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Photo by Hugh R. Smith

INNER CITY SURVIVAL THROUGH EDUCATION

— The American Nature Study Society —

A Message from the President

How does one greet the members of an organization who are spread across these United States, already teaching the concepts and advancing the programs which will help a largely indifferent world help itself? We know that our members, sensitive to the natural world, are passing on their knowledge and their principles to students, are leading discovery trips around the block and across the world, are directing effective programs in nature centers, are writing significant books, and otherwise contributing their best efforts to promote a certain quality of life. This philosophy is embodied in "the Nature Study Idea," expressed by the founder of ANSS in 1908. Liberty Hyde Bailey early emphasized that nature could be studied with either of two objectives: "to discover new truth for increasing the sum of human knowledge; or to put the pupil in a sympathetic attitude toward nature for the purpose of increasing his joy of living." It has seemed necessary, as we have become increasingly aware of flagrant degradation to include environmental education in his "idea."

Productive as we are in our own communities perhaps it is fair to ask: What are we doing for the American Nature Study Society, and what is it doing for us?

We know many of you are making substantial contributions to the Society, in many different ways, with your gifts of effort, time and money. Many of you are writing articles, poems, and news information for "Nature Study." Some of these are in the form of "Tips" and are reprinted to send to hundreds of teachers, students, and youth group leaders. Many of you are authors of outstanding books, and with your contributions we have organized an ANSS Book Exhibit which is displayed at national conferences, nature centers, universities, museums and teacher workshops all over the nation. We estimate that 10,000 people poured over the volumes last year. The subject matter varies greatly but we have three rough categories: adult nature books, children's nature books, and environmental education material. A leaflet with each title, author, publishing company and cost is available to each viewer. It is exciting to watch the readers mark on their list the books which they wish to procure!

Many of you are carrying heavy responsibilities within the Society: arranging meetings at AAAS, sending out Tips and answering innumerable questions, managing the finances, editing the journal, serving on the board, and otherwise keeping the wheels in motion.

Are we collectively doing enough? Enough to make the impact which is necessary for the health of the organization and to meet its objectives? The answer is simple. "We must do more." We need more significant contributions to "Nature Study." We need more "Tips" to send to teachers. Will each of you check the list of available "Tips" and write one concerning your own area of expertise?

We need more members — to keep our operation solvent and to more completely reach people who need our material. Last year there were many gifts, which we gratefully accept, but members who share our concerns and use to advantage our publications and programs are tremendously more important. Have you encouraged students and teachers whom you know to affiliate with us?

Our Annual Meetings with AAAS are informative and inspirational; they cement firm friendships, too, which are warm and encouraging. But due to distance and time conflicts, attendance is limited. We need more state and regional meetings to fill the gap. In July we are initiating a new venture, an urban environmental education workshop, in cooperation with the Connecticut Audubon Society and Bridgeport University. This is an area which seems to be neglected. Is it possible that this effort provides a challenge to duplicate such a workshop in every state? Students seem to be seeking new experiences provided by workshops. A state-wide retreat with new activities and old philosophies might be another possibility.

We are a part of The Alliance for Environmental Education, a union of nearly thirty groups concerned about support for schools by government, community, state and individuals. We are all hoping that there is strength and depth in this venture, and that it will generate people power for expanded environmental education programs.

Consider with me these words graphically displayed on the walls of the beautiful lobby at the Morton Arboretum:
"Contemplate matter and say, "From this is the universe, the world and life made"

As the clouds rise from the sea, rains fall and rivers flow, say 'Nourish us from the sea that we may live.'

To the Oceans say, 'Ancient home, nourish us with waters.'

Turn to the sun and say, 'Shine that we may live.'

To the atmosphere ask, 'Protect and sustain us.'

Hold in your hand some soil, know that the essential decomposers are there and say, 'Be and work that we may be.'

Look to the plants and say, 'Through you we breathe, through you we eat, through you we live.'

Do these things and say, 'We are your good stewards; we shall not destroy our home.'"

Our work has just begun.

RUTH W. MELVIN

We Never Promised You a Rose Garden!

A Plea for Urban Environmental Education

GLORIA S. BARNES

The Puzzle

Part 1. The Bridgeport, Connecticut Board of Education, a major urban school system, requests assistance from the Connecticut Audubon Society in the planning, development and implementation of an environmental education program – but it has no funds available for the project.

Part 2. The program must be a *realistic* one for inner-city students, a high percentage of whom are far below grade level in basic skills and who have little enriching experience or background.

Part 3. Assistance and consultation are needed in providing means of broadening teachers' backgrounds in basic concepts of ecology and in methods for teaching these concepts – particularly in field techniques and in using the school yard as a classroom.

