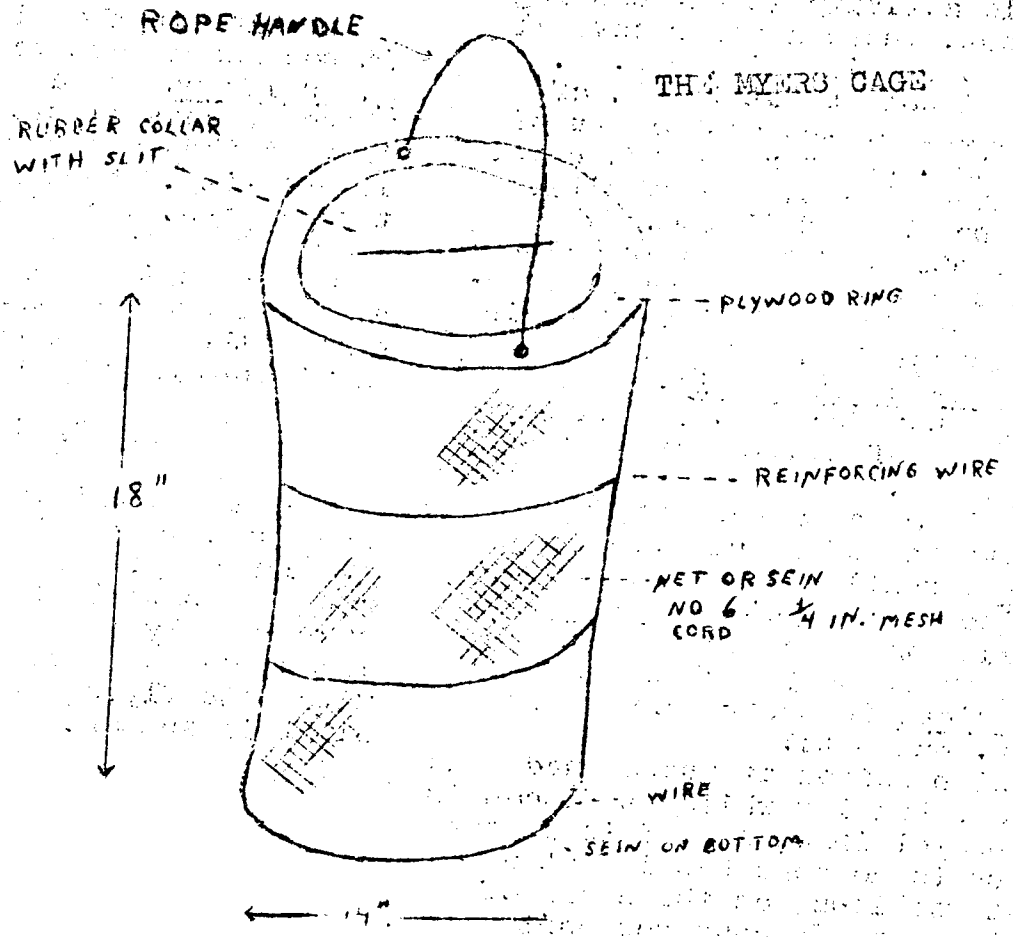
I was the one who had the collapsible banding cage. The materials used are: # 6, ½" cotton sein, plywood (½in.), # 11 wire and a piece of rubber inner tube. Form a tube of the cotton sein; at the top attach a plywood circle (with a hole in the center large enough to stick a fist with several bats through), and at the bottom tie on a wire hoop with sein stretched across it. Put a rope handle on the plywood and you are ready to go. Diagrams on next page.



THE MYERS NET



THE MYERS CAGE



I have tried various combinations and find this size cage best. One person can carry six or seven of these plus other banding equipment. Easy to crawl with. Will hold about 400-500 Myotis grisescens without suffocating.

Basically a cage should:

1. be well ventilated - use nets or seins
2. be light in weight - collapse into a 1½ - 2 inch package.
3. sein must be able to take a lot of chewing. Mine were built in fall of 1956 and are just now giving out after 50 or 60 thousand bats have been in them.
4. handle must be adequate. I have carried 1500 bats through 2½ mi. of cave simply because I could put all the cages around my neck.

HERE AND THERE

The Southwest is enjoying considerable activity in bat banding at present. There are now several banders active in Ariz. & N. M. E. Lendell Cockrum at the U. of Ariz. is one of the old timers of bat banding. He began as a student at Southern Illinois University, and has now banded 60,000. He and his students have been doing considerable netting of bats for banding. One of the major interests in the Southwest is in the migration of Tadarida brasiliensis. Glass and Villa have both published on the results of banding studies in this species.

Tinkle & Patterson at Texas Tech have banded about 5,000 Myotis velifer, mostly in NW Texas. They have also banded 500 Eptesicus. I would like to hear from them as to how and where they pick up numbers of Eptesicus in their part of the country. Bat nets?

Gaston Boison at Quebec had done done some banding while at Wisconsin but none yet in Canada. This winter he plans to do some banding at a cave at Desbiens, on the shore of Lake St. John. In case you dont know where that is it is way up in the cold! North of the Laurentides. He has heard that 200-300 bats winter there. It will be interesting to learn what kinds of bats he finds there. There is considerable banding activity in Canada now. We will have a report on this soon.

Since most banders are associated with schools and colleges, Christmas vacation is a time of heavy activity. John Hall has really covered the circuit. He worked the Chester Massachusetts emery mine before Christmas and then headed for Ky., where he will be working with Wilson and Martin. They have been getting some interesting information on the M. grisescens of the Mammoth Cave area. Hall & Wilson plan to give a paper at the Mammalogist meetings in June on their work.

Your editor is grounded for the holidays with the arrival of a new offspring. I have heard that Myers is in a similar situation.

1B BANDS

Pending further information it now seems best to use 1B on M. lucifugus and anything larger whenever convenient. The problem is that they are hard to apply in quantity. About 100 will tire the fingers. I am investigating plans of making it easier, but do not report as yet. Indications are that small band-aid strips on the thumb and index finger may be quite helpful.

NEXT TIME

For the April issue I would like to have all the information you can supply on finding and catching bats in summer. I would particularly like to hear from anyone who has has experience with bats flying into caves at night in summer.

BAT BANDING NEWS

VOL. 2 No. 2 REPRINTED JULY 1961 April, 1961

Compiled by Wayne H. Davis, Editor, Biology Department, Middlebury College, Middlebury, Vermont

EDITOR'S COLUMN

This is the most interesting time of year for the bat bander. In spring when the bats start moving out of the caves and traveling to summer quarters the greatest number of recoveries comes in. April is the best month for recoveries of Eptesicus fuscus and May for Myotis lucifugus. April is also an excellent time for visiting the caves. Although most banding is done in November and December during Thanksgiving and Christmas holidays, I have found that the bat populations are better in April. The weather is nicer and the roads are dependable.

Plans are underway for my annual trip to my pipistrel caves in W. Va. to begin Monday, April 3. If anyone would like to join this interesting expedition, I would be most glad to have him. You could contact me April 2 at the home of H. A. Davis, 307 Duquesne Ave., Morgantown, W. Va. This year we will be handling banded pipistrels that are at least ten years old. I have been most fortunate in having a small group of local speleobiologists help with this work each year. One of these, Richard Hessler, 54 Kingwood St., Morgantown, is a new subscriber to the News.

Bat banding in New England received a big boost when Dr. Hitchcock learned in January that his application for a grant from the NSF to study migration of Myotis lucifugus in this region had been approved. This is to be a two-year program. We already have a nice start on the project, having banded over 10,000 during the past twelve months and accumulated a number of interesting recoveries. We profited greatly from a tip from Lyle Conrad recently with the discovery of a nice mine with a winter population of over 15,000 little brown bats. Lyle had been up here in August investigating the old mines and suggested an area for me to check. Although the mine is within an hour of Middlebury it is in extremely remote mountainous country and would be very difficult for a person to find even with directions. We found no evidence of human visitors since it was abandoned prior to 1893, and it is quite likely that the bats have been entirely undisturbed. This is the finest population of Myotis lucifugus that I have ever seen and affords an excellent opportunity for study. In two afternoon's work we have put on 4,300 1B bands here. From this and future work we hope to get a good picture of the dispersal patterns of Vermont's wintering populations One banded bat was found; I had tagged it at Middlebury in July. as a juvenile.

The most famous bat cave in the eastern U. S. is that in Carter Caves State Park in eastern Ky. Very careful estimates have put the wintering population of Myotis sodalis here at about 100,000. About a dozen banders have worked here at one time or another and their listing would read like a a Who's Who in bat banding. The cave is open to the public and large numbers of people visit it annually. Biologists come from hundreds of miles to see the bats. In view of the traffic in this cave I think it is remarkable that the population seems not to have decreased (Hoffmeister, Hall, Winkelmann and I made a careful estimate of 98,000 on Jan. 29,

1957), because indications are that disturbances have caused drastic decreases in many wintering populations (see Mohr, C. E., NSS News, Nov., 1953, p. 4). Knowing about the situation at Carter Cave I was not at all surprised when I heard the following from Mr. Ralph O. Ewers, Cincinatti Museum of Natural History:

"----- On December 26 of this year moments before our arrival, three boys from Ashville entered the bat chambers and tore great masses of bats from the ceiling and trampled and stoned the helpless animals. Thousands fell into the stream---- and were drowned before they could rouse themselves---. An estimated 10,000 bats were killed by these boys." He went on to suggest that a gate be erected at the cave and that we write to the Commissionar of Parks of the State of Kentucky urging that this be done. Mr. Ewers wrote to a number of people interested in mammals and conservation and their response was most gratifying. I received copies of Ewer's letter from Manville, Hoffmeister, Mumford, and Cope, all of whom wrote to Kentucky officials concerning the matter. Brother G. Nicholas, President of the National Speleological Society, and several other officers and committee chairmen of that organization wrote. So did Charles E. Mohr; Philip W. Smith of the Cave Research Foundation. How many others I do not know.

The results of this effort was most gratifying. I have a letter of Feb. 2, from the Governor of Kentucky informing me that a gate is being constructed in Carter Cave. We are indebted to Ralph Ewers for starting this highly successful uproar. He informs me that responsible persons will always be admitted to the cave by arrangement with the caretaker. Ralph Ewers is now a subscriber to the News and indicates that several others of the museum staff have expressed interest in bat banding. They would have a good opportunity to do a study on survival of Myotis sodalis in Carter Cave. Banding there goes back at least to 1942.

