

Nature Study



A JOURNAL OF ENVIRONMENTAL EDUCATION AND INTERPRETATION

Spring, 1972

Vol. 26, No. 1



NPS

Action Must Follow Awareness

The American Nature Study Society

UNTITLED

Oh Man, what have you done?
Because of you the spring will no longer come
In its season, nor will the golden day.
You have blotted them out, taking endlessly
And never giving back,
You laughed as you stole,
But now that which you have left
Will rise to mock you.

The meadow's scented greening is no more,
But the shrivelled grass, the drained marshes,
The swirling dust accuses you.
You cannot escape your guilt.
The bloated fishes' bellies tangled in the algae
Grin up at you,
Their dead, sightless eyes saying,
"Live now and realize your youth.
Soon you will have laid all the world to waste,
So live, but give no thought to those
Who come after you."

Man, because of you
A crane cries out no longer in a Wisconsin marsh,
And no longer do a million raucous pigeons
Darken the skies or make a furious thunder
With their beating wings.

Soon, though perhaps not in your day,
The light will fail, the darkness descend.
The earth will be desolate and alone,
As it was in the beginning.

Man, attend a funeral, and mourn the passing of a species
Your own.

— Susannah West

Nature Study for the Pre-School Child

JANET NICKELSBURG

The nature program for the small child is quite different from a science program. A nature program serves to place the child in direct contact with the objects in the world about him and to help him observe these surrounding phenomena. It does not, as in a science program, seek to explain causes and effects, such as showing the effects of certain foods upon nutritional development or organisms; nor does it expect the child to remember the distance to the moon, nor to understand the principles of photosynthesis.

A nature program for the small child aims to introduce him intimately to what is accessible to his own senses. It should encourage him to use these senses, so that touch supplements vision, taste supplements smell, and vision, hearing. Thus he develops his powers to observe the world about him, for he is not yet ready to understand the disciplines of science where one cannot and should not trust implicitly to subjective observations, but where controls must be established before conclusions can be reached.

The pre-school child is sensitive to a multitude of impressions that can either permit him to build a full and satisfying relationship with the outdoors or else may erect barriers that throughout his life may prevent him from enjoying, let alone understanding, the natural world about him. Certain impressions may carry overtones of fear, disgust, and withdrawal; or others can, step by step, build up in the child the freedom to experience with joy all he encounters.

Unfortunately, however, well-meaning parents and teachers are prone to place around the child certain barriers that shut him off from what should be free and unstructured experiences in the outdoors.

There are three important barriers, the first being our insistence that nature experiences cannot be enjoyed unless each object has been correctly named and placed in its scientific category. I call this first barrier *pedantry*, a parade of one's learning. In the case of the pedant, teacher or parent, he is merely showing off to the child by inferring that the little one does not yet possess the key to interpreting nature and therefore must acquire all sorts of incomprehen-

sive and cumbrous facts before he can enjoy nature to the full. A child seeing a pink cloud, or a slithering snake, or his own reflection in a rain puddle, is quite capable of receiving a deep and satisfying experience of nature without anyone interpreting to him what he is seeing. Adults can help the child make his own discoveries by taking him to places where they can be found, and therefore the less we add in the way of explanations, the less we talk about what he is observing, the better the child may be able to observe for himself and to develop his own impressions.

Allowing the child to make his own observations does not mean that the adult holds himself aloof and unwilling to share with the child the experiences he is having. It merely postulates that he keep quiet so that the child can do the talking—if he so wills. Children often are not articulate about their emotional experiences. "It's nice!" may be the only reaction we get from a deep esthetic experience. On the other hand we might receive such truly charming statements as that of the little girl who told her teacher who had taken the class out to a flower-strewn hillside after the rain, that she knew why there are so many flowers. "It's sprinkle time!"

To understand what is happening to such a child the teacher must, as one gifted teacher expressed it "be aware of the child's awareness." This may not be easy to achieve. We are all too eager to instruct, explain, to tell a child how *he* feels about something. Which brings me to the second barrier we place between the child and his study of nature: The certitude that our own prejudices are valid. We dislike among other things dirt and mess: "Don't bring that horrid thing into my house!" "Look at your hands and your shirt. Where in the world have you been?" "Why do you want to play with that slimy, nasty thing?"

Since no one can do nature by remote control, and since touching, handling as well as seeing, listening, smelling and even tasting are the tools by means of which we come into contact and therefore learn about nature, naturally our hands, our faces and our clothes bear the marks of our experiences. I have a

theory about cleanliness and children: They should be clean when they go to school, have clean hands when they come to their meals and go to bed clean. *But the rest of the time they may be as dirty as they like.* It is their prerogative.

The third barrier is the most inhibiting of all. It is fear. We instill fear of the most harmless objects in our children. "All snakes are poisonous, or at least nasty. Don't touch it. Don't let that dragonfly get near you. It'll sew up your ears. Bats are horrible creatures. They suck your blood and tangle themselves up in your hair."

There are many things that can be done with children of pre-school age. There might be live animals such as hamsters, guinea pigs, snakes, lizards, fish and birds that are semi-permanent residents in the nursery school. Plants grown by the children from cuttings, seeds and leaf-sprouting add indoor experiences valuable in fostering nature study.

Above all it must be stressed that nature offers a program for the child to enjoy. It must always be fun. We must trust in the children's desire to learn and learn they surely will in their own way from the raw material which is nature itself, not nature interpreted by an adult, seen through his eyes and therefore presenting only a sorry secondary experience for the child.

Basic truths do not change as noted in a quotation made by Asa Gray in his book, *How Plants Grow—Botany for Young People and Common Schools* published in 1877. Conditions today are much as they were then, evidenced by the following:

"To learn *how to observe* and *how to distinguish things* correctly is the greater part of education, and is that in which people otherwise well educated are apt to be surprisingly deficient. Natural objects, everywhere present and endless in variety, afford the best field of practice; and the study when young, first of Botany, and afterwards of the other Natural Sciences, as they are called, is the best training that can be in these respects. This study ought to begin even before the study of language."

Environmental Education for Young Children: SOME FUTURE TEACHERS' PERCEPTIONS

LOIS ANN SMITH

"There was some good: the woods and river themselves; the enthusiasm of the consultants and their rapport with the children; the equipment and displays in the classrooms; but what do the children bring back with them?"

"I wonder if the teachers really knew what they were hoping to accomplish?"

"I don't condemn all the teachers — some were obviously where they didn't want to be. This is not a Sweeping Indictment of American Schools; and you *know* I am not being flippant."

"This whole experience did not seem right for those teachers who were unprepared and consequently, it wasn't right for the children."

So wrote young teachers-in-training in their observation logs after spending a portion of a day with primary grade children and their teachers at an environmental resource center. The *modus operandi* for recording their experiences with chil-

dren in the elementary school classroom — an integral component of this course in educational psychology and child development — had been followed previously: react to your experiences with children in terms of what you can learn about them and from them; concentrate on the children. Yet, after this experience these young adults were unexpectedly breaking out from the limits formerly defined.

Should we dismiss such statements as arrogant? I think not. As demonstrating more ignorance than arrogance? I think not. Rather, many of these observant, perceptive future teachers were responding, as Rachel Carson wrote in *The Sense of Wonder*, with "... a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength." Ann James' observation log illustrates this personal sense of involvement and wonder:

On the trail: smell of rotting leaves; cold damp that penetrates to the marrow; the children following the teacher obediently. Wait! There is a stuffed skunk beside the path. It has faded to a soft red-brown. The children in the lead do not go back to see it. 'Is it a squirrel?' asks the teacher. She does not go back either. She holds a guidebook in her hand. 'You'd better keep your eyes on the ground,' she advises. But we are looking for birds!