Part 4. Many schools are located in severely-blighted areas with high rates of crime, vandalism and a transient living pattern that causes a high rate of student turnover.

Part 5. With an elementary school enrollment of 16,000 youngsters, the Superintendent believes it more important to reach as many schools as possible with some program, than to work in depth in a few.

The Situation

Bridgeport is a typical old industrial city of bright and beautiful mixed with decay and despair. The area has chronic poverty related to high rates of unemployment, social disorganization, crime and drug abuse. These exist within a blighted physical environment where much housing is substandard, overcrowded and sordid.

Yet, there are areas of beauty; a sweep of beach on Long Island Sound, a working harbor, a salt marsh, a lovely old park and a small zoo, some solid residential areas, a section of handsome modern buildings framed by a curve of superhighway.

Some excellent urban renewal projects have been accomplished and the city administration is attempting, against great odds, to revitalize the school system, public institutions, recreational areas, services, business districts and housing.

There are many major environmental

problems to be solved: energy source sites and distribution; land use for industry, housing and recreation; municipal and industrial pollution; in addition to questions unique to Long Island Sound and its tidal wetlands.

With the majority of our population living in our cities and with sociologists' predictions that this will be an accelerating trend, public awareness of environmental problems and alternative solutions is vital to the preservation and ordered growth of the city. Without care, our cities will be economic millstones around the public neck or at worst, a land mine under the public foot.

The cities, burdened with seemingly insurmountable problems of the poor, with the necessity of large municipal expenses for police and fire protection, health services, housing, sanitation, and other needs have the least economic ability to educate their residents in ways to retard and reverse the degradation of their city.

If the goal of environmental education is an informed citizenry capable of making enlightened political decisions, the public schools are one of the best vehicles for arriving at this goal. In ten years, students will be part of a vast urban voting block which will decide major environmental issues. The city child who has little or no experience with the natural world and is isolated from the source of his very requirements for life can hardly be concerned for it.

Connecticut Audubon was most anxious to respond to this plea from Bridgeport's school system, but it was obvious if the answers to their challenge were to be effective, some creative "loaves and fishes" approach was needed.

Finding The Answers

In the suburbs surrounding the city and through the membership of the Society, there is an excellent source of concerned people who are willing to donate time to an education project. In order to stretch the leadership and expertise of his staff, Marshal Case started a training program for volunteers from the greater Bridgeport area. Training workshops are conducted throughout the year and a minimum of twenty-four hours instruction is offered in basic concepts of ecology, biology, botany, local geology

and field techniques.

In the beginning, it was felt that the concept structure of the children's program would have to evolve from our experience with them and with the teachers. The main objective was to create in the child an awareness of his environment, to build interest and concern, but most of all to cultivate a reverence for life. This idea, which had inspired the volunteers, was often an affront to the sensibilities as we started working with the children. The lives of so many of these children were already such a burden to them, it seemed impossible that they could respond to experiences designed to sensitize them to beauty, to living things, to the wonder of the web of life. Yet they did respond, miraculously, giving us a glimpse of the resilience of the human spirit and encouraging us to build and continue. At the risk of losing its meaning from over-use, we came to call this program "Reverence for Life," for first and last, this was its reason for being.

Through the coordinated planning of a Connecticut Audubon volunteer program chairman and the office of the Bridgeport School Volunteer Association, the trained volunteer is scheduled into a school where she works for three to four hours a week as part of a team. She offers in-class presentations using live animals and plants and the team conducts the popular "city walks" which are explorations of the school yard and environs to discover the web of life in the city.

An effective volunteer teacher program requires real commitment, time and energy on the part of both the volunteer and professional staff, but working in the inner-city with truly deprived children develops one's sense of urgency for a program of environmental education that has real impact.

"I've never seen them notice or care about their environment before" – these words came from a principal to a volunteer who passed his office commenting "Two hours of grubbing on my knees and marshaling those kids to investigate under broken glass and beer cans and I don't think I've even made a dent." The principal then drew her to a window and pointed out the children on their

way home to lunch. They were in little knots examining the underside of some shrub leaves and on their knees looking for ant colonies. They were indeed noticing their environment — and positively!

The abilities, discipline and background of students vary so widely, that the program really must be "tailored" to each school. However, after evaluation, we found a simple structure of sequential concepts that seemed to be effective in most schools. They build in this manner; requirements for life, variety and diversity of life, adaptation, plant and animal communities, systems and cycles, inter-relationships and the web of life, then finally to man as guardian.

The most effective ways to teach these concepts seems to be using living things and providing situations where the children investigate and observe for themselves. They need visual dictionaries of beauty rather than blight and a bank of pleasant experience with the natural and man-made world to draw from when we speak to them of environment.

Incorporating environmental education into the curriculum requires the development of resources for both student and teacher. We feel that in-service teacher training workshops are the most valuable in producing long term results.

To aid in the development of the teacher training, a proposal was made for federal funding. The initial program was begun with meagre funds; contributions from community groups and churches plus the donation of the staff's time. In 1972, the Connecticut Audubon Society was awarded a grant from the U.S. Office of Health, Education and Welfare to develop a model program of environmental education.

With this grant, Connecticut Audubon provided twenty hours of training workshops for which the Board of Education gave three credit hours. One primary and one intermediate teacher from each of the thirty-two schools were selected to attend. To provide a "ripple effect," it was intended that these teachers would then conduct workshops in their own schools using the curriculum materials developed under the grant, demonstrating the development of concepts presented to them and passing along the skills they had developed.

Although we haven't done a true follow-up, we suspect that the latter intended "ripple" quickly disappeared. In hind-sight, we could have encouraged the Board of Education and the principals to establish in the school calendar, a definite schedule of in-school workshops by these trained teachers.

In the evaluation study the teachers teaching, in demonstrating techniques of field study that many felt were not included in their college training, and in



PHOTO BY LOUIS SCHUEFER

providing and reviewing sample units of environmental education.

There is still much to be done in consultation with the Board of Education on curriculum content and on coordinating teacher and volunteer efforts. As the program has evolved, the volunteer often acts as a resource liaison to Connecticut Audubon's Community Services Center if the teacher requests material or assistance in follow-up activities or unit planning. In addition, she will often coordinate field trips that re-enforce and extend the program objectives.

The response to the program from the administration and teachers has been most enthusiastic with ever-growing requests for continued support.

The response of the volunteer is shown in her dedication. Teaching in ancient classrooms, city lots, salt marshes or city parks requires much planning, but is fascinating and great fun. Using living things means dealing with surprises. One must learn to field questions like "Hey, lady, where does this snake go to the bathroom?" or be prepared to coax a rooster down from a classroom ceiling light where he is perched beyond reach, endearing himself to the children with each passing moment. Observing skunks, turtles, frogs, owls, dandelion puffs, ants, spiders and flowers is a shared delight for teacher and child and a joyful way to create a reverence for life.

Bless the beasts and the children!



PHOTO BY C. BROOKS BARNES

Nothing Grows Here

MIRIAM E. DICKEY

I was to hear this many times as I went in to the city to teach school children about their environment or to take children and adults on a walk through one of the city parks or playgrounds. Frequently, when holding a dandelion in my hand, I asked the children if they could tell me what it was. I received the answer "just a weed."

These two attitudes were those of the people who lived in the city as well as those who lived in the suburbs and thought of the city as a sterile place. The words "just a" seemed to me to imply that the flowers of the city were hardly worth looking at.

We set out to change these attitudes where we could.

In 1968 I started teaching in three elementary schools in Boston — in the inner city. This was a funded program.

The Garrison School was the largest elementary school in the Boston system. It was situated very close to Franklin Park (where Boston's Children's Zoo is located) in a residential neighborhood of very large single houses and 3-6 story apartment blocks. Its enrollment in September 1968 was 99% black. However, in the previous September the great majority of the children came from Jewish homes with good motivation to learn. A number of the children came to school in chauffeur driven cars. This was a tremendous change for the school and the community.

The new families represented those which had lived in Boston for several generations and many new families which had arrived recently, and were still arriving from our southern states. Many of the latter came from rural or semi-rural communities. There were also many children who had recently come to Boston from Puerto Rico and other islands. The social, economic and political customs of these groups varied greatly and there were many adjustments to make.

The Garrison School itself was old — a typical three-story brick building. It was, however, one of nine schools in the Boston system which, before World War II, had had an active garden program with each class having its own work section. The programs had long since been discontinued but there were still flowering dogwood, lilac, forsythia, mountain laurel, rhododendron, spruce as well as the Norway Maple and red oak which I have found in most city schoolyards. Because of this we planted tulips in the fall. Each class had its own

bed and each bed was of a different variety. Each child had a part to play — digging the hole, placing the tulip, adding fertilizer, covering the tulip bed or making a class label. I was told "they" will dig them up. We did have some trouble but there was a good deal of pride in the looks of the yard the next spring. Third and fourth graders often find it hard to wait for results so each class also prepared a bowl of paper white narcissus for the classroom. We suspended an onion in a tumbler of water so that we might see the roots and stems grow.