At this time of writing (Mar.11) there have been no less than 18 new subscribers since the last issue! Among them are the following new banders: Paul Troutman, 396 Sunset Rd., W. Reading, Pa.; Ronald Linsky, Biol. Dept., U. of So. Cal., Los Angeles 7 ; D. H. Baldwin, 69 Forest Hill Rd., Toronto 7, Ont.; and Iyad Nader, Zool. Dept. U. of Ill., Urbana. I have not had opportunity to correspond with most of the new subscribers. I would be very glad to hear from those of you who are banders or would like to start banding.

All bat workers should seriously consider getting rabies immunization. Quite a few have taken an experimental vaccine being produced and tested by Lederle Laboratories. This is a series of four shots at weekly intervals. If you are interested in trying it, have your physician write to Dr. M. J. Ruegsegger, Medical Research Director, Lederle Laboratories, Pearl River, N. Y. He has been supplying this free of charge to bat workers.

Dr. Hitchcock took the series of rabies shots at least twice, and failed to get immunization. He therefore has recently taken the old standard Pasteur treatment. He informs me that ones Blue Cross insurance pays for this treatment.

Some progress has been made with the band injury problem in the last three months, but we still do not have the happy solution. Last week we returned to a cave in which we had applied about 100 new clips and 100 1B bands to little brown bats in November. Nearly all these bats were retaken and none had injury or chewing. However, we feel it is necessary to have the bats drag their tags through the buildings for a summer at least before we can draw any conclusions. In February I accompanied Dr. Hitchcock on his annual excursion to his caves and mines in Ontario where he has been banding for 20 years. He has tried a half dozen or so different kinds of tags here. We learned quite a bit about band injury. With the standard type no.1 bird bands on

Myotis lucifugus serious injury or chewing or both was almost 100%. I have never seen injury problem so bad. Ear tags, on the other hand, were completely free of chewing, and seemed to cause little or no trouble to the bat. Two types of tags were perfect, at least in the small samples recovered: a large very thick 1A band on Eptesicus. Three of these were recovered. They had been banded in 1953. They looked so good that I might suggest you get a few for trial if you are working with relatively small numbers of larger bats such as Eptesicus or Lasiurus. The other perfect results were with a number 1 band with the edges rounded smooth. We recovered perhaps a half dozen of these. They look so promising that Dr. Hitchcock is now trying to get some more of these produced.

The existence of the Cave Research Association has recently come to my attention. It was organized in October, 1958, by a group of graduate students in Zoology at the University of Illinois. Vol. 1 No. 1 of the Proceedings has just appeared. One of their projects is to make a file of caves which will contain some worth-while information about the cave, and I was fairly well impressed with their accounts of individual caves. This is a most worthy endeavor. I have been most disappointed with accounts of caves given in the NSS News. They are written by spelunkers, and are absolutely worthless to the biologist. If you are interested in the Cave Research Association write to Iyad Nader. Dues are $2.00.

The annual meeting of the American Society of Mammalogists will be held June 12 through June 15 at the University of Illinois, Urbana. I hope all bat banders will be able to attend. If anyone is not a member and is interested in joining this organization, I will be glad to send him a membership application card.

MYOTIS LUCIFUGUS - SUMMER MYSTERY

The little brown bat is a common resident in the hibernation caves where most banders work in winter. Many caves and mines are known in which several thousand can be found. Yet the populations known can not anywhere near provide the tremendous numbers of these bats that inhabit the North in summer. For anyone who has not watched bats in the northern lake regions these numbers may be hard to imagine. In my back yard last summer I counted 1,000 in 15 min. at dusk moving upstream along Otter Creek. At the other end of town I have seen even greater numbers leaving buildings and moving downstream. My banding work across the state last summer showed me that Middlebury is not a particularly batty viliage. My present guesstimate is that there are about half a million of these bats in the tiny state of Vermont in summer. The population in the rest of New England, Quebec, Ontario, N.Y., Mich., Wisc., Minn., Manitoba, and N. D., may well run over 100 million. Where do these bats winter? In all these regions good caves and mines for wintering bats are quite scarce. In several of these bats are most abundant in April, seeming to indicate a movement after having wintered elsewhere. Where do they winter? As yet few workers have tried to find out. Griffin's classic works on this are well known. Recently he and Gifford have added to this (Ecology, April, 1960). Perhaps 2500 have been banded in eastern Mass., and many of these are known to winter in the western part of the state and in Vt. and Conn. Hitchcock banded 1500 in houses in London, Ontario, many years ago, but was unsuccessful in finding their winter quarters. A scattered few banded in Mich., Wisc., and Minn. have produced no results.

Winter banding has produced many rather disappointing and a few interesting results. Banding at the large colonies has generally given only a few quite local returns. Of 1,000 I banded at the Blackball Mine, Ill., six years ago, there are only two recoveries,

both from within a few miles of the mine. Hitchcock reports similar results for the 1,000 he banded at Hibernia Mine, N. J., in 1947. I have heard that results from Durham Mine and other places in Pa. have been no more exciting.

On the other hand banding of a few hundred in a cave near Morgantown, W. Va., 1950-1953, has given very good results. Eight recoveries have been made, giving a good pattern of movement to the north and west into Pa. and Ohio. Results have been so good that I hope to do more banding in this cave and publish results sometime. Banding of greater numbers in other W. Va. caves during the same time has resulted only three recoveries.

Mumford has had reasonable success in showing some movement from the caves of southern Ind. northward (Outdoor Ind., Jan., 1953), and I have heard that Cope is getting some interesting results in Ind. and Ky.

Without doubt the little brown bat is a species deserving of intensive study in the future. I do not believe that we are likely to solve the problem of their mass disappearance in fall until we get [illegible] banders working in the northern [illegible]. The big question is where they might be spending the winters other than the caves and mines with which we are familiar. A list of known hibernation places which might give a clue is as follows: wells (Griffin, from Cape Cod); old British Fort on island in the St. Lawrence near Kingston, Ont.; concrete highway conduit; city storm sewer; buildings. I would appreciate learning of any others. I have no authentic record of Myotis lucifugus wintering in a building. I have a report of two of mine being found in a house in Marlinton, W. Va., in Jan., 1957, but I do not know but what they may have been found dead. Eptesicus very commonly winters in buildings at least as far north as Ottawa. They are much more resistent to cold and low humidity than little brown bats.

LITERATURE

(Note-. This is a new column which will be a regular feature. Any literature, old or new, of interest to the bat bander will be considered here. If you have never sent me a reprint of your works on bats, please do so.)

CONSTANTINE, D.G. An automatic bat-collecting device. J. Wildl. Mgt., 22: 17-22, Jan., 1958. A method of catching bats using taut vertical .012 inch misic wires, spaced one inch apart. Bats strike the wires and slide down into a receptacle. He found his traps quite successful on Tadarida and Lasiurus but not for Myotis. He suggests .006 inch wire traps may be successful for the latter in the field. If anyone has improved upon such a trap or has had success with it catching Myotis or Lasiurus in the field, I would be most anxious to hear about it.

DALQUEST, W.W. (Biol. Dept., Midwestern U., Witchita Falls, Tex.) Netting bats in tropical Mexico. Trans. Kans. Acad. Sci., 57: 1-10, Mar., 1954. This paper describes the use of the now famous Japanese mist net (now available for about $3.00 ea. from W. B. Davis, 254 F.E., College Station, Tex.) in catching bats. He gives tips on where to place nets:-"---nets should not be set in the 'dead air' of caves or buildings nor in the open where bats hunt and are familiar with all obstructions. Nets set across roads can be detected and avoided by bats. Bats that are hunting can best be trapped in nets set among bushes and trees where the presence of vegetation seems to prevent the animals from detecting or perhaps causes them to disregard the nets as spider webs--. Nets set across ponds where the bats come to drink, or across arroyos, are highly successful."

WILSON, NIXON. A northernmost record of Plecotus rafinesquii Lesson. Amer. Midl. Nat., 64:p?, Oct.

1960. Describes the taking of this bat in Dec. from a concrete conduit along a highway 1.3 mi. N of West LaFayette, Ind. He also mentions that small groups of Eptesicus hibernate in this conduit.

TINKLE, D.W. & W.M. MILSTEAD. Sex ratios & population density in hibernating Myotis. Amer. Midl. Nat. 63: 327-334, Apr., 1960. Describes the changes in sex ratioof M. velifer from Oct. through Mar. in three Texas caves. They usually found more females than males.

ALBRIGHT, RAY. Bat banding at Oregon caves. Murrelet 40:p?, Sept.-Dec., 1959. He found very few bats in Oregon Caves in daytime during July but large numbers were discovered between 10:00 PM & 2:00 AM. Collecting with a butterfly net produced as many as 72 in 3 hours. During three months he banded 381 bats of eight species.

HITCHCOCK, H.B. Bat-banding in the United States. Ring, 2:277-280, Nov., 1960. A history and growth of bat banding, plus purposes, problems and some results presented to bird-bander readers.

BEZEM,J.J., J.W. SLUITER, & P.F. VAN HEERDT. Population statistics of five species of Myotis & one of the genus Rhinolophus, hibernating in the caves of S. Limburg. Arch. Neerl. Zool., 13: 511-539, no date indicated (1959?). This paper is a mathematical treatment of survival using banding data. The writers are at the U. of Utrecht.

SHORT, H. L., DAVIS, R.B. & C.F. HERREID. Movements of the Mexican free-tailed bat in Texas. Southwest Naturalist 5: 208-216, Dec., 1960. A study of bat movement between Texas and N. M., Okla. & Mexico. They found indications that the fall migration may follow a more westerly route than the spring.

DAVIS, W. H. Disproportionate sex ratios in hibernating bats. J. Mamm. 40: 16-19, Feb., 1959. Study shows differential mortality the major cause of the 4:1, male: female ratio of hibernating Pipistrellus subflavus in two W. Va. caves.

NOTES ON THE BATS OF E. TENNESSEE
by Merlin D. Tuttle

Examinition of approximately 25,000 bats in eastern Tennessee during the past year has led to the accumulation of considerable information on the species occurring in this region. These data are presented as follows:

Myotis grisescens seems to be the most common bat in eastern Tennessee, but I have found this species in only four caves except for a few individuals.

Myotis sodalis usually occurs in large numbers when it is found at all, but it does not seem to be well represented in most of our caves. During the summer I have found only small numbers of males, but during the winter it seems to be a little more common than M. lucifugus.

Myotis lucifugus occurs in large numbers in only a few of our caves, but it seems to be found in nearly all of our good bat caves.

Myotis keenii was thought to be a rare bat in eastern Tennessee until recently. I caught what I was told were some of the first specimens of this species ever taken in this part of Tennessee. Since then I have found this species in more different caves than any other Myotis. The most that I have found in a single cave was about 50.

Lasiurus borealis is plentiful during the fall, winter, and spring, but I have never been able to shoot more than just a very few specimens during the summer. I have shot quite a few pregnant females of this species in the spring; so I believe that they are here in the summer even though I have not been very successful in collecting them.