The stuffed animals appear at regular intervals along the trail: woodchuck, muskrat. . . . The children pause briefly and move on. 'Tree 10,' says the teacher, reading, 'note the bark like curled-up potato-chips. . . .'

Do they note the bark? Watch the children. What are they saying?

— The pine forest stretched for miles on all sides and smelled dry and warm and slippery underfoot, but where there were dells and tall fern it was different, smelled different, and you might startle a white-tailed doe and her fawn; sometimes you could be looking at a red pine tree trunk through red pine tree trunks and then it wasn't; it was a buck watching you as your focus changed; once it was a bear! The birches leaned like maidens among the dark pines . . . and the lake, like a blue surprise — though you knew it was there all along . . . but, still a surprise.—

There is a wooden woodpecker on the woodpecker tree.

— You could get a chipmunk to run

over your foot, but you had to give a morning to it; you could go down to the far pasture to watch the deer at the salt-lick, but it meant getting up in the dark, and a mile's walk through the dew on an empty stomach. The deer made a sound like blowing on a coke bottle, so we took one along one time, and they answered it; bats sound like running your thumb down the teeth of a fine comb; we had a little green snake who'd run himself around your fingers like a silk scarf . . . very cool, very cool, but he'd warm to your hand. If you wanted to hear the loons, you had to keep yourself awake until the others were sleeping. Then you could sneak down to the shore and scare yourself silly listening. You can send a canoe so silently over the water that the deer won't see you until you're gone, and there's only a silver seam behind you, but you have to practice, practice . . . even the little kids could do it; they were light in the bow.—

'Stop here and smell,' the teacher suggests, following the guidebook. 'What do you smell here that we don't smell at home?'

There is a noxious stench, like rotting peaches, like my sponge when I don't soak it in ammonia. Does it come from the river?

'Leaves?' asks one hopeful.

'All right,' she says. 'Oak leaves. Wet.'

The oak forest, late in fall, has a clean and antiseptic stench that purifies the soul after all the mad, red riot of Octoberfest. Oh, I know an oak forest well;

its owls and its moonrise and its druid spirits. An oak forest never smelled like rotting peaches.

Ah! What does the literature say about children and nature and environmental education? We lie to them, we lie to them! No one knows a tree in a moment. There are no birds in that little woods to be seen by a troupe of children at mid-morning. Is there a *living* muskrat in the woods? Woodchuck? Many children still believe that every forest teems with wildlife! Books, television, and friends tell them so. Walt Disney tells them so. There are adults who believe Africa is alive with lions!

They will never go to a camp that costs a thousand dollars the summer; most of them will never know how a canvas canoe feels when they are paddling it. Perhaps they will never swim in lake water so clear that they can see the bottom ten feet below, and the little fish between.

But, one good man can take one child into the cornfield with him, or out for the cows; or sit in the yard at dusk with him; can stand on the riverbank and show him how to be *still*.

Nature study that is a lie can't turn out science students; it can't produce men who know that the world is in danger or care that it is. For the sensitive child it can set the scene only for a moment of bitter disillusionment; if he remains curious, then he must begin the arduous chore, the painful work of *un-learning*.

Perhaps as an apologia, one student ended her observation log by noting, "Good teachers crave feedback; this is feedback." Yes, indeed. Many of these young adults currently en-

tering the teaching profession are bringing with them a humanism, a bittersweet idealism along with a hard-headed pragmatism. If they persist, refuse to be contained, join forces

with like-minded oldsters, the impact must surely be felt in the education we provide for our nation's children.

More specifically, the epicenter of this impact in curriculum may well be in the area of environmental education which can and should serve to relate subject matter fields, reinforce and provide relevance to the existing curriculum. From this epicenter—radiating out and permeating the entire experience of schooling and living for both children and teachers—viable possibilities exist. One such possibility is that of the development of an environmental ethic which will redirect and guide man's behavior in his relationships with other living things, including those of his own species, as well as with the inanimate resources of our spaceship earth.

But how might we begin to realize these possibilities? My student asked, "What does the literature say about children and nature and environmental education?" Vast quantities of literature have become increasingly available. Professional journals have especially responded to environmental concerns, in general, and to environmental education, in particular prior and subsequent to Earth Day (April 22, 1970). One recurring theme in the literature, directly related to a major concern expressed in the students' observation logs, is the importance of environmental education pre-service and in-service training programs for teachers. While many teachers and administrators have a sincere interest in environmental education this is not a sufficient requisite for providing the necessary leadership in the development and implementation of a sound program. In his paper, "Environmental Education: Approaches for Curriculum Development," William B. Stapp of the University of Michigan includes, in specific guidelines for the structuring of an environmental education program, the need for providing a comprehensive in-service teacher education program directed at assisting teachers to increase their understanding, awareness, and teachings skills in environmental affairs as well as involving them in curriculum development. The experiences of those individuals—children, teachers, consultants, administrators, college education students, and citizens—who have participated, directly or indirectly, in environmental education programs would seem to confirm this principle. Man may yet learn to behave in ways which demonstrate an understanding of man's place in nature as opposed to his dominion over nature.

Understanding the Environment -- An Educational Imperative

RUTH W. MELVIN

Through a conservation committee, and later a section, the Ohio Academy of Science contributed to research in the environmental field and served in an advisory capacity to branches of state government. In 1951, under the leadership of Dr. Paul Sears, the Academy recommended the promotion of conservation education in the public schools, as well as wider use of field study in the school program.

At the end of 1971, because these suggested programs had not been implemented, and because of increased population and technological advances, problems had multiplied leading to a crisis. All of us throughout the United States must recognize a need to develop an environmental ethic which would provide guidelines for individual action and environmental education. The ethic concept has been mentioned by others and particularly Mr. William C. Everhart of the National Park Service and by William Ruckelshaus. Such a concept would require each individual to take a new look at his attitudes and values. Up to now we have had an awesome respect for dollars and cents. We have tended to ignore our kinship to lesser animals and to plants, and our interdependence with them, and with the physical environment. We have refused to accept our humble beginnings in the natural world. We have wasted, exploited, polluted, and saturated the physical world. We have been confident that our opulence and our abundance would not be exhausted.

We are beginning to see the light and to feel the heat. Mr. Ruckelshaus in an address to Earth Day II students at Ohio State University made these challenging statements:

"Now we must abandon the concept of a gross national product in favor of an environmental ethic that encourages us to see the net cost of the goods and services we consume. The flashy new car on the showroom floor must be seen for all that it is, and not just an attractive convenience. It represents one more car on already crowded highways, a heap of junk to be disposed of someday, but also a conglomeration of valuable resources to be recycled someday. Moreover, it is a major source of air pollution. When all of us adopt that outlook we will have established an environmental ethic in this nation which will

be our best insurance against abuse of our resources."

With this same mental and emotional process taking place in the use of energy-producing fuels, the consumption of war, the disposal of wastes, it may be possible to achieve the goal of a clean and healthy environment within this decade, as Mr. Ruckelshaus further suggests.

How can it be done? Basically our attitudes and behavior patterns are the result of education, and education provided in a variety of societal institutions. They begin in the home, continue through the school years, enlarge with church opportunities, youth group experiences, college and technical training, on and on from the cradle to the grave. Along the line, each individual influences and is influenced by organized business and industry, local, state and federal government, and a variety of private institutions.

It is difficult to assess the value of the educational process at any one level. Assuming a positive environmental ethic could be important to each individual, that each person could make a contribution, success in maintaining a quality environment could be the result.

Because school is an accepted institution reaching all persons, it is a place to start. An awareness of natural beauty, the interdependence of all parts of the living and non-living world can become a part of each day's observations. Awareness creates understanding, which then leads to action, whether it means protection to a migrating monarch butterfly, a captured snake or a clean sidewalk.

