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Observing City Animals

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Introduction

City animals are often taken for granted. Both teachers and children alike feel that the woods are the only place to learn about wildlife. While the woods would make a more suitable wildlife classroom, it is not the only wildlife classroom. Inner city animals are abundant and thriving in habitats very close to city dwellers. While it is very difficult for many children to get into the woods to study wildlife, it is easy to do in the city. The gray squirrel, the house sparrow, the starling, and the pigeon are all good examples of animals who have adapted to a city environment yet maintain a wildlife status. These four animals of the city will be the main focus of this unit. Each animal has peculiarities that lend themselves to being of great interest to most fifth and sixth grade Science students. The unit could be five weeks long and take place at any time of the year since these animals are year round residents of New Haven. Or it could be an ongoing unit which studies changes in behavior, habitats and physical appearances of the animals over an extended period. The latter would utilize charts and graphs to record differences and/or similarities throughout the year.

The objectives of this unit are:

1. to observe animal behavior in natural environments;
2. to familiarize children with animal observation and data gathering techniques;
3. to draw conclusions and make assumptions from data gathered during observations;
4. to create in children an awareness of animal life in their environment;
5. to sensitize children to the needs of animals that live in the city.

Rationale

As was previously mentioned, the city is an excellent resource for learning about wildlife. The information you may be seeking about a particular animal is readily attainable. Birds can be observed right on school grounds. The species being discussed have a propensity for making their nests on buildings. They might even live on the school itself: A walk to a nearby park can also be quite revealing. Squirrel activities are observable while bird song fills the air. The Peabody Museum, located in the center of New Haven and easily accessible to all schools, is another good place to get a close-up view of the coloration and physical features of birds and squirrels. The West Rock Nature Center offers the best of both worlds: caged animals for close-up observation and a large wooded area where animals run free.

This unit is necessary, particularly in the elementary and middle grades. Not only are our children hampered by a limited amount of experiences with wildlife, but they are also victims of distorted perceptions. Peer pressure has fostered a disdainful view of nature. It is not uncommon to see birds and squirrels being pelted with rocks or shot at with sling-shots and B-B guns. Nests and eggs, if found, are quickly destroyed in many cases for fun. Television, in particular cartoons, has done much to perpetuate this attitude. The animals in cartoons seemingly have one-hundred lives and are able to withstand the severest of attacks. The number of children whose attitudes about nature have been shaped from these versions of life among animals is surprising. Wildlife education is important.

Information

A certain amount of pertinent information is necessary in teaching any Science unit. In this next section I will impart some of this vital information while also citing some resources for those who would like to delve deeper into the subjects discussed.

1. *The gray squirrel*

Gray squirrels are common to cities and forests all across America. They live in the cavities of trees; often times enlarging a natural cavity and waterproofing it with leaves. Gray squirrels are naturally more abundant near a major food source. Therefore it is no wonder that oak, chestnut and hickory forests are teaming with squirrels. Squirrels feed on nuts, buds, fruits and berries in the main. They will eat an occasional insect and sometimes invade a birds nest devouring either the young bird or the eggs.

Gray squirrels are mostly observable when foraging for food. They can be seen most often in the early morning hours or in the late afternoon because that is when they eat. In the fall squirrels bury acorns and other nuts as well as mushrooms in anticipation of winter. The gray squirrel does not usually venture out of its nest in inclement weather. However it is possible for a squirrel to find nuts buried under several inches of snow. This amazing feat is attributed to the marvelous sense of smell squirrels possess.

Squirrels have two litters a year. They mate in mid-winter and produce two or three babies in about forty-four days. They mate again in early summer and have another litter by the end of summer. Young squirrels begin to move about on their own after about five weeks in the nest. Adult squirrels play a mating game that involves chasing and running around before settling down.

Gray squirrels have slightly different coloration in the summer and winter. While underparts remain white all year round, the coat changes from a silvery color in the winter to a yellowish brown in the summer. The long bushy tail stays gray all year long. Sharp claws for grasping bark and powerful hind legs make the squirrel a swift mover in trees and on the ground. In the city, man is the main threat to gray squirrels. They are sometimes used for target practice. During the Revolutionary War, marksmen gained skill at shooting by using gray squirrels as targets.

Gray squirrels seem to regulate their own population. An area can only support so many squirrels. Others move to an area where food is abundant for survival. An interesting phenomenon did occur in the 1930's dealing with the overpopulation of squirrels. Thousands of gray squirrels left Connecticut and emigrated to New York by way of the Hudson River. Most died trying to cross the river to get to New York. Scientists concluded overpopulation was the reason for this mass emigration. A very good account of this phenomenon can be found in Monica Shortens' book, *Squirrels* .

2. *House Sparrows* (English Sparrows)

In Brooklyn, New York back in 1850, eight pairs of English sparrows were introduced by an Englishman who felt there were not enough birds in New York City. Today the population of these sparrows has multiplied to such enormous proportions that it is considered a pest. House sparrows will nest most anywhere: in gutters, eaves of buildings and mailboxes. Because of their boisterous habits and defacement incurred on buildings, they have been described by some as "vermin of the air."

House sparrows eat grain, berries, fruits and garden vegetables. They also eat a small amount of insects-especially caterpillars. Their water is supplied from dewdrops that form on the grass. At times house sparrows will infest premises associated with food such as bags of grain or flour. This causes real problems for the proprietor.

House sparrows, as was previously mentioned, will nest most anywhere and in a haphazard fashion. The nests are ragged and loosely put together. Grass, straw and even string are used in nest construction. Sparrows are very proficient reproducers. The male is an ardent wooer. He does a hopping dance with trailing wings to a seemingly indifferent mate. They have from four to eight eggs at a time from four to eight times a year. The eggs are whitish, spotted and blotched with shades of gray and black. The mother sits with them until hatched. When they do hatch they are fed insects by their parents. This high protein diet accelerates growth and strength in the young birds. The insect portion of their diet becomes less important as the bird grows older.

The average house sparrow has around 3,000 feathers. They are used naturally in flight but also to hold in body heat. The feather amount increases to around 3,500 in the winter which provides additional body heat during cold temperatures. The body temperature has been measured at 106.7 degrees even in the severest of weather.

House sparrows have been classified by many as pests. They roost on buildings in great numbers and deface property with their droppings. Many naturalists dislike them because they drive other birds more beautiful and rare away. They are fierce competitors for food. Ornithologist Elliot Coues said of the sparrows temper in 1873: "they attack, harass, fight against, dispossess, drive away and sometimes actually kill various of our native birds which are much more insectivorous by nature than themselves." Dealing with their overpopulation is a problem since they have too few natural enemies to even make a dent in their numbers. Shooting and trapping are not effective in urban areas for obvious reasons. Recently scientists have been

experimenting with a chemical called x-chloralose to reduce the sparrow population. This chemical, when ingested, has an adverse effect on ability to produce fertile eggs. People can discourage sparrows from roosting in undesirable places by shooting a stream of water into particular sites while the sparrows are sleeping. More often than not, though, they just pick another undesirable spot to roost and the problem lingers.

3. *Starlings*

Starlings are often confused with blackbirds. They are distinguishable from blackbirds by their yellow beaks. In the spring, starlings have a purplish green tint to their feathers while in the winter their feathers become speckled with light dots.

Starlings have a background similar to house sparrows. They were introduced, one hundred strong, in Central Park New York City by an Englishman who wanted to have British birds in the United States in the late 19th century. Today they number in the millions and Roger Tory Peterson has declared that they are the number one bird in America. They roost in trees and on buildings in the city. They have taken over territory once held by native birds in the United States. Starlings eat grains and berries and sometimes the eggs of other birds. They feed their young insects, just as house sparrows do. They are effective destroyers of insect pests such as cutworms, grasshoppers and weevils. This makes them less hated than the otherwise useless sparrow. Starlings raise two broods a year with four to six eggs in a brood. The eggs are a pale bluish green in color.

Starlings are often observed roosting together in flocks of great numbers. They stay together for many reasons one being protection from predators. This flocking together causes many problems, the least being the noise a group of starlings can make. (In fact starlings are great imitators of sounds. Some have been heard in forests imitating the sounds of chain saws.) More serious problems are those associated with human diseases and interference with airplanes. Starling droppings, when dried, form a powdery dust that can infect humans with a tuberculosis type disease called histoplasmosis. Although very rare, it is a serious illness. Cities have had to develop ways of dispersing this undesirable guano with chemicals not harmful to humans. Interference with aircraft is a more common problem. An airplane in Boston crashed at takeoff in 1960 killing 62 people. The reason for the crash was engine malfunction due to starlings being sucked into the engines at takeoff. This problem has become more prevalent recently as the starling population has been soaring.

Urban dwellers have little recourse in dealing with these noisy birds. One suggestion is to play a tape recording of the starling distress call over a loudspeaker. This disperses flocks. Another is to water the birds down while they are sleeping. Scientists have sprayed flocks with a detergent called Tergitol. Tergitol dissolves the oils on the feathers causing death due to exposure. This must be done when temperatures are below 45 degrees F and in the rain.

4. *Pigeons*

The former cliff dwellers of hundreds of years ago now inhabit “man-made cliffs” in the form of nooks and crannies of buildings. Pigeons are probably the most recognizable bird on earth. Roger Tory Peterson in *The Birds* says that pigeons need no description everyone knows them. Pigeons live in shabbily built nests located in gutters, corners of buildings and rooftops. In fact the nests are so flimsy they must be sat in to protect them from the blowing wind.

While some people classify the pigeon as a pest, many people have developed an affinity for the bird. People go to parks to feed them. Because of this relationship, pigeons are less afraid of humans than the birds

previously discussed. People have been known to have a special favorite pigeon in a particular park that they feed often. It comes as no surprise then to find that the main foods of pigeons is people food garbage, crumbs, scraps and the like. An interesting diversion does take place in the feeding of their young. I have mentioned that the starling and sparrow (and most other birds) feed their young insects for protein.

The pigeon does not need to do this. Instead pigeons feed their young a protein-filled, cheesy secretion called “pigeon milk”. The mother builds this secretion up naturally and regurgitates it into the mouths of her young ones. This satisfies the nutritional requirements of young pigeons.

The mating habits of pigeons are also very interesting. They consist of four stages: 1. head bobbing, 2. preening of partners, 3. the “bow-coo” session and 4. male regurgitation of food into the females mouth. Once these four stages have taken place the mates begin their lives together. They stay together for life. When the eggs are laid each partner takes a turn sitting on the brood. Usually two eggs are laid at a time. Pigeons are capable of nesting seven times a year.

Pigeons are considered pests by some for similar reasons as the starling and sparrow. They have overpopulated many of the large cities of the world causing considerable defacement of buildings and property. They also are responsible for a rare disease called ornithosis. It is a pneumonia-like disease that takes quite a while to recover from. It is contracted from the dust of dried pigeon droppings. Reports of such cases are rare but do cause a stir among populated regions. For this reason controls have been instituted on the pigeon population. Screens are placed over gutters to discourage nesting. Pigeons have been poisoned, shot, had their eggs taken all to no avail. Recently a method of chemosterilization has been started to reduce the pigeon population. Putting mestranol in food produces infertile eggs. The level of success, however, has been minimal.

Earlier in this century in New York City pigeons had a natural predator peregrines. Peregrines were falcon-like birds whose only food source was pigeons. But the peregrines died off eventually becoming extinct. The reason DDT poisoning. So pigeons are left to thrive bringing solace to some and rage to others.

5. *Other Birds*

There are many other species of birds that occur in New Haven far too many to name here. A trip to the Peabody Museum to see the stuffed bird collection can be an asset in identifying birds observed on field trips or at feeding stations. Also several books described in the Student and Teacher reading lists can help in this most interesting activity.

Course Outline

I. Introduction to “Animals in the City”

A. Brainstorming in class for animals found in the city.
B. Students will classify different animals as to their habitat. (tiger-jungle, deer-woods, pigeon-city)

II. The Birds

A. Discuss characteristics of pigeons, starlings and sparrows.
    1. Books, pictures and filmstrips introduced.
B. Field trips to bird sites.
    1. examine physical features
    2. observe eating habits
    3. listen for sounds made
    4. observe nesting habits
    5. look for means of locomotion
C. Record information on individual and room charts.
D. Take the field trip to the Peabody Museum.
E. Make feeding stations.
F. Enrichment activities

III. The Gray Squirrel

A. Discuss characteristics and habits.
    1. Introduce children to books, pictures and filmstrips.
    B. Field trips to gray squirrel sites.
    1. observe physical characteristics
    2. observe eating habits
    3. observe sounds made
    4. observe nesting habits
    5. observe means of locomotion
    6. observe other interesting activities
C. Record information on individual and room charts.
D. Field trip to the Peabody Museum.
E. Enrichment activities

IV. Evaluation

A. Worksheets to quiz children on what they have learned.
B. Writing of comparison papers based on chart recordings.
C. Comments from students on the effectiveness of the “Animals in the City” unit.

Classroom Activities

Animal observation is the core of this unit. Therefore it is very important that the children are instructed as to their behavior when observing animals. Specific points should be brought out to maximize the observation experience. The book *How to Watch Birds* by Roger Barton is an excellent resource that focuses on techniques of observation vital to this unit. A few of his major points that help in observing birds are:

1. The clothing of the observer should be subdued so as not to startle birds.
2. Observers should approach quietly not talking and taking “soft” steps (avoiding twigs and leaves as much as possible).
3. Hands of observers should be held behind their backs. Waving and/or pointing motions will startle birds.

Remember also that an objective of this unit is for the children to gain a knowledge of and respect for wildlife. Therefore, 1 feel that any display of disrespect toward animals shown by the students be discussed and dealt with as soon as possible.

Activity A *Group Observations*

Field trips to habitats of city animals should take place as frequently as possible. These trips need not be planned weeks in advance nor do they have to last beyond the normal Science time period. As was pointed out earlier, it should be possible for these observations to take place on school grounds or at a nearby park or wooded area.

You could have the children look for different behavior patterns of the animals being observed each time out. The first time out the children should look for and record information pertaining to physical traits of the birds or squirrels. For example, their size, coloring of various body parts and distinguishing features could be noted. (I’d like to suggest that for record keeping purposes it would be more beneficial to make a separate trip for observing squirrels. Concentration on the particular species at hand would be maximized if done separately.)

Other trips to the same or similar sites could be made to observe the following activities:.

1. eating habits how, what and when the animals eat and, if possible, what they feed their young;
2. dwelling places where the animals make their homes and the relationship, if any, to food sources;
3. sounds they make especially in the case of birds, try distinguishing various species and various types of calls;
4. methods of locomotion running, hopping and the varied types of flight.

All of this information should be recorded by each student as it is observed on a chart. (Refer to Figure 1.)

This information can be compared and contrasted by the students and conclusions deduced about the similarities and differences of the animals studied. These charts can also be compared to descriptions the children find in books. This will hopefully reinforce information gathered.

These group observations can also take place over an extended period so that the children will get an idea of the adaptability these animals have in a changing climate. In this respect, the unit is also adaptable in that it can be 4-5 weeks long or ongoing.

Activity B *A Field Trip to the Peabody Museum*

This field trip should be taken for the sole and expressed purpose of visiting the third floor bird and mammal displays. The Peabody Museum has many other elements and displays worthy of seeing but they are not useful in this particular unit. In fact, 1 feel they would detract from the purpose of the unit to observe peculiarities and differences among birds and squirrels at a close-up range so physical features not evident outside can be readily viewed.

Arrangements for the trip should be made through the Public Education Division of the Peabody Museum. Upon reaching the third floor bird room, the children will be able to sit on the floor and look at various types of birds. Especially of interest is a showcase display of the birds of Connecticut. As was mentioned before, this information can be recorded and compared to other information the children have found in books. The gray squirrel is situated in a display case that shows its typical environment trees, birds and other animals they live with. It is a valuable resource that bears careful study by the students.

lt can also be arranged, through the Public Education office, for a group to view what goes on “behind the scenes”, so to speak, in a museum. Of particular interest to the teachers and students of this unit is the room where bird specimens are prepared. Here the children can learn the specifics of stuffing and preserving birds while also seeing the differences in appearance of some varied species from all over the world.

The experience at Peabody can be a rewarding one for the students if used properly. The students must be instructed as to exactly what they will see and why. They must be told specifically what to look for and why. It would be a good idea to bring pencils and notebooks for the jotting down of information and the sketching of various animals. The teacher must also do some preparatory work for this field trip. He or she should visit the third floor displays and plan a lesson according to the information to be viewed.

Activity C *For the Classroom*

I will suggest several ideas that can be used inside the classroom.

These can be expanded on, borrowed from, or changed around to fit each particular program.

1. *Making feeding stations —*

The Barton book, *How to Watch Birds* , and a childrens book by Glenn Blough and Jeanne Benedick, *Bird Watchers and Bird Feeders* , give easy to follow instructions on how to build bird feeding stations. These feeders could be made by the students and placed outside the classroom window. This would allow the children to view at close-up range the eating habits of city birds. They will attract a variety of species and observations of many previously noted activities can be recorded.

Experiments in which you control the types of food given to the birds can take place. Food type preferences, aggressiveness in going after food and many other bird activities can be observed.

2. *Picture-Story Study Prints*

There is a series of very vivid pictures depicting various animals on 13”x18” cards put out by the Society for Visual Education (SVE) that can be useful in class discussions. Basic information is given along with lists of films and references available on the back of each card.

3. *Recess Activity*

Often times birds are attracted to their food by its color. As they fly overhead they spot something to eat and swoop down to get it. There is a game that can be played with the children that simulates this action. All that is needed is several pieces of construction paper of all different colors. Be sure to include brown, black and green among the other colors. Cut this paper into 1”x3” strips. Mix all of the colors together and spread them out over a grassy area. Have the children run by this area one at a time each picking up the first piece of colored paper that catches his or her eye. Encourage the children to be honest. Record the results as to what color was spotted first, second, third and so on until every color has been chosen. Discuss with the class the advantages or disadvantages of certain colors. A chart could be made depicting the colors chosen and in what order. Variations of this game can be played by spreading the colored strips out over different ground surfaces (i.e. tar, sidewalk, dirt).

4. *Examining a Birds’ Nest*

Bird nests are an interesting, if not fascinating, phenomenon. Even though the starling, sparrow and pigeon build very sloppy, haphazard nests, they are worth examining nonetheless. Just seeing the variety of objects used in the weaving of the nest would be a good activity. These birds use string, thread, sticks, weeds anything to build a nest. If it is possible, try to get a nest and bring it into school. Examine its makeup. You may be able to determine what kind of bird weaved it. If it is not possible to bring in a birds nest, you might be able to spot one in use or better yet see a bird going about the task of gathering materials for ones construction. The book, *Window Into a Nest* by Geraldine Flanagan and Sean Morris, shows nest building vividly in excellent photographs. The activity of learning about nests should foster an appreciation in children of how wild animals must prepare homes for themselves and their families.

5. *Enrichment Activities*

The information gained in a unit such as this can also be carried over into other areas of the curriculum.

Stories about fictitious animals can be written in an English class. Animal storybooks can be given out to supplement a reading program. Drawings of animal activities can be made during art. The teacher has to gauge the interests of the students in a unit such as this and make the lessons reflect those interests.

Teachers Annotated Book List

Barton, Roger, *How to Watch Birds* . NY: McGraw Hill Co. Inc. 1955.

Good tips on bird watching. Filled with ideas for attracting and caring for birds. Good list of references inside.

Hamilton, W. J. Jr., *American Mammals* . NY: McGraw Hill Book Co. Inc. 1939.

Facts about all mammals in North America. Interesting section on squirrel emigration from CT. to New York.

Orr, Robert T., *Mammals of North America* . NY: Doubleday and Co. Inc. 1943.

Vivid pictures of mammals. General information about squirrels included.

Peterson, Roger Tory, *The Birds* . NY: Time-Life Books 1968. Beautifully illustrated. Life-like pictures of every facet of bird life.

Peterson, Roger Tory, *A Field Guide to the Birds* . Cambridge, Mass.: Houghton Mifflin Co. 1947.

Descriptions and pictures of bird types their habits, markings and range. Excellent reference book.

Reed, Chester A., *North American Birds Eggs* . NY: Dover Publication Inc. 1965.

A virtual encyclopedia of every type of bird egg. Picture of the egg is followed by a description of the bird and its habits.

Roberts, Thomas Sadler, *Bird Portraits in Color* . Minneapolis: U. of Minnesota Press 1934.

Succinct description of bird habits with close-up pictures of each species. Good for help with identification.

Shorten, Monica, *Squirrels* . London: Collins Clear Type Press 1954. Excellent information about squirrels. Filled with action pictures and very good charts.

Welty, Joel Carl, *The Life of Birds* . Philadelphia: W. B. Saunders

Co. 1975.

Factual information about bird anatomy and biology. In depth descriptions and pictures for the very scientific minded.

Zim, Herbert S. and Hoffmeister, Donald F., *Mammals* . Racine, Wisconsin: Western Publishing Co. 1955.

Good handbook. Short descriptions and maps of regions where particular are very helpful.

Student Annotated Book List

Beecher, W. J. and Brod, F. (illustrator). *A Child's Book of Birds* . New York: Platt and Munk 1968.

A handbook of birds with vivid pictures and short descriptions. Good for quick identification.

Blough, Glenn 0. and Bendick, Jeanne (illustrator). *Bird Watchers and Bird Feeders* . New York: McGraw Hill Book Co., Inc. 1963. How to make bird feeders, what birds like to eat, and recordkeeping activities are included. Easy to understand directions and illustrations.

Conklin, Gladys and Marokvia, Artur (illustrator). *If I Were a Bird* . USA: Holiday House 1965.

Easy to read short descriptions of various common birds. Also good tips on how to make a feather collection.

Earle, Olive L. *Birds and Their Nests* . New York: William Morrow and Co. 1952.

Various birds and how they make their nests.

Clear text good illustrations.

Earle, Olive L. *Squirrels in the Garden* . New York: William Morrow and Co. 1963.

The life of a squirrel from birth to adulthood is depicted. Easy to read text good illustrations.

Flanagan, Geraldine Lux and Morris, Sean. *Window into a Nest* . Boston:.

Houghton Mifflin Co. 1975.

A *must* for any bird study. A hidden camera placed in a bird nesting box provides vivid and unique pictures of every facet of bird life.

Gans, Roma and Emberly, Ed (illustrator). *Birds Eat and Eat and Eat* . New York: Thomas Crowell Co. 1963.

Feeding habits of birds are discussed. Very simple book for below grade level readers.

Gans, Roma and Mizumura, Kazue (illustrator). *Its Nesting Time* . New York: Thomas Crowell Co. 1964.

Bird nesting habits from building to caring for young are explored. Easy reading for below grade level readers.

Peterson, Roger Tory. *The Birds* . Time-Life Books. NY: 1968. Beautifully illustrated. Vivid pictures of every facet of bird life.

Roberts, Thomas Sadler. *Bird Portraits in Color* . U. of Minnesota Press, Minneapolis: 1934.

Succinct descriptions of bird habits with close-up pictures of each species. Good for help with identification.

Teal, Mildred and John. *Pigeons and People* . Boston: Little, Brown and Co. 1972.

Excellent study of pigeon life for the advanced reader.

Williamson, Margaret. *The First Book of Birds* . New York: Franklin Watts. 1951.

Excellent book with easy to understand text. Good descriptions and illustrations of egg development and hatching.

Zim, Herbert S. and Gabrielson, Ira N. *Birds* . New York: Golden Press Inc. 1949.

A handbook describing 129 North American birds.

Good for identification.

Zim, Herbert S. and Hoffmeister, Donald F. *Mammals* . Racine, Wisconsin: Western Publishing Co. 1955.

Good handbook with excellent pictures, short descriptions and maps of regions where animal is most abundant.

16 MM Films

Animal Homes . Churchill. 1955. Color, 20 min.

Nature in the City . Journal Films. 1971. Color, 13 min.

Where Should a Squirrel Live . University of Arizona.

Filmstrips and Slides

The Birds the Bees and the Trees . American Forest Institute New England Office. 80 slides. Free loan.

Ecology: Street and Park . Captioned filmstrip.

Other References

Armstrong, Edward A. *A Study of Bird Song* , London: Oxford University Press 1963.

Chapman, Frank M., “The European Starling as an American Citizen”, *American Nature* , 89: 60-65 (Sept.-Oct. 1925).

Connecticut Board of Fisheries and Game, *Places to Look for Birds* , Hartford: Dept. of Agriculture 1970.

Delacour, Jean, *Wild Pigeons and Doves* , Ford du Lac, Wisconsin:. All-Pets Books Inc. 1959.

Doughty, Robin, “The English Sparrow in the American Landscape: A Paradox in Nineteenth Century Wildlife Conservation”, Oxford, England: Oxford Publishing Co. Feb. 1978.

Hamilton, W.J.Jr., *The Mammals of Eastern United States* , Ithaca, New York: Comstock Publishing Co. 1943.

Lack, David, *Population Studies of Birds* , Oxford: Oxford University Press 1966.

Murton, R.K., and Wright, E.N., *The Problems of Birds as Pests* , London: Academic Press Inc. 1968.

Scott, Jim, “Those Startling Starlings”, *Colorado Outdoors* , May-June 1980. (pp. 30-32).

The Peabody Museum Public Education Division 436-1710 (call in the AM).