Lasiurus cinereus is probably far more common in this locality than collections would indicate. I collected one of these beautiful

bats near Dayton, Tennessee, this spring. There is a single specimen in the Southern Missionary College's collection and two Knoxville specimens in the University's collection. I have seen this species quite often during April, but I usually see them when I do not have a gun or when they are out of range. They go by fast and usually do not pass the same place twice.

Lasionycteris noctivagans was thought to be rare in eastern Tennessee until I shot 12 in my own back yard last April. There was only a single record previously. I have three locality records for this species in eastern Tennessee. I have taken hibernating specimens in February and November. This species probably occurs here throughout the entire year, but it is not easily collected except during April.

Nycticeius humeralis is rather scarce here throughout the year. I have collected four specimens in two different localities in eastern Tennessee. As far as I know, these are the only records from this area.

Plecotus rafinesquii seems to be fairly abundant in the Great Smoky Mountains National Park, but the only record outside of this area is a single specimen which I caught in a cave in Elk Valley, Tennessee. This species may be more abundant than we now think, because we have not yet searched extensively in old buildings.

Pipistrellus subflavus is very seldom if ever encountered in large numbers, but it is found more often in more different places than any other Tennessee bat.

Eptesicus fuscus is almost never if ever found in large numbers, but is commonly encountered in caves, usually near the entrances, and in old buildings. It seems to frequent as many if not more different types of caves as Pipistrellus subflavus.

CORRESPONDENCE

FAYETTEVILLE, ARK.-I am not doing any banding at present but do try to get out once or twice a year to keep track of some of the bands of former years. I am interested in what you and others are doing in this field and hope to get a graduate student interested some time. John Sealander.

CAMBRIDGE, ENGLAND. It was good to hear from you, as I have thought often of you and Hal when visiting bat "ringers" here. There is an undergraduate named Roger Ransom, Zool. Dept., Univ. of Bristol, Bristol, England, who is doing a very thorough job with the Rhinolophus. Hal should be in touch with him about types of bands. Apparently no one here has a really satisfactory design, but he thinks his own special one is better than that used by the--- British Mammal Society---. I continue to feel that improved bat marking methods are badly needed, and that advances in this practical field would pay large dividends in better migration studies after improvements were effected. I do hope you are able to continue working at Mt. Aeolus; this certainly is a most interesting cave population, and your exciting recoveries last summer should be followed up.-D. R. Griffin.

LOS ANGELES. My current research is dealing with the development of a new bat band. But, by the News I see I may be too late, but I won't give up; maybe mine will help the problem too. Right now I am working on a metal-rubber combination;---. This will be preliminary work leading to a much larger problem of homing in our local bats. R. B. Linsky.

LUBBOCK, TEX. I note in the last issue of the News that you wish to know how we caught series of Eptesicus in western Texas.- We have several summer nursery colonies out here between the walls of buildings. As the bats leave at night, we netted them with mist nets. This is not the best procedure, and we soon abandoned it in favor of another. We hung parachutes around the emergence holes and funneled the parachute into a can. We have also used bee smokers to drive the young bats out. D. W. Tinkle.

UNIVERSITY PARK, N.M. At present I am banding bats only infrequently and generally as a by-product of capturing bats for other purposes. I have no convenient tally of bats banded- would have to wade through many field notebooks. However, we did band over 30,000 Tadarida at Carlsbad Caverns, the records all being in two special notebooks kept for that purpose only. D. G. Constantine.

WOLFVILLE, NOVA SCOTIA. I feel that it would be most interesting to undertake a bat-banding program in Nova Scotia. We have some particularly interesting problems here. It is uncertain whether I will be able to undertake the studies myself, but I hope to interest some students on a continuing long-term bat study program.- The bat colonies which I have observed in Nova Scotia consist of small colonies found in attics, and winter colonies in abandoned mines and caves. Nova Scotia has a great many natural caves in its limestone and gypsum formations. One of these caves I have penetrated for nearly a quarter of a mile and it goes still further as the air currents indicate. It is possible that there are some 5,000 bats in this cave in winter, for we counted over 2,000 plainly visable on the cave walls and noticed that there were many others in small cracks, crevices, and side chambers. J. S. Bleakney.

LAFAYETTE, IND. Enjoyed the latest News and can see where you have worked yourself into a job keeping this going. Am sure you will have no trouble from other banders, who seem to be as happy with the News as I. - I have little data on summer habits of bats entering caves, but Cope has gathered a large amount of data on this subject. I did find in Aug., 1957, that bats entered a cave at Spring Mill State Park at night and put up a net for two hours but caught nothing. Later Cope netted this cave many times and got up to 100 bats a night. The first Ind. reference to bats entering caves at night in summer is information in a letter from Robert Goslin. On June 16, 1932, he entered Ray's Cave at dusk and found no Myotis keenii. Returning at 10:30 that night he found 8 male keenii. This is the clue that tipped me off to looking for bats at night in caves in summer. I think a high proportion of the bats that behave this way are males, and I will be interested to see if other data bear this out. (Editor's note.- John Hall & I found bats flying into the entrance of a cave near Paducah, Ky., in summer where they had not been during the day. We shot a half dozen. They were male keenii & lucifugus)- Bats will also roost under cement bridges after dark. At Turkey Run State Park I found bats at midnight , in July, hanging up; a few days later I returned and put up a net at dark. No bats were seen at the time; after a couple of hours I had taken one red bat & one Eptesicus, but by 11:00 PM there were several bats of at least two species (Eptesicus & Myotis) hanging high overhead. The problem here is that the bridge is over 100 feet above the canyon it crosses. It is not possible to place the nets where they will be most effective. Otherwise this would be a good spot to net bats in summer.- In June, 1960, I was camped near a small, concrete bridge in N. M. That afternoon I noticed what appeared to be stain from bat urine under this bridge, but found no bats. At midnight I found Eptesicus hanging under the bridge. At 2:00 AM the next morning there were two clusters of Antrozous there. Had I known of this behavior, I could have netted them I am sure. Such places are possibilities for nighttime netting. - I use size 0 bands only on pipistrels now, having switched to 1B several years ago, especially for Eptesicus. Some of these 1B's have been on for 5 years and are still plainly legible and unchewed. I dont think the larger bands are a hazard to the bats. R. E. Mumford.

SANDWICH, ILL. I have banded nearly a thousand M. lucifugus and 200 M. keenii, sodalis, Eptesicus and

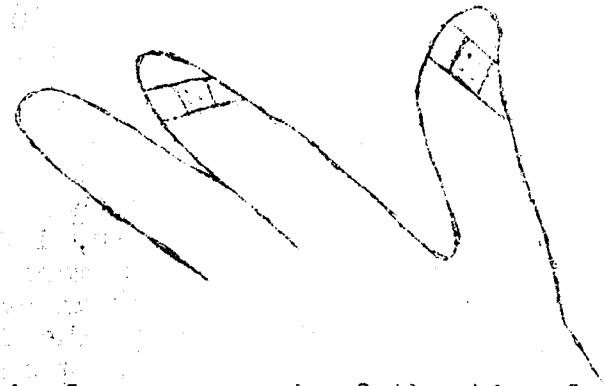
Pipistrellus. Since the middle of December I intended on doing consider banding during the holicays, but had a son born on Jan.1. This has tied me down considerably. Most of my banding has been done in South Blackball mines, although I have done some banding in those unexplored mines up the trail from the North mine. Bats are few and scattered in these mines while in the south mine several passages contain close to 5,000 lucifugus, although I have not found the large colony of sodalis you spoke about. As yet I have not recovered any of your banded ones, but probably will upon going further into the mine. - I received a letter from Dr. Mueller this week. He has asked me to join him with some homing experments. - Received a card from Mr. Martin, in regards to our working together in N. Ill. It is possible that we might be getting together shortly. Harlan Valley.
WORTHINGTON, MINN. At the moment I am not doing any banding since we are in Worthington and there are no caves in the area. The project that I was working on with the bats in Mankato while at Mankato State College has been abandoned . Some 90% of the colony that I was banding was destroyed by vandals. During the summer months I have been banding at Whitewater State Park, Minn. I expect to do some this summer while we are in Calif. & Ariz. Stan. W. Elems.
SILLERY, QUEBEC. We finally did that bat banding trip to Lake St. John, between two snow storms. We had a wonderful time, and everything went just right. I used the traps you described in the last newsletter, and both 1 and 1B bands. We trapped the whole population of bats, and did not find anything but Myotis l. lucifugus. We banded 475 of them, killed about 10 and 10 more escaped. We found 41 females out of the 475 bats, which should be of interest to you. - I plan to go next summer to see if they spend the summer there and if the sex ratio is different.- We will publish a note shortly in the "Naturaliste Canadien", describing the cave, and also what we know about the bats. Gaston Moison.
CONCORD, TENN. Last October I banded 225 M. grisescens in a cave near my home 10 mi. W. of Knoxville. On Dec. 4 I found 15 of these banded bats 100 mi. north in a sink hole type cave which is about 20 mi. N. of Rogersville, Tenn. I also found a bat, banded by someone else, which seemed to be quite old. Its band was imbedded in the flesh of its forearm, and the first number was difficult to read. This may be a good record for whoever banded it; the number was 23-93598. On Dec. 11 I took three more returns from this cave. I have also taken three partial albinos and watched the mating of Eptesicus in this cave. One specimen of M. grisescens had white wings with normally colored body, and the other two were entirely white ventrally and stripped with white strips on the dorsal side with wings that were about two-thirds white. All three had normally colored eyes. - There were at least ten thousand of this species in this cave, and there could be thousands more that we have not found. These bats become active very soon when lights are turned on them, and they even changed roosts several times. The temperature whier we found the M. grisescens was 38 F. Last week we banded 800 more of this species.- I check Little Mammoth Cave in Elk Valley each month. This is a very good bat cave in winter, but poor in summer. I have collected seven species there during a single visit. At present there are about 4,000 bats. Saltpeter Cave, about 20 mi N of Rogersville is an excellent cave for M. grisescens and has small numbers of several other species. The Norris Dam Cave has at least 4,000 M. grisescens in summer. Indian Cave, about 20 mi N of Knoxville, contains several thousand M. grisescens. This is where the M. austroriparius is supposed to have been taken. The Baloney Cave which is 3 mi. from my home is inhabited by at least 500

and possibly 2,000 M. grisescens in summer. There are several other caves that I have not yet visited in winter which may be added to my list of good bat caves when I get time to check them.-- Banding has been progressing rather well lately. On Feb. 5, I banded 800 M. sodalis, and examined 100 M. sodalis, lucifugus, and keenii which had been banded for four or five months. A M. keenii had growth over the edges of the band, but no infection. One sodalis and one lucifugus had well healed, small wing tears, and 3 sodalis had some skin growth over their bands. The other 94 bands were in good condition. - On March 4 I took a Plecotus rafinesquii from a medium-sized cave approximately 40 mi. N of Chattanooga, Tenn. Shortly after leaving the cave I shot 4 Lasiurus borealis 2 Lasionycteris noctivagans, and 2 Nycticeius humeralis. - On March 11, I visited Little Mammoth Cave and noticed that M. keenii have already started to migrate. On Feb.5, 1961, I had found only 3 of these here; today there were about 75. Thirty were in a single cluster 450 feet from the entrance, and the rest were scattered throughout the cave, some being 1,000 feet from the entrance. All were very alert, and many flew when my light shown on them. Nearly all of these will probably be gone within a month. Merlin D. Tuttle.

TIPS & TECHNIQUES

If you use a tapered rod for spreading bands be sure that the taper is slight enough that both ends of the band are opened the same amount. Bands that are not opened evenly cannot be closed evenly, and the end that remains open a slight amount can become imbedded in the flesh. Hitchcock's band injury problem is far more serious than that which I have seen in any other colonies, and I think it is quite likely due to problems of unevenly opened bands. A band opening rod should have its effective opening surface a smooth taper of at least an inch. Also it should be such that it opens the band no wider than is necessary to get the band over the forearm of the bat.

I have come up with a successful method of applyibg lB bands rapidly without wearing out the fingers. It takes a little practice and patience to master the technique, but once learned it is as simple as putting on the old no. 1 bands. Procedure is this: Apply 3 or 4 bands, so as to get a firm imprint on the thumb and index finger of the place where the band is squeezed. Then take a pair of Band-Aid Junior strips and very carefully place them in such a manner as to have the padding over the points where the bands are pressed, thus:



This leaves enough of the tip of the thumb free for handling the bands. Use the third finger, which is not covered, with the tip of the thumb in handling the band and getting it into place. Then simply exchange the index finger for the third finger and clamp the band shut, putting all pressure on the padding. Using this method I can band indefinitely at a rapid clip without tiring the fingers; without pads I could do only about 100 to 150.

For trapping bats in buildings where one could not get at them by day I have used the technique described by Griffin of building traps at the holes where the bats emerge. I have found that the clear tough plastc storm window material, thumb tacks, and plastic adhesive tape are quite useful in this operation.

I have invented a trap for bats which will work when one is not

able to climb up to where the bats emerge. This wierd device attracts considerable attention, and if it didn't work one would feel rather silly. It consists of burdock burrs attached to the end of a pole and held a few inches in front of the opening when the bats are emerging. It is nearly 100% effective. Its disadvantages are that one must attend it continually and that it must be unloaded every time a bat or two is caught, and during these times the bats which emerge escape.

To build my present model I formed a rectangle from a coat hanger to attach to the end of a pole. Then I strung burrs on a thread using a needle, and formed a complete sheet over the frame and covering all wire. I then glued them in place.

When bats leave a building they sort of "drop" out at an angle and fall several inches before taking wing. They seem either unable to detect, or unable to avoid the burrs. It is amazing how effective a burr is in entangling a bat. The wing membrane need only touch it. Indeed I have found that I can catch bats with a single burr dangled on the end of a light thread and held over water where bats are feeding.

Although I could take bats with my burr or occasionally with a dry fly used in the same manner, I found that an insect net was more efficient. Using this I took an average of 15 per night during the 20 minutes when bats were flying and it was light enough to net. My high for one night was 34. The method was to use as a decoy a cage of squeaking bats. Bats would fly in near the cage and were simply dipped out of the air. When I had no decoys I had considerable trouble catching the first bat. One squeaking bat held in the hand was sufficient to bring in others. Lest this account sound too encouraging let me remind you that bats are extremely abundant over the creek behind my house. If I were able to net it, I should pick up hundreds in an evening.

The Japanese mist net seems to be the only really practical method available for catching bats where they are flying in the wild. I shall give account of my very slight experience with this method in hopes that those who are more familiar with the techniques will write to help us out. As I have heard it most people simply place their nets in a good locality (see Dalquest, in Literature Sect.), and catch the bats which happen to fly into it. In my experience working with Dr. Hoffmeister in Arizona, we found that most bats detected the net, and it was only the occasional straggler that was caught. Most bats would fly right up to the net and then turn away. We soon discovered that with three persons we could "operate" the net so as to catch most of these bats. The method was this: a gasoline lantern or two were used to illuminate the pond or other area where we were working. A person held each end of the net, holding the bottom with a toe, having one hand on the middle string, and the other holding the upper string as high as possible. Then when a bat approached the net, both operators brought the top of the net down as quickly as possible in an attempt to trap the bat. The third person then removed the bat from the net. Using this method we were able to take over a hundred western pipistrels in one evening.

The stretched wire method has never been successful for me. I tried ot several nights over a pond in W. Va., and captured only two Eptesicus. Red bats were so abundant that they kept the wires vibrating almost continually, but none was caught. One pipistrel hit the water, but flew from the surface. I tried combinations of two and three wires, and the red bats would hit them all, but never fall into the water. At the creek behind my house I can easily tip M. lucifugus with a fish line, but the bats always take off from the surface successfully.

I once talked with Milt Trautman, the Ohio ichthyologist, and he expressed amazement that I was unsuccessful with the wire method. He told of having excellent succ-

ess in catching Lasiurus and Lasionycteris over little woodland ponds in Ohio. Mumford has also had some success from the wires. If there is a secret to the proper use of wires, I would like to know what it is.

HERE & THERE

JOHN HALL says he had a very successful time in Ky. during the Christmas holidays. Bob Martin, Jim Wallace, Nixon Wilson and Jim Cope all joined him. They banded over 5,000 bats of six species and handled a large number of returns. He reports that the owner of Coach Cave, Edmonson County, Ky., plans to commercialize it. There will be lights strung down the passage that contains about 50,000 M. sodalis that Hall has been studying. I am certainly sorry to hear of this development.

Hall is planning a short trip into W. Va. in late April to look at the sodalis populations and dig through some saltpeter caves.

CLARE D. SMITH, 5835 Woodlawn, Chicago 37, Ill., a new subscriber, is working on Pizonyx vivesi, and would like to know if any banding has been done with this species. Could anyone supply this information? I would be quite surprised if any had been banded.

IYAD NADER saw a copy of the News which Bob Martin had, and decided to subscribe. He is a mammalogy student from Iraq who is working under Dr. Hoffmeister at Illinois. He has been on several trips banding with John Hall, and now plans to start a banding program of his own, working on Eptesicus in Ill., Ind., & Ky.

HARRY GOEHRING got a nice write-up in the Picture Magazine section of the Jan. 22 Minneapolis Sunday Tribune. There are pictures of him emerging from his storm sewer carrying a case of bats, of extracting bats, and of weighing bats in the lab. A Minneapolis TV station conducted an interview with him at the mouth of the storm sewer and ran it on the 10:00 o'clock news.

Goehring reports that he has worked this sewer for the past nine years and that it contains between 60 and 94 Eptesicus in winter. This winter he collected two which he banded 9 years ago. This ties the published record for longevity of this species.

Did you know that DICK MYERS once collected and banded 1,500 bats by himself in 11 hours? He says he wouldn't do it again-without food and warmth! At the iron mine at Pilot Knob, Mo., he and three others banded 3,000 little browns in 4 hours, 20 min. including time for cooking, collecting and exploring. Myers suggests that folding stools, stove and food are well worth while in a big operation. After trying it, I heartily agree. Those new tiny camp stools that fold up and weigh nothing are ideal.

LYLE CONRAD has been dickering for a summer job as park naturalist at Mammoth Cave National Park. He writes that in 1959 he banded 46 little brown bats in a barn in Petersham, Mass., with gold and yellow bands.

The Carter Cave incident made the newspapers. BOB MARTIN sends a clipping from the Jan. 26 (Louisville?) Courier-Journal. It reads in part: "The battle of the bats has been won by an unshakable combine of spelunkers, bat banders, mammalogists, and conservationists.

"The first shot of the battle was fired by Ralph O. Ewers, Curator of the Cincinatti Museum of Natural History. He wrote Governor Combs that he was seriously concerned over the wholesale killing of the cave's bats by vandals.

"'Mr. Ewers must have written bat fanciers all over the country at the same time he wrote the Governor', said Park Commissioner Ed Fox, who inherrited the gubernatorial bat problem. "'All at once we were showered by a deluge of letters from people just as concerned as Mr. Ewers. Among other sources, they came from eight colleges, two museums, one priest,

two doctors, and five agencies of government in other states."'

The article carries a photograph of the passage in the cave where the gate is being built.

HAROLD HITCHCOCK'S annual Canadian trip was held in mid-February this year. We drove to Kingston, Ontario the first afternoon out, and there we met DR. ROLAND BESCHEL. Dr. Beschel then joined us in the bat work in the caves and mines.

Hitchcock has been banding in these caves and mines since 1939, each year examining all bands found, and banding the new bats. He has made the trip (which involves some 900 miles) by car, train, bus, bicyle, hitch-hike, and considerable stretches of walking at various times during this study. He has now accumulated a real wealth of information on longevity.

THANKS

Thanks again for the continuing stream of comments on the News. You people are most kind. I delete nearly all these comments when putting these letters in the News, but they are read and appreciated.

The News is growing in size and circulation and also in consumption of my time. I limit the time consumption by doing no rewriting. All is extemporaneous, and directly onto the stencil. Unfortunately, this often shows in poor sentence structure and difficulty of interpretation.

So far I am well pleased with the progress of the venture. I think the News is here to stay. Hope so.

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Mailed March 24, 1961.

BAT BANDING NEWS

VOL. 2 No. 3 (Reprinted 1962) July, 1961

Compiled by Wayne H. Davis, Editor, Biology Department, Middlebury College, Middlebury, Vermont

EDITOR'S COLUMN

The big news of the day is the discovery of a very simple method tremendously to increase the rate of recovery of banded bats. Simply use no. 2 bands which have the inscription - write F. & W. Serv. Wash. D. C., U S A - on the outside, instead of inside. We have used 11,000 of these on Myotis lucifugus since April and, although it is still too early for comparative figures, the difference in recovery rate is rather striking.

The number 2 band is rather large for little brown bats. However, we do not believe that they cause the bats any difficulty. We have recovered several in their summer quarters and they were in good condition. I think it is likely that they will prove to be excellent tags and will give a minimum of injury. They have the advantage that they are much easier to handle than 1B or 1A. They do not tire the fingers and they open very easily on a plastic knitting needle. They can be closed firmly with the fingers and still there is enough restitution that they do not bind. In our first experiments with this band we slit the wing membrane and put the band around the forearm. This did not prove desirable, however.