The first lesson was Our Environment which extended from our reach progressively through the classroom to the school — the neighborhood. Drawings and maps were used to expand the meaning of the word to Boston, Massachusetts (some could tell what state they came from), North America (the Winter Olympics being shown on TV were taking place in Mexico), The World (they were learning about Eskimos), and finally the Earth as a member of the Solar System. We retraced our journey back to the classroom and talked about the live guinea pig and geranium which I had brought to class and about themselves. What did we — living things — need to keep us alive and healthy? Food, air, water, sunlight and heat, room to grow and (they added this) T.L.C. This is what we were going to talk about when I visited them every other week.

At first the children were not inclined to answer questions that I asked. I only asked questions which I felt the majority should be able to answer. When I called on a child whose hand had been half raised he quickly shook his head "No." I asked, "Are you afraid you will make a mistake?" He nodded "Yes." "Well," I said, "I have made lots of mistakes but that is how I learned." Gradually, throughout the year, the children were more willing to answer. We learned from our mistakes (many parents and teachers are quick to rebuff these children and they need much encouragement). By the end of the year I often had to say, "Robert, you've had your turn. Let's listen to William now."

Following a walk around the school block to collect seeds or what looked like seeds we experimented to see what might be light enough to fly in the wind, what might roll, what looked like it would be food for the bluejay or squirrel we saw often in the schoolyard. We divided into groups to start seeds in water glasses lined with paper toweling to see what

happened as the seed grew. We used hand lenses to find the embryo in the lima bean but also in the peanut (would this grow inside of us? No — but we knew why it wouldn't). Some children took very good care of their seeds and the resulting plants which they transplanted. It was important that they — and not the teacher — do the "caring for." One class set their tall bean plant on a chair and tied it with soft yarn to a yardstick taped to the desk behind the chair. Another taped the plant to the side of the window. Both ideas originated with the children. Other classes got poor results as might be expected. The school grapevine was busy — we all knew where the successes and failures were. One failure was due to "her" (the teacher) throwing the starting seeds out because "they stunk."

Taking care of a living thing was an important lesson. Perhaps it could develop a habit of taking better care of one's books, crayons, clothes, etc.

We compared our pet guinea pig with the squirrel that lived in the oak tree — to really see what is a pet? What is wild? How did they move? What did they eat? What makes a mammal? Why are we mammals? Seeing and looking are not the same.

The pigeon, starling, and house sparrows were our common birds — but one day Derek called our attention to the white-breasted nuthatch walking on the ridgepole of the house next door to the school. You never know what you will see in the city!

Raymondo told us about the starling building a nest in the hole of the Norway Maple tree in front of his house. In September it had been a bird in a tree. We learned a bit about Ecology by this association and that between the squirrel and the oak tree.

When we started school in the fall the children knew the acorn came from the oak tree but we learned that it could produce a new oak tree where we found one sprouting in the schoolyard.

The favorite lesson was the day we picked the dandelions on the lawn of the apartment where the Senior Citizens lived. We said "dandelion" "dent-de-lion" (the dentist tends our teeth) — we took the "flower" apart to examine with our hand lenses the florets that made up the bouquet of flowers. We looked at the lion's teeth on the leaf margin. The girls made necklaces and the boys made blowguns (a dandelion seed in the hollow stem). In so doing we discovered the bitter taste but also learned how they are used as food. In answer to my question as to what the dandelion seed was I was told "it is a dandelion grown old and gray."

All classes made frequent ten to fif-

It Is Not Just A Pigeon

by DAVID JUNKIN II

teen minute trips to the schoolyard to see sprouting maple keys, to check on the tulips in spring, to watch a bat flying around at noon-time (before I could stop it many pebbles were thrown, unsuccessfully). Our next and unscheduled lesson was on bats, with a mounted one. "Gee, he's clever!"

All the children went with me to MAS Drumlin Farm to learn about farm animals and their wild neighborhoods and to have a hayride. John said as we turned from busy Blue Hill Avenue onto multi-laned route 128 "Miss Dickey, I can see the whole wide world from here." Cheryl said, "Happiness is every other Thursday."

I also taught 5th grade at two schools in North Dorchester — pupils at both were white — one school was in a well kept neighborhood of mixed races and religions. The other was in a depressed area separated from the waterfront (a Boston Harbor marina) by the South-east Expressway with the constant din of jets taking off from the airport.

Two projects were especially successful. Each class studied a different mini-habitat on the schoolgrounds: vacant lot, asphalt play yard, dirt yard, or tended lawn. Each class was divided into 5 groups to make a census of their area. Names were unimportant — we made them up — but we found that grasshoppