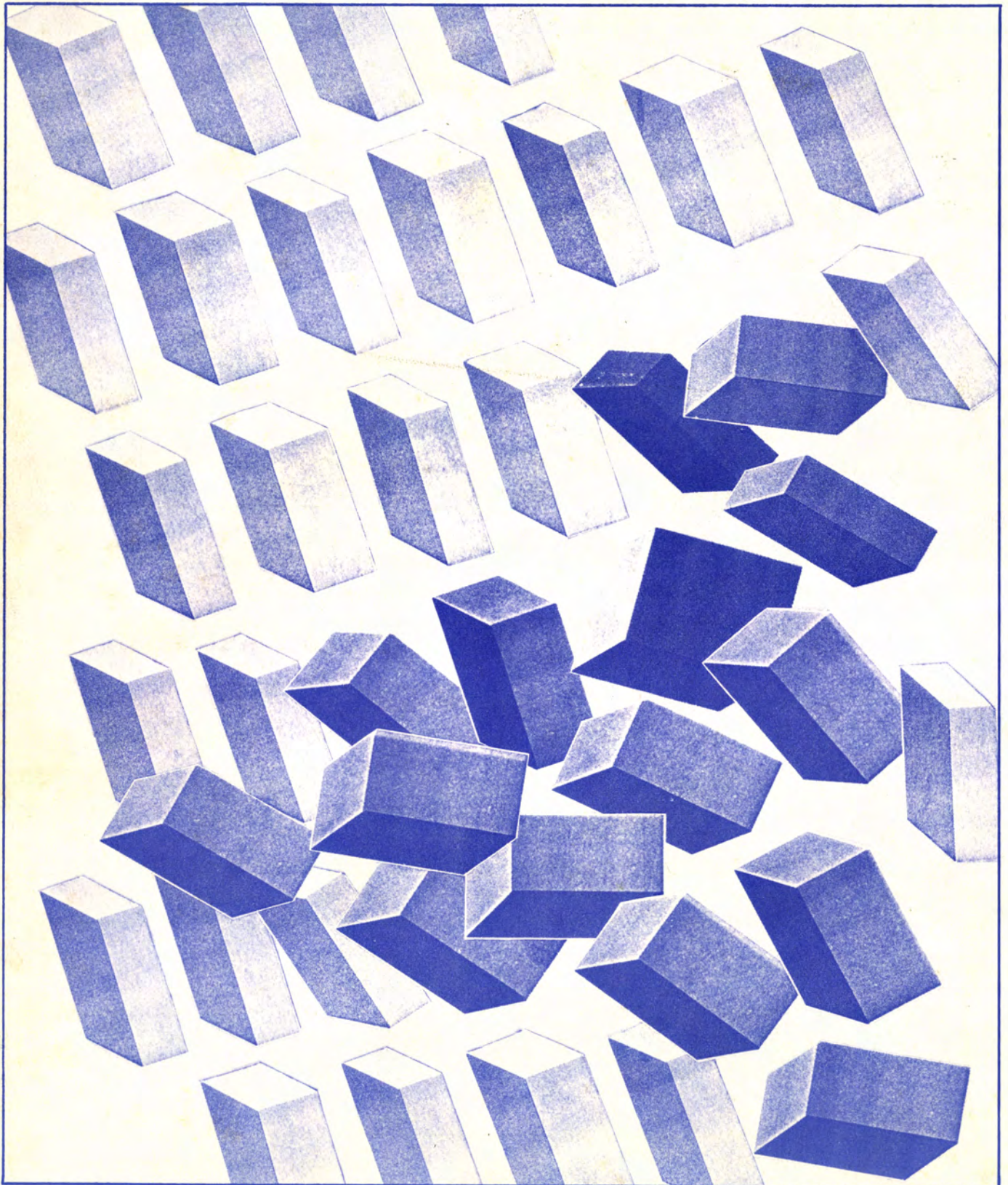


Nature Study

Volume 36, Numbers 3 & 4



THE CITY ISSUE

NATIONAL CONGRESS FOR ENVIRONMENTAL EDUCATION FUTURES: POLICIES & PRACTICES

The First National Congress for Environmental Education Futures will take place 12 to 17 August, 1983 at the University of Vermont in Burlington. The American Nature Study Society, one of two sponsors, will celebrate its 75th Anniversary throughout the 5-day conference. It is planning a number of special events, displays and publications for its members.

The Alliance for Environmental Education, coordinator of the event, has launched this pilot venture in an attempt to determine future policies and explore practices impacting environmental education in the United States. The Alliance, together with the American Nature Study Society and the Conservation Education Association, has developed two conference tracks. A "policies" strand still examine the potential of various environmental education strategies. Interest groups will be established for citizen organizations, youth programs, public education (K-12), higher education, government and industry.

The second track—"practices"—will offer a more direct experience for the practitioner. It will address trends and identify specific activities which are representative of the national environmental education effort. Speakers of national stature and specialists in the fields of communications, funding and networking will address the conferees.

The University of Vermont (UVM) in Burlington is situated on the shores of Lake Champlain between the Green Mountains of Vermont and the Adirondacks of

New York. It is 90 miles from Montreal, 235 miles from Boston and 300 miles from New York City; it is accessible via convenient air, rail, bus and auto transportation. Warm sunny days and cool nights make August an excellent time to explore scenic Vermont by hiking, canoeing, sailing or bicycling. Plan your vacation around the Congress and bring the entire family.

UVM's barrier-free Living and Learning Center will serve as the nucleus of the conference. Lodging will be in single or double bedrooms. Food will include cafeteria-style meals as well as banquets, with vegetarian options at all meals. Food and lodging will cost approximately \$150 for the entire conference. Several state parks and private campgrounds will be available within a few minutes' drive for those who prefer camping.

To experience the unique natural and cultural features of Burlington and Vermont, there will be an early evening ferry trip on Lake Champlain and a lamb roast at nearby Shelburne Farms, followed by contra and square dancing. Sites for field trips on Sunday and Wednesday mornings include: Shelburne Museum, tundra environment atop Mount Mansfield and Camel's Hump, the Green Mountain Audubon Nature Center, Colchester Bog, Bristol Cliffs Wilderness Area in the Green Mountain National Forest and the UVM Morgan Horse Farm, Fort Ticonderoga and Crown Point, an electrical generating station using wood chips for fuel, and Montreal. In addition, directions will be provided for individual fishing, canoeing, hiking or bicycling trips.



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March, 1983

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Nature Study

A JOURNAL OF ENVIRONMENTAL EDUCATION AND INTERPRETATION

The City Issue



Features

3 DOWN TO BASICS Ruth Melvin

Getting down to bedrock as well as the building blocks of cities.

5 ON THE RIGHT TRACK Ed Bieber

Tracking in the city can be challenging and rewarding.

8 TODAY'S YOUNGSTERS— TOMORROW'S DECISION MAKERS Mary Lou Ferbert

The Cleveland Museum of Natural History invites you to go on a series of adventures in your own neighborhood!

12 THE SOUTH BRONX — A NEW FRONTIER Jamie Gibbs

The Bronx Frontier Development Corporation—a community-run, not-for-profit organization—is making the wilderness of the South Bronx bloom with community gardens.

14 VOLUNTEERS UNLIMITED Anne Cloutier

The rewards of being an unpaid teacher.

16 ROWS = WILDLIFE CORRIDORS Darrell D. Young

The rights-of-way of utilities provide the same kind of edges for wildlife as farm hedgerows.

18 PHOTO ESSAY

20 EVA L. GORDON AWARD Jessie Kitching

Peter Parnall received the 1982 award for children's science literature.

22 TREES THAT GROW IN BROOKLYN, BOSTON AND MANY OTHER CITIES Miriam Dickey

Many trees can survive in an urban setting.

25 TREE ACTIVITIES Helen Ross Russell

Trees are a valuable teaching resource in any school area.

26 LEARNING BY DESIGN Alan R. Sandler

The AIA recognizing the interrelationship between the human environment and the natural environment has prepared material to help people make wise decisions.

Departments

28 MEET TWO MEMBERS

A volunteer who does a professional job and a professional who volunteers much time and know-how to ANSS.

31 TIPS — PLANNING A MUSEUM TRIP Marjorie M. Ransom

Using a museum as an environmental resource.

33 TIPS — PHOTOGRAPH STORAGE Ray Pfortner

Protecting photographs from damage while making easy retrieval possible is a necessary part of successful photography.

34 GOOD READING

Ann Arbor Alive; *Travels*; *Water for the World*; *The Changing City*; *The Changing Countryside*; and *Billions of Bats* are reviewed.

36 NEWS AND NOTES FOR ENVIRONMENTAL EDUCATION . . .

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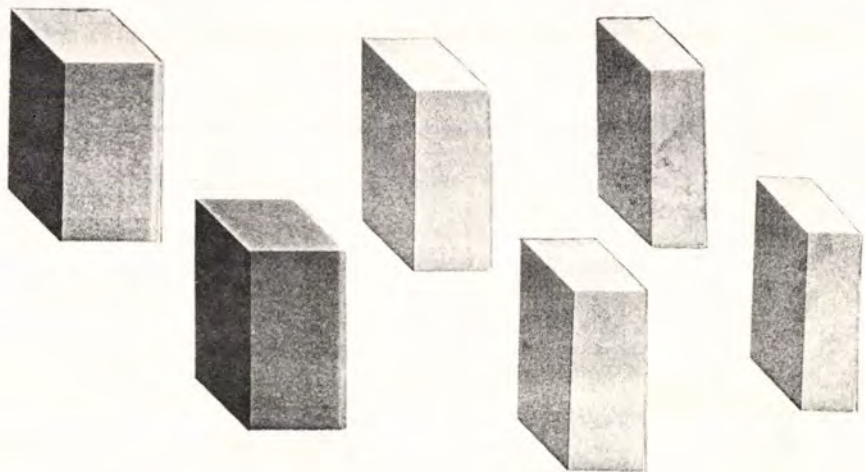
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Down to Basics

Ruth Melvin



Cities! According to the 1980 census, approximately three-fourths of us live in or near them, more work in them, go to school in them or visit them for pleasure and enrichment. Few of us pause to really see the outside or even the inside of the buildings we visit, failing to note even large fossil forms, startling crystal faces on polished surfaces or the quiet glory of highly burnished metals. Seldom do we stop to put time, space and structure in perspective to find the intrinsic beauty of a city street.

Literally thousands of school children each year skip up the broad, white steps of the Ohio State Capital in Columbus. Ostensibly their field trip is designed to expose them to the place and function of state government. But fortunate indeed is the class whose teacher thinks in broad, ecological terms, who can find ways of enhancing government with environment. There is so much to see: the broad white steps are made of Columbus limestone, highly fossiliferous, with brachiopods, gastropods and cephalopods, tails of trilobites and fish teeth! These are still more evident in the huge blocks of limestone of which the great pillars are formed, pillars known widely as "the purest examples of Greek Doric architecture in the United States." Startling are the 5000 black and white marble tiles on the floor of the rotunda and the hallways which are arranged in a manner symbolic of the history of the state. They will note the huge bronze doors, the finely-wrought ironwork and white marble in the stairways, look excitedly at the carved figures,

carved of Carrara marble from Italy, that used by Michaelangelo himself. What fun it is to combine history with architecture and earth materials!

The Center of Science and Industry in Columbus recently instituted a project designed to provide the kind of information which helps create awareness and appreciation of the making of a city. The project began with the study of four segments of the downtown area, each involving five or six outstanding buildings significant for their history, architecture, and earth materials. These four units serve as short walking field trips requiring only an hour

or two of time, even eliminating transportation complications. One field trip can help participants visualize the growth of the city from its log cabins on the wooded edge of a river to a sizeable metropolis. Beautiful old churches constructed from local sandstone and the state house made from local Columbus limestone contrast markedly with a state office tower of carnelian granite brought from South Dakota, a bank building with windows outlined in travertine from Tivoli, Italy, and a telephone building constructed with Swedish quartzite. In sharp contrast, too, is the English Gothic architecture with the strict-



Examining glacial grooves in Central Park, Manhattan.

RUTH MELVIN, Past President of ANSS, has written two books involving the geology and geography of Ohio.

ly modern and utilitarian structures of tremendous size. A self-guiding manuscript with a body of researched information was developed to help teachers or visitors understand what they are seeing. Participants in such a field trip see the history of Columbus unfold before their eyes along with a study of earth materials from many parts of the world, some dating back to the oldest known rocks.

One of the exciting aspects of looking at geology in the city is the realization that in learning to recognize the building materials in one urban area is to be alerted to the repetition of the use of the same rocks appearing in other cities. A case in point is Bedford limestone from Indiana. Builders in Columbus have used, are still using this rock material. It appears in churches and skyscrapers. This stone is 310 million years old and contains fossil fragments indicating that Indiana was once covered with a warm, long-lasting interior sea. Amazingly, this same rock is found in Rockefeller Center in New York; it is a part of the Jefferson and Lincoln Memorials, the National Archives Building, and both the South Interior building and the Department of Interior structure. This stone was used in the construction of several of the Ohio State University buildings and presumably could be found in numerous cities and campuses throughout the United States. In fact, any college campus may be an excellent place to explore for fascinating geologic, historic and architectural masterpieces. The author conducts one hour field trips for urban interpretation classes to one famous old building on the Ohio State campus. Orton Hall was planned by the first State Geologist and contains all of Ohio's building stones in sequence from bottom to top, plus a huge glacial boulder from Canada, tillite, concretions and a 48 inch core of Ohio sandstone on the grounds around the edifice. A sad story is told regarding the new Bedford limestone steps. When the broad steps wore (weathered, physical and solution!) to the replacement level, maintenance people, disregarding the history and intent of the founder, replaced the fossiliferous Columbus limestone steps with the "foreign" material.

The geology of New York City has been delightfully described by Christopher J. Schubert for the American Museum of Natural History. A teacher could easily plan field trips to many parts of the city where building materials, underlain by the metamorphic rock for which New York is famous, and its glacial deposits reveal

great tales and exhibit an unusual wealth of earth's early historic events. Central Park with its Manhattan schist, the cuts made along I 90 east of the George Washington bridge revealing sections of Fordham gneiss, the Inwood marble exposures in Harlem, the serpentine rock exposures on Staten Island all tell the story of a very old and worn down mountain range from which many sedimentary rocks of the Appalachians were derived. The igneous sill forming the Palisades forms a later chapter in the geologic history.

mishmash of this famous endangered area! One might hope that the publication has been updated but the information remains relevant and helpful.

An enterprising teacher may do geology field trips in an urban or university area without the aid of previously researched information. After a preliminary examination teacher and students can ferret out much information for themselves. With a curious mind and even a limited background of mineral and rock identification plus a hand lens, a ruler, a geologic time



Children studying rocks and minerals identify mica in a stone wall.

— Photos by Ray Pfortner

Washington, D.C. and environs tell another fascinating tale. Several resources are available but a booklet entitled *Building Stones of Our National Capital* contains a good map, beautiful photographs, descriptions of the major buildings and memorials but also includes the underlying bedrock geology and a description of the local formations used in the early days of construction. It is easy to see how strongly influenced our forefathers were by the physical environment they selected for a capital!

San Francisco has *A Walker's Guide to the Geology of San Francisco* published in 1966 as a special supplement to the Mineral Information Service, the California Division of Mines and Geology. It is detailed and covers much of the geologic

scale, and perhaps a small amount of dilute hydrochloric acid they can have an exciting experience identifying fossils, tracing crystal faces on igneous polished surfaces, estimating the weight and height of a building, acquiring a feeling of being at home with rocks from all over the world. Exercises in mapping a city street, photographing, interviewing builders and/or architects are a few follow-up activities.

Geology and its wider relationship with the history and architecture of a city can add a new dimension to environmental education. Students, teachers and visitors react enthusiastically to this challenge which provides awareness, knowledge and appreciation for cities everywhere.

(continued on page 32)

ON THE RIGHT TRACK

Ed Bieber

Illustrations by Beth Martinez



On the trail of a maple tree

ED BIEBER, originator, director and instructor of The Nature Place, has been an outdoor education specialist since 1970. This year, 1982, he is the recipient of the Golden Award from the New York State Outdoor Education Association. This most prestigious award is given for outstanding contributions in the field of outdoor/environmental education.

"C'mon, let's see what left this track!"
"I'm going to bring this one back to the classroom." "I haven't seen this kind of track before!"

Overhearing this third grade class of Sherlock Holmeses in the middle of their tracking expedition would lead a listener to believe that the class ventured outside their school somewhere in the wilds of Manitoba. Actually it was the wilds of Manhattan!

Animal tracks and the concept of tracking have intrigued authors and outdoor educators for years. Kids' eyes light up when they hear stories of an expert tracker stalking his or her prey and along the way interpreting the tracks as to age, height, weight, sex, health and peculiarities of the animal in question. The most common cry of youngsters upon seeing tracks in snow or mud is "Let's follow them!"