Throughout the United States, schools have taken great strides in this kind of teaching. The greatest difficulty lies in finding teachers with the right attitudes necessary to adequately carry on such a program. The educational challenge begins with providing in-service training for teachers already in the school system and requiring multi-discipline experiences in teacher preparation.

Since college professors and public school teachers constitute a great part of academy membership, academies are in a position to effectively influence the academic communities to increase on this basic need. Many are doing an effective job.

Energy Goals and Educational Processes

NANCY AYERS

Executive Director, Susquehanna
Environmental Education Assn.

America is the world's principle polluter. The 6% of the world's population who live in this country produce some 40% of the world's non-human wastes while consuming approximately the same percentage of its natural resources. If the other countries of the world, especially the undeveloped countries, imitate our "progress" the dire predictions of the "doomsday Jeremiahs" will come true one way or another.

Why does the United States lead the world in the production of pollution? Is pollution an inevitable by-product of capitalism, of industrialism, of energy production? Does prosperity naturally produce a poisoned environment? Are we really bound to foul our own world with the lethal refuse of affluence? Not necessarily . . . but the reason we are the world's leading polluter is simply that we have made it profitable to pollute. We have made pollution pay. We have carelessly arranged the incentives in our society so that the vigor and ingenuity of the free enterprise system is dedicated toward despoiling the environment. We have placed no value on our priceless resources of air, land and water.

The present incentives of our system encourage industry to make maximum use of available "free public assets" such as rivers, oceans, air, beaches and forests, among others. *The use of these public assets by industry imposes a hidden cost upon society as a whole.* These costs are not yet fully measurable, but we must immediately begin to find a means of measurement and impose it upon those who make use of public assets.

Whole new technologies for avoiding pollution would be born. The basic theory behind the success of capitalism is that businesses, industries and individuals prosper who produce a better, cheaper commodity or service than their competitors. Imposing the full costs of pollution abatement, solid waste disposal and resource depletion on the automobile, for example, would not only change its competitive value but would surely encourage the development of mass transit. Just one of the major benefits would be to reduce further chopping up of cities, farms and forests with sprawling super highways which dislo-

cate thousands of individuals and disrupt the tranquility of many thousands more.

The situation with public utilities should be different, since actual competition is supposedly less, but the rate structure favors the large industrial user. If the true costs were applied, that rate structure would be among the first things to change. There is no question that there will be increased requirements for electricity, even when based on absolute need rather than unlimited use . . . AND EVEN IF THE POPULATION GROWTH RATE STABILIZES.

If we are to minimize the environmental impact of energy production, facilities location and power transmission there are certain critical considerations to keep in mind:

- We need comprehensive planning geared to statewide, regional, interstate and national conditions.
- This planning has to be based on the demand for power, fuel supply, economic and engineering factors, as well as full evaluation of environmental and ecological factors, including health, safety and environmental quality.
- All alternatives as well as consequences must be considered.
- All power systems, private, public and cooperative, must be involved and coordinated.
- The biases in public policy which promote energy growth must be reduced.
- Intensified research and development must be directed towards new energy sources, efficiencies and environmental compatibility.
- All solutions must be designed to reflect and to respond to the changing needs, goals and values of society.

Going on beyond these purposes, the National Environmental Policy Act of 1969 states, "that each person has a fundamental and inalienable right to a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment." This is a very important point. Not any one of us is likely to save the world by ourselves, but if we don't recognize our personal responsibility we will never be concerned about corporate responsibility.

In New York the voice of the people has been heard in a number of

ways on environmental issues. Perhaps one of the best examples of public opinion was the passage two years ago of the Constitutional amendment known as the "Conservation Bill of Rights" which expresses the State policy "to conserve and protect its natural resources and scenic beauty . . ." The policy further stipulates "adequate provision for the abatement of air and water pollution and of excessive and unnecessary noise, the protection of agricultural lands, wetlands and shorelines, and the development and regulation of water resources."

Environmental Education

How can we accomplish the tasks we have been describing? How do we review corporate ethics? How do we evaluate management responsibility? How do we estimate intangible values? How do we effect incentives for a balanced ecosystem as well as a balanced economy?

We begin by sharing our views instead of talking to ourselves in a series of monologues. Unless and until you accept the premise that the survival of the human race depends on sound environmental management, and that every single one of us must re-evaluate our habits and attitudes, we are wasting our time. As business and professional leaders, have you ever frankly appraised your role in society? Are your value choices based on the way things were when you were a kid or on the way things are now? What you do . . . or don't do . . . in the daily decision making processes not only influences your company policy and your cohorts around you in the office, but reveals your real values to your family and the community.

To understand and achieve the broad perspectives which sound environmental management at any level require, we must utilize environmental education. As defined in the National Environmental Educational Act of 1970, "Environmental education means the educational process dealing with man's relationship with his natural and man-made surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment."

This law is but one of the channels which can be used for all kinds of education to explore environmental prob-

Prepared for the conference on **Energy Goals and the Environment**, Albany, N. Y., Nov. 1971.

lems, alternatives and solutions. Regardless of who you are or your role in the community, you must acknowledge that your *life style*, your *consumer demands*, your *social values*, determine environmental quality in more backyards than your own.

To analyze the choices and the consequences requires two major efforts: first, *continuing education* from the cradle to the grave, and second, *participatory citizenship* for all of us, executives, administrators, educators, scientists, engineers, ministers, housewives, students . . . men, women and children.

The French author LaRocheFoucauld observed that "We are never as fortunate or unfortunate as we suppose." Paraphrasing for our purposes here, neither are we as brilliant or as stupid as we might seem. As the history of the 1970's is being written in the pages of time, we read that human nature hasn't changed much. The tangible success of our mechanical ability overshadows the development of our intellectual logic, leaving us precariously close to annihilating ourselves . . . or at least future generations. If this premise makes you uncomfortable, consider the question raised by Alvin Toffler in "Future Shock." He asks ". . . if one does withdraw from participation, refusing to join organizations, refusing to establish close ties with neighbors, refusing, in short, to commit oneself, what happens to the community and the self? *Can individuals or society survive without commitment?*"

Obviously we have a lot to learn and a lot to do. Based on the assumption that you recognize the existence of the problems and want to do something serious about relieving them, let's explore further the environmental facts of life and how we put them to work.

Do Your Homework.

What do you really know about the products used in your company or how they effect the community? How . . . or does . . . your daily life relate to the world around you? Have you done any environmental homework to find out if the alarmists are right or wrong? Without study and research, one has no right to criticize, since criticism is predicated on analysis and evaluation (as defined in the American Heritage Dictionary of the English Language - 1969).

To illustrate the complexity of the dilemma facing us, *suppose you were born with a bank account which held all the money you would ever have, but you had no way of knowing the total amount. You would always know how much you had spent but never how much was left. How would you spend that money?*

Start at Home.

The next time you brush your teeth, take time to look in the mirror. Think about your personal habits and value choices. Are you just another "organization man" programmed to spew forth technical data at specified intervals? Consider only one of your by-products, the amount of waste materials you produce every day. Multiply that by the number of people in your county or city. Double that number and you approximate the predictions for people and garbage by the year 2000.

Speak English.

Semantics is one of the most wasteful games people and industries play. Understanding and problem-solving require clear and frequent communications . . . and honesty. Take advertising, for example. Much of the lack of confidence in industrial and utility planning is due to blatantly distorted or misrepresentative advertising. To say that nuclear power plants give off no more radiation than the Statue of Liberty is an insult to the intelligence of the public. He already suspects any more radiation is TOO MUCH, which is why nobody wants a nuclear power plant next door. Those utilities who do not resort to such practices will have to insist on "truth in advertising" within the industry to escape guilt by association. As an environmentalist, it is difficult not to be skeptical of conflicting reactions. Who would you believe if the plant manager said he was as concerned as you are about clean air for his kid to breathe while at the same time the utility president chooses to ignore a written request to discuss siting problems and alternatives?

Join the Group.

You cannot let George do it forever. Get involved in an existing group working on energy problems to help them understand your point of view. Encourage a group to which you now belong to include the environmental impact of energy production in its programming. Study together "A Procedure for Evaluating Environmental Impact" by Luna Leopold and others for the U.S. Geological Survey (Circular #645, Washington, D.C. 20242). Concentrate on examining the community energy prospectus first. Emphasizing local energy problems does not minimize the larger issues at the state, federal and international levels, but it does make them easier to recognize.

Know Your Adversary.

Another reason to get involved is to find out who's for you and who's against you . . . and WHY. Group discussions or encounter sessions might almost be called a fad these days, but the basic

idea is certainly valid. We need to get acquainted with our legislators, public officials, educators, scientists, industrialists, businessmen and environmentalists. Until we understand the various points of view, we cannot begin to talk about pollution solutions. Until we understand that environmental ethics take precedence over economics and engineering, we cannot begin to cope with the social myths of growth, expansion and development . . . our Gross National Product which measures progress in quantity rather than quality.

Participate in the Legislative Process.

It is hardly necessary to remind you to write to your legislators, testify at public hearings or lobby in the legislature. Before any of us intervenes in the legislative process, we should carefully review our motives. If we are sincerely pursuing society's best interests as outlined in the National Environmental Policy, we must be prepared for some painful compromises. If free enterprise is to survive, we must accept the fact that the U.S. does not "own" the world . . . that we are not entitled to a disproportionate share of its wealth and resources . . . that we have no right to shower our pollution beyond our boundaries. Whether we are talking about peace, pollution, poverty or population, the only way to resolve the conflicting objectives is through the principles of *coexistence*.

Support Environmental Education.

If we are to make an intelligent approach to "Energy Goals and the Environment" as the convening of this conference suggests, we must begin by admitting that the more we think we know, the more we don't know. Education cannot be mandated because it is a voluntary, perpetual process which demands the involvement and commitment of which Toffler speaks. It also requires objectivity, flexibility and cooperation. You and I need to review pending state and federal legislation related to energy goals in this light . . . and on a continuing basis, not only striving for the best immediate compromises but anticipating future modifications as science and technology tell us more about the implications of our actions on the entire ecosystem.

Ordinarily, keeping up with the Joneses . . . or with the Russians . . . is of little consequence to me. In the case of energy production, the Soviet Union is years ahead of us in developing magneto-hydrodynamics technology. They have three MHD plants in operation and a \$300 million, 1500-megawatt MHD complex planned. Among the advantages it is said to have are 60% more

efficiency and no pollution effects. Maybe a little more "keeping up" would be helpful. Nuclear-fueled power plants and their successors, the breeder reactors, give the illusion of innovation and radical departure from conventional power sources, but they are only intermediate steps that will help bridge the gap until truly new pollution-free sources can be developed. Massive efforts must be made to research alternative sources of power, including besides MHD, fuel cells, fusion and solar energy.

Environmental education goes far beyond our discussion of energy goals, spanning as it does everyone's lifetime. In addition to complex basic research, one of our compelling necessities is environmental education for everybody, especially the kind that begins in the PTA and the Chamber of Commerce. One way to do this would be to open our existing schools as community education centers for all ages, all day, every day . . . and evenings, too. Or, how about the churches? Surely they share an environmental responsibility. As industry has taught us, idle facilities and equipment are a waste of time and money.

Now that industry is becoming aware of how many environmental management jobs will need to be filled in the next ten years, perhaps we can become allies. There are many other ways industry could support environmental education besides multiple use of property and facilities, from meeting rooms to park space. In-service training for employees becomes more crucial as the gap widens between one group of specialists and another. Other possibilities might be qualified speakers, scholarships, research grants, recycling company wastes, consumer information, donations to independent environmental groups. Just as industry currently lends staff members to assist in United Fund Campaigns, so they might also lend personnel to help organize and develop county environmental management councils, which could be a very valuable educational and advisory forum for local government in coping with environmental issues.

Change Your Lifestyle.

As our understanding of ecology grows, of its closed systems and finite resources, of its all-inclusiveness, we must question society's standards and whether they are still based primarily on primitive beliefs rather than contemporary reality. Nothing is free, and we face some hard choices. *Do we need more cemeteries or more playgrounds? Do we need more roads or more mass transportation? Do we need more local power plants or more power parks?* Can we juggle them all?

If we are to outmaneuver the cockroaches and the crabgrass in the evolutionary race, we may well have to develop new and different approaches. We may have reached the point where we should consider technical jobs and professions as part-time occupations to support a lifelong vocation of maintaining a safe, sane, ecologically sensible global environment. Barry Commoner, author of the recent "The Closing Circle," sums it up this way:

"Everything is connected with everything else, everything has got to go somewhere, and there is no such thing as a free lunch."

Being a professional or specialist does not exempt anyone from civic responsibility. Being a teacher, a parent or a student is no excuse either. The environmental dilemma has developed because we buried ourselves in the research lab, the market place, the bowling alley, or some other isolated interest. It will require radical changes for most of us to nurture an ecological conscience . . . if we're not too old for the challenge. Review your philosophy and refine your objectivity. Dust off the courage of your convictions. Regularly ask "Why?" and "Why not?" It's your world . . . don't leave it to the experts.

*For where I dwell,
Where I put
My foot,
My mind,
My soul,
After each day's
Victory
Or defeat . . .
Where I dwell,
Becomes
The epitome
Of a little bit
Of Heaven . . .
Or a large part
Of Hell.*

Anon.

Welcome New Members

R. H. Ahrens, Victoria, B.C.
Richard A. Arnold, Hinsdale, Ill.
Australian Conservation Foundation,
Parkville, Victoria
William J. Avarell, Running Springs,
California
Warren Balgooyan, Ossining, N. Y.
John C. Bennett, Smyrna, Del.
Board of Cooperative Educational
Services, Belmont, N. Y.
Robert A. Bonazzi, Fayetteville, N. Y.
Sherry Lee Brothers, Ithaca, N. Y.
Dennis L. Bruno, Altoona, Pa.
Clackamas County Intermediate
Education District, Oregon City, Ore.
Community Education Center, Bronx,
New York

Mrs. John B. Curry, Belchertown, Mass.
Hugh Curtis, Wausau, Wis.
Béla K. Dér, New York, N. Y.
Joseph E. Desiderio, Glassboro, N. J.
David M. Dumond, Raleigh, N. C.
Edouard-Montpetit College, L'Angeles,
Quebec
ECSB Environmental Sensitivity Project,
Pensacola, Fla.
Charles Erickson, Atikokan, Ontario
Lee S. Fink, Litchfield, Conn.
Maxine T. Frankenfelder, Mamaroneck,
New York
Georgia Conservancy Library, Atlanta,
Georgia
Al Grass, Burnaby, B.C.
John Green, Jr., Philadelphia, Pa.
Kevin M. Harris, Ithaca, N. Y.
Ferdinand S. Haverly, Schenectady, N.Y.
Dr. Clyde W. Hibbs, Muncie, Ind.
Kempville Public Library, Virginia
Beach, Va.
Kenosha County Girl Scout Council,
Kenosha, Wis.
John R. Kozura, Morrisville, N.Y.
Gayle Lawrence, Melrose, N. Y.
Dr. J. David Lockard, College Park, Md.
Mrs. Robert London, Scarsdale, N. Y.
Neil R. MacL. Mackerras, Sydney, Aust.
James Mallow, Snow Hill, Md.
Mary H. Manderbach, Shillington, Pa.
James Mason, Woodstock, Ill.
Margaret H. McDaniel, Needham, Mass.
Betty J. McKnight, New Paltz, N. Y.
William T. Miller, Huntingdon, Pa.
Minneapolis Public Library,
Minneapolis, Minn.
Missouri Southern College Library,
Joplin, Mo.
Ann Moreton, Ocean Springs, Miss.
Carl Moritz, Newark, N. J.
James K. Muncey, Wooster, Ohio
Rancho Santa Ana Botanic Garden,
Claremont, Calif.
Orear Robinson Library, Pikeville, Ky.
J. W. Scheel, Corvallis, Ore.
Theodora Schubert, Newark, N. J.
John A. Serrao, Ithaca, N. Y.
Norman Skliar, Wantagh, N. Y.
Frank Stern, Potsdam, N. Y.
Susquehanna County Library, Montrose,
Pennsylvania
Marion P. Sutherland, Madison, Wis.
Katherine B. Tatman, Ann Arbor, Mich.
Tennessee Valley Technical Library,
Knoxville, Tenn.
Jay Ford Thurston, Genoa, Ill.
Twinfield Elementary School,
Marshfield, Vt.
Michael Ware, Newark, N. J.
Wayne Community College, Goldsboro,
North Carolina
University of Wisconsin, Green Bay,
Wisconsin
Virginia West, Atlanta, Ga.
Audrey E. Wilson, Cobourg, Ontario
Mrs. Elmer Worthley, Owings Mills, Md.
Yale Forestry Library, New Haven,
Connecticut

CENTENNIAL YEAR PROCLAIMED



Old Faithful Geyser has been pictured many times, but here is a photo of Tower Geyser, a spectacular but infrequent erupter.

The year 1972 marks the 100th anniversary of a uniquely American idea that has grown to have international significance.

On March 1, 1872 President Grant signed into law an act setting aside two million acres in Wyoming and Montana Territories as a "public park or pleasuring ground for the benefit and enjoyment of the people."

Today there are almost 300 areas in the National Park System. More than 100 nations have established national parks or equivalent reserves. But it was Yellowstone, with its myriad natural wonders, magnificent vistas and diverse animal life, that so impressed frontier explorers that they were determined it not be exploited for private gain but rather protected for the public good.

A pioneer in the park movement, John Muir, expressed our need for national parks this way in 1898: "Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wilderness is a necessity; and that mountain parks and reservations are useful, not only as fountains of timber and irrigating rivers, but as fountains of life."

The National Parks Centennial Commission, created by

an act of Congress to coordinate the celebration of the Centennial, has suggested that the emphasis of this year should be as much on the future as on the past.

Two major Centennial events are the National Parks Symposium, held in April at Yosemite National Park, California, and the Second World Conference on National Parks, to be held in late September in Yellowstone and Grand Teton National Parks. This latter event is co-sponsored by the International Union for the Conservation of Nature and Natural Resources.

Both of these conferences seek to analyze the problems facing National Parks and look for solutions to them so that Americans and people the world over will be able to enjoy a second century of national parks.

Almost every area of the National Park System will have some kind of centennial event during the year. All Americans are invited to join in these local events.

National Parks can do many things for many people. As President Richard Nixon noted in his proclamation designating 1972 as National Parks Centennial Year, these parks often provide the "one touch of nature (that) makes the whole world kin."

TIPS for Environmental Education and Interpretation

I. Nature Had It First

STANLEY B. MULAİK

Ideas useful for a game, classroom project, a display or demonstration, even a TV program, can be developed around the theme "Nature Had It First," by first it is meant to discover those things which organisms had before man. There can be quite a challenge here and will require careful review of the structures which animals or other organisms have which fit into this category.

One of man's most useful tools is the pliers which he uses by modifying the basic pattern for holding, crushing, or cutting. This tool has a counterpart in nature in the claws of the crayfish, lobsters, crabs, scorpions and others. Can you discover others? You might note that one claw of a lobster is thick-edged for crushing, while the other is best equipped for cutting. In the process of food getting these two patterns could have a useful part.

Another of man's tools is the hypodermic needle duplicated in the sting of a bee, of an ant, wasp or scorpion, the fangs of a rattle snake and the chelicera of the spider.

Jet Propulsion is ancient

The use of the jet principle now found in airplanes and space vehicles has been common among such animals as the squid and the dragon fly nymph. In the latter, water is drawn into a cavity at the rear of the abdomen. Powerful muscles contract to force the water out. The reaction propels the nymph forward. This same cavity is lined with gill filaments which play a part in the O_2 - CO_2 interchange.

Most ponds where pollutants have not killed out aquatic life will yield dragon fly nymphs. Placed in a pan with water, the jet action can be observed. A drop of ink placed behind the insect improves the results.

Squids use jet propulsion in a very interesting way. The library should yield information on this animal and its method of movement.

The Eye and The Camera

We have all noticed how the pupil of the eye becomes smaller when the light gets brighter. When visiting the zoo observe the eye of the owl. Note the rapid

change in size of the pupil as light intensity changes. You could use a small mirror to direct more light across the eye to get better results.

Man has used the iris diaphragm in a camera to regulate the amount of light which passes to the film. Use a camera with an iris diaphragm for demonstrating this mechanism. Most microscopes are equipped with this type of mechanism to regulate the light.

Ask your oculist what the f-value is of the human eye. It is surprising that some have no idea of its value. Even many photographers have no real understanding of how the f-value such as f4 is derived.

Echolocation and Radar

While man uses extremely high frequencies of radio type waves in his radar apparatus, bats use high frequencies of sound waves. The principle is the same. Both rely upon echoes from objects to determine their location. The bat sound vibrations are in the region of 100,000 to 200,000 vibrations per second. Most children with normal hearing can hear up to about 15,000 to 20,000 vibrations per second. The bat "radar" or echolocation call is far beyond that of human ears to hear.

A bird which uses echolocation is the cave dwelling bird in Venezuela known as the oil bird (*Steatornis*). The porpoises are known to have a very efficient system of echolocation. These natural radar systems were in use millenia before man even thought of them.

Smoke Screen

Modern armies have on occasion used a smoke screen to hide the movement of troops. The squid has been using such a system for perhaps over a million years.

Chemical warfare has been outlawed for modern armies. It was a relatively recent discovery for military purposes. The bombardier beetle has been able to blast a pursuing enemy with an acrid chemical thus protecting itself. Better known is the defensive mechanism of the common skunk which very effectively protects itself with a blast of acid, irritating and highly volatile fluid which few animals can stand.

Is Electricity as old as life?

The electric eel of the Amazon Valley has been publicized for its ability to discharge electricity into the water as a protection and perhaps for food getting. When our muscles contract, a current of electricity is generated. Brain waves are discharges of electrical energy. Small aquatic animals which live on pond bottoms or in its mud generate electricity as they move about. These involve various crustaceans, insects and worms.

When such birds as ducks, avocets, snipe, willits and others work in mucky bottoms it is very likely that cells in the tongue detect the electrical discharge which living things have, and sort these from the non-living material. Perhaps this is a new idea, and there is a greater need to disprove it than perhaps to prove it? It is quite likely also that electricity has been a part of life since it first appeared.

Fishing Nets

Some caddis fly larvae, and particularly *Hydropsyche*, weave a net in suitable running water, usually on a stone. As living forms such as insect larvae, crustaceans or others happen to drift with the water, they may be trapped by these webs which the caddis fly empties for lunch.

The Bolas

The gauchos of Argentina tangle animals' legs with a device consisting of a rope with weights on the ends. This is thrown at an animal so as to entangle its legs. This is called the bolas. A spider of the southwest has a similar device. This consists of a strand of silk about two inches long on the end of which is a dense wad or ball of silk. This silk ball hangs freely from the leg of the spider suspended in its web. When an insect approaches, the spider flings the ball at the insect and entangles it. The ensnared insect is pulled up and the spider has its meal.

There are many other devices which man uses which had been in some way used by animals many centuries earlier. An imaginative teacher and a group of students will discover many others. Your editor would be interested in any stories of some of these which the students unearth.

A Matter of Interpretation

And the sum of the world / In soft miniature lies — EMERSON, "THE SPHINX"

MILLARD C. DAVIS

Some of the most significant nature writing occurs along the better "nature trails." Often this appears in the form of the self-guided tour pamphlet. In its most superior aspect the writing is called "nature interpretation."

I would like to see this extended more often to captions we use under pictures in books, magazines, and other sources of information, especially those aimed at the layman. Many "amateurs" have become well-schooled in field identification. They are ready for the further step of interpretation. With all the good photography going on now, and the tendency of naturalist groups to show each other their latest, we can live up the show by emphasizing interpretation. And a fine place to begin is by picture captions.

To offer examples most of us can examine later in more detail, I have looked through reasonably recent issues of four natural history magazines. Here are some of the better interpretive observations from randomly chosen pieces. Each will also illustrate a point in the art of interpreting:

1. Be ready to prove your point.

Experts in particular often operate from such a wealth of researched information that their statements have a backing most naturalists cannot assume on a broader scale. Thus this statement in *Audubon Magazine* (July 1971:21) very likely has a certain authority even in its apparent simplicity:

The rough green snake is the well-camouflaged "vine snake" that climbs into vines or shrubs in search of spiders, grasshoppers, butterfly larvae.

We assume that the snake does normally disappear among the greenery and achieve a camouflaged effect as far as its enemies or prey are concerned. The photograph offered here shows the green snake on a natural dark brown background, which, of course, is planned to bring out the snake's color by contrast.

But, do not assume that all apparently matching colors of organisms and habitat involve camouflage effects. A yellow crab spider that seems to you quite hidden on a yellow flower may not be at all difficult for a honey bee to see. The bee perceives ultraviolet as well as other colors, and the reflective values for ultraviolet may well be different in the spider and the flower. Camouflaged against whom or what, then? You'll have to go farther than just say "camouflaged." You'll have to interpret the apparently matching colors.

2. Make your picture and caption correspond as closely as possible.

Some photographs seem almost to have a texture of their own, such as heat, roughness, or even moisture. The photograph in *National Wildlife* (December-January 1972: 39) which accompanies the following caption has the latter:

Periods of dryness and moisture act as biological clocks for land snails. In damp weather, snails are active both day and night, like this polygyra snail which is feeding.

The photograph glistens with countless little highlights, giving it a damp effect. The reader will likely remember the idea simply through the subtle association rather than by the clear statement of activity during dampness.

3. Keep your interpreting to a single point.

Photographs of primates often lend themselves easily to such a wide range of comments that the writer of this caption (*Natural History*, August-September 1971:43) showed con-

siderable and wise restraint in holding to a single idea:

An adult female holds an infant so young that its coat is still black. By three or four months the coat will be brown.

Certainly anyone coming across future photographs or individuals will know that a black-coated member is probably younger than three months old. In the photo the infant's color would hardly induce excitement by itself — so many immature animals differ from the adults in color. But the precise identification of age with color effectively makes the fact a significant and memorable event.

4. Tell a larger story if possible.

The bold type of the third sentence is mine and points has a neat "indicator" value. That is, an object or so indicates something about nature that is less evident. The following comment was not put in caption style but rather is a brief numbered observation about a similarly numbered photograph. The intent is much that of the usual formal caption (*Ranger Rick's Nature Magazine*, August-September 1971: 47):

Pinesap, also called false beechdrop, is yellowish-orange to pinkish in color. It has a slightly hairy stem and grows in dry woods over the roots of pines and oaks.

The bold type of the second sentence is mine and points out the moment of true nature interpretation. From here on a real naturalist simply *has* to look for pinesap, as an indicator of the roots.

Once an interested audience has read or heard such an observation in conjunction with a picture, the game of interpretation outdoors cannot be avoided. The keynote is "Everything has hints about something else." The only rule is "See what this can tell you about nature."

Part of *your* enjoyment in presenting such an approach will come from trying to discover interpretive clues yourself. The research, both indoors in the library and outdoors in the field, will give your original experience far more depth. Contemporary emphasis on "environmental indicators of pollution" follow this method. It certainly applies to the general naturalist's view.

Incidentally, even home movies such as "our vacation at the beach" can be heightened in impact if a few hints are embedded in the action. If Pete limps across the screen, a shot of the nail-studded board in the sand will go nicely to show how ragged that cut under the bandage *really* was!

Board Member Dr. Snygg Dies

Dr. Carlita Leona Snygg died on February 23 in Syracuse, N.Y. after an extended illness. She was a professor of Zoology at State University College at Oswego, New York. She was the daughter of Karl and Carla Hoffmeyer Nesslinger. She received her BA degree from Woman's College at the University of North Carolina, her MA from Mount Holyoke, and her doctorate from Cornell University in 1955.

She was a member of many scientific societies and was currently a board member of the American Nature Study Society. Her many articles in scientific and professional magazines and her weekly column, *Nature Rambles* which appeared in the *Palladium-Times* Oswego newspaper were worthy contributions.

Good Reading

Eat the Weeds by Ben Charles Harris. Barre Publishers, Barre, Mass. 1969. 223 pp.

This book is neither a recipe book nor a book of identification for persons interested in wild foods. It is a book that can make a contribution to a wild food library as a source of additional information on many of the common edible plants both from a historical and nutritional approach. The author, Ben Charles Harris, is a registered pharmacist and his primary emphasis in *Eat the Weeds* is health, disease prevention and herbal medicines.

The forty-four page introductory section gives instructions for preserving and preparing wild foods to provide maximum vitamin, flavor and nutritional values. This includes frying, freezing, sprouting and pickling techniques. It also includes three charts giving nutrient, vitamin and mineral values of 20 common wild foods.

The balance of the book discusses about 150 plants: representative mushrooms, seaweeds, lichens, weeds, grasses, fruits and nuts. This includes things like the history of the plant's use, reference to it in literature, places where the plant may be collected, season for collection, part eaten and general suggestions for preparation as well as medicinal or health food implications of the plant.

There are no illustrations, nor plant descriptions. The plants are arranged alphabetically by common name—but indexed by common and scientific name. Mr. Harris suggests that if you don't know, you should go to an expert for help. This would be a limiting factor in the use of the book by many persons who might be interested in collecting and using wild foods.

The author ignores the fact that indiscriminate gathering by anyone can wipe out the stand of "root crops" like spring beauty tubers, Indian cucumber, Jack-in-the-pulpit and others.

—HELEN ROSS RUSSELL

Inadvertent Climate Modification. Sponsored by Massachusetts Institute of Technology, MIT Press, Cambridge, Mass. 1971. 308 pp. \$2.95.

This book presents the results of the study of man's impact on climate. Those people interested in CO₂, the possible melting of the icecaps, land surface modifications and climate, and many other aspects of man and climate should find this book a must.

The Limits of Growth by Donella H. Meadows, Dennis L. Meadows, Jorgen Randers and William W. Behrens III. 1972. Universe Books, New York. 205 pp. \$2.75.

The use of the world by man has raised serious doubts whether mankind can exist for even another century because of the violent impact man has had. The book contains a message of hope, as well as presenting a possible catastrophe: "Man can create a society in which he can live indefinitely on earth if he imposes limits on himself and his production of material goods to achieve a state of global equilibrium with population and production in carefully selected balance."

The Alien Animals by George Laycock. Ballantine Books, New York. 246 pp. 95¢.

This Audubon Ballantine Book goes far beyond the Australian rabbit story which many have heard about. It recounts many other introductions of alien animals into America. The English sparrow, starling, nutria, coturnix and other importation fiascos are recounted and documented. It is worth reading.

Tree Maintenance by P. P. Pirone. Oxford University Press, New York. 1972. 574 pp. \$15.00.

For the student of trees interested in their usefulness and value to cities and towns, this book offers a wealth of information. The value of individual trees, soils and trees, cavity treatments, tree diseases and their control are only a few of the many topics which are discussed. While this book was originally copyrighted in 1941, this fourth edition has been enlarged and brought up to date.

Antarctica edited by Charles Neider. Random House, New York. 1972. 464 pp. \$10.00.

This is a recounting of the experiences of many of the explorers of the Antarctic. In a surprising number of instances these men were also gifted writers, and Neider has abstracted the best in this intriguing volume.

Birds of Mexico and Central America by L. Irby Davis. Illustrated by F. P. Bennett, Jr. University of Texas Press, Austin. 282 pp. \$6.50.

This is a much needed book of birds of Mexico and Central America, and Mr. Davis was many years in pre-

paring it. The thorough field work which the author had done over a period of 35 years makes this a well rounded field guide. Each species found in the area which is not found in the United States is figured in color. Thus over a thousand species are figured.

Basic Natural History—a Procedural Approach by William B. Nutting. The Macmillan Co. New York. 1972. 386 pp.

This book attempts to bring some satisfaction with the emotional needs for satisfying experiences in the natural world. The preface states "there has been a healthy reawakening to the fact that through studies in natural history young people can use their curiosity as a springboard to a sustained interest and concern for the natural world and its impact on their fellowman."

Alligator by Evelyn Shaw. Ill. by Frances Zweifel. Harper and Row. New York. 1972. 61 pp. \$2.50.

This is one of the new Science I Can Read Books suitable for children of the lower elementary grades.

More Potatoes by Millicent E. Selsam. Harper & Row, New York. 64 pp. \$2.50.

This is another of the Science I Can Read books by the author who has published over a score of children's books which have been received favorably. *More Potatoes* reviews for the children the story of how potatoes get from the fields to the table.

Round River from the Journals of Aldo Leopold by Luna B. Leopold. Oxford University Press, New York. 1953. 173 pp. \$1.75.

In the preface the author points out that "Value is not measured entirely by scarcity, and possession may have little to do with the law. But to be rich in these subtle goods (of nature) requires perception that grows slowly and sometimes not at all.

"Perception is not acquired by formal education, nor is it necessarily vouchsafed to those who are learned in the arts or sciences. Perception is merely a recognition of ethical and aesthetic values to be found in natural things. It is clear, therefore, that perception is something that grows through various stages of development."

To read the excerpts from Aldo Leopold's journal is to gain hints of the progress in this development. One may get some hints of how to progress from the stage of awareness of the natural world to some degree of understanding it.

NEWS and NOTES for Environmental Education . . .

U.N. To Attack Environmental Pollution

The United Nations has provided an outline of their first attack on environmental problems which will be considered at the U.N. Conference on Human Environment in Stockholm June 5 to 16.

Major concern will center in (1) a declaration of principles in which nations accept responsibility for environmental effects of their activities; (2) An "action plan" of more than 500 recommendations of international bodies and governments; (3) The establishment of new U.N. bodies to lead and coordinate the action.

The general secretary of the conference, Maurice Strong of Canada, told a press conference the declaration would be the basis for effective management of the global environment, as the U.N. charter or treaties are the basis for other international action.

The plans propose establishment of a global system for monitoring environmental dangers and relaying both information and recommendations for specific remedies to governments.

Nations of the world will be watching with much interest the developments at this Conference on Human Environment.

Out of The Mouths of Babes or Learning From Four-Year-Olds

Often in this world of glib, vitamin enriched, overstimulated, television-educated children we tend to lose track of the simplicity and directness of their thinking. This was dramatically brought home to me when I was guest teacher in a summer program. We were studying plants.

The four-year-olds were exuberant. They had each planted and watered their own sedum plant after examining the leaves, stem and roots.

They had talked about putting it in the sun where it would grow, and for a few minutes the little pots with each child's name and symbol had made a gay line-up on the window sill. But four-year olds are possessive little people, and one by one the pots were reclaimed with an "It's mine. I'm going to take it home."

As each child sat with his pot in front of him waiting to be dismissed, Tommy

cupped his hands around his flower pot. As he leaned over it he said, "This is my little plant. It's a pretty little plant. I'm going to take it home and put it on the window sill. Then I'm going to give it a chicken leg."

"Why are you going to do that?" I asked.

"Because this is just a little plant. It needs food to grow and a chicken leg is the best kind of food that there is."

— HELEN ROSS RUSSELL

Eagle Refuge

A major step toward improving the lot of the bald eagle in Alaska was the designation of almost 11,000 acres of the Tongass National Forest as a management area for that bird. This is the first of its kind in Alaska and encompasses part of the Seymour Canal of Admiralty Island and several smaller islands. New research on feeding habits, causes of mortality and routes of migration will be studied under optimum conditions. Southern Alaska has the greatest concentration of bald eagles in North America.

— Response, USDA, April, 1972

Skycroft Camps

Skycroft Camps, owned and operated by ANSS members Allan and Ellen Bonwill offer an educational program on the outdoors during the summer months. This camp, located on a 2000 acre tract 40 miles north of the Thousand Islands in Ontario on Rideau Lakes, has facilities for family and group camping where courses in ecology for families and teachers is the major theme.

For further information write to the Bonwills at Skycroft Camps, Chaffey's Lock, R.R. 4, Elgin, Ontario.

Tell About Your Compost

The corner compost pile where lawn clippings, shrubbery cuttings, and even kitchen trash are recycled is a prominent interest to many people.

The Editor of *Nature Study* would welcome getting some items about success with composting which members have had. Ideas about how best to speed up the composting process is especially timely. Let others share your experiences.

Utah Group Plans Mexican Safari

A trip through Mexico not to be forgotten soon is planned by Recreation Vehicle owners of the Utah Nature Study Society for November. The most memorable feature will be the piggyback trip on railroad flatcars from Chihuahua across the massive Sierra Madre to Los Mochis on the Pacific.

The land of the Tarahumar Indians is traversed for nearly 400 miles. Practically no roads exist in this land where the Spanish influence has had little impact. The customs, dress, and social practices have been altered very little from the pre-Spanish era.

The railroad across this land took 90 years to build because of the ruggedness of its mountains. In its 400 miles, streams are crossed by 37 bridges, and the tracks pass through 86 tunnels, one over a mile long.

Recreation vehicles are driven onto flatcars and thoroughly secured. During the leisurely five day trip these vehicles serve as motels; each a headquarters for preparing meals, for sleeping and as observation cars. A lounge and club car is also available. Many stops at scenic areas for photography and ecological interpretation by bilingual guides add richness to the experience.

After unloading the flatcars on the Pacific the group will drive to Mazatlan where for five days trips into the jungle, deep sea fishing, beach combing and sight seeing will occupy the group, then northward to Nogales to end the 18-day safari.

Friends are invited to join the caravan. For information, contact your editor.

The Porcupine — Good or Bad?

Few animals have caught the fancy of the American people as has the porcupine. Many stories have been woven about its behavior, often distorting the animal's real nature. It has successfully survived many centuries of persecution and predation. Its failure to retreat readily from danger is attributed to poor eyesight, hearing and capacity to smell. Its compensation for these weaknesses may be said to be the veritable fortress of many-pointed armor in which it is clothed.

Dogs of hunters and others have learned the hard way that an attack on "porky" leads to acquiring vicious quills sometimes over two inches in length. Each has a sharp tip with an array of back pointing barbs. A quill which pene-

trated the skin cannot be withdrawn readily, for every movement causes the quill to imbed deeper. Inquisitive cattle are sometimes struck by the tail of a cowering porcupine and get a collection of quills in the nose and lips. It is a painful lesson not soon forgotten. Occasionally horses bump the unhurried porky to receive quills in the feet.

Until recently, laws protected the porcupine as a source of food readily available to persons stranded in winter. This animal does not hibernate, yet there is little or no record of any lost starving man being saved by a "porcupine meal." Today the picture is quite different. The carnivores, or natural predators (lynx, fisher and bobcat) which kept the porcupine's numbers down, are largely missing from many mountain areas. As a result, there has been a population explosion with interesting repercussions.

The diet of the porcupine includes a wide range of plants. In summer, juicy ground vegetation (including alfalfa, if available) is consumed. The buds, leaves, inner bark and cambium of numerous trees and shrubs are favored in the winter. Where their numbers are not too great, damage to plants is negligible, but the increase in numbers has resulted in excessive damage to summer crops, fruit trees and trees in forests. Drastic measures of control are being used to reduce the number of porcupines. In the Black Canyon of the Gunnison National Monument, there are groves of immense pinyons and junipers, many from 750 to 1000 years old, where every tree shows some heavy damage. These fine trees are irreplaceable. Bryce Canyon National Park and others, and many National Forests have areas of heavy damage.

Porcupines mate in late fall. In early spring, usually one young, larger than a new-born bear, is born with eyes open and well furred. Its quills are soft and pliable, but soon harden and become effective protection. The mother feeds the young for a few weeks and in a few days, bark of trees is also eaten. Dawn and twilight are favored for eating and travel. In winter, the animals migrate to lower elevations. A "resting" tree is often selected and if a storm, or a series of storms of winter, keep them in it, the porcupine may be forced to eat extensive areas of bark. Some individuals have peculiar food preferences. Most frequently it has an insatiable craving for salt, and it will gnaw on almost any object handled by man where salt from the hands was left. Pick or other tool handles, toilet seats in open privies, porch steps, picnic units, all may be damaged by their gnawing. Should tourists leave their cars unattended overnight in Glacier National Park, their tires when

stopped along the Going-to-the-Sun Highway might be injured because porcupines have developed a taste for rubber.

The increase in numbers of the porcupine illustrates that a seemingly inoffensive animal can become a problem where man, not understanding the interrelationships in nature, even though he gives lip service to the idea, creates problems for himself.

GO BEYOND AWARENESS

Awareness of problems which are centered in the environment is certainly not enough. With awareness alone, apathy develops because the sense of awareness does nothing to solve the problem.

As with many movements in the educational world during my half century of contact with the teaching world, well intentioned development of awareness, whether concerned with problems in the social, economic, political or environmental world, died in the limbo of apathy. Awareness must be followed closely with action.

Facts must be gathered and sorted. Letters written to those who are creating the problems and letters to those who are in a position to initiate steps toward the solution of the problems are needed. Phone calls to these people are effective. Send letters to the local newspapers expressing concerns and offers of solutions through avenues of action.

Attendance at hearings on ecologically important issues is a must for the involved. Awareness of such hearings is not enough, there must be participation. It is not enough to look at some critical environment situation and bemoan the fact that nobody is doing anything about it. It is you and I who must be doing something. Oral or written statements must be submitted.

Get involved in the action which such organizations as the Wilderness Society, National Audubon Society, Sierra Club, Environmental Defense Fund, Friends of the Earth, and National Wildlife Federation find worthy of their attention. A good citizen must be involved.

A Walk In The Woods

A walk through the woods in summer can be a therapeutic experience to brush aside the things which make our lives fretful. Antics of a chipmunk, the drumming of a flicker, even the sight of a bee struggling into the narrow confines of a flower will push aside the worries one may have had and which turn out to be of little importance by the end of the walk.

The contrasts between the field at the

edge of the woods and the tree-shaded area can enlighten our ecological conscience. Most likely the field had once been cultivated, and the old corn rows or that of other crops may be quite clear.

Should one by chance come upon a bird nest and be roundly scolded by the parent birds, it would serve as a stern reminder that others have worries and fears. Yet one can be reminded of the comment of a Guatemalan guide among the ruins of Tikal that one should not worry over that about which one can do nothing, nor should he worry over that about which he can do something. Watch what the bird does. How does its behavior fit into the guide's philosophy?

A walk through the woods or fields is free, and is one of the best things in life. We need to take advantage of these experiences on which there is no price but which have such great value.

Most people who have come through a school system whose scheme is linked to a textbook or even a reference book have little skill at noticing the gifts of nature along the trail. But this situation is not hopeless. Pick out any object along the trail for experiment. A flower closely looked at will reveal an intricacy of makeup that becomes more clear the longer one examines the pattern. Pollen, petals, sepals, stamens, pistil — all tell something.

It may be that the names of the things observed are unknown. This is of secondary importance. What a thing does, what it reveals from its structure, is far more important than its name. Yet we must not consider the name unimportant. It has a place. Some highly trained botanists may know all the names, even the scientific ones, yet know practically nothing about the plant and may care less. To the observer who walks in the woods or fields, the name is only a convenient handle.

In this vein, what you are is far more important than what your name is.

Quotes from Germany:

"No construction producing a scattered settlement pattern or occupying good farm land should be allowed.

"The open landscape should be constantly maintained and developed, abandoned holdings should be reintegrated into the landscape . . . The banks of streams and bodies of water should be accessible to all residents.

"The built-up areas should be provided with green areas . . .

"Community areas — playgrounds, open air swimming pools, youth centers, should be located within easy reach.

— Gartenamt, Feb. 1967

Nature Study

The journal of the American Nature Study Society

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NATURE STUDY is published quarterly in March, June, September and December by the AMERICAN NATURE STUDY SOCIETY, and is sent to all members and subscribers. *Deadlines for copy:* January 25, March 25, June 25, September 25.

Concerning subscriptions, change of address, and membership: address the treasurer.

Concerning requests for back issues, TIPS, and other information: address the secretary.

Concerning manuscripts, notes, letters for publication, and membership news: address the editor.

Reprints of articles may be obtained within six weeks after publication by placing order with the editor. Cost of reprints is \$4.00 per page for 100 copies and \$1.00 per page for each additional hundred copies.

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Dingman's Ferry, Pa. 18328

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I have learned

To look on nature, not as in the hour

Of thoughtless youth; but hearing oftimes

The still, sad music of humanity,

Not harsh nor grating, though of ample
power

To chasten and subdue. And I have felt

A presence that disturbs me with the joy

Of elevated thoughts; a sense sublime

Of something far more deeply interfused,

Whose dwelling is the light of setting
suns,

And the round ocean and the living air,

And the blue sky and the mind of man;

A motion and a spirit, that impels

All thinking things, all objects of all
thought,

And rolls through all things. Therefore
am I still

A lover of the meadows and the woods,

And mountains; and of all things that we
behold

From the green earth; of all the mighty
world

Of eye, and ear — both what they half
create,

And what perceive; well pleased to
recognize

In nature and the language of the sense

The anchor of my purest thoughts.

— Wordsworth

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