I have come to the conclusion that the no. 1 bird band should not be generally used on bats. Even for the eastern pipistrel I think it is likely that 1B is superior. Unless one is working with Pipistrellus hesperus or Myotis californicus he has no use for a no. 1 band.

Tests on our wing clips are still in progress. I think we can draw no conclusions about them until the bats have dragged them through the crevices of buildings for a summer.

Another interesting bit of news is that I can report that real progress is being made in the development of techniques for handling bats in summer colonies. Nearly all banders have had some experience with summer colonies in buildings; most have been unpleasant and many discouraging. Colonies are hard to find, many leads are wild goose chases; once found the bats are nearly inaccessible; once accessible they are found to be in crevices out of sight and out of reach. A day's work on a ladder or in a hot attic at the risk of breaking one's neck often produces from 0 to 50 bats out of a colony of hundreds. After several such experiences, and with our usual 0.00% of foreign recoveries, I had about decided that summer bat banding was just not worthwhile. However, the use of no. 2 bands and new methods which commonly get us from 300 to 900 bats from a building makes it much more inviting.

The meetings of the American Society of Mammalogists in Urbana, Ill., in June, turned out to be the most interesting session yet for the bat banders. Several papers were presented on the results of banding studies, and informal conferences of bat banders were held. Among those present were Cope, Mumford, Wilson, Myers, Krzanowski, Glass, Sealander, Herreid, and Walley. One thing which came out of the meetings was the realization of the seriousness of the problem of conservation of bats. It appears as if such species as M. grisescens and M. sodalis are likely to disappear except where protected by state and federal parks. Myers points out that the entire population of M.

[illegible] in Missouri, Arkansas, and Oklahoma. Winters in three caves in Missouri and some of these are protected. In fact the owner of one wants to get rid of the bats, and another is keen on protected to ever increasing spelunker pressure. This species, like Plecotus townsendi in the East, lives only in deep caves and cannot tolerate repeated disturbance. Myotis sodalis winters only in the larger caves and here the entire population of the species is probably readily accessible to man. In the past 10 years this species has disappeared from New England where it formerly occurred by the hundreds. Myles Conrad and John Hall were unable to find any in Trout Cave, W. Va., last winter, and Phil Brutsch informed us there were only 150 there the previous winter. In the winters of 1950-1953 there was a colony of 600 there.

The decline of bat populations has been noted before (see Mohr, C. E., Possible Causes of an Apparent Decline in Wintering Populations of Cave Bats; N.S.S. News, Nov., 1953, p.4) but the problem is getting much more serious. There has been a tremendous increase in the use of bats by physiologists and rabies seekers as well as in spelunker activities. During the past two years a virologist in Texas has got bats 150 at a time, rather frequently replenishing his supply. I could list a dozen places easily where bats are regularly used in physiological work. I do not object to such work, merely point out its existence. When we realize that our common bats produce one young per year per female, and commonly live 10 - 20 years we see that the repeated taking of bats will lead to the destruction of the large populations.

When I began my studies of the pipistrels of two W. Va. caves ten years ago, I never encountered people in the caves which I worked. In recent years I never fail to meet people there; have encountered as many as four different parties on a single visit. A recent issue of the NSS News tells of placing a register in an Indiana cave and finding that between Oct. 16, and Nov. 30, 1953, a 31 day period 81 spelunkers and a boy scout troup had visited the cave.

I feel that it is most likely that within the next few years we will find that one will no longer be able to go into a wild cave in the eastern U. S. and see bats in the hundreds and thousands. Legislation by the states to protect cave fauna is a possible partial solution to the problem. The National Speleological Society has long been aware of the uniqueness and vulnerability of cave fauna and is interested in its preservation. They have a standing committee on cave conservation to work on such problems. Perhaps with their help and that of other conservation minded organizations we could influence states to pass laws protecting cave fauna.

On my annual expedition to W. Va. in April I had the invaluable help of the Penn State and V.P.I. Grottos of the NSS, as well as from Merlin Tuttle and his father. If you need help on a banding project or in getting into a cave which requires elaborate equipment, I suggest you contact your nearest grotto of the NSS. You are most likely to find that they are anxious to be of help. For that matter most of them suffer for lack of worthwhile projects to keep them going. They visit all the caves in their region, take a few longer trips, look for new caves, map a few, and then wither.

CURRENT ASPECTS OF U. S. BAT RABIES PROBLEM
by Robert L. Martin

As a description of rabies, its symptoms and characteristics can be readily found in reference works, the information to be presented here will be restricted to that showing the contrast between bat rabies and "typical" rabies. Up to comparatively recent times one of the main concepts concerning

the disease was that it was invariably fatal once symptoms became apparent. As vampire bats have exhibited typical symptoms, including the ability to transmit the virus, and then recovered, the presence of rabies neutralizing antibodies in the serum of large numbers of cave bats in the U.S. may be considered at least indicative of survival following exposure. Large numbers of bats have been found to possess the rabies neutralizing antibodies, and there has been almost complete failure in effecting transmission by bite of naturally infected bats to adult mammals. Because of this, the strain of rabies present in most bats may be considered modified to a high infectivity and lowered virulence for bats. This does not mean that there is no danger of transmission of the virus to other mammals or that other mammals will necessarily survive. On the contrary, at least five human deaths in the U. S. have been attributed to bat rabies, and numerous other mammals have possibly contracted rabies from bats.

Although most bats found to have the disease were moribund or taken under unusual conditions, often there is no visible evidence of the disease in bats. They may appear to be absolutely normal in behavior. As there is a reduction in the formation of Negri bodies, cytoplasmic inclusions characteristic of the disease, one of the oldest and fastest methods of diagnosis has lessened value. With standard animal inoculations and the new serum neutralizing tests, there is no loss in accuracy or speed of diagnosis, however. The discovery of the virus' presence in the brown hibernating fat of bats opened a new field of inquiry, as the virus may be present there but not in the central nervous system or the salivary glands.

Since 1953, when the first known case was reported from Florida, 30 other states have reported the finding of at least one occurrence of the disease in a bat. The species and states involved are presented in the table following this report. Apologies are offered to mammalogists for applying vernacular names to subspecies, but such differentiation seems desirable here. The apparent expansion of the disease in bats in the U. S. may to a large extent be attributed to a greater awareness and consequently more intensive testing. However, the gradual northward extension from South America of bat rabies records during the last 40 years and the recording of cases in Europe give an indication that the disease in bat may be spreading. It is the writer's opinion that bat rabies is probably already well established throughout the U. S. and that more extensive testing will result in its being recorded from every state. This would not indicate an increase in range of any greater danger than at present if I am correct.

Because of the fact that bat may be a potential reservoir for rabies for other species, and because their destruction in large numbers would be more detrimental than similar destruction of any other mammalian group, the results to be obtained from bat banding have assumed greater importance than ever before. It is very desirable for those working with bats to take the series of pre-exposure rabies vaccinations. With or without the vaccine, it is probably a good idea to use gloves and/or special care when handling such large species as Eptesicus fuscus. For smaller species, the best suggestion to be given when handling large numbers is to use cages such as that described by Lyle S in the January issue of Bat Banding News. This enables the bander to see the bat he grasps, thus reducing scratches and bites. Our work with bats is no more dangerous than work with large numbers of any wild mammal.

	Alabama	Arizona	California	Colorado	Connecticut	Florida	Georgia	Illinois	Indiana	Iowa	Kansas	Louisiana	Maryland	Michigan	Minnesota	Missouri	Montana	Nebraska	Nevada	New Jersey	New Mexico	New York	North Carolina	Ohio	Oklahoma	Oregon	Pennsylvania	Tennessee	Texas	Utah	Virginia	Washington	Wisconsin
Little brown myotis (Myotis lucifugus)			X	X														X	X								X ?						X
Cave myotis (Myotis velifer)																												X					
California myotis (Myotis californicus)			X													X																	
Grey myotis (Myotis grisescens)						X																											
Southeastern myotis (Myotis austroriparius)						X																											
Long-eared myotis (Myotis evotis)			X														X																
Long-legged myotis (Myotis volans)																	X																
Eastern pipistrelle (Pipistrellus subflavus)						X																											
Western pipistrelle (Pipistrellus hesperus)			X																														

	Alabama	Arizona	California	Colorado	Connecticut	Florida	Georgia	Illinois	Indiana	Iowa	Kansas	Louisiana	Maryland	Michigan	Minnesota	Missouri	Montana	Nebraska	New Jersey	New Mexico	New York	Ohio	Oklahoma	Oregon	Pennsylvania	Texas	Utah	Virginia	Washington	West Virginia	Wisconsin
Big brown bat (Eptesicus fuscus)		X						X ?							X		X				X	X									
Pallid bat (Antrozous pallidus)		X																								X	X				
Florida yellow bat (Dasypterus floridanus)						X																				X					
Hoary bat (Lasiurus cinereus)		X	X					X		X	X ?		X			X					X		X		X						
Red bat (Lasiurus borealis)	X				X	X	X		X										X								X				
Seminole bat (Lasiurus seminolus)	X				X	X																									
Mexican free-tailed bat (Tadarida brasiliensis mexicana)		X	X																		X		X				X				
Florida free-tailed bat (Tadarida brasiliensis cynocephala)					X	X															X										

	Alabama	Arizona	California	Colorado	Florida	Georgia	Illinois	Indiana	Iowa	Kansas	Louisiana	Maryland	Michigan	Minnesota	Montana	Nebraska	New Jersey	New Mexico	New York	Ohio	Oklahoma	Oregon	Pennsylvania	Texas	Utah	Virginia	West Virginia	Wisconsin
Big free-tailed bat (Tadarida molossa)																		X										
Silver-haired bat (Lasionyeteris noctivagens)			X	X																								
California leaf-nosed bat (Macrotus californicus)			X																									
Species name not provided				X			X	X			X											X				X	X

Table 1. Occurrence by states of bat species found naturally infected with rabies, to March, 1951.

X indicates the record of at least one occurrence of natural infection in the species and state listed.

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and is all the more valuable because of their wide range of movement.

Dept. of Zoology, Univ. of Illinois, Urbana. (Present address: Dept. of Science, State Univ. College of Education, Plattsburgh, N. Y.)

TIPS & TECHNIQUES

I now have a great deal of information on equipment and techniques for working with summer colonies which I wish to pass on to other workers. One of the biggest problems encountered in summer colonies is in getting the bats out of tight crevices. Long bottle forceps are a necessity here. If anyone knows where forceps of greater than 8 foot length can be obtained, please let me know. Charles DeLaughlin of the Los Angeles County Museum informs me that they use placental forceps which they obtain from the junk pile in hospitals. He says they are longer and more narrow than bottle forceps. If bats are where they cannot be reached by forceps there are ways of getting them to come out. Wendell Goodpaster introduced us to the technique of driving them out with tear gas, chloropicrin.

It is available under the trade name of Larvacide from the Morton Chem. Co., 110 N. Wacker Dr., Chicago 6. Unfortunately, we have found that it is much more effective on humans than on bats. It usually takes a pretty strong dose to drive out the bats. Using it and a mist net, however, we have been able to get bats out of places where we have considered them inaccessible before. One must be careful in using it, for too strong a dose will kill bats. Get it in behind them and leave the hole open. If you cannot get it behind them, stick a swab of cotton in close to them and then remove it quickly. The bats will pour out.

Something we have found as useful as Larvacide is an insect bomb called Raid. Other brands we have tried were poor. Sprayed into the holes, it sometimes causes bats to pour out. Here again one must be careful, as a dose full in the face can kill a bat. Tests for adverse effects should be done before wide use of these repellents. We had about 40 Raid collected bats in a cage overnight and two died.

Perhaps better than either Raid or Larvacide is the technique of catching the bats with forceps as they emerge naturally. If one plugs all but the major holes in a building, puts traps over these, and then works inside the building with forceps and dip net or mist net in evening he will get his best haul of bats. Bats do not like to enter a trap and they will begin crawling out of the crevices into the attic.

A bat trap, by the way, consists of a piece of smooth plastic sleeve fastened around an entrance with thumbtacks and adhesive tape and leading into a suspended container. It works fairly well if the population is large enough that they push one another out, and if all escape routes are plugged.

I have invented a carrying cage that is very convenient for working in an attic. A one gallon antifreeze with both ends removed is drilled on opposite sides at one end. Then two hooks are made with bent nails and cord attached so that it can be carried around the neck. Then a bag is put over the can and fastened near the top with a very strong rubber band. Bats can be dumped into the can by the handful and they scurry up the bag on the outside of the can until they go no further and then settle down. I use nylon knit small laundry bags of three sixteenths mesh ($\frac{1}{4}$ in mesh is too large). If you cannot find these bags in the five and ten the material can be obtained from Davis Mills, Inc., Lake City , Tenn.

A battery powered headlamp is useful when gathering bats in buildings. When using gas or spray, with bats coming out very rapidly from several holes, one can catch the most using a pair of forceps in one hand and grabbing with the other.

We have several methods of locating bat colonies. If you are looking for Myotis lucifugus in the north walk the streets at dusk and watch where they come out. In places like Middlebury, Vermont, where bats can get into most houses it is a shopper's market and they take only those along the streets next to the stream. I located nine colonies one evening. It takes them over 45 minutes to emerge, so one has time to cover a good bit of territory in an evening.

If you do not have opportunity to be around in evening, you can locate many colonies by looking for the signs on buildings. An opening at the ridgepole or along the roof with dark stain close around it is sign of bats. Also the droppings spattered on the side of a house are often visable from a distance. I have located many a colony in New England while driving by on the highway.

Inquiry at the post office or general store in tiny towns has been productive. Also we find most people are glad to have one remove bats from their attic.

Joe Waters located 18 bat colonies for us near his home in

eastern Mass. by running an ad in the local weekly. In the classified section he said " Anyone having bat colonies or knowing of anyone who does please call---. Biological Research.-"

Information gleaned at the mammal meetings: Wilson and Mumford find Eptesicus colonies commonly in the expansion cracks of highway bridges. Woodrow Goodpaster "catches" Eptesicus by putting Larvicide on the end of a long pole and putting it next to them early in the morning when they are still cold and drowsy. Mumford has been catching hoary bats by stretching nets across small wooded streams in Indiana. He got as many as 5 in one net one night. Findley has been taking hoary bats in large numbers in N. M. during spring migration. He has taken as many as 40 in one evening. Myers finds bats by investigating all abandoned houses (he walked in on a family of eight folks at the supper table once), and Cope never fails to look behind a window shutter (it is said that he has been arrested for window peeping).

I have found the best yet extension pole for taking bats from the ceiling of a cave. Sears, Roebuck markets a 16' telescoping fibreglas rod for about seven dollars. In using it in W. Va. I found it rather remarkable how the so-called 50' ceilings came right down within reach.

MOLOSSIDS IN MINNESOTA??

On June 23, 1961, I was standing with a friend at the edge of a lake 2 mi. NE Fosston, Polk Co., in NW Minn. watching for bats. Two or three Myotis were seen working over the water, the first having appeared at 10:10 CDT. At 10:15 a very rapidly flying bat came in from behind making a clearly audible whooosh sound in flight. It then disappeared over the water. At 10:27 another came in from the same direction, this one passing right over our heads at close range, and making a rather loud sound in flight. Its movement was very rapid and it too disappeared over the water. Observations were made the following evening, but the bats were not seen again.

On one side of the pond is a steep bank cut by the road and topped with sparse scrubby oaks. The rapid-flying bats had apparently come in from over this ridge. A search of a large barn in the vicinity produced no bats.

The possible identity of these bats is a matter of speculation. Tadarida brasiliensis occurs sparingly in a building in Lincoln, Nebr., some 475 mi. to the south. Since this powerful flying species is known to migrate many hundreds of miles, it is not inconceivable that wandering males might occur occassionally in western Minnesota. W. H. Davis.

HERE AND THERE

Nixon Wilson, Entomology Dept., Purdue Univ., LaFayette, Ind., writes that he is interested in ectoparasites of bats and would like to have specimens preserved for him. He is interested in distribution and host relationships and would be gald to identify ectoparasites for any interested worker. Data needed with the specimen are: host, locality, date and collector. Seventy per cent alcohol is a suitable preservative. Ectoparasites which are to be expected on bats are ticks, mites, fleas, bat bugs, and bat flies.

Stan Elems new address is Box 361, Worthington, Minn.

Robert L. Martin moves this fall to the State College in Plattsburgh, N. Y., where he will be teaching. Since that is just across Lake Champlain from Vermont, it is likely that we will be joining him on some bat work this winter.

Only one new bat bander has appeared since the last issue of the news. He is Robert W. Ayre, 2510 S. Julian St., Denver 19.

Your editor has been on the go continually since the end of

the college session at Middlebury. After the meetings in Urbana, I went to Minnesota for a visit, and returned to begin our bat work in New England July 3. Since that time we have been in every New England state and haven't spent more than a day at a time at Middlebury. Since this day is well filled with keeping records of bat work, corresponding with people who have written us concerning their bat colonies, and lawn mowing, I have had difficulty getting this issue of the News out. Several items I had planned for this issue will be in the next.

Our work this summer has been giving encouraging results. We have picked up over a dozen of our bats which had been tagged in the caves. On our most recent trip we found five more than 100 miles from where they were banded. It is rather thrilling to reach into a a crevice in a bog house in a remote Cranberry glade and pull out one of your banded bats.

CORRESPONDENCE

DAVIS, CALIF. (Zool. Dept., Univ. of Calif.). I am a graduate student in Zoology and have been working with bats for several years. I am using bands issued to Dr. Robert L. Rudd for my banding studies. I have been concentrating lately on roosts which show definite rapid turnover in the spring and fall. My results so far indicate that these roosts are used by bats in transit to other locations during these times of the year.

I have experimented with band placement both in the laboratory and in a few field colonies with stable populations. I have found that rotating the band through the wing membrane in Macrotus californicus, Antrozous, and Tadarida reduces the incidence of band damage. I have used 1A bands for the first two species and 1 for Tadarida. The band which clips onto the wing sounds like a quick way of placing bands in my present method. I have been cutting through the membrane by running my thumbnail over the edge of the bands which easily cuts through the thin wing membranes. It is time consuming and tiresome, however, and I often switch back to the conventional method. The European type band is really not much better than the American type and causes more injury to the wing membrane in the vicinity of the band.

I have been using old fashioned steel knitting needles for expanding and holding my bands. The bands go on very quickly and evenly with an even spread. The new aluminum knitting needles are easier to obtain, but show wear after being used a few times.

Burlap bags are easy to obtain here and make excellent bags for collecting and as collapsible cages. I use a heavy gauge wire to form a hoop for the top and bottom. A wire or burlap piece is used to cover the opening. I intend to make a trap door in the center of the wire top which will be held shut with rubber bands. They are easy to push handsful of bats through without other bats escaping. Two or three light metal or wooden rods with a notch at each end, long enough to engage each metal hoop, converts the collecting bags into cages for the trip back to the laboratory. Pillow cases also make excellent collecting bags. I just hold them over clumps of bats on walls and low ceilings and scoop the bats in. They hold 200 to 300 Myotis. I close them off with a heavy rubber band and stick the bag through my belt.

Bat colonies in California tend to be small, a few individuals to a hundred or so being the usual. There are a few colonies of over 500 (Macrotus, Myotis yamanensis, and M. velifer). I have been having good results working the small colonies, collecting certain individuals in consecutive years. Recently, I have had evidence of northward movement in the spring by Tadarida brasiliensis.

I am increasing my efforts so that I will better be able to check for movement patterns in the fall and again next year.

Your Bat Banding News fills a long-existing gap. I have been in touch with a few other banders, but your list gives me names and addresses of others interested in the same problem. Albert J. Beck. (Ed. note-. The process of getting the band through the wing membrane need not be long and time-consuming. When experimenting with this I devised a method that takes practically no extra time. A needle-point replacable scalpal blade (available from Clay-Adams, Inc., Rochester, N. Y.) is inserted beneath the end of a piece of tape on a roll, with the point protruding upward. Then when one has the bat in hand he simply brings the wing down onto the scalpal blade before applying the band.)

WASHINGTON, D.C. (U.S. Marine Band, 8th & Eye Sts. SE). I have compiled and am keeping up to date a file on caves and related features in the Mississippi basin at and above the Des Moines River valley on the west and the Rock River valley on the east. Any bander whom I could help should by all means write me. The file includes mines in the zinc-lead district. --- Many of the 300 -400 caves now on file are by no means well known, but I will be glad to provide any information that I'm able. Sgt. James Hedges.

DAVENPORT, IA. (1102 Kirkwood). I am a biology major at St. Ambrose College here, and would like to be of service to anyone interested in bats. At present I have no plans to do any banding.--I know of hibernating quarters for over 500 Eptesicus and know of a cave that seems to be a stopping place for fall flights of Myotis. Its average summer population is about 50; the average winter population 500. On a visit in the fall the population was well over 2000. In winter there are some pipistrels and not over 40 Eptesicus. I have never seen M. keenii in this cave, but other caves have up to 4 specimens. Stewart Peck.

BAND INJURY

We have just revisited a colony of little brown bats where we had banded several hundred with 2 bands. I am sorry to report that band injury was present. The bands had cut through the membrane, and some swelling was evident. Only a few in which the band had not been completely closed showed no damage. Therefore we are now trying them closed not so tightly.

One must be careful not to leave a band too loose; that causes worse trouble than too tight. It works out onto the muscle and becomes imbedded.

All our recoveries of 1B bands have shown no injury whatsoever.

Mailed: July 29, 1961

BAT BANDING NEWS

VOL. 2 No. 4 October, 1961

Compiled by Wayne H. Davis, Editor, Biology Department, Middlebury College, Middlebury, Vermont

Bat Banding News appears quarterly: January, April, July and October. Subscription rate is $1.00 per two years. Exchange with Speleological and Bird Banding publications is solicited. Foreign Banders with currency exchange restrictions will be put on the mailing list without charge upon request.

EDITOR'S COLUMN

The problem of rabies in bats appears to be getting quite serious. The weekly Morbidity & Mortality report of the U. S. Public Health Service for Aug. 11, 1961, lists ten cases of people bitten by bats in N. Y. and Pa. within the past two months. Tests showed seven of these to be rabid bats; two others were pending; and the last was destroyed without study. I am finally becoming convinced that it is rather likely that rabies in bats in the U. S. has appeared recently and is spreading rapidly. Recent records seem too numerous to be attributed entirely to the increased search for rabies.

On Sept. 12, 1961, the U. S. Public Health Service sent a memorandum to the State Health Officers reporting on the findings of Denny Constantine at Frio Cave, Texas. He put dogs, foxes, coyotes and cats in cages covered with plastic mesh so fine that no animal, including insects, could get in. Some coyotes and foxes died of rabies. Time Magazine got the story into their Sept. 29 issue after adding the appropriate (for Time) exagerrations and sensationalism about the stinking guano, bones and skulls, fierce dermestids, etc, that make up the horror chambers of a bat cave.

Under a headline that bats were declared the pest of the year an upstate N. Y. daily ran a story about a regional convention of professional exterminators at which two workers were given an award for developing better techniques for gassing bats in buildings.

Undoubtedly these recent developments will lead to an increase in the slaughter of bats.

Dr. Joseph Waters, 65 Bonney Hill Lane, Hanson, Mass., is a new bat bander. He is a mammalogist who went to school at Michigan and Connecticut and has been a bird bander for some time.

Several people have asked permission to quote from the News in local spelunker publications, etc. I do not object to anyone using information from here.

Back issues of the News will always be available. I keep all stencils and rerun an issue whenever necessary.

My annual trip to the pipistrel caves in W. Va. will probably be during Christmas vacation. I would be glad to hear from anyone who might be interested in helping on this project this year.

The latest news on band injury is encouraging. Returning bats this fall which carry # 2 bands show no injury. It seems that the swelling seen this summer must have been temporary. On a visit to our mine Sept. 12 we found about 4,000 bats. Of these 43% were banded, the same percentage as when the bats left last spring. None of the young were in yet. So far we have seen bats on which we closed the band tightly, some not tightly, and some we had slit the wing membrane. None showed injury. The # 2 band looks promising. The recovery rate for them remains very high. We have had about 100 foreign recoveries already, and the pattern of bat movement up here is taking form on our maps.

One of the most successful bands

ever tested was a # 1 with rounded edges which Dr. Hitchcock got made a few years ago and several banders tested. It seems to cause no injury whatsoever. Thinking that the sharp corners cause injury, we clipped a couple thousand # 2 bands with nail clippers. These caused some swelling on the fifth finger within a week. One of these found at our cave last week showed no injury.

Our experimental clip has been disappointing. Most of them cut through the wing membrane and cause serious injury.

Dr. D. F. Hoffmeister has written suggesting that the News be expanded to cover all phases of bat biology and be published. He says that several people have mentioned to him the need for such a publication, and that he believes that such a journal could be put on a self-sustaining basis. Perhaps such a journal should appear in addition to Bat Banding News. We might discuss such an idea at the bat workers sessions at the meetings of the American Society of Mammalogists at Middlebury, Vermont, next June. Plan now to attend!

NETTING BATS IN AUGUST

At our bat cave in Vt. where many thousands of bats stop by in April and May the population drops off in June till none are left in mid-month. They appear again in fall, though not in such large numbers. Since John Hall found a couple hundred there on Aug. 18 a few years ago, Dr. Hitchcock decided that we should check the cave to see when they began to come in. He went up Aug. 9, and to his surprise found over 200 bats. Next day John Beauregard and I went back to the cave and found 1,300 bats including none of those Hitchcock had banded the day before. We decided to spend the nite and watch the bats. The number of bats coming in at nite was remarkable. Using a section of 10 feet of mist net across the path some 20 feet from the entrance we caught 700 in four hours. We then stopped, but the bat flight continued. We caught only a small percentage of the bats present.

For a later return to the cave I invented a new bat net. A quarter inch steel rod ten feet long was bent to form a hoop a yard across with a foot long handle. Netting is made from 3 yards of curtain material. Using this at the entrance of the cave we were able to pick up bats much easier than with a mist net. One could wave it leisurely and slowly until about 20 bats were in it and then pick them out quickly as they crawl up the sides. Such a net is a wonderful tool and should prove very useful in many caves which have summer populations of bats as well as in attics and churches. I plan to make another using light weight flexible copper tubing for next year.

We found that our summer colonies had dropped off considerably in the houses by mid-August. Perhaps they begin going into the caves and mines by that time. Netting at such places at nite might prove productive. One could work old mines which are too dangerous to enter. Jim Beer netted several hundred bats at the entrance of the old iron mine at Hurley, Wisc., during the last days of August and first of Sept. He says that the mine was too dangerous to enter.

Whatever the bats may be doing at our cave in mid-August, they are on the move. Recoveries have shown that some go 100 miles or so within about a week after we band them.

KNOW YOUR MYTOIS-MYOTIS KEENII

Since the mammal books are written by people who are not very familiar with bats, and the keys are for the identification of a single museum specimen in the hand, we need some information that will be of real help to the bander. His most common problem is separating a different species from among a large group of living Myotis. Those of us who are most familiar with these bats can furnish information which will be

quite helpful to those who are not. Contributions for this series are wanted.

The recognition of Myotis keenii in the field has caused many workers difficulty - and it need not. The ear is so much larger than that of M. lucifugus that the two need not be confused. The ear of M. keenii is 18mm and that of lucifugus is 15mm. However occasional individuals of the latter will measure 14 or 16, natural variation within the species. There is a strong tendency for people to look at large-eared lucifugus and wonder about its identity. A rule of thumb that I have found infallible for students helping us with banding is that if there is any question about the bat, it is lucifugus - if it is a keenii you will know it at once.

Another thing helpful to the beginner is the fact that in a large group of active bats in a Myers cage the keenii will separate out and either be by themselves or at the lower edge of the group. One can look into the cage, learn to recognize them, and pick them out readily. If one has live M. keenii and M. lucifugus side by side he has no difficulty in separating the two species.

Myotis keenii is a northern species, slightly hardier than M.lucifugus. On the average they are found closer to the entrance of caves in winter than the latter species. They tend also to be in wetter and breezy regions of the mines and caves. In the North they are often found wedged into a crevice in a cold cave. They are sometimes found in small mines which are unsuitable for lucifugus.

Myotis keenii is most common in the midwest - Ind., Ill., Wisc., etc, where it is encountered in many mines and caves in winter, though seldom in numbers exceeding 100. It is also rather common in the northeast, but is quite scarce in the caves of W. Va., and probably in most of the Appalachain region. Recent observations by Tuttle have suggested that they may move into the caves of eastern Tenn. in fair numbers in March. John Hall and I found half a dozen or more flying about at night in June in a cave in western Kentucky, where no bats had been found during the day. At our Vermont cave the largest number we ever got was 43 netted the nite of Aug. 25.

Mumford says that M. keenii is commonly found behind shutters in summer in Indiana. I have never found one outside a cave. One was brought to me once in Sept. in W. Va. where it had been found beneath the tar paper on a bee box.

Myotis keenii also occurs in the West, although there it is apparently scarce. The inexperienced could confuse it with M. thysanodes or M. evotis

TIPS & TECHNIQUES

Those who have tried to catch bats with an insect net know that it takes a lot of practice and skill, even in a cave passage or closed room. Very light-weight fish landing nets of large diameter are much more effective. They can be purchased in two foot diameter or greater. My large home-made net is far more effective than these, and anyone who works with other than hibernating bats should build one for trial.

My modification of Bell's handy bat cage has undergone another improvement. In using a gallon can we found that an occasional bat would escape by flying out. We found that five quart oil cans, available at any service station, are fool-proof. See July issue for instructions.

In making the Myers cage (Jan., 1961) I have found that the middle hoop is unnecessary. I use one at the bottom only. A cage will hold 700 M. lucifugus without danger of suffocation if they are active when put in. If they are torpid, it will hold about 400. Since the bottom surface area is the important factor for handling hibernating bats in a cage, I have found that a Myers cage without a top, that is just a hoop bottom, side cloth and draw-string is convenient for

collecting hibernating bats.

Bob Martin writes that Roger Barbour uses a reverse action pliers for opening bands. This is a gadget which I have seen bird banders use, and it might be useful to anyone who never tags more than a few bats at a time.

HERE AND THERE

Cameron Gifford, who banded bats in Mass. a few years ago before going to graduate school at the Univ. of Ga., is now teaching at Earlham College, Richmond, Ind. He will be joining Jim Cope in some bat work.

Gerald G. Raun has moved to Austin, Tex., where his address is Texas Memorial Museum, 24th & Trinity, Austin 5.

Clyde F. Herreid has gone to the Marine Biological Laboratories at the Univ. of Miami, Florida. I do not know if he plans to continue any bat work.

CORRESPONDENCE

DENVER, COLO. (2510 S. Julian St) I have collected several bat tick flies (Trichobius corynorhini Cockerell) from our Corynorhinus. These are best collected dry. Several put into 70% alcohol bloated and spoiled. I was at Jewell Cave National Mon., S. D. and found that the cave had a winter population of 1600, - mostly Corynorhinus. Jim Stokes is banding here. - I will keep you posted on my banding activities as I progress. Bob Ayre.

PITTSBURGH, PA. (U. of Pitt. Med. School, Anatomy Dept.) We are anxious to get a single old bat say of known age over 15 years. This animal should be brought to the lab alive and killed, opened and fixed immediately in 10% formalin. I realize this is quite a request. We are particularly intrigued with aging. Those bats studied so far indicate practically no atherosclerotic changes with age. Phil Krutzsch.

STATE COLLEGE, PA. (P.O. Box 649). If you are looking for good cave description published within the NSS, I suggest you get the regional publications. "Missouri Speleology", "Mid-Appalachain Region Bulletin", "The Texas Caver", "NSO Cave Reports"are a few that I can think of off hand. Ninty per cent of all of these publications is detailed reports of the caves in the area. If you are interested I can send some addresses. Jack Stellmack. -Editor NSS News.

NEW YORK, N.Y. (Office of the Dean, School of General Studies, Columbia Univ., New York 27). It has been some time since I last assisted several graduate students at the University of Wisconsin with their banding activities in the old lead mine area in SW Wisc. I was then still a teenager, but I feel the urge to begin again. Do any of your subscribers know of good bat caves within 50 miles of New York or perhaps in the vicinity of Raymond, N. H.? This information would be most helpful. - Does any national organization for the study and preservation of Chiroptera exist? If not, has anyone given any thought to the possibility? Kerry B. Sterling, Asst. to the Dean.

LOS ANGELES (Biol. Dept., Univ. of So. Calif., Los Angeles 7). I am hoping to have some banding programs going in this part of the country in the next year or so. I have two students now who will be working with bats and we expect to start banding by the end of this summer. We are going to try some banding in Costa Rica this summer and I am expecting some interesting results. We will be working with homing and colony fidelity with some of the phyllostomids. Andrew Starrett.

SAN MATEO, CALIF. (1959 Ticonderoga Drive). I am quite interested in bat banding. I have no specific project at this time, but would be glad to undertake one for someone else or to help anyone band out here. I work in summers in Sequoia National Park which contains several caves, but I don't know if there are any bat

colonies. Richard T. Gale. (Ed. note Mr. Gale is an experienced and active speleologist).

CONCORD, TENN. (Little Creek School). I was interested in the comments in the last News about the night roosts of bats. There is a cave near my home which contains several large piles of bat manure; however, we have never seen more than four bats in it at one time during the day. Recently I visited the entrance at 10:00 P. M. and saw about a dozen bats enter the cave. Several days later I visited this cave and found a considerable amount of fresh manure on each of the old piles. Another cave, near this one, contains from 500 to 2,000 Myotis grisescens during the day in spring and fall; however even during these seasons they are not always present during the day. One afternoon last spring I went to this cave to band bats but was greatly surprised in not finding a single one. By chance I returned at 11:00 P. M. and found a cluster of several thousand M. grisescens where there had been none only a few hours before. I returned the next day but all of the bats had left.

Thus far I have banded only about 4,000 M. grisescens but have made more than a hundred recoveries this summer. Fifty-six of these were found more than fifty miles away from where they were banded. These latter bats traveled the following distances: 3 - 56 miles; 5 - 66 miles; 7 - 68 miles; 38 - 80 miles; and 3 - 130 miles. There would be several times this many records if it were not for the fact that I have banded only 4,000 out of well over 100,000 of this species in my area. On our last banding trip, my father and I were able to catch only 430 of the more than 20,000 that we found. Eleven of these were banded. We figured that if 11 of 430 caught at random were banded, there should have been about 500 of our banded bats in the group. We are now nearly certain that the M. grisescens which hibernate near Kyles Ford on the Tennessee-Virginia border migrate about 184 miles southwest to Nickajack Cave on the Tennessee-Georgia line. All during the spring and early summer nearly all of my banded M. grisescens were moving steadily southwest toward Nickajack Cave. At present this species is quite rare in all the caves where it was so plentiful this spring; however, Nickajack Cave, which had very few, if any, during winter and spring has many thousands of them now. We have made two unsuccessful attempts to reach them. We plan to try at least once more this summer; but even if we do reach them it will be like searching for a needle in a haystack to find any of our 4,000 bands among the many thousands of unbanded bats.

I am rather discouraged about the prospects of anyone else ever reporting any of my banded bats. Recently a game warden caught one on my banded bats and said he threw it away because he didn't know what to do with it. Two people have found my banded M. grisescens in rather unusual places and taken them to the University. None of these people had any idea what should be done with the bands. I plan to try the # 2 bands as soon as possible. Merlin D. Tuttle. (Editor's note: We are discouraged too. In New Hampshire this summer we met a Middlebury graduate who had found and killed a banded bat behind his window shutters just the day before. He examined it and saw that there was a number on the band. He was very sorry that he had thrown it on the trash pile, but he had no idea that anyone might be interested in it. We all searched the trash pile but did not find the bat. We have found that people have no idea that bats migrate. Many people think the bats live in the attic all the time and never come out. Most people think they are there year around).

WARRENSBURG, MO. (Biol. Dept., Central Mo. State College. The

netting I have used to make my cages is ¼ inch # 6 medium cotton netting, handled by the Linen Thread Co., Inc., 701-3 N. 2nd St., St. Louis 2, Mo.

I built (actually had built for me) a "harp" trap similar to Constantine's. The frame is made of 3" T beam aluminum, six feet on a side. The wires are 0.008 music placed on a inch center. Attached to the bottom is a trough about 15-18" deep with plastic covered sides to prevent bats from crawling out. At the top-center I placed a three inch pulley on a swivel, so the trap may be raised, lowered and turned at any angle.

I never have caught bats in it outside caves, even with electric light on it. I have had it in towns, the country, in trees, bushes, and over streams. But in a cave which has a 6' by 6' passage it is somewhat more effective. I estimated that I caught one M. grisescens out of every 10 hitting it in a wintering population of about 125,000. Even here many bats avoided the trap. Of the nine-tenths which struck and escaped some bounced off (tension of the wires was reduced to about 2 lb. and this helped), others echolocated the trap and turned enough so that they slipped sideways between the wires.

I would not endorse this trap for small populations, for it seems that much confusion and commontion by the bats is necessary before much success is realized.

Try the 12 meter, 4 bag, 5 taut line mist net that Bergstrom in Conn. sells. I find them more effective than the shorter 2 bag nets Davis in Texas sells. ..Dick Myers. (Ed. note: My new net should be much more effective in the 6' by 6' passage than the "harp" trap. Also I think that if one could get that very sturdy very light-weight aluminum of which fish landing net frames are made, he could construct a hand dip net ten or fifteen feet in diameter, or long and narrow, and catch bats in the great Tadarida caves. I think there is much yet to be done in building bat nets.)

SANDWICH, ILL. (R.F.D. 1). I got some # 2 bands to use at Utica and in the abandoned lead mines at Galena. Robert Martin and I spent a wonderful weekend banding in both the North and South Blackball Mines April 22nd and 23rd. The number of bats banded was not great, although we recovered numerous Pipistrellus banded by you and possibly others. I banded 300 M. lucifugus. They were still fairly common in the mines, but only two Eptesicus were found and banded. All your pipistrels having # 1 bands showed no signs of band injury or wear.

We explored the mines on the hill north of North Blackball and found these to be connected with the North Mine. Two of the farthest ones were small and not connected. Both of these had few bats. I hope to visit the mines at Oglesby in the near future and hope to find populations of bats.

(Another letter - May 8). I would be more than happy to test # 2 bands on pipistrels for you. I plan on banding in North Blackball on May 10 and 14, and will visit Pruce's mine during one of these dates. I applied 100 # 2 and 150 # 1 bands on lucifugus on May 7 in N. Blackball. They were still rather common in both mines. I recovered your 54-19116, with considerable overgrowth of tissue on the band.

(May 15 letter). On May 10 I banded 15 pipistrels with # 2 bands, but found they had an extremely hard time maneuvering and avoiding obstacles. The majority of them either flew into the walls or collided with the stud-posts of the mines. I would have banded more pips, but found no others in N. Blackball. I will investigate Pruce's mine on May 17, if my #2 bands arrive. From what I've seen so far, I'm rather doubtful as to the pips carrying these bands. On May 10 I recovered five of your 1954 bands.

This evening I heard from a local farmer that bats are using

his cattle-shed as a roost. Upon visiting the site this evening I discovered about 200 Eptesicus fuscus between two rafters. These seem to be all females, and possibly this will be a maternity colony shortly. I examined and banded 35 females. I failed to get more because of lack of equipment at the time. The owner of the farm informs me that by mid-summer there are at least 10 times as many bats there. Harlan D. Walley.

LITERATURE

Vermont Mines & Mineral Localities
Maine Mines & Mineral Localities
New Hampshire Mines & Mineral Localities by Philip Morrill. This series of five booklets (two volumes each for Me. & Vt.), available from the Dartmouth College Museum, Hanover, N. H., should be quite useful to anyone working with bats in New England. Over 100 mines are listed for Vermont, and similar numbers for the other two states. In most cases information is given as to whether a mine is a pit, shaft or tunnel. However, nothing more is said about the mines, since the two booklets are written for mineral hounds who are interested in the slag piles; I found one of the tunnel mines to be only ten feet long. Directions are given by road, trail, and compass; also a method of locating on a topography map to within about a quarter of a mile. I found the road distances consistently off by as much as .3 mi to the mile in seeking a dozen or so mines in Vt., and was able to locate only three of them.

Distribution and speciation problems concerning the long-eared bat, Plecotus townsendii virginianus. Lyle Conrad. D. C. Speleograph, 17: 49 - 52, August, 1961. This paper presents all locality records for this bat in Va. & W. Va., including an annotated map. The records are those from Handley's revision of the genus Plecotus plus a number of new ones which Conrad has discovered. He asks for information on further localities of this bat. (I have taken it in W.Va.: Grant Co., Cedar Hill Cave; Tucker Co., Mill Run C Cave; and Pendleton Co., Keel Springs Cave, which can be added to his list). Conrad says that Plecotus rafinesquii (= Corynorhinus macrotis LeConte)"does not occur as far northeast as the Upper Virginia and West Virginia Region", apparently missing the record of Frum (J. Mamm.29:418,1948) reporting the taking of this species in Nicholas Co., W. Va.

Berichte und Ergebnisse von Markierungsversuchen an Fledermausen in Deutschland und Osterreich. Bonner Zoologische Beitrage, Dec. 22, 1960, p 1-263. This is a collection of over 20 papers on bat banding in Germany and Austria. An introduction by M. Eisentraut gives the history and development of bat banding in Germany, and a paragraph on bat banding for each of the other 18 countries where this work is being done. He also gives directions for banding bats and a key to the native species.

These papers give the results of many individual banding projects. These range in scope from the tagging of a few hundred bats in a single building to the extensive works of Eisentraut on Myotis myotis. The final paper, by H. Roer, summarizes the results of all banding of European species, giving information on movements, longevity, sex ratios and homing. Of particular interest is the report of a greater horseshoe bat, Rhinolophus ferrumequinum, banded by Casteret on Dec. 30, 1936, and found again on July 2, 1960. I think this is the oldest bat yet reported in the literature. At the end of the paper there are seven pages of literature on bat banding.

Mailed October 9, 1961.