Urban teachers may feel short changed in terms of opportunities to provide tracking experiences for their students. Well, teachers, take heart and pick up your magnifying glasses! The nearest tracks can be found just outside the school room door. No longer must you wait for a visit to a local park or for the annual fifth grade camping trip. You do not have to be an expert naturalist nor do you need extra skills other than those teaching skills which are used daily within the classroom. The "secret" to tracking in the city is to look around at the immediate school site with a fresh eye and new approach and to see the learning potential that is there. It will become evident that even such possible deterrants to outdoor learning in the city, such as dog droppings, broken glass, undesirable characters, traffic, etc., can become part of an educational experience.

The most common definition of a track, used by most naturalists and outdoor educators, is the footprint(s) of an animal. If that definition is expanded, however, some new ways of tracking will be opened up, especially to city students. Let's think of a track as a clue that indicates that someone or something was or is present. Consider a track to be a found piece of a puzzle or of a larger picture. When thought of in this fashion the number of tracks in an urban setting becomes great. And the interpretations and activities centering around them can take many shapes and forms, depending on the needs of teachers and students.

Children love to go outdoors, they get excited about adventures. They are natural explorers and their joy over discovering the smallest things that most adults would consider insignificant is limitless. Combining these ingredients with the kinds of urban tracks mentioned below will make for a highly motivating and very real educational adventure for all concerned. Once the idea of the new kind of urban track is seen, many more will probably come to mind. The ideas and questions after the following tracks are suggestive springboards for activities that go beyond just finding the track. They can involve many curriculum areas. They can pave the way to further outdoor education experiences on the school site. They can open up a whole new way of seeing the outdoors, wherever that outdoors may be, as a learning environment in which to meet curriculum goals and children's needs. Teachers do not teach tracking, urban or otherwise. They do not teach urban environments. Teachers teach children.

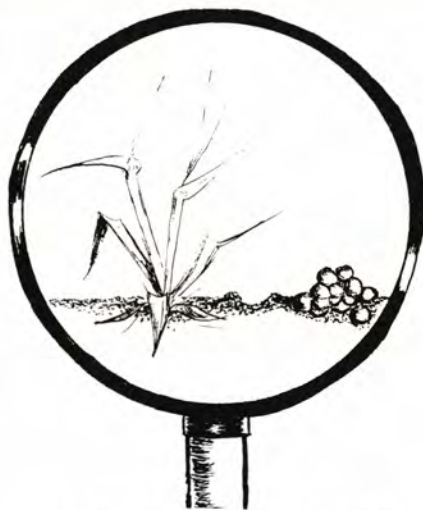
STEPPING OUT TO FIND . . .

Although we are expanding and stretching the former concept of tracking, there are possibilities for finding real animal tracks within the city confines. Classes have discovered people, squirrel, dog, cat and bird tracks in snow, mud and even cement! Thinking of tracks as clues, we can then say that finding a bird's nest, nibbled pieces of acorns left by a squirrel, a feather, dog droppings and anything else "left" by these animals would also be tracks that indicate their presence.

A plant growing in a crack—the track of a seed. "A plant is only a seed's way of making another seed." What other seeds are in the crack? What other kinds of plants can be found within the crack? How did the seeds get there? Categorize the kinds of items found within cracks.

Seeds on the ground—the track of a nearby plant. Look around to find the source of the seed. How are seeds important in our lives? What percentage of these seeds will germinate if planted back in the classroom? Carefully dissect some seeds to identify their parts.

Tiny mounds of dirt on lawn or bare soil—track of earthworms. These soil "bumps" or castings are the result of earthworms tunneling and then depositing the excavated soil on the surface. What other underground tunnels exist in the city? Compare the textures of the soil from various worm mounds.



Above ground track (casting) of earthworm excavation.

Why are many worms found after a rainstorm? A skinny, winding trail on the soil surface is probably the track of a worm that was busy moving about while feeding during the evening.

Zigzag patterns on a leaf—the track of an insect tunneling within the leaf. Try to measure the length of the track. Does the leaf show any other insect tracks: bumps or swellings that may be insect homes called galls; tiny eggs; munched on pieces? And while on the topic of zigzag tracks, examine some pieces of wood without the bark for the curving or butterfly-like patterns of tunnels engraved by bark beetles. These



Tracks in Cracks

tracks lend themselves to being "captured" by putting a piece of paper over the tunnels and rubbing with the side of a crayon. This will result in the transfer of the pattern from wood to paper.

Glistening, long skinny trail over rocks, sidewalk, leaves, etc.—the track of a snail or slug. Morning is the best time for seeing this track for the maker forages at night. Follow the track for as long as possible. A creative writing lesson is possible by letting students pretend they are travel agents and asking them to describe, in terms that would lure tourists, the itinerary of the snail or slug as indicated by the track.

Scars on a tree trunk—the track of carved initials; or the scar tissue from a broken branch or other injury. Do initials on a tree grow higher up each year? How does a tree grow?

Scars on a winter twig—the track of a former leaf, a past bud or the site where the veins from a former leaf entered the twig. (Leaf scar, bud scale scar and vascular bundle scar.) Twig identification using these twig characteristics is both fun and challenging.

. . . AND NOT SO ELEMENTARY, MY DEAR WATSON.

Dried oil spots—the track of a leaking car or a careless oil delivery person. Make a map of the oil spots. Add some water to a spot and observe a rainbow. Are all oil spots the same color? How long does it take for a particular spot to be

erased? Make a flow chart showing the source of the oil and all the steps it went through to wind up as the oil spot in the parking lot.

Graffiti—the track of a vandal, or looking at it another way, the track of a frustrated writer or poet. Imagine, and possibly even create on the side of the school using a long roll of paper, the kinds of graffiti that would have been here 200 years ago; 200 years into the future; if England had won the Revolutionary War.

Litter—the track of a litterbug. What kind of person was here? Combine the different pieces of found litter and consider them as an archaeological "find". Then interpret the tracks of our present civilization. How many kinds or forms of pollution can be found outside?

Rust—the track of water, iron and air. Look for objects that are in varying stages of rusting. Does an older car necessarily have more rust than a newer one? What other kinds of chemical reactions occur every day? Which ones are important to us?

Scratch or dent on car—the track of an unfortunate meeting with another car or truck. How bad was the accident? What color was the other car? Look around the school site and immediate neighborhood for the tracks left by the highway safety department to promote safe driving, *i.e.* stop signs and lights, crosswalks, danger signs, traffic islands, white lines, etc.

Gouges on a telephone pole—the track of a phone company employee climbing with spikes. Look to the top of the pole as well as between poles. Can you track the route of a telephone call or the flow of electricity? Or the cable-vision track? What are all those things on top of the pole? Your local utility company may be able to send out a representative to help you follow the tracks of the utility trails.

Irregular crack in the sidewalk—the track of the forces of weathering and perhaps pressure from many feet and vehicles. Why are the straight, regularly spaced cracks purposefully built into sections of sidewalk? What famous geological features were also shaped by weathering? The only thing constant in the universe is change. Search for other objects in the urban environment that are also changing as the sidewalk. Is it possible to find something that never changes?

Peeling paint—another track of weathering

forces. Does one color appear to peel more rapidly than another? Find as many different shades of one color as possible. Besides protecting from the elements, how else is paint used in a city environment?

Skid marks—the track of a fast stop or a fast start. How long are the marks? What kind of vehicle made them? How long will they last? What kinds of things can be interpreted from the length, width, direction, color and position of the tracks? Invite a traffic safety officer to talk to the class about reading these kinds of tracks.

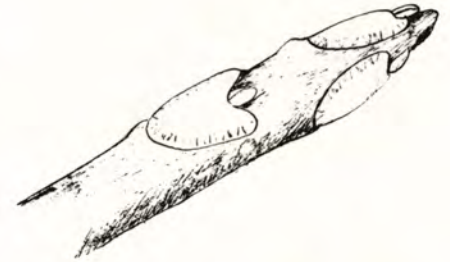
Pipes, fire hydrants—track of a vast underground system of pipes and tunnels involved with water delivery, energy transmissions and exhausting of wastes. Try to construct an underground map using only those tracks found on the surface as starting off, or rather, starting down, points. Find surface tracks of a subway.

Shadow—track of the earth in relation to the sun (apparent "sun travels"). Place a small stick or other marker on the tip of a shadow made by a pole. Come back in 30 minutes and observe how the shadow has changed. Take a "looking down" walk (looking up is not allowed) and find shadows. Try to guess what is making the shadow without looking up. Utilize the track of the sun's apparent path in the sky to make a sundial. Aside from the tracks made by our nearest star, the sun, what other kinds of tracks are left by other members of our solar system?

First patch of ice in the Fall—a track of cold weather coming. Are there any tracks imbedded in the ice? Under the ice? Most icy patches will reveal the tracks of imprisoned air—what are they? When the ice melts, observe the puddle during a light rain. What kind of tracks do rain drops leave in the puddle?



Results of a leaf mining insect



Shield-shaped leaf tracks of Ailanthus twig

Blowing leaves, seeds, litter—the track of the wind made visible. Observe a flag, watch a wind vane, feel the wind on your face. Devise experiments to indicate differences in wind speed and/or direction found in various microclimates around the school, *i.e.* ground level and 5 feet above, north side of school, protected alley, etc.

Rivulets of soil and sand after a rain-storm—the track of erosion. What causes erosion? Experiment with ways of preventing it. Where was the water flowing the fastest? Go on a miniature geography hunt to find such features as gulleys, valleys, deltas, islands, peninsulas, sand bars, etc.

Fossils in rocks and building stone—tracks of past life. Ranger Rick magazine, within the past 2 years, had an excellent article on finding fossils within some of the common building materials in a city. Looking carefully at a building may reveal some of these ancient "tracks."

Symbols of the city—find the tracks or symbols that indicate the path to a hospital (blue "H"); doctor's office (caduceus); drug store (Rx); one way street (arrow); and many others. Create symbols, using imagination and creativity, for a number of other city objects or services that seem to be without their own symbol.

Some possible tracks to be seen in snow:
Pushed up mounds of snow—the track or result of a snowplow, snow blower or snow shovel.
Bare spot on lawn, sidewalk—the track of an underground (and warm) pipe or heating system which melted the snow.
Long thin depression in snow on a sunny day—the track of an overhead wire from which the snow has melted and dropped.

(continued on page 30)

Today's Youngsters --

Tomorrow's Decision Makers

Mary Lou Ferbert

The Cleveland Museum of Natural History invites you to go on a series of Adventures. GO PIONEERING! Find an uncared-for spot of land in the immediate neighborhood and start a chain reaction of awareness, understanding, and appreciation. NO TRANSPORTATION COSTS! You don't have to worry about bus schedules or the price of gasoline. The opportunity is wherever *you* are.

"Look! A praying mantis egg case!" After our first sighting of one of those small engineering marvels, sharpened visual awareness triggered a chain reaction. "Here's another!" came from all directions as if we were in an echo chamber. In a matter of minutes the children located over thirty praying mantis egg cases.

Close by, Jim, the museum botanist, was the hub of a tight network of youngsters, crouched down, eagerly investigating an area of ground blanketed with fine green hairs. On closer observation, the fine green hairs turned out to be a homogeneous mat of tiny annual seedlings, some still attached to the coats of the seeds which had been their progenitors. In early March the seedlings were already pushing up through an area of heavy stress to begin their short life cycle.

Someone found a compressed cardboard carton that had obviously been there for an extended period of time.

MARY LOU FERBERT is Co-ordinator of the Environmental Information Service at the Cleveland Museum of Natural History. She is the author of "Nature in the City," an environmental awareness program that was developed in conjunction with the Museum Environmental Information Service, Education Division, and science specialists in the disciplines related to urban natural history.



Discovering a praying mantis egg case is always an event.

What secrets might it conceal? We all gathered around and watched attentively as the discoverer peeled back the soggy mass. "There he goes!" "Yeeeeuuuuuw!" "Look at that creepy-crawly!" We had uncovered a dark, damp microcosm of animal activity. Millipedes, ants, and worms, disturbed in the midst of their vernal resurgence of activity, quickly retreated or scurried for cover.

It was one of those dull gray days in early March when we acutely sense the fact that we face another four to five weeks of dismal weather before spring arrives to stay. The school we visited that March day was *not* a suburban, upper-

class elementary school, and the incidents described did *not* occur at a land laboratory, a park, or a natural area. Case Elementary School is an inner-city public school a stone's throw from Cleveland's Public Square.

A light wet snow was falling when Jim, Bruce—the museum photographer, and I arrived to visit one of the fourth grade classes piloting the Museum's environmental awareness program. We located the classroom and soon were on our way back outside with the teacher and children to visit a vacant lot half a block from school. "Depressing" not only described the season and the weather; it also defined the

walk to the study site and the site itself. Shortly after we left the building however, the exuberance of the children, as they embarked upon a series of natural history discoveries, quickly dispelled the negative impact of the neighborhood and the weather. I have already described the kinds of experiences that occurred at the vacant lot.

What we witnessed at Case that early March morning verifies the original concepts behind the Nature-in-the-City curriculum. The young people there found hidden beauty; most of them either saw their immediate natural world for the first

anists and zoologists. The underlying principle of the program is: let's have young people experience the nature in their own community instead of reading about it in books.

The Nature-in-the-City materials include an ADVENTURE GUIDE (the teacher's manual) and a set of four colorful season cards for each student.

The ADVENTURE GUIDE is a series of activities, many of them game-oriented. Among others, the List of Adventures includes: PIONEERING . . . Select Camp; MAPPING THE TERRITORY . . . Maps and Rules; TAKING INVENTORY . . .



Two boys examine a new specimen.

time or saw it in a new context.

Although the natural communities within our cities have been drastically altered and reduced by human activities, a "vacant" lot contains essentially the same lessons as a pristine wilderness area. To teach such lessons, "Nature in the City" was developed as an exciting field trip to the immediate neighborhood—the children's personal world where they play, walk to the grocery store, and take out the rubbish. Our goal was to design a program which would increase the children's awareness, understanding, and appreciation of the natural world of which they are a part. It was not meant to produce bot-

Observation; SHERLOCK HOLMES . . . Discovery; MOVIN' ALONG . . . Motion in Locomotion; SENSE AND NONSENSE . . . Sensory Awareness; LUNCH . . . Food Chain; SOIL APPRECIATION DAY . . . The Importance of Soil; SIGNS OF SEASONS . . . Seasonal Change; and ABRA-CADABRA . . . Create a Change. Although it was written with third through fifth grades in mind, it can easily be adapted to any elementary grade, and the experiential approach to learning is applicable from pre-schoolers to adults. The activities may be carried out on any uncared-for spot of land within walking distance of your school.

The materials and the methods presented in the ADVENTURE GUIDE require no prior knowledge of natural history on the part of teacher or student, only the desire to learn and the wisdom to say "I don't know; let's look it up."

The Nature-in-the-City program discourages focusing on the question "What is it?" When enthusiastic children bring their discoveries for identification they are stimulated by questions like "What do you think would be a good name for this plant?" or "How many legs does the animal have?" Our program hopes to promote active, not passive, learning. The teacher's own excitement heightens the motivation of students and thus helps them to expand the curiosity that will ensure their growth.

The four Nature-in-the-City cards depict the same location as it may be seen during each of the four seasons. They are designed so that each 8½" by 11" picture can be divided into four separate parts that will fit easily into the pockets of blue jeans. Thus, children are able to take some reference material into the field with them. For example, the bird quadrant (small card) for each season has text on the back where many valuable natural history concepts about the birds pictured on the front are set forth in a question-statement format. Similarly, the other three quadrants for each season are devoted to mammals, invertebrates, and plants commonly found in an urban vacant lot. The Nature-in-the-City cards can be the basis also for excellent rainy day activities.

To carry out the activities in the ADVENTURE GUIDE, each student should have in addition to the Nature-in-the-City cards, a folder with pockets, access to a classroom set of simple field guides, and the use of a magnifying lens for discovering additional mysteries.

The approach of the "Adventure Leader" to the outdoor experience is the key ingredient for success. Imagine yourself carrying out this type of Adventure with your class:

WEEDS AND SEEDS

PLANTS ARE LIVING organisms. The life cycle of flowering plants is seed-plant-flower-fruit-seed. Plants cannot move from place to place; yet plants appear in new areas.

MISSION: to become aware of the life cycle of plants.

MISSION: to become aware of the large numbers of seeds city plants produce.

MISSION: to discover how fruits and seeds travel.

MISSION: to recognize the importance of city plants.

Included in this Adventure are: a search for flowers, fruits, and seeds at Camp (the outdoor study site); The Weed-fruit and Weed-seed Scavenger Hunt; investigation into the arrival and survival of wild city plants; an introduction to the composite family of plants and its prodigious production of seeds; the Flying Contest in

which the fruits and seeds from the Scavenger Hunt are "flown"; the group definition of "weed"; and an enumeration of the benefits plants provide for human beings.

WRAP-UP OF MISSION: The arrival and survival of city plants are helped in two ways: by the vast numbers of flowers produced by the plants and by the efficient travel methods of fruits and seeds.

A girl who participates in the **WEEDS AND SEEDS** Adventure might be amazed to discover that when she blows one puffy dandelion head, she disperses to the wind hundreds of seeds, the precursors of new dandelion plants. A boy might be surprised to find, when he inspects his pant-legs, that he is a seed carrier and therefore, plays a role in the "arrival and survival" of city plants. Children, as well as adults,



SPRING and

might become aware of the fact that every flowering plant produces fruits, and that milkweed pods, "wings" from maple trees, tomatoes, and apples are all fruits that contain seeds. With a hand lens, a child might discover that grasses produce beautiful flowers. Perhaps children will decide, as I have, that they no longer wish to call wild city plants "weeds."

No one can complete this Adventure

and fail to become more sensitive to the urban plant community and his or her relationship to it.

The most important attitude that The Cleveland Museum of Natural History hopes to nurture through this program is respect for nature. Perhaps the young people at Case Elementary School who found the praying mantis egg cases, which may have opened their eyes and their

minds to a whole new world filled with excitement and magic, took the first step toward reaching this goal. With a greater respect for all kinds of life on earth, whether it is a dandelion in a city lot or an edelweiss high in the Austrian Alps, we may avoid some of the ecological errors that have been made in the past. Today's youngsters will be making decisions about the quality of life in tomorrow's world. □



... SUMMER

Two of the colorful seasonal cards used in the program.



The South Bronx -- A New Frontier

Jamie Gibbs

The Bronx FRONTIER Development Corporation—a community-run, not-for-profit organization—is making the wilderness of the South Bronx bloom with community gardens . . . providing jobs and income and food for local families through an unprecedented land reclamation project . . . and educating thousands each year about the facts of nutrition they had never been taught before.

The pioneer spirit—for centuries it has made America's wilderness bloom. The first pioneers turned the rocky fields and thin soil of New England into successful, self-sustaining farms. Two centuries later pioneers in the Southwest and California were producing an abundance of crops on land which once was parched, forbidding desert.

Seven years ago, a dedicated group of resourceful pioneers began the arduous task of reclaiming a new kind of American wilderness—the devastated South Bronx of New York City. Empty, derelict buildings, rubble-filled lots, grinding poverty—all make this corner of America as awesome and challenging as any desert or mountain range that earlier pioneers faced. But the greatest challenge of all is the fact that for years the South Bronx has been a wilderness of the human spirit.

It has the highest crime rate, the poorest people, the greatest unemployment. More than a third of all cases of malnutrition in New York City occur in the South Bronx. Seventy-five percent of all youngsters never graduate from high school. One in forty babies born there dies in infancy—a shockingly high rate of

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*Triangle Garden — July 1982
Damen Lentz — DFY Summer Worker*

mortality. And over the past ten years, the area has lost over 30,000 buildings to fire—most of them the result of arson. In the face of these grim facts, many influential people gave up on the South Bronx, agreeing with one Task Force report that suggested, "Let the rubble return to rubble."

But a handful of the South Bronx's 600,000 residents refused to give up. Determined to improve their community, these new pioneers took as their motto the first principle of the frontier—to make good use of what they found around them. "If there's one thing we have plenty of," said one resident, "it's open space and garbage." From these unpromising resources has come one of the most exciting and innovative urban development programs in the world that has touched

the lives of tens of thousands of America's poorest citizens.

At FRONTIER's "Ranch," castoff vegetables from the nearby Hunts Point Terminal Market are processed into compost—rich, fertile, organic material which, when mixed with ordinary soil, will turn even the dustiest city lot into arable land. This process has so far helped create over six acres of community gardens and parks—oases of green where families can cultivate the nutritious vegetables they desperately need to supplement their poverty-level diets.

And the Bronx FRONTIER Development Corporation does much more than plant gardens:

Our composting operation provides jobs and training for young people who learn marketable skills at the same time



BEFORE



AFTER



they improve the lives of those around them. The premium topsoil is given free by the truckload to local block associations and sold to commercial nurseries as a means of building self-sufficiency.

Our community organizing activities have persuaded thousands of fearful South Bronx residents to come out of their apartments and reclaim the wasteland that for too long was the turf of street gangs and drug addicts. Working together those same residents are restoring burned-

out buildings, clearing rubble and organizing arson protection teams.

Our four educational programs have been designed to reach both children and adults. The FRONTIER Chuckwagon program reaches grade school students, teaching them the benefits of good nutrition, the use of green and fresh vegetables and how good foods are also good tasting foods. Chuckwagon runs in six week cycles throughout the year. The F.O.O.D. (Focus On Our Diet) program educates

teachers and parents on these same values and coincides with the Chuckwagon schedule. The third FRONTIER educational program, a division of the Horticulture project, teaches basic gardening techniques and plant development to grade school children. For many, this is their first exposure to living and growing things. They learn in fascination as a seed sprouts, forms roots and green growth and eventually becomes an edible food or attractive flowering plant. The program visits classrooms once a month from March through June. Each session is the next stage in the plant-growth process. Children plant, transplant, water, fertilize, and harvest their own vegetables and annuals. To expose older youth, the Teenage Pregnancy Prevention Program is sponsoring a community garden. These participants will receive training at the garden site and in a classroom situation. The garden experience continues through the summer with instruction and assistance from the FRONTIER community gardening crews.

The combination of these programs has sparked interest in growing plants and a new awareness of how fresh vegetables add both flavor and good nutrition to the diet. The participants learn how easy it can be to grow food, how cost efficient it is, and what enjoyment it offers. There are many community greening peoples who have begun with the idea of saving money and then discover the joys of gardening. They remark that they feel better after working outside, have more pride in their neighborhood, are more protective of their community, and have met their neighbors for the first time. For these people that's what community gardening is all about!

We are proud that we have accomplished so much using simple, inexpensive methods and alternative technologies. We even built a sixty-four foot windmill, Aeolus, which generates electricity for our Ranch operations more cheaply than utility companies provide it. Most of our hard work is donated by the community itself.

But there are some expenses that cannot be met by high hopes and hard work alone. The seed money for the frontier project was a federal grant to the South Bronx Open Space Task Force.

Today since the direct funding line for park construction has dried up, FRONTIER has responded to the community's greening needs by continuing to supply horticultural, design, and cost estimate

(continued on page 29)

VOLUNTEERS UNLIMITED

Anne Cloutier



Volunteers may be found stalking woodland birds . . .

"HELP WANTED: Enthusiastic docents who enjoy working with people young and old. Prerequisites: eagerness to learn and a one day per week donation of your time."

The requirements aren't too rigorous. The job sounds intriguing. But, what is a docent? and who may apply?

A docent is a teacher—usually unpaid—who contributes knowledge, experience, time or simply a vibrant dedication toward a common cause. Frequently the cause is education, and may take the form of museum tours for inner city youth, reading instruction for learning-disabled students, or primate research at the local

ANNE CLOUTIER, a member of the ANSS Board of Directors, is now photo-journalist at the Pocono Environmental Education Center.

zoo. The array of docent-run programs in cultural institutions throughout the country is awesome, and presents solid evidence that the volunteer spirit is a powerful human resource to be tapped with care.

Almost anyone may become a docent. Recent graduates of a museum docent training course might consist of retired teachers, students, housewives, or college professors. The background of experience is vast; the potential for growth is unlimited, and the rewards are many.

There is the chance to expand one's knowledge in a specialized field. There is stimulating contact with like-minded individuals. There is the satisfaction of watching a child's eyes light up with the thrill of discovery. Opportunities such as these naturally result in a cooperative spirit and positive communication between volunteers of all ages and backgrounds.

Many cultural and educational institutions, such as museums, nature centers, historical societies, art galleries and zoos, rely heavily on volunteer help. Without this unique workforce, educational services would be drastically curtailed; school children, youth groups, and the public in general would be missing a whole world of experiences which these centers provide.

In Buffalo, New York, for example, the recently remodeled Zoological Gardens has a loyal group of 85 docents. Outfitted in safari jacket uniforms (with snake skins and mammal skulls bulging from pockets), these dedicated men and women lead tours of the zoo, bring the "ZOO TRUNK" to nursery schools and libraries, and accompany the Zoomobile to schools throughout the city. They help organize training sessions for prospective docents, publish the Docent "Gnusletter," and meet periodically with volunteers from the other cultural institutions in Buffalo to swap ideas, stories and techniques.

This scenario is repeated throughout the country with minor variations. The Museum of Cultural History (UCLA) trains adults and teenagers from inner city Los Angeles to give tours of temporary exhibits which are displayed in associated neighborhood museums. At San Francisco's Exploratorium, high school credit is given to "explainers" who serve as floor staff and answer visitors' questions. Volunteers who work at the Smithsonian Institutions' National Portrait Gallery spend half a day per week at elementary schools preparing students for their upcoming visit to the museum.

The types of docent activities are only as limited as the imagination. A survey of docent programs in the United States found volunteers engaged in a wide variety of endeavors. These included running a children's science club, giving tours in foreign languages, managing a book shop, and providing curatorial assistance. A large percentage of docent functions involves teaching or working directly with

other people. There are opportunities, however, to study animals, raise money, garden, prepare audio-visual materials, write newsletters, do research or help with office work.

Many of these jobs require training. Most organizations provide such training as the initial phase of a docent's career. Indeed, some of these programs are models for out-of-school learning, incorporating in-service training, open communication, diverse teaching methods and evaluation.

There is an integration of content and communication skills in many of the training courses. In addition to reading lists, formal lectures, observation of model tours, and follow-up discussions, a docent class may also receive assertiveness training or lessons in effective communication skills.

Many organizations rely on their veteran docents, their education staff, or outside specialists to train the freshman class. These resource people utilize a variety of teaching techniques and materials. A training handbook is often the beginning docent's bible and may include fact sheets, activities, tour techniques, docent policies, educational philosophy and information on the history and programs of the particular institution. "The Watermelon" is the training handbook for volunteers at the New Orleans Museum of Art. Docents are encouraged to devise their own tour techniques after completing a series of worksheets for each of the museum's galleries.

In addition to initial training courses, which may last a few hours or a full semester, most docent programs conduct periodic enrichment classes. The Gladys Porter Zoo in Brownsville, Texas, offers monthly seminars on specific topics in zoology. Sign language has been taught to docents at the California Academy of Sciences in San Francisco so that deaf visitors may benefit from the guided tours.

Outreach programs, such as Zoomobiles, supervans, library visits and field trips, require further training for docents seeking to extend their experience. This additional coursework can lead to some unique adventures. A Zoomobile docent, for example, may find herself cleaning ferret cages in the morning, riding with a raucous bunch of animals to an elementary school at midday, and gently encouraging second graders to feel a snake's smooth scales that afternoon. A docent quickly becomes a jack-of-all-trades!



... or touring third graders through botanical gardens.

Docent groups generally evolve into a highly structured organization, with by-laws, officers, committees, minimum time requirements, evaluation procedures and publications. They may be supervised by education staff from the institution, or they may be autonomous bodies. Recognition for their valuable contributions comes via parties, certificates, badges or plaques, honorary membership to the institution, college scholarships, university credit or newspaper announcements.

Despite the current economic climate,

volunteerism remains a positive avenue of community involvement. The spirit and the personal style of these men and women have helped immensely in broadening the scope of our educational systems. They are emissaries of the humanitarian philosophy espoused in the words of Helen Keller:

"Not until we can refuse to take without giving can we create a society where the chief activity of men is the common welfare."

□

ROWS = WILDLIFE CORRIDORS

An Urban Resource

Darrell D. Young

Snaking into and out of our cities is a vast network of transportation and utility lines. These highways, railroads, electrical transmission lines, gas and oil pipelines all make up what is called in the trade as Right-of-Way or ROWs. As such they have been the domain of the engineer and maintenance worker. But another aspect of these ROWs is beginning to attract some attention, i.e. as wildlife highways or Biological Corridors.

It has been long known that these linear strips of land have been used by wildlife as a means of moving quietly, relatively unobstructed, and usually unobserved from one open space area to another. But unlike the Europeans who have studied these corridors, we have given them little attention. Thanks to the concept of the Environmental Impact Statement we now have had to focus our attention more fully upon our natural environment.

Within the urban area these biological corridors will frequently be found adjacent to or passing directly through open space areas. Gill and Bonnett note that open spaces in the urban area can be grouped as institutional, utilities or domestic-commercial. Institutional lands include schools, corporations, golf courses, clubs, zoos and parks. Utilities of course include the ROWs whereas the domestic-commercial grouping includes the garden, the backyard and the industrial estate.

The total amount of open space in our urban areas is difficult to estimate since it keeps changing. Nor do we seem to have a formula for determining how much we as humans need but in Alberta, Canada, provincial planning dictates that 10 percent of all new sub-division lands, or cash in lieu of, must be set aside for schools and parks (Wilson, 1982). Wilson further

points out that a further 26-28 percent of the available land is set aside for roads and lanes. We have tended to increase the amount of space far beyond that needed to build our highway ROWs and thus unwittingly have provided increased mobility for our wildlife.

In a study performed in Indiana in 1979, Machan pointed out that the amount of wildlife habitat was shrinking at an alarming rate, and as a result of this the Division of Fish and Wildlife proposed habitat improvement measures on the ROWs. They based their planting proposals on an earlier 1974 investigation whereby biologists studied 58 one-hundred yard segments of existing tree-shrub plantings and 58 one-hundred yard segments of grassed ROWs. The results, as can be seen from the following table, clearly indicate the value of tree-shrub habitat for supporting a greater diversity of wildlife. It had been assumed that ROWs managed

for wildlife would have higher roadkills

1974 Indiana ROW Survey			
	# of birds	# of bird species	
Tree-shrub	485	34	
Grass	151	20	
	# of nests	# of rabbits	
Tree-shrub	108	21	
Grass	6	7	

but it was actually found that the number of such kills were 35% less in tree-shrub segments since fewer animals actually crossed the highways. Thus it would seem obvious that if the four basic needs for habitat; food, cover, water and space, are met, then wildlife will flourish.

Since most animals are territorial, this means that we can expect movement along the corridors. And since most of our urban ROWs promote some sort of vegetative cover and our open space areas abound with a variety of wildlife cover it



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is not illogical to expect such movements to occur. It is worth noting that because of these corridors, it is generally believed that wildlife has actually increased in numbers as desirable open-field habitat has been artificially maintained. Note that the ecological principle that ecosystem stability is proportional to its diversity holds true for cities as well as for rural areas.

Many species of animals use the corridors, but among the mammals, the following are probably most representative: raccoons, squirrels, deer, rabbits, skunks, chipmunks, mice, moles, shrews, bats, rats, coyotes, foxes and opossum. Of course not all of these will be found in any one urban area but many of them will. Because of the small size of some of these and the nocturnal habits of some others, they are not usually seen. But for those who walk the ROWs, the signs of their presence will be noted.

Adams and Geis (1979) noted that grassland species generally prefer ROW habitat while many less-habitat specific species are found in both ROW and adjacent edge effect habitat. They found that more species were present in ROW habitat than in adjacent habitat. Significant differences in small mammal abundance were found when comparing Interstate ROWs with County ROWs. The smaller numbers on the County ROWs were thought to be the result of the small size of the areas.

The role that wildlife will play in the lives of humans is difficult to ascertain but that a need exists, there is no doubt. This in spite of the fact that many people cannot identify many of the animals that are sometimes present. In 1974 over \$500 million was spent for birdseed, binoculars and camera equipment (Leedy, *et al.*, 1978). A survey made by the New York State Department of Energy and Conservation in conjunction with Cornell University found that the sightings of wildlife were considered to be important aspects of outdoor recreation experiences. Furthermore, nearly 75 percent of those who replied to their survey indicated an interest in learning how to encourage wildlife to live in backyards or neighborhood areas (Miller and Matthews, 1979).

In addition to highway, railroad, electrical, gas and oil pipelines, one major corridor has yet to be mentioned, that of the aquatic corridor. This corridor which is based primarily on the floodplain should be left in its natural condition to a width of not less than 200 feet on

each side of the stream (McHarg, 1969).

Unfortunately, many communities will fully destroy these corridors by building upon the stream banks or, even worse, by stream channelization. The process of stream channelization usually begins by the physical removal of all vegetation within 100 feet on either side of the stream followed by the widening, deepening and straightening of the stream in order that it can carry more water. Once channelized, hundreds of years must pass before a stream will return to a natural state and then only if there are no further alterations (Folkert, 1973).

Instead of destroying these corridors, every effort should be made to develop their potential in terms of both recreation and wildlife use. It must be remembered that in general, water and land conditions favorable for fish and wildlife are also favorable for people.

The Biological Corridor holds great promise for human recreation including a vast array of possibilities for nature study and investigation. However, it must be noted that most ROWs are privately owned and permission will be necessary to walk their lengths.

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IN PRAISE OF PIGEONS

The D.P.W. Auxiliary—
full-breasted matrons
scouring the streets
for all edible litter.

Pirouetting on gutter-edges
for stale donuts.

Cooing in the eaves,
nesting on the bridge pilings,
who knows? who notices? who cares?
Go raise your young in peace.

— by Patricia E. Culver

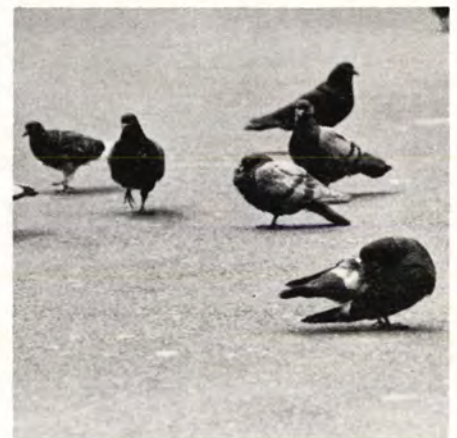


Photo Essay



Trees, rocks, soil formation, invertebrates, birds, plant adaptations have all been studied on this corner of Fifth Avenue by Manhattan County school children.

Photography by Ray Pfortner



These children are using two areas of their Bronx school ground to find answers to questions they had raised in a geography discussion about deserts and grasslands. Obviously the two areas could be used for many other studies. Photographs by Arline Strong for Wave Hill Center for Environmental Studies.

After the field trip to school ground, vacant lot, or park, record keeping is essential, and satisfying! Harrisburg City Schools, Pennsylvania.



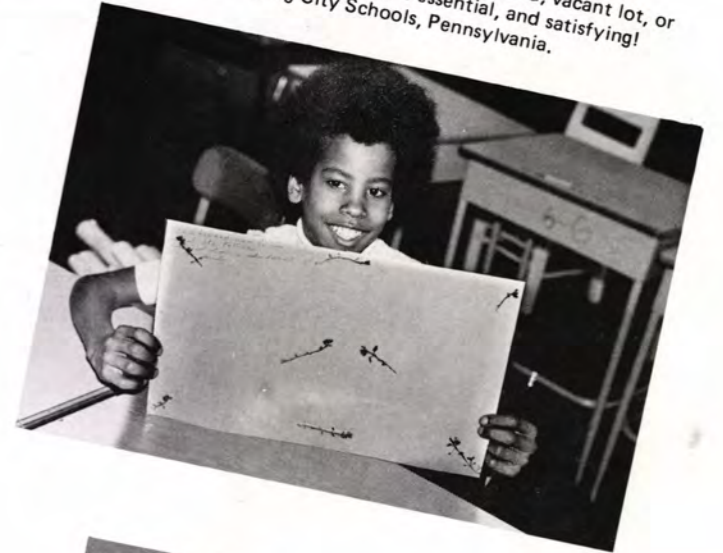
Vacant lots, school grounds and other nearby areas provide opportunity for individual and team study.

Cleveland Museum of Natural History.



A vacant lot may have a greater variety of plants and invertebrates than any other equal area.

Cleveland Museum of Natural History.

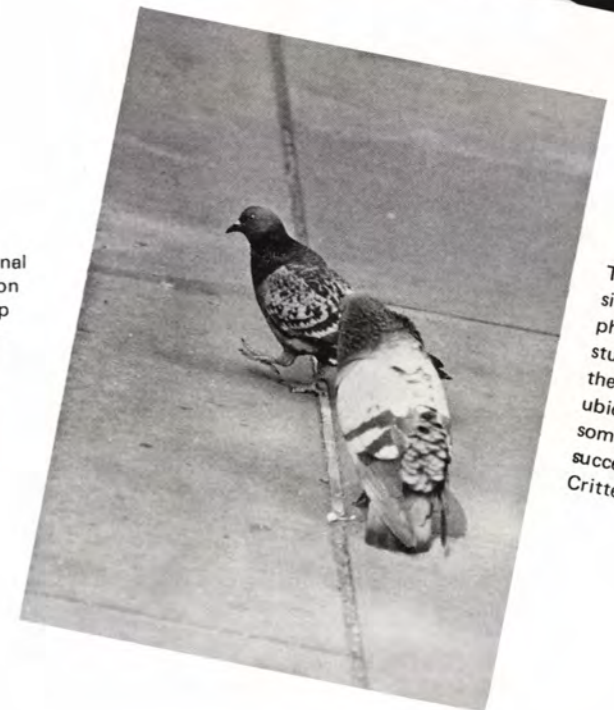


Parents and other persons in the community contributed money and labor to turn this hard topped school ground in Kensington, California, into a multiple use area under ANSS member Herbert Wong's direction (see ANSS Journal Vol. 29, No. 1). Here children conduct research and record results in their fenced-in garden area.

Photos courtesy Alex Krakower



Adaptations, behavior, seasonal changes, family life, impact on the environment, relationship to humans, intelligence, genetics and census studies are some of the topics the city squirrel population may contribute to.



There are cracks in sidewalks—good for physical-earth science studies punctuated by the presence of the ubiquitous pigeons—some of the most successful City Critters.



American Nature Study Society

Elections

(SEE BIOGRAPHICAL SKETCHES ON CANDIDATES ON FOLLOWING PAGES)

The following members have been contacted and have agreed to run for office:

PRESIDENT-ELECT

(vote for one)

Marshal T. Case _____

John J. Kirk _____

FIRST VICE-PRESIDENT

(vote for one)

Rose Blaustein _____

Bill Hammond _____

SECOND VICE-PRESIDENT

Doris V. Parkman _____

SECRETARY

Anne Cloutier _____

TREASURER

John A. Gustafson _____

DIRECTORS

(vote for five)

Harry T. Barnes _____

Thomas P. Benjamin _____

Susan Burleigh _____

Robert M. McClung _____

Louise Ritsema _____

Robert S. Russell _____

Paul C. Spector _____

Paul T. Zeph _____

PLEASE RETURN BALLOTS BY MARCH 25, 1983

Anne Cloutier, Pocono Environmental Education Center, R.D. 1, Box 268, Dingmans Ferry, PA 18328

BIOGRAPHICAL SKETCHES ON CANDIDATES

PRESIDENT

TALBERT SPENCE — continues for a second year.

PRESIDENT-ELECT

MARSHAL T. CASE — B.S., Conservation and Nature Education, Cornell University. Former board member ANSS, and co-editor of *Nature Study*. Northeast Vice President, National Audubon Society: in charge of environmental education and issues in New York and New England; works with 60,000 Audubon members through network of fifty-eight local chapters; responsible for Audubon centers at Greenwich and Sharon, CT. Helped design and build: Cape Cod Museum of Natural History (Director, 6 years); Connecticut Audubon Center (Director, Connecticut Audubon Society, 7 years). Former President, Living Music Society (Paul Winter concert). Associate faculty member: Tufts University (MA); University of Bridgeport (CT). Conducts classroom nature education programs in New York and New England schools. Author of a book on the care and feeding of small wildlife. Life member, ANSS.

JOHN J. KIRK — B.S. Boston University; M.A., Ph.D., University of Michigan. Board member, ANSS. International authority in environmental education and the administration of resident field centers. Director and Professor of Environmental Studies at Montclair State College, New Jersey School of Conservation, since 1969. Past activities: lecturer at universities throughout Europe: consultant to the governments of Mexico and six Canadian provinces on the development of environmental education programs; speaker at national recreation and camping conferences in Japan; featured speaker at three world congresses on education and an international conference on environmental education. Former President, American Camping Association and National Chairman, Outdoor Education Council. Author of numerous articles and professional papers on outdoor and environmental education.

FIRST VICE-PRESIDENT

ROSE BLAUSTEIN — is Science Coordinator in School District 2 in New York City. In that capacity she has implemented several environmental programs. Among them are the Environmental Resident Program and the Fireboathouse Environmental Center. She has also taught several in-service courses for teachers involving a study of the urban environment. In her work as Adjunct Assistant Professor at Hunter College she has instituted and for several terms taught a course entitled "Environmental Science for Elementary School Teachers."

Mrs. Blaustein has written several books and filmstrips. In addition to being vice president of ANSS, she is past president of the Elementary School Science Association, currently Treasurer of the Science Council of New York City, vice chairperson of the Educational Section of the New York Academy of Sciences, chairperson of the Education Committee of the New Jersey Audubon Society. She is editor of the Elementary School Science Association newsletter and regularly writes a page called "The Science Teacher's Notebook" for the New Jersey Audubon Society.

She is a recipient of the Distinguished Service Award presented by the National Science Teachers Association and an award from the Environmental Council of New York City. Several months ago, the Science Unit of the New York City Board of Education presented her with a plaque for her contributions to science education.

BILL HAMMOND — Involved in teaching Science and Environmental Education from preschool to university and adult senior citizen levels for the past 22 years. Currently President and Chairman Pro Tem of The Human Habitat Study Inc., and board member of the Conservation Education Association and the ANSS. Former co-founder and initial director of The Nature Center of Lee County in Fort Myers, Florida, for three years. He believes that nature is the ideal context and holistic delivery system for learning the "basics" and patterns for living responsibly on the Earth planet.

SECOND VICE-PRESIDENT

DORIS V. PARKMAN — Associate Professor, Parks and Recreation Department, Slippery Rock State College, PA. Member of ANSS since mid-70's, conference planner and registrar during that time. Class of '82 Board of Directors, concerned with membership. Representing ANSS as pre-registrar of 1983 National Congress for Environmental Education Futures. Teaches courses in teaching methods in environmental education and interpretive services for parks, nature centers, museums, schools, camps, and commercial enterprises. Workshop leader for ANSS and other environmental education organizations. Active member of the Conservation Education Association and New York State Outdoor Education Association.

SECRETARY

ANNE CLOUTIER — Board member, ANSS, and contributing editor, *Nature Study*. Program Coordinator and Photojournalist, Pocono Environmental Education Center, PA. Former environmental educator, Tiff Farm Nature Preserve and Beaver Meadow Audubon

BIOGRAPHICAL SKETCHES ON CANDIDATES

Center, NY; wildlife educator, Buffalo Zoological Gardens, NY; outdoor/nature specialist, two children's summer camps. Author of articles appearing in *Nature Study*, *The Outdoor Communicator*, and local newspapers and newsletters. Field trip leader for bicycling and backpacking.

TREASURER

JOHN A. GUSTAFSON – Member ANSS, since 1949; President 1963; Treasurer 1964-77, 1980-present; Editor 1974-80. Former President, Alliance for Environmental Education. Professor of Biology, State University of New York (retired 1981). Chairman, Central New York Chapter, The Nature Conservancy. Author and publisher. Nature photographer; field trip leader for nature and poetry.

DIRECTORS

HARRY T. BARNES – Director, since 1972, of the Montour Preserve, Pennsylvania Power and Light Company's 6,000-acre multiple land-use project and environmental education center. Outdoor educator and administrator for 15 years. Has designed and implemented outdoor and environmental education programs, conferences, seminars, and workshops. Former Director, Lakeside Outdoor Education Center, New York. Helped found the Pennsylvania Alliance for Environmental Education. Bird bander and member of the Pennsylvania Outdoor Writers' Association. 1982 Columbia County Conservationist of the Year.

THOMAS P. BENJAMIN – Institutional Advancement Consultant, Certified Fund-Raising Executive. B.S. Resource Management and Environmental Education, University of Michigan; graduate studies, University of Sheffield, University of Buffalo. Board member: ANSS; National Society of Fund-Raising Executives; Former positions: Director, Tiffit Farm Nature Preserve; Coordinator of Education, Onondaga Nature Centers, Inc.; board member, numerous conservation organizations; financial advisor, nonprofit groups. Helped establish several national nonprofit organizations; designed nature centers, trails and environmental education programs. Workshop leader for local, state, and national conferences. Authored articles.

SUSAN BURLEIGH – Working for the Board of Education of the City of New York for 15 years; teaching educable and trainable mentally retarded children for 11 years. As freelance artist, completed two art exhibits at the Pocono Environmental Education Center (PEEC), contributed sketches for the ANSS membership brochure, and painted an ANSS display. Workshop leader for ANSS and PEEC, and serves on the art committee for *Nature Study*. Served on the planning committee for the *Culture and the Environment*

workshop. For eight years has been active in environmental education for children.

ROBERT M. McCLUNG – A.B., Biology, Princeton University; M.S., Science Education, Cornell University. Full time free-lance professional writer/illustrator of books for young people on wildlife, conservation, and the environment. Formerly on the curatorial staff, Bronx Zoo, including curator of birds and mammals; book service and editorial staff, National Geographic Society, writing and editing books and articles. Authored over 33 nature books. Lectures to schools, library groups, etc. Winner, Eva Gordon Award and Golden Kite Award of Society of Children's Book Writers.

LOUISE RITSEMA – A.B., Western Michigan University; M.A., University of Michigan. Studied at several universities and on study trips abroad. Elementary teacher for nine years; elementary principal for 29 years in the Ann Arbor School System. Currently teaching elementary science education at Piedmont College in Demorest, Georgia. Former member and chairman of the Michigan Department of Education Curriculum Committee on Science; member and chairman of the Advisory Board for *Science and Children*. Recent member and chairman of the Eva L. Gordon Award Committee for ANSS.

ROBERT S. RUSSELL – Potter, sculptor, and Pre-Columbian art historian. Active as a resource person (sculpture) on many ANSS programs. Co-chairman of the recent "Culture and Environment" workshop sponsored by ANSS. Has traveled widely to Pre-Columbian sites in North and South America and conducted research on Peruvian culture. Life member, ANSS.

PAUL C. SPECTOR – B.S., Environmental Conservation, Cornell University; coursework, Slippery Rock State College, PA. Director of Education, Holden Arboretum, Ohio; in charge of programs, publications, audio-visuals, and monitoring of natural areas. Former Director, Silver Lake Outdoor Education Center, PA. Board member: Ohio Alliance for Environmental Education; Native Plant Society of Northeast Ohio. Resource Center Director, Outdoor Biology Instructional Strategies.

PAUL T. ZEPH – M.S., Environmental Education, University of Michigan. Environmental education specialist, National Audubon Society, Aullwood Audubon Center and Farm, Ohio. Designed K-12 school programs emphasizing environmental knowledge, values, awareness, skills, and citizen participation. Experience in trail interpretation, development and administration of formal and non-formal youth programs, teacher training in outdoor and environmental education, volunteer training, and Audubon chapter networking.

ANSS Seventy-Fifth Anniversary

Here's a super opportunity to join with your friends and fellow-members in celebration of seventy-five years of service by ANSS to the cause of nature study and environmental education. The observance of this noteworthy event will be included in the program of the National Congress for Environmental Education Futures (see write-up on inside front cover, NATURE STUDY Vol. 36, No. 3 & 4), held at Burlington, VT August 12-17, 1983.

In addition to an Anniversary Luncheon tentatively scheduled for Sunday, August 14, there will be a series of field trips/workshops conducted by ANSS experts: Helen Russell, Ruth Melvin, John Gustafson, Dick Baldauf, and many more. It will be a great time to renew and make acquaintances, to involve the whole family in a worthwhile vacation experience in scenic Vermont.

National Congress for Environmental Education Futures:Policies & Practices

Please complete the Preregistration Form below and send with your check

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Participating Spouses, Students: 25		Participating Spouses, Students: 30	
(deadline July 15, 1983)		Day User Fee:	25

Registration packet available May 15, 1983.

NATIONAL CONGRESS FOR ENVIRONMENTAL EDUCATION FUTURES: POLICIES & PRACTICES

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Eva L. Gordon Award for 1982



Peter Parnall

Jessie Kitching

Peter Parnall's technically superb, pictorially fascinating drawing makes something very special of the more than 40 books he has illustrated or has both written and illustrated. As an author of children's books whose works exemplify the late Eva L. Gordon's high standards of accuracy, readability, sensibility to interrelationships, timeliness and joyousness, and also go far to involve the child who reads them in natural history, Mr. Parnall is the 1982 winner of the Eva L. Gordon Award.

JESSIE KITCHING, a member of the Eva L. Gordon Award Committee, is author of the newsletter Books About Birds.

Parnall's career as artist-illustrator-writer spans roughly 15 years. Born in Syracuse, New York, in 1936, he spent some of his childhood in the Mojave Desert and in Texas. For many years he has lived on a Delaware Valley farm, the same farm pictured in his book "Alfalfa Hill" (1975). There he shows the animals on a country hill preparing for a cold and snowy winter. The squirrels gathered "acorns, black walnuts and tulip tree seeds," "grouse leaped high for frozen clumps of dried wild grapes," and the raccoon "ate and he ate, and he ate and he ate." The snow comes, and Parnall's delicate pen drawings drape the landscape, first in fragile veils and then in a white blanket that makes a new world.

He has taught design at Lafayette College. His limited-edition prints, notably

the prints of the Peregrine Falcon and of the Osprey and several prints of owls, are collectors' items. Characteristic of these prints is the fine pen-and-ink drawing, with spots of color.

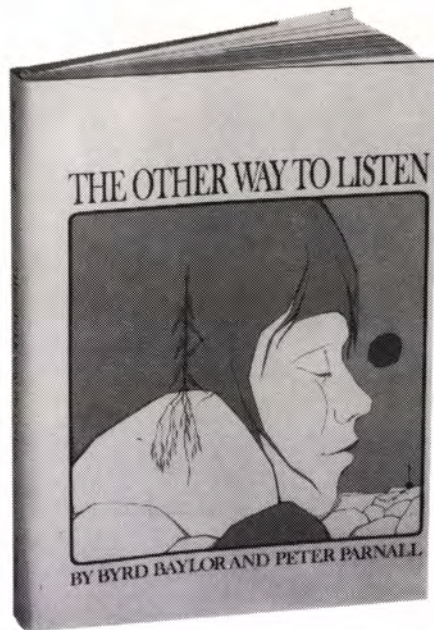
His versatile talent has illuminated American Indian folklore, desert life, marine life, small animals' existence in the wild, poetry for children, and the precarious balance of ecology. This last theme is most pointedly stressed in his book "The Mountain" (1971), a picture book about the destruction of a mountain in the West; or in his drawings of whales for Sally Carrighar's "The Twilight Seas: A Blue Whale's Journey" (1975); or in the Peregrine Falcons he drew for Alice Schick's book about them (1975).

Children, young people, and adults all are attracted to his works.

For ages 6 to 9, there is an outstanding book that gives full play to the artist's sense of fun, "A Dog's Book of Bugs" (1968). This book, with simple and deft text by Elizabeth Griffen, was so popular that it achieved a paperback edition in 1974. Dedicated "for dogs that like bugs," the oblong pages, stretching wide when the reader opens the book, star a big shaggy dog which joyfully and curiously pursues ants, bees, earwigs, and other bugs or insects ("This stick seems to be walking."). There has been a sequel, "A Dog's Book of Birds" (1977), this one both written and illustrated by Parnall.

Among the many other Parnall-illustrated books are several on American Indian ways of life. First, "The Fire Bringer; A Paiute Indian Legend" (1972) by Margaret Hodges, about Coyote's theft of fire from the Fire Spirits. Also, "The Great Fish" (1973), which Parnall both wrote and illustrated, telling a fable of how the silver salmon saved the Indians from starvation in the past, but their river has now become polluted. Also, "The Desert Is Theirs" (1975) by Byrd Baylor, an especially effective collaboration in which animals, people, and the strong, looming shapes of the desert landscape demonstrate the closeness of the Papago Indians and the land.

Parnall's remarkable skill with animal and bird drawings is evident in most of his work, but particularly so in "The Moon of the Wild Pigs" by Jean Craighead George (1967)—peccaries, a Cactus Wren, a family of Gambel's Quail in the mountains near Tucson; "Kävik the Wolf Dog" by Walt Morey (1968)—a sled dog; "Year on Muskrat Marsh" by Berniece Freschet (1974)—Minnesota bullfrogs, ducks, bears,



raccoons; and "The Rabbit's World" by Miriam Schlein (1973)—a snowshoe rabbit.

There is also a lovely flora-and-fauna

ABC, "Apricot ABC" by Miska Miles (1969) set in a California garden given form and life by Parnall's very bright oranges and greens (bees, a hummingbird, a hen, a sparrow). And "A Little Book of Little Beasts" by Mary Ann Hoberman (1973): verses, and drawings to match, about moles and mice, shrews, and raccoons.

Perhaps the high point so far of Parnall's work as an artist for books was reached with "The Nightwatchers," a collection of anecdotes and descriptions of owls. Parnall did the spectacular drawings; Angus Cameron contributed the text. It is one of the most widely known and praised of the books with Parnall's illustrations, and deserves its status as a modern classic.

A sequel, "The Daywatchers," about hawks and eagles, is planned for 1984, Parnall doing both drawings and text. Text will be partly autobiographical, with emphasis on hawks he knows at first hand—osprey catching trout on a Michigan stream, a marsh hawk observed as it scans a barnyard. □



City Critters

Helen Ross Russell

A book to enrich your classroom teaching, to broaden your horizons as you walk down city streets, or give you a feeling of at-homeness as you travel around the world.

Youngsters will enjoy making observations on these easy-to-find animals; some may even meet the challenge of unanswered questions like "How do earthworms make sounds? and why?" and "what triggers a squirrel migration?"

Proceeds from the sale of this book will be used by the American Nature Study Society to further its program of environmental education through publications, teacher workshops and conferences.

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Trees That Grow in Brooklyn, Boston and Other Cities

Miriam Dickey



A city is made up of many different parts. Many cities have a common, garden, or park in their centers. One can find beautiful examples of both native and introduced trees here. These trees are often well cared-for and even labeled. City workers, residents, and shoppers may be seen eating their lunches, feeding the squirrels and pigeons or just resting on benches or the grass in the shade cast by the trees.

At the other extreme we find the poorer tenement or business sections almost devoid of trees. And yet, even here, the Ailanthus or Tree of Heaven will grow under the harshest conditions; and whenever a building is taken down, Sumac, Aspen, Gray Birch, or Ailanthus are quick to appear among the weeds of the vacant lot. They are important, if for no other reason than that they break up the monotony of brick, cement, asphalt, and glass. They are the nurse trees whose roots and decaying leaves prepare the way for others.

Between these two areas we find small parks, playgrounds, and cemeteries, all of which may have a variety of trees. If the park or cemetery has been there for long many of the trees may be large. A number of new office buildings are including small green areas with trees. The trees are often of just one species and are not planted with the best growing conditions.

Look at the names of streets in the city: Boston, where I live, has Acorn, Beech, Locust, Pine, and Poplar Streets, to name a few. There are also many Chestnut, Elm, Linden, Maple and Oak Streets.

MIRIAM DICKEY is a semi-retired member of the Massachusetts Audubon Society staff who teaches about the environment in the city of Boston.

There are now no chestnut trees on Chestnut Street. A school where I taught was just off of Elm Hill Avenue which was hilly but the only elms were tall, dead ones, lining the length of the street. The several Willow Streets which I am familiar with are in wet or once wet areas. A new street has been named Cherry Road. People go out of their way to walk or drive along this street because of the beauty of the flowers in spring and the color of the foliage in fall. Street names can be a key to environmental history!

We should not overlook the yards around houses near our school. The present owners often appreciate the trees that were planted long ago and have left them there. The Museum where I worked for many years was near Orchard Street. There is an apple or pear tree in almost every yard to remind us that at one time there was a large orchard here.

A Sugar Maple tree on a lawn may be what is left of a former wood lot. Some city houses and even short streets are where a large estate once stood. Look around your city for these reminders and remnants of the past.

One tree is a very special living thing. It provides beauty and shade, and thus may increase the value of one's property. It provides homes, shelter, and food for a variety of wildlife. It slows the fall of rain and lets the water sink into the ground and water table. It gives off oxygen through its leaves and makes our air better. It also gives off water to serve as a natural air conditioner. A tree helps to protect us against dirt and dust pollution. It removes surplus carbon dioxide from the air.

Several trees do even better. They may form a buffer zone between house or school and traffic thus reduce noise. They

may temper our local climate by making us cooler in summer by their shade and warmer in winter by protecting us from strong winds. And, of course, in the past they provided us with the material for our houses as well as the fuel to heat them. Some people today are cutting valuable trees to get wood for their fireplaces and woodburning stoves. A few teachers or parents may be tapping Sugar Maple trees for their syrup but we never hear of nutting parties today.

A tree is usually a tall woody plant with one main stem or trunk. Trees are long-lived and continue to grow as long as they live. The tree grows in two ways: It adds a new layer of wood to its trunk and branches every year. The layers may be seen in the stump of a cut tree, or in a good sized piece of firewood. The width of the growth rings tells us something of the conditions under which the branch or tree grew.

A tree grows also at the ends of its branches and twigs where the leaf and flower buds are. This growth gives shape to our tree. Each species of tree has its distinctive buds leaf arrangement and leaf scars (where last year's leaves were) and these aid us in identifying the tree.

The roots of the tree also continue to grow and often extend as far from the main trunk of the tree as the branches do above ground. When planting or caring for our trees we need to remember this.

The leaves of a tree manufacture its food by combining the water which comes from the ground up through the trunk, out through the branches and twigs and through the veins of the leaves with the carbon dioxide from the air which enters the leaves through the pores or stomata on the undersides of the leaves. The green chlorophyll which is in the leaves acts as

a catalyst in the presence of sunlight in breaking down the carbon dioxide and water and recombining the carbon, oxygen, and hydrogen into sugars. This process is known as photosynthesis. Like all other living things trees obtain the energy for their life functions by combining the plant-produced sugars with oxygen in the process of respiration, thus releasing the trapped-sun's energy and forming carbon dioxide and water and completing the cycle.

Conditions in the city are not always the best for our trees. The soil under a tree may be so compacted that rain runs off and cannot sink into the ground. This ground is often covered with cement or asphalt speeding the run-off even more. Such compacted soil or cement cover prevents proper growth of roots. Roots are also damaged when new houses or streets are built or sewer pipes put in. Trees may suffer from tall buildings in two ways: the trees may be so shaded that photosynthesis is slowed or the trees may be buffeted by strong winds as if they were in a wind tunnel.

Weed killers, gasoline, motor oil and detergents may burn the trunk or roots of city trees. Salt, liberally poured on roads in the winter, may result in the eventual death of the tree. We tend to overlook the harm done by the increasing number of city dogs.

City departments often plant just one species of tree along a street. If a disease of that tree gets started it can move along easily to the others—as we sadly learned with the once great American Elms. People living in the city need to be educated in the value of the trees and in ways in which they may protect them.

A variety of trees provides a teacher or parent with an opportunity for comparisons between deciduous and evergreen trees, simple and compound leaves, opposite and alternate branching, as well as the different kinds of buds and leaf scars, flowers, fruits, and seeds.

Yes, there are trees living in the cities—but we need only one on the school grounds or a neighbor's lawn to enable us to teach our children how a tree changes as it grows, and how it makes its food.

Let us look at some of the trees best adapted for living in the city. AILANTHUS or TREE OF HEAVEN . . . This has been called the best city tree because it grows so well in poor soil, with very little water, in too little or too much sun, and surrounded by polluted air. It needs little room, too. I saw one growing out of



the bricks of a building near Boston's Back Bay. It grew tall and the branches could not grow in all directions. Only the tips of the roots reached down into the cinder soil. Yet the tree was thriving. The Ailanthus was introduced from the Orient about 1809 as food for the Ailanthus or Cynthia Silk Moth (the experiment failed). The tree plants itself and grows quickly. Male and female flowers are borne on separate trees. Children call it the stink tree because of the odor of the male flowers. The leaves are long and compound. The winged samaras persist on the female trees in winter. Look for this tree along car lines, and near gas stations and other small city buildings.

GINKGO or MAIDENHAIR. This tree was also introduced from the Orient. Whole streets lined with these trees are found in my city. It is a slow-growing tree and casts little shade. The leaves are attractive, resembling little fans. They turn yellow in fall. In winter the tree appears to have little stumps growing along its branches. The sexes are separate and the female tree bears round yellow fruits which have an unpleasant odor, while the fleshy seed coat causes a dermatitis for some people. For these reasons you will find more male than female trees. The Ginkgo is one of the oldest trees known. It existed 200 million years ago and is found as a fossil in Ginkgo National forest in the State of Washington. It must

be adaptable to many changes in the world to have changed itself so little in all that time.

SYCAMORE or Plane Tree. There are several varieties and some are more resistant to smoke and exhaust fumes than others. All grow to be large and can be recognized by the patch-like appearance of the bark on the trunk and branches, where the outer bark has peeled off exposing the lighter whitish or yellowish inner bark. The simple leaves, too, are large, sometimes as much as 9 inches across. They are lobed and resemble maple leaves but are coarsely toothed. The flowers are tiny and inconspicuous but produce long-stemmed round brown balls that give the tree a third name, Buttonball. These fruits remain on the trees all winter. Each consists of a hard spherical core surrounded by hundreds of hair-tufted seeds which are blown away. Look at the base of the fallen leaf to find the enlarged "cup" which covered next year's bud.

BASSWOOD or LINDEN are increasingly popular along city streets as they are hardy and symmetrical. Several of the varieties used were imported from Europe. The bright green leaves are heart-shaped and finely toothed. The flowers are small and attached to a leaf-like bract that later serves as a helicopter blade for the fruit. In spite of their small size the yellow flowers are so numerous that the

blooming tree glows with a pale gold tone. You may hear the tree before you see it for honeybees are extremely fond of the nectar. Linden blossom honey is sold in the stores. The blooming tree's fragrance also announces its presence. Sometimes sucker-like growths at the base of the tree need to be cut back. The bark can be peeled from these and twisted to form twine as our ancestors and the native Americans did.

CATALPA. This is a small tree, but is the joy of young boys who use the long slender pods as canes or weapons in the fall and early winter. The branches spiral in a whorled pattern instead of being placed alternately or oppositely. The showy white flowers grow in loose groups. The leaves are large and somewhat heart-shaped. They turn black after the first frost. The low branches are a disadvantage to its use as a street tree.

NORWAY MAPLE. The introduced Norway Maple is the best of the large family of maples for street planting, especially on narrow streets for it is resistant to many of the ills to which city trees are subjected. These trees have largely replaced the more handsome Sugar Maples which cannot tolerate heavy pollution. On my street there are both for comparison of bark pattern, time of flowering and leafing, and spread of the keys or fruits. The leaves are similar, but when broken off those of the Norway Maple have a milky juice. This is a good tree to watch from the purple-green buds of spring to the yellow fall foliage. A variety with red pigment in leaves and fruits called Schwedler's Maple is also planted. We take frequent "10-minute field trips" to the Norway Maple on our school grounds. Red Maples and Silver Maples are less commonly found in the city.

RED OAK. There was hardly a school grounds which I visited where there was not a Red Oak nearby. They tend to grow naturally (rather than to be planted) largely due to the fact that the acorns are left to sprout and grow by the Gray Squirrels and Blue Jays which prefer the sweeter acorns of the White Oaks. The leaves of the White Oak have rounded lobes without points while those of the Red are sharper and with hairs at the tips. Black Oak and Pin Oak, sometimes planted in the city, belong to the Red Oak group. Oaks attract many birds in search of the insects on their foliage. Oaks often bear galls, another source of study. Notice that saplings often have larger leaves than older trees.

AMERICAN ELM. There may be an isolated American Elm which has escaped the Dutch Elm Disease. If so, it is a splendid tree with its high branches reaching out from the trunk like flowers in a vase. Many of the elms served as Council Trees for the Native Americans or as Treaty Trees for the early settlers. The small flowers appear in clusters at the end of winter before the simple leaves and by early spring the ground beneath the tree is often covered with piles of the water-like fruits which are greatly appreciated by birds and squirrels. It is difficult to see the flowers, leaves, and fruits until they fall for the lowest branches are beyond reach. The leaf is lop-sided at its base, strongly veined, and doubly toothed. Chinese Elm, while not as dramatic as American Elm, is disease resistant and is sometimes planted along streets.

Look also in vacant lots for Aspens or Poplars, quick-growing but short-lived small trees whose leaves have longish flat stems which cause the leaves to tremble in the slightest breeze. These trees provide the shade necessary for other types of trees to sprout and get a start. You will also find both Staghorn and Smooth Sumac. They have long compound leaves and are small trees which tend to grow in clumps which arch out from the center. Red berried sumacs are not poisonous. Even in cities we find Poison Ivy with "leaves 3" but not always shiny. Learn to recognize it as a shrub or vine and avoid it.

One never knows what tree one will find in a park or cemetery. Most have been planted for their shade or beauty of shape, flower, or fall coloring. Some of the more common ones are varieties of Magnolia, Hawthorn, Flowering Dogwood. All are small and have conspicuous flowers. There are also many varieties of apple, pear, and plum planted for their flowers and color but also to attract birds. The Horse Chestnut, which was introduced from Europe, often occurs singly. It has spectacular upright white or pink flower clusters and palmately compound leaves. Children love their prickly seed pods and large shiny nuts which do not seem to be favorites with any animals.

Tulip and Locust trees are among the tallest of the park trees. Each is interesting for its flowers and fruits.

Evergreens are harder to find. Lawns and parks are good places to look. In New England the most common is the White Pine with its long needles sheathed in groups of fives and its long cones. Various species of yellow pines with needles in

bunches of three are found farther south. If there is a group of these trees you will enjoy the odor and the sound of the wind blowing through them. Hemlocks, Spruce, and Fir are there, too, but less common. Arbor Vitae and White Cedar are smaller evergreens and may form screening for monuments and seats. The soft-leaved Yew is often used in hedging. It is attractive with its small bright red arils. **WARNING:** needles and seeds of this tree are extremely poisonous.

Broad-leaved evergreens include the Rhododendron which may often indicate the location of a building or paths on a once large estate.

Is your city known for its trees? Washington D.C. is known for some 70,000 trees; New Haven, Conn. has been called Elm City. Miami, Florida, has banyan trees as well as palms. Eucalyptus trees scent the air in San Francisco. Ohio has done some interesting things for city trees: Toledo planted 150,000 trees of several species to replace 100,000 elms that were lost; Columbus trimmed, removed and replaced trees and sold the wood to the public; Dayton, too, sold its wood; Cincinnati made a census of its trees. In 1869 taxpayers in Boston were allowed an abatement on their property for every four trees set out under specific conditions and were fined for any injuries that they caused to trees.

Be grateful for the trees in the city. Learn to nurture and enjoy them. Utilize them as a learning resource. □

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Tree Activities

Helen Ross Russell

A tree study carried on for an entire year can incorporate concepts of seasonal change, growth, and environmental relationships. Early childhood and primary grade classes can adopt a tree and keep a class record on a wall chart. Third graders and middle school children can each adopt their own tree and keep a monthly journal about it. Booklets should be prepared for this activity with lined pages alternating with blank ones.

Each month the tree should be drawn and colored on the blank sheet, while two or three sentences are written on the lined page. Both pages should be dated.

In addition to drawing the tree each month and noting its appearance, children should have a special topic for observa-

tion. Some have already been suggested in Miriam Dickey's article; others follow:

1. Collect and mount one leaf or make a leaf print or rubbing.
2. Collect and mount the seeds. Decide how they travel. If the tree does not have seeds at this time, note this fact. Trees that produce seeds in the spring like the elms and silver maple are important to migrating birds.
3. Look at buds, leaf arrangement, leaf scars. Draw a twig. Drawing is better than collecting because it demands observation while it reinforces the idea of protecting the tree. Bud study should be done in early fall so children can discover that trees produce their buds for the following year during the summer.



A park bench is a good work area for recording tree activities.

— photo by Ray Pfortner

4. Look for invertebrate animals hiding in holes, in bark ridges, around the base of the tree. Watch for invertebrate activity; eaten leaves, spider silk, galls.

5. Do the same for vertebrates.

6. If it snows look at the snow patterns. How did the tree influence the snow fall? the snow melting?

7. Go out in a rain and observe the way in which the tree directs water, tree leaves on the ground soak up water, roots slow water, water erodes uncovered soil.

8. Make bark rubbings. Measure the tree's circumference.

9. Use the snow to read animal track stories in relationship to the tree.

10. Watch for spring tree flowers. Some like elm and maple will be big surprises.

11. Watch leaves unfolding. Draw them.

12. If the trees are street trees, learn about their problems.

13. Contact the park department and see if there are things you can do to help the trees.

14. Plant a tree.

Indoor Activities:

1. A study of tree products.

2. A survey of wood products used in the classroom or the school.

3. A study of paper in relation to forests. A paper recycling project.

4. Learn about tree growth patterns.

5. Study evergreens in December, including a report on tree farms and Christmas trees as a crop.

6. Write tree poems.

7. Have a tree banquet where all the food comes from trees. Include things like a temperate zone fruit salad, unsweetened orange juice, fresh coconut, figs, dates, sweet plantains fried in olive oil, basswood honey, nuts. □



"ON THE RIGHT TRACK"

Answer to "Mystery Track", page 30

Answer: A bicycle track in the snow. The long middle part of the track is of course the tire marks and the gashes on the sides occur whenever the pedals reached their lowest point.

Learning by Design - The AIA Environmental Education Program

Alan R. Sandler

Architects and Environmental Education

Architecture is only one of the many forces affecting the environment, but it is one of the most important. Today's architects are concerned with environmental education because they are concerned with achieving and preserving quality in the environment. For this to happen on a meaningful scale in the United States, there must be a widespread public expectation and demand for quality in the environment.

Aware citizens can make better choices. They require buildings designed to a human scale, streets designed for safety, furniture designed to fit the human body, classrooms designed for learning, parks designed for rest and recreation and public buildings designed to express the values of the community.

This human-designed environment is the architect's particular area of domain. What is built, why it is built and where it is built are all a part of the profession's responsibility. The architect, in collaboration with the client, strives to achieve an architecture of consequence. Architecture has a personal and often dramatic effect on everyone. The architect relies on the public's participation and interest in the design process, for it is that interest that stimulates the architect to achieve work of significance. The public should be an educated participant.

No other art form so completely pervades our daily lives. We live, work, study and play in our buildings. Our surround-

ings affect our moods and temperaments; certain buildings, parks, plazas and streets lift our spirits, others diminish them. If we are to influence our architecture—and its lasting effects—we must embark on a strong and pervasive environmental education effort.

Role of The American Institute of Architects

The American Institute of Architects (AIA) is the national organization of the architectural profession, established in 1857. The AIA fulfills the basic goals of maintaining the standards and competence of architects. The following statement from its Bylaws gives clear expression of the ideals of the profession:

"The objects of The American Institute of Architects shall be to organize and unite in fellowship the architects of the United States of America; to combine their efforts so as to promote the esthetic, scientific, and practical efficiency of the profession and building industry by advancing the standards of architectural education, training, and practice; to coordinate the building industry and the profession of architecture to insure the advancement of the living standards of our own people through their improved environment; and to make the profession of ever-increasing service to society."

Membership in the AIA is open to every architect licensed to practice in the United States. Currently, the membership of the AIA is composed of approximately 30,000 licensed architects in over 200 local chapters. The Institute's national office is in Washington, D.C.

Since 1966, the AIA has been involved in environmental education—working on the national level to help clarify issues and develop methods and materials for raising the public consciousness of this vital issue. The AIA has been instrumental in providing the general public—and especially school-age children who will become decision-makers as adults—with a better understanding of the factors that influence the nature of its physical surroundings. Our objective has been a thoughtful citizenry, equipped with skills and values, taking reasoned action necessary to shape cities, towns and countryside into better places to live, and remaining active in efforts to ensure that these will continue to be better places in the future. That is why architects, both individually and collectively, have supported environmental education and have become activists deeply involved in environmental education. Participants have taken many roles: legislative activists, theorists, consultants, architect/educators, community workshop organizers and civic speakers.

The group within the AIA that carries on this task has been known variously as the Task Force on Primary and Secondary Education, the Elementary and Secondary Education Committee, the Environmental Education Committee and, most recently, the Public Education Committee. Its primary objective has not altered: "To create an awareness of and concern for the human-designed environment as it relates to the total environment among all education sectors, pre-kindergarten through adult education."

In this role of environmental education catalyst, the AIA has developed several resources and services through the efforts of this committee. Informational materials for teachers introduced the need for integrating human-designed environmental concerns into the classroom. Information bibliographies were developed, with the first in 1970. Active support of effective legislation establishing environmental education at both the federal and state levels has been pursued.

Then, in 1980, the AIA conducted a survey to determine the needs of the education community in environmental education. Over 900 persons were contacted throughout the country, including state environmental education coordinators, primary and secondary school teachers, education administrators, graduate faculty of architecture and education, textbook publishers, representatives of nonformal

ALAN R. SANDLER is director of education for the American Institute of Architects.

education sectors—including television, children's magazines and museums—AIA components and Public Education Committee members. The overall response rate across all sectors of the survey was more than 50 percent.

The most significant findings of the survey indicated the critical need for access to high quality environmental education resource material, particularly instructional and activity guides, and training that would demonstrate how to integrate human-designed environmental education into existing curricula.

Faced with these findings and determined to meet these needs, the AIA Public Education Committee embarked upon an intensive period of planning which included consultation with professional representatives from the formal and non-formal education sectors. What emerged from these discussions was the structure of a system of interrelated material resources, the mechanisms for delivering these components and, perhaps most important of all, a conceptual framework—the basic notions—upon which the program would rest. The program has been entitled "Learning by Design" and surpasses all previous AIA environmental education activities, both in scope and in substance. The ultimate goal of this program is for every student to develop the ability to live in harmony with the natural environment and the skills to design a quality human environment.

Learning By Design

"Learning by Design" has five key elements: the conceptual framework, information resources, a workshop program, an action program, and an information and technical assistance network.

The Conceptual Framework. Basic to the program is the articulation of the concepts and ideas that constitute its knowledge base. This framework explores the relationship between the human-designed environment and the total environment. It integrates the human-designed and natural dimensions of the environment and synthesizes the dynamics of environmental systems with those of human perception, values and behavior. The concepts are offered neither as a mandate nor as a new course of study, but rather as an approach for blending environmental principles into existing instructional programs.

Information Resources. In order to answer the needs indicated by educators for information about existing materials, *The Sourcebook* has been developed and disseminated. This publication is a com-

pendium of information about existing programs, currently available teaching materials and persons and organizations that are vitally involved in environmental education activities. It is the centerpiece of the informational aspect of this program.

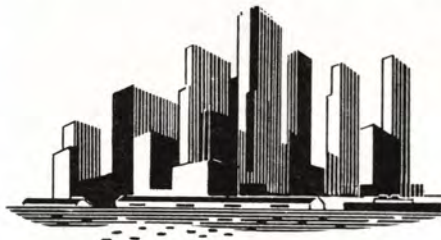
Workshop Program. The workshop program, conceived as a partnership between school representatives and architects, explores ways to make the human-designed environment accessible to students. This program features active collaboration between architects and educators in the development of new learning strategies and activities for classroom use.

Action Program. To meet the needs of teachers and architects in the classroom, the action program develops and disseminates activities. The development of learning strategies and guidelines, the testing of environmental education models, the development of an environmental education guidebook to local resources, and the production of classroom activities in a variety of formats are the major functions of this component.

Information and Technical Assistance Network. To ensure the widest dissemination of information related to environmental education newsletters, reports, position papers, presentations, and response to requests for materials and assistance are ongoing functions of the program, as is participation in meetings, seminars and workshops held by public and private organizations.

"Learning by Design" is a comprehensive approach to education for a quality environment. Educators will develop an enhanced perception of their surroundings and translate this into practical activities for their students. Architects will become a resource to involve students and educators in exploring the design process for decision-making. Together we will develop this program to create a demand for environmental quality.

For further information contact: Alan R. Sandler, Director, Public Education, The American Institute of Architects, 1735 New York Ave., N.W., Washington, D.C. 20006 (202) 626-7573. □



FUELWOOD CRISIS IN THIRD WORLD

We as a nation have been made keenly aware of our vulnerability to current sources of energy production and fossil fuel reserves. Many Americans have subsequently turned to wood as a supplementary source of fuel. But in less developed countries where half the world's population resides, people living in rural areas rely on wood and its charcoal derivative as primary sources of energy for cooking meals and heating homes. Today where wood is harvested either haphazardly or on too large a scale for regeneration to occur, as a resource it can hardly be called renewable. The implications of deforestation in the Third World on the natural ecosystem are many. Soil fertility may be lessened due to increased erosion flooding, and desertification. Further losses may occur as farmers, faced with the difficult task of gathering sufficient wood for fuel, begin to use cow dung, normally a fertilizer, as a cooking fuel. Deforestation also disturbs the year-round and seasonal habitat of thousands of plant and animal species—a situation which ecologists fear may result in rapid and widespread extinctions.

Some would argue that organizations such as the United Nations, World Bank, and the U.S. Agency for International Development must provide advice and financial aid to Third World nations in their energy crises. But the problem of fuelwood supplies may not end there.

The Department of Environmental Conservation in New York State reported in October of 1981 that 3.4 million cords of fuelwood are now consumed annually in New York State alone. If made into one continuous stack of wood, 5 ft. wide by 5 ft. tall, that volume would stretch approximately 5,200 miles long! Unless we as citizens develop an intelligent and concerned outlook towards our own management of wood for fuel, the fuelwood crisis in the Third World may not appear so distant from us after all.

EARTHWATCH Expeditions, Inc. announces its 1983 biology field research expeditions, open to the general public. For further information, contact: EARTHWATCH, 10 Juniper Rd., Box 127z, Belmont, MA 02178. (617) 489-3030.

Corrigendum: Volume 35, Numbers 3 & 4, on page 10 the caption should read The *Covenantor* graveyard lies in the distance.

MEET TWO MEMBERS

KATHLEEN BLANCHARD

My first acquaintance with the American Nature Study Society came in 1974, when I was studying for my Master's Degree at Cornell University. I remember finding a membership form and note from my Chairman, Verne Rockcastle, on the old wooden desk that had belonged to Anna Botsford Comstock and is still used by graduate students today. The note read something like, "I think you will find this to be a good organization."

Although I had never heard of ANSS before, I deeply admired the work of Bailey, Comstock, and other founders of the nature study movement in America. I noticed, too, that the ANSS directors were my mentors from Audubon camps and nature centers in various parts of the country. So I quickly joined!

While at Cornell, it was "Rocky" who encouraged me to write and who first opened the doors that led to publications in science education. With my strong interest in research and teaching, I was committed to help make the world of nature and of scientific research better known to the general public.

From Cornell I moved to Ipswich, Massachusetts, where I joined with two other Cornell colleagues in founding the Atlantic Center for the Environment—the environmental division of an older non-profit American/Canadian organization called the Quebec-Labrador Foundation. Now in its sixth year of operation, the Atlantic Center maintains a very active internship program while conducting education and research in remote, rural areas of northeastern North America.

My most engaging work for the last ten years has been in the field of seabird management. Starting with the National Audubon Society's project to re-establish a colony of Atlantic Puffins in Maine, in 1978 I moved on to the remote, roadless North Shore of the Gulf of St. Lawrence, where populations of puffins, razorbills, and other seabirds were threatened due to illegal harvest of birds and eggs.

There, by combining my Newfoundland ancestry with a fascination for seabirds, I developed, through the Atlantic Center, a



MARY
LOU
FERBERT

When my son left home to go to college and his younger sister began to make plans for her higher education I knew that I needed something to channel my energy into; so I enrolled in art school on a part time basis and began volunteering at the Cleveland Museum of Natural History. Both activities have grown into full time interests. I eventually completed my art school program and have had watercolor exhibits locally, in New York City, and abroad.

In the meantime my Museum involvement has taken several directions. As a volunteer I teach primary level children in our galleries—generally evolution of the vertebrates and North American Indian cultures. In addition, I coordinate the Environmental Information Service at the Museum, and have developed a natural history program, *Nature in the City*, for

elementary school children.

With a Girl Scout Council I have developed a badge-patch program called *The Natural World Around Me*—a spin-off from *Nature in the City*.

Another spin-off was becoming a member of American Nature Study Society. Several years ago I presented a program on *Nature in the City* in Boston at a meeting of the National Association of Biology Teachers. The moderator for my session was Richard Cucchiara, an ANSS member who is a professor at Bridgewater State College. We had a long talk at the end of the session and he suggested that I would find the American Nature Study Society and the Journal involved in the kind of things that I was doing. And he was right! I love the Journal. It is both interesting and helpful while it maintains a personal quality that larger publications have lost. □



Kathleen Blanchard

program in biology and wildlife management aimed at helping people become more informed about the consequences of their actions and training them for leadership roles in conservation. Funded by the World Wildlife Fund, I attribute the success of the project thus far to the fact that we do a lot of listening and learning rather than preaching. We try to be a voice of reason, backed by knowledge of research and of opinions from all sides. While no longer a question of survival, the harvest of birds, fish, and seals is deeply ingrained in the cultural traditions of the English, French, and Amerindians who value wildlife from a utilitarian perspective. The politics of migratory bird legislation and research on seabird mortality are necessary parts of a complex puzzle that poses exciting challenges for environmental educators and is the subject of my doctoral dissertation. Working in communities that are decades behind by urban standards, I am constantly reminded of Leopold and the early 20th century conservationists, each of whom recognized the importance of being, at the same time, biologist, educator, hunter, and friend.

Just over a year ago I was asked by

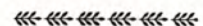
Ruth Yarrow to assume editorship of the ANSS newsletter. Having long wanted to be of service to the Society, I eagerly accepted and happily found myself working with Ruth and Helen Ross Russell—two remarkable women in environmental education. Now, as Chairperson of Publicity for the National Congress for Environmental Education Futures scheduled for August, I have the good fortune of interacting with other ANSS leaders, all of whom are dedicated, enthusiastic teachers with a thorough background in the basics of natural history.

My trusted friend, Verne Rockcastle, was correct nine years ago in his assessment of ANSS. I urge the younger members to become involved in one or more of the many activities planned for 1983, particularly at Burlington in August, and to experience, as I have, what there is to learn from ANSS leaders.

With my husband, zoologist Tom French, I am experiencing the joys of companionship in the lifelong pursuit of nature study. I thank ANSS members for the encouragement and support given me during my first year of active service, and I hope to enjoy much more in the years to come. □

THE SOUTH BRONX (continued)

assistance. When available, FRONTIER also sponsors gardening supplies and plant material give-aways. To aid in the construction of more or expanded gardens and parks FRONTIER assists groups with funding proposals, supplies monetary sources, and explains the New York City vacant land leasing system. FRONTIER, through its nonprofit fund raising, has obtained matching grants for gardens and works with the groups to match the funds. We also continue to assist gardens with summer horticulture teams and work crews funded by foundations, city youth programs, and private donations. While the development of new gardens is slower, the work is continuing. Since much of the development responsibility is now placed on the community organization, there is a stronger commitment. This commitment is reflected by the improved year to year maintenance and development of the green spaces. □



TRACKING THE EASTERN COYOTE

Coyote expert Dr. John I. Green of St. Lawrence University is embarking on a study to determine the population density and home range of the Eastern coyote in the vicinity of St. Lawrence County, New York. In order to monitor the movements of coyotes, he is employing the technique known as radio telemetry.

"The procedure is simple," reports Dr. Green. "First catch a group of coyotes, attach transmitter collars, release, then relocate them at intervals. Home range and density population data result. Add lots of luck." The former ANSS President also hopes to learn the exact time of year when pairs form and denning occurs.

"The presence of coyotes brings a wolf-like element into the human-encumbered ecosystem," comments the man who enjoys wildlife and the outdoors. But the "brush wolf" is not popular among people who mistakenly believe that it, along with the timber wolf, is a fearsome enemy of sportsmen and sheep ranchers.

As stated in an earlier article (*Nature Study* 33: 2 & 3), the laws which allow a seasonal trapping of this fur-bearing animal help protect the coyote from the archaic bounty system and ensure that its population is more carefully regulated. Meanwhile, more studies such as the one by John Green are needed if we are to better understand this wild, yet adaptable resident of the Northeast. □



WHO NEEDS A PELICAN?

"Who needs a pelican?" I heard someone say.
 "Who cares if they all disappear anyway?"
 And I thought, and I thought, could it really be true.
 That a pelican-fella can just say "Adieu"
 Without leaving a wisp of a feather behind,
 And not truly be missed by all of mankind?
 So I called on a pelican fishing at sea,
 To ask if he'd answer a question for me.
 "Won't it matter at all," I yelled from a pier,
 "If all of your race is erased from this sphere?"
 Soon the pelican landed and said with a sneer,
 "I say, did I hear you perfectly clear?
 Or is there some seaweed stuck in my ear?
 Erase my place without a trace—
 What a disgrace to your human race!"
 The pelican jeered with a frown on his face.

"But who DOES need a pelican?" I asked with a squeak.
 Eyeing this fisherman's powerful beak.
 Yet, instead of the tweak on the nose I deserved.
 The bird calmed his temper and looked quite reserved.
 I waited and waited — it seemed like a week.
 When finally the pelican started to speak.
 "Your question," he said, "I can't answer for you.
 But you may want to listen to this point of view.
 For you might be surprised, if you took a short poll.
 At opinions my fellow creatures extol.
 Ask the whales and the eagles, the lion at the zoo.
 The deer and the elephants, butterflies too.
 Ask the cottontails, bears and furry raccoons.
 Or the herons who nest on sleepy lagoons.
 When it comes down to needing, we all must confess,
 You may not need us, BUT WE NEED YOU EVEN LESS!
 With all your pollution, and thoughtless progress,
 You humans are making a terrible mess.
 So be careful my friend, when you ask who needs who,
 Or someone may answer — WHO REALLY NEEDS YOU!"
 Before I could utter a brief word or two,
 That wise old bird flapped and away he flew.
 Up from the pier, and into the sky,
 Winking his eye in a sly goodbye.
 So I thought and I thought, and I know you'll agree.
 THAT I NEED A PELICAN MORE THAN HE NEEDS ME!

— Bette Mazzetti
 Knoxville, Tennessee

COMPLAINT

We have received complaints from Pat Click of Houston, Texas and Jan Nelson of Great Falls, Montana, about a strong Northeastern slant in American Nature Study publications.

No one needs to be told about the vast area or the diversity represented by our membership. We try to handle this in the Journal by dealing with techniques, issues, programs and topics that we hope will have a wide appeal. We admit that the job opportunities, workshops, and meetings announced in the Newsletter and sometimes in the Journal have frequently featured the Northeast.

To this we can only say HELP! We are all volunteers—writers, reviewers, reporters, artists, photographers, editors. We do not receive any cash remuneration; in fact, we pay our own expenses. We invite ALL of you to join us in this challenging and rewarding venture. There is no way that we can know what is happening in fifty states if volunteers in all areas do not keep us informed.

Send Newsletter material to Kathleen Blanchard, Atlantic Center for the Environment, 30 S. Main St., Ipswich, MA 01938; Journal material to Helen Ross Russell, 44 College Drive, Jersey City, NJ 07305.

ON THE RIGHT TRACK (continued)

THE END OF THE TRAIL . . .

. . . Only if we stifle our imaginations and put blinders on. The only city tracks mentioned so far—and the list is far from complete—are those that are visible. If our senses of hearing and of smell are thought about next, a whole new realm of city tracks comes into focus. Who can forget the olfactory track of a nearby bakery? And surely the clangings, buzzings and other noises that always abound in a city environment must be tracks of some kind. There are many things to be learned in, from and about an urban area and if we begin to take students outdoors, as part of their educational program, we can be assured that we are "on the right track."

Post-test (sorry, there was no pre-test) for the reader. Identify the track below. This is a real track seen in a city situation

after a snowstorm and identified finally by a group of first graders after teachers and older students were unable to decipher the track. First some background: the track looked as the sketch below but continued on with the same pattern for at least 25 yards. The width of the track was 18 inches. The snow was 5 inches deep. If the snow were any deeper the track probably would not have been made at all. If there were only one or two inches of snow the long continuous middle section of the track would still be visible but the smaller tracks to either side of the middle section would be absent. Curious? Excited about finding out? Wracking your brain right now? Welcome to the feelings that kids have when learning in the out-of-doors.

For the answer turn to page 25. □



Who, or what, goes there? (Mystery Track)

TIPS for Environmental Education . . .

PLANNING A MUSEUM FIELD TRIP

Marjorie M. Ransom

"We're going on a field trip." Do these words conjure up images of birds building their nests, offer the chance to be a guest at an Indian powwow, or promise lunch by a fish filled pond? Not necessarily, if you are a city child. The mind of a city child is more likely to become excited by the anticipation of a trip to one of the city's great museums, such as The American Museum of Natural History in New York.

Natural history museums are phenomena in that they are city-born and city-bred; yet it is they that turn the minds of city folk to the beauty and majesty of the natural world. It is they that remind us that, even in cities, we can enjoy the earth and that humans in all parts of the world have always been affected by and have affected the natural world.

The easiest way to use a museum is to take advantage of the teaching programs offered by the education departments in most museums. You will note that the topics or themes offered are quite specific. Museum educators are firmly convinced that the good museum trip is one with a small focus, one that concentrates on a few concepts well illustrated.

Trust your museum instructor to have planned a well balanced trip. In addition to exhibition hall study, your program may include a film or slides, and, if you are lucky, first-hand experience with appropriate museum materials. Even if your topic is one in anthropology, "Indians of the Eastern Woodlands," for example, you will probably discover that some insight into their natural environment is given as a background for understanding much that developed in their culture. Natural history museums, like The American Museum of Natural History, that encompass anthropology as well as natural science, take the view that any culture and its natural milieu are inseparable. Whatever your area of study, the museum instructor's task is easier and the program more effective if the students, children or adults,

have been motivated and prepared before they make the museum trip.

It is harder to use a museum independent of any museum program, but this is often the only possible course. Museum programs are in great demand. An appointment may not be available when you wish or your choice of topic may not be covered. The very large museum, by virtue of its size and its ability to dazzle the eye, can confuse the mind. The wise leader will avoid this problem not only by the careful planning of pre-visit motivation and group preparation, but of the actual trip and of the follow-up activities. Without such thoroughness in planning, the experiences of the day could well become negative in value.

Let us consider some of the basic issues in planning a hypothetical, but typical museum field trip:

1. What is my theme?

Spring Is Here!

2. What is my teaching goal?

To present spring as a time of rebirth and the renewal of activity. To help my students be better observers.

3. Which exhibits in the museum are the best and most appropriate for the theme and for my students? Which are most apt to capture their interests and

stimulate learning?

This part of the scheme requires the leader's greatest efforts; greater even than the trip itself. *It is vital that an exploratory visit to the museum be made for the purpose of selecting exhibits and probing them for their appropriateness.* Three things must be kept in mind. First, there is nothing so detrimental to a good field trip as an inept, poorly informed leader. Second, it is best to develop such concepts as animal-and-plant-relationships using local materials before applying that knowledge to distant or foreign areas. Third, in large museums care must be taken that the itinerary not be fatiguing. Tired students do not learn. Nor do distracted ones. Do not wander through the museum's Dinosaur or African Game exhibit on the way to the pond in spring.

4. How do I stimulate interest and prepare my group? The students must be made to feel that they have played a role in the shaping of their trip to the museum. Share *your* theme with them. Ask them to bring in pictures they think show springtime. Rest assured, they'll arrive with pictures of trees, baby birds and frogs in a pond. Help them to select those shown in your local museum and in nearby outdoor areas. What would they like to know about these animals and plants? This



MARJORIE M. RANSOM is supervising museum instructor at the American Museum of Natural History in New York City.

list is *their* theme. Talk with them about what they and you like about spring, the things they can do, the fun they can have.

5. The trip to the museum.

If the museum near you has large habitat groups, you are fortunate. They are marvelous teaching tools, for they recreate actual scenes and help you see and talk about the relationships among plants and animals as you develop such concepts as the ecological niche or the food chain. Use the questions you and your students have drawn up for discussion, prompting them to tell you what they see and encouraging them to ask questions of themselves. For example:

- a) What would it be like to be in this place?
- b) How many different shapes of leaves do we see? What does this tell you? Do all the trees have the same kind of bark?
- c) Can you name some of the animals you see? What do they find to eat?
- d) Why does the spider make a web? How many legs does a spider have?
- e) What have the birds used to build their nests? Do all birds use the same things? why? Does the same kind of bird always build the same kind of nest? Why do some of the eggs have spots? What kinds of eggs might you have at home?
- f) How are the frogs' eggs different from the birds'? What is missing?
- g) What would happen if we took away the pond, or the trees, or the grass?

The questions I have posed as examples to elicit data from the leader and, more importantly, from the students. Let us not forget that all of us have picked up bits and pieces of information that we seldom use or relate to anything else. A good trip leader makes the students aware that they know much more than they think and helps them make connections. A good trip leader, one who encourages students to question what they see, is helping them develop techniques that go beyond nature study. Learning to become more aware of one's surroundings and to teach yourself is a skill that, once learned, is carried with us always, everywhere, bringing new meanings and insights to many life experiences.

I cannot stress too firmly that the students be encouraged to express their feelings and emotions. Without the build up of a sensitivity about the natural world



and of the ability to look and really see, nature remains an abstract concept. The natural world must be made to be a personal thing, to be a recognized part of life. Without such feeling, how can we expect our youth to become the informed citizenry we will need to preserve what we have?

The museum visit is not the end, nor should it be. It can lead to all kinds of activities: creative writing, painting, a nature corner in a classroom, or a trip to a nearby natural area or park. The city park, incidentally, is an ideal choice for it can be revisited independently by the students.

In New York City we are most fortunate to have large urban parks in the midst of our most crowded areas. In the borough of Manhattan, Central Park provides 800 acres of trees and shrubs, lakes and ponds, and lawns. The park is on the eastern fly-way used by migrating birds. Each spring and fall it becomes a mecca for thousands of bird watchers. What an opportunity!

Now is the time to put into use the looking skills learned on your museum trip. Let the same stream of emotional reaction flow and bring back all the old questions. Try to identify some of the birds you see by using one of the many field guides available. Why do they stop here? What do they hope to find? The mind can be made to soar as it considers the far away places from which they have come and to which they will go.

Look around at all the things you think you have seen before. They have new meaning. The trees have become the

homes of birds and squirrels. Watch them, but do not disturb. Listen to the birds as they identify themselves and communicate with one another. Leaves picked up from the ground will be appreciated for their differences. Make a collection. It may become the base upon which learning to use a key can be developed. The pond is a hatchery for tadpoles and fish. The entire park is full of things to watch and study. It is interesting. It is fun!

Nature study has no boundaries, if only we know how to look and really see. The wonder is that these things were here all along, just waiting to be enjoyed. □



DOWN TO BASICS (continued)

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TIPS for Environmental Education . . .

GETTING THE MOST OUT OF YOUR CAMERA

--- AND YOUR PHOTOGRAPHS

RAY PFORTNER

Photograph Storage

Crafting your photographs must not be your only concern. What becomes of your finished products now and well into the future should be equally important, and storage is a main consideration. With care, storage can (1) extend the life of your photographs, and (2) provide for easy retrieval and convenient viewing.

There are five main threats to the useful life of your photographs, whether negatives, prints or slides, namely:

1. chemicals
2. rust
3. light
4. heat and
5. humidity.

An almost unbelievably long list of commonly-occurring chemicals can seriously damage your photographs. Peroxides given off by cardboard boxes and bleached, unpainted wood (as in bookshelves) tarnish silver and cause the loss of detail and the fading of color. Lignin and aluminum sulfate in low grade fiber paper causes fading. Acids in glues discolor and bleach photographs, and many glues attract moisture promoting the growth of fungus. Vapors given off by some plastics fade dyes, while sulfur compounds given off by rubber bands brown or yellow silver images. Acids on your fingers discolor photographs while other chemicals there

promote fungal growth. Even some air pollutants discolor photographs.

Dust can scratch negatives and slides, and become embedded in the gelatin surface of prints. Light fades slides and color negatives in particular. Heat and low humidity make photographic materials brittle; heat and high humidity increase the rate of chemical corrosion. Moisture also promotes the growth of fungus.

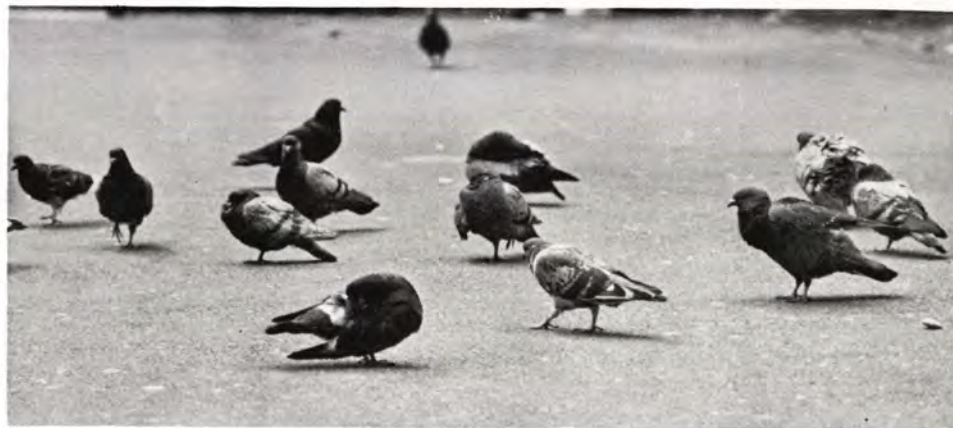
Clearly, storing your photographs in the attic or basement is not advisable; best is a room of average temperature and humidity. Your negatives and slides are best kept in boxes of metal coated with a baked enamel and stored on painted wooden shelves. Plastic sleeves are often used for slides and negatives by professional photographers and stock photo agencies. Most eventually cause some fading, but the significant tradeoff is that they also protect against fingerprints and ensure good air circulation, which guards against fungal growth and moisture. Archival quality plastic sleeves, which give off no such vapors, are available, but at higher cost.

Prints are best kept in acid-free holders and separated within the holders by acid-free sheets to improve air circulation and avoid sticking. Photo albums are very useful, for they reduce fingerprints and keep prints separated.

To make the best use of your photographs, a cataloging system is a must. The system you adopt is an individual consideration, for it must be the one that best serves your special needs now and well into the future. As a minimum, it must ensure both simple and accurate retrieval and allow for the safe handling plus convenient viewing and comparison of any photographs selected. Many photographers number each roll as it comes back from processing. Since each photograph in any roll has a frame number, this system gives each photograph in your collection a unique number (a combination of roll and frame numbers). As a minimum, each roll is logged in chronologically, recording date, subject and roll number, and photographs are stored chronologically. From this point, a number of indexing systems are possible, including a cross-indexed file card system with cards listing individual photographs for any number of different subjects. Or second slides can be kept chronologically while firsts are stored in plastic sleeves directly in folders with appropriate subject headings.

The choice is yours, but be sure to give your system careful and timely thought. Trying to make the most use of your slides, especially for teaching, requires systematic storage, and the time, money and effort invested in your photographs demands safe storage. Setting up a system late in the game in the face of boxes and bags of old slides can be a hopeless task.

As Project Manager in the Hazardous Waste Site Branch of the New York City office of the United States Environmental Protection Agency, ROY PFORTNER has many occasions to use a camera. He also teaches courses on photographic techniques.





Ann Arbor Alive: The Ecology of a City. Michael J. Caduto and Lori D. Mann. Ann Arbor, Michigan, An Ecology Center of Ann Arbor Publication, 1981.

This is the kind of book that should be written about every community. It is a fascinating look at the city of Ann Arbor, Michigan, as an ecological entity. The authors explore many aspects of the interrelationships between man and nature in terms of this one, specific location, starting with an explanation of how the retreat of the Wisconsin glacier has influenced the present geography of the city. All of the chapters include a useful map with numbers keyed to places mentioned in the text, so that you may use the book as an actual tour guide.

It certainly should be used as such by people who live in the area, for it gives intriguing lessons in how to make observations and interpret them—in how to read the city landscape. For instance, there is a description of how the lichen growth on graves in one of the local cemeteries indicate differences in the purity of the air. The lichens become more frequent and the growth heavier as you go from the entrance near a heavily travelled intersection, to the border that adjoins an arboretum. How to read the signs of drought in the leaves of trees on a certain street where the openings in the pavement around each trunk are not large enough, is pointed out. The book encourages you to climb to the top of one of the city's parking structures during a rainstorm. There you can observe the fact that a city surface of roofs and pavements provides little opportunity for absorption of water. You can experience the venturi effect first hand, the authors tell you, if you go to a particular spot on the university campus.

But the book is more than a tour guide. It gives a tremendous amount of background information in understanding what the city is made up of, and how it functions. How many trees are there in total, along the streets and in the parks? Who is responsible for them? How much solid waste does Ann Arbor and the surrounding communities produce? *Ann Arbor Alive* not only tells you, but helps you visualize such facts. The yearly solid waste production of 600,000 cubic yards, would "fill the University of Michigan stadium at least two times." How much wat-

er does the city use in a day? Where does it come from? How does the sewage system work? These and similar things are explained in some detail.

The changes that have been occurring in the ecology of the city over time are also discussed. Facts about things such as increase and decrease in energy use, average ambient temperature, and changes in modes of transportation all are given.

Problems that face the city in terms of growth and resource use are explored in this book, and possible solutions are outlined. You learn here what branches of government are in charge of various aspects of city resource use, and what citizen committees are involved. The role of government and other organizations in the planning and administration of environmental and human services is considered as well. Although Ann Arbor has its share of problems, outsiders will discover that it is no ordinary city. Civic concern there has been translated into action in many ways. Learning how Ann Arborites are coping with some of their environmental problems is one of the things that makes this book worthwhile reading.

In their introduction the authors say that they hope that their book will be used as a template for similar studies in other cities. Hopefully, communities of all sizes will be moved to do so. They might well consider, however, leaving out what seemed to this reader an excessive amount of stern lecturing about the necessity of doing something about ecological problems, and of philosophizing about what is ecologically sound behavior. The facts speak for themselves, and the authors have presented their case so well that it seems unnecessary to be quite so didactic.

A book like this provides a real service to teachers, bureaucrats, interested citizens and students of a community. It is an ecological guide, a sourcebook of resource-use information, and a comprehensive picture of a city from an ecological point of view. It is extremely interesting in its own right, and deserves serious consideration as a model for similar publications in other communities.

— Mary D. Houts

Corrigendum: *Nature With Children of All Ages* by Edith A. Sisson was reviewed by Mary D. Houts in Volume 36, Numbers 1 and 2.

Bartram, William. 1980. *Travels*, Peregrine Smith, Inc., Salt Lake City, 332 p. 18 x 10.6 cm., paperbound. \$3.95. (One of a series: Literature of the American wilderness).

Travels, by William Bartram, is a journal describing Bartram's journey during 1773-1777 through the Carolinas, Georgia and Florida. He wrote in great detail on his observations of the natural history of the area.

Occasionally in *Travels*, there are flowery passages, but most of the observations are objective. Some of his accounts, such as the following, cannot help but fill the modern reader with wonder. About forty miles from Augusta and about ten miles from Wrightsborough, he describes:

"... the most magnificent forest I had ever seen. We rise gradually a sloping bank of twenty or thirty feet elevation, and immediately entered this sublime forest; the ground is perfectly [37] a level green plain, thinly planted by nature with the most stately forest trees, such as the gigantic Black Oak (*Q. tinctoria*) Liriodendron, *Juglans nigra*, *Platanus*, *Juglans exaltata*, *Fagus sylvatica*, *Ulmus sylvatica*, *Liquid-amber styraciflua*, whose mighty trunks, seemingly of an equal height, appeared like superb columns. To keep within the bounds of truth and reality, in describing the magnitude and grandeur of these trees, would, I fear, fail of credibility; yet, I think I can assert, that many of the black oaks measured eight, nine, ten, and eleven feet diameter five feet above the ground, as we measured several that were above thirty feet girth, and from hence they ascend perfectly straight, with a gradual taper, forty or fifty feet to the limbs; but, below five or six feet, these trunks would measure a third more in circumference, on account of the projecting jamba, or supports, which are more or less, according to the number of horizontal roots that they arise from: the Tulip tree, *Liquid-amber*, and Beech, were equally stately.

"Not far distant from the terrace, or eminence, overlooking the low grounds of the river, many very

GOOD READING



magnificent monuments of the power and industry of the ancient inhabitants of these lands are visible. I observed a stupendous conical pyramid, or artificial mount of earth, vast tetragon terraces, and a large sunken area, of a cubical form, encompassed with banks of earth; and certain traces of a large Indian town, the work of a powerful nation, whose period of grandeur perhaps long preceded the discovery of this continent."

William Bartram's descriptive and non-judgmental accounts of the Indians he encountered are of great interest, as are his accounts of many other individuals. The work was recognized as scientifically valuable with excellent botanical and zoological descriptions and observations.

There was a fourteen year delay before *Travels* finally appeared in print, after securing subscriptions from such people as President Washington, Vice President Adams and Thomas Jefferson. The first edition had limited sales in the United States and was not reprinted here until 1928. In Europe, the book was well received and several editions were published.

Today Bartram's work is still of immense interest and value to diverse fields, such as historic interpreters, conservationists, botanists, zoologists, anthropologists and anyone concerned about our threatened wilderness areas.

— Marie Long

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Branley, Franklyn M. 1982. *Water for the World*. Crowell, New York. 95p. illustrations by True Kelley. 23.5 x 16 cm., hardbound. \$9.50.

This book, well illustrated with clear, easily understood cartoon-like diagrams, will be especially useful to middle or junior high school students. What happens to the limited supply of water on the earth, the water cycle, the various sources of water on the earth, pollution, sewage disposal, and the importance of water conservation, are all treated. The text is filled with interesting facts that will intrigue youngsters of all ages. The diagrams suggest activities with water that will be fun and inexpensive for children to do at school or at home.

— Marie Long

The Changing City, Jörg Müller, Atheneum, NY 1977. \$11.95.

The urban landscape is an ever changing scene, but do the changes enrich our lives? Does urban removal and renewal bring improvement or strip us of our past? In *The Changing City*, Swiss artist Jörg Müller addresses the issue of urban change in a unique and thought-provoking way. His medium is not words, but beautifully executed drawings. In a portfolio of eight 28 by 12.5 inch, full color, fold-out pictures, Müller graphically traces the environmental changes within a typical city neighborhood over a span of 23 years.

With the unfolding of the first drawing, one is visually transported back to 1953 and a quaint city neighborhood. Each subsequent drawing depicts the same community at 3 year intervals. Müller's rich use of color and detail quickly sweeps the viewer into an in-depth study of each scene. The artistry of the pictures compels one to not only see the changes but also feel their impact.

Unrestricted by words, Müller's drawings allow for personal reactions & interpretations. People of all ages, even the very young, can interact with each drawing. The open-ended nature of the pictures allows classroom teachers, at all levels, to use the portfolio in a multitude of ways. Social studies, creative writing, critical and interpretive thinking, as well as language development could be enhanced through the use of Müller's *The Changing City*. Libraries and families alike will find it a valuable addition to their collections and an insightful visual commentary on the urgent problems facing our urban environments.

— Carolyn Caselton Spence

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The Changing Countryside, Jörg Müller, Atheneum, NY. \$11.95.

This portfolio is arranged exactly like its companion volume, *The Changing City*. Here we watch every scrap of the culture and natural beauty wiped out bit by insidious bit as the dirt road, the two-track railroad, the small village, the farm with its pond, brook and wooded hill are completely replaced by a four-lane highway, industrial plants, oil storage tanks, and a housing development.

It is the pictures worth ten thousands of words on the topic that ANSS and AIA are writing about in this Journal. Like its companion, it is a superb teaching resource. It is also a treatise that should make the residents of all of the rural areas of this and every other country stop and think; and then take steps to protect, not only their heritage of natural resources but the cultural ones as well.

HRR

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Schlein, Miriam. 1982. *Billions of Bats*. Lippincott, New York. 56p. illustrations by Walter Kessell. 21 x 17.5 cm., hardbound. \$9.50.

Billions of Bats will delight and fascinate young readers with interesting data and descriptions of the myriad differences among bats. There is an excellent account of vampire bats, of how they walk on their feet and thumbs and how they feed. Echolocation is also detailed, as are structures such as the nose-leaf, extra big ears, the flap of skin in front of the ear called a *tragus*, and the tiny muscle inside the ear. Because most bats fly at night and hang upside down by their toes to sleep in the daytime, usually roosting in dark, hidden places, many people have never seen a bat, even though they are distributed in diverse cold and hot climates throughout the earth. There are about 800 kinds of bats known to exist, including species that vary widely in size, structure, and general appearance. Walter Kessell's exquisite drawings of many of these strange mammals are utterly engrossing and will amaze the reader. Students, teachers and other interested readers will find this book most interesting and informative. A must for juvenile natural history collections.

— Marie Long



NEWS and NOTES for Environmental Education . . .

SUMMER EMPLOYMENT OPPORTUNITIES

The Cooperative Extension Association of Oneida County, New York, is seeking an Assistant Environmental Director for its 4-H Program in Oneida County. The individual will work as a summer assistant to the 4-H Environmental Program Director, beginning June 1. Primary emphasis will be placed on environmental science instruction at the Stoneybrook Nature Trail and Erie Canal Village land track in Rome, New York. For a complete list of responsibilities and qualifications, contact Dennis Mudge, Cooperative Extension, 4-H, 2 Oxford Rd., New Hartford, NY 13413; Tel: (315) 724-7131.

A summer nature counselor position is available as part of a day camp program at Point O'Woods, Fire Island, New York, beginning June 28. Responsibilities will include directing a nature program for children ages 5-14 from 8:30-3:30 Monday through Friday and maintaining a crafts shed and small nature center. Salary is \$1,000 plus free room and board. To apply, please write Mrs. Karen N. Budd, 385 Church Rd., Devon, PA 19333; tel: (215) 688-3926.

The Atlantic Center for the Environment is seeking a director for its summer educational program in natural resource conservation at two scenic locations in northeastern New Brunswick: The Tabusintac River estuary and Mount Carleton Provincial Park. Responsibilities will include directing a staff of five instructors in youth and teenage programs plus special events for adults. Applicants must be 24 years of age or older and possess a Master's Degree plus experience. For information write The Atlantic Center for the Environment, 39 South Main Street, Ipswich, MA 01938; Tel: (617) 356-0038.

EDUCATION OPPORTUNITIES

A special Watson Summer Ecology Workshop in natural and human ecology will be held at Maho Bay Camping Resort on St. John, U.S. Virgin Islands, July 3-10, 1983. The Watson Ecology Workshop is a family camp and environmental education program for formal and nonformal educators and nature lovers. ANSS President Talbert Spence will be a field instructor at

the workshop. The cost, including round-trip fare from New York City, room and board, supplies, and program is \$625 per person. For information, please write Hy and Joan Rosner, 6370 S. W. 50th St., Miami, FL 33155, or call Talbert Spence at (212) 549-2055.

The New York City Urban Park Rangers offer free Sunday afternoon walks in each of the city's five boroughs. Come greet the early birds in Brooklyn and the Bronx, spy on ships from Owl's Head Park, and visit the historic bridges and arches of Central Park on horseback. For information, contact Sherman Jackson at (212) 360-8141 or Adrian Benepe at (212) 360-8194.

INTERNSHIP

Project C.A.R.E., a nationally acclaimed energy education program in the Schaumburg School District is accepting applications for a five week (Monday-Friday) internship beginning April 25, 1983 thru May 27, 1983. Responsibilities include working in a resident program called "Energy Encounter" in which 4th thru 6th grade students budget their existence on a limited amount of energy. Room and board plus a \$600.00 stipend are provided. For more information, please contact: Rich Ammentorp, Project C.A.R.E. Director, 320 W. Wise Rd., Schaumburg, ILL 60193; Tel: (312) 893-1890.

GRADUATE FELLOWSHIPS

Graduate Fellowships providing teaching opportunities and course work leading to a Master of Arts degree in Environmental Studies are available at the New Jersey School of Conservation in Sussex County, New Jersey. Applicants should hold a Bachelor's Degree from an accredited institution, with teaching experience preferred. Responsibilities will include teaching approximately 15 hours a week, with opportunities to attend graduate courses at Montclair State College. Room, board, and a \$1,200 stipend, plus remission of tuition for all graduate courses, will be provided. For information write Dr. John Kirk, Director, New Jersey School of Conservation, Montclair State College, R.D. 2, Box 272, Branchville, New Jersey 07826; Tel: (201) 948-4646.

STUDENT EXPEDITIONS SUPPORT FIELD RESEARCH

Sometimes it takes a different approach to gain financial support for needed research. Staff at The School for Field Studies seem to have the right idea.

They take a small group of scientists needing research funds for field studies and match them with a select group of qualified college students eager to gain practical first-hand experience in field research techniques. The result is a system which seems to work in an age when funds for research are scarce and students are thirsting for unusual experiences to enhance their credentials.

Here's how it works. Each year approximately ten projects are selected, ranging from studies on African wildlife and Galapagos tortoises to human impact on the Grand Canyon ecosystem. From ten to twelve students, age 16 to 26, are chosen for the expedition teams. The students' tuitions go directly into the cost of supporting the research.

Students need no previous training or experience. The purpose of The School for Field Studies is to train them in the skills they will need—in research methodology, teamwork, a scientific discipline, and outdoor skills. Researchers, on the other hand, are chosen in part for their eagerness to share their knowledge and the excitement of research.

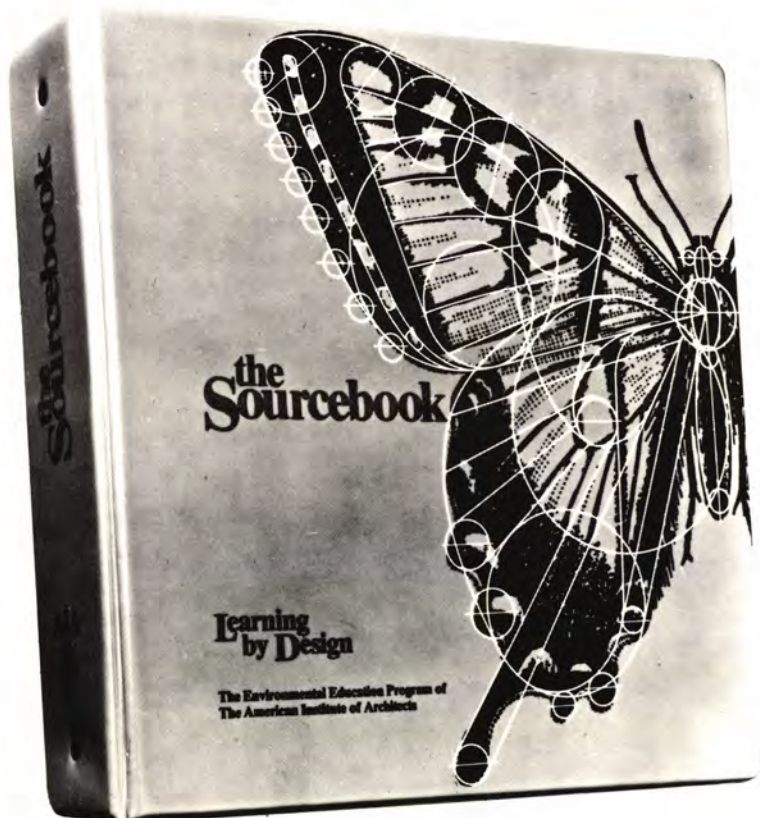
Like the similar Massachusetts based group, Earthwatch, programs such as The School for Field Studies help bring researchers and students closer together in the study of nature. To find out more about the School, write: The School for Field Studies, P.O. Box 171, Prudential Center, Boston, MA 02199.



the Sourcebook

"The Sourcebook helps teachers select program materials that fit their teaching styles."

David A. Kennedy
Supervisor, Div. of Instructional
and Professional Services (WA)



Now you can have—in a single volume—the most up-to-date collection of environmental education resources and references ever assembled. This unique system of information is called **The Sourcebook**.

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AIA also offers an annual update to provide you with additional resources. The service is \$10 per year.

To order **The Sourcebook**, the updating service or to get a free brochure, write: The American Institute of Architects, 1735 New York Avenue, NW, Washington, DC 20006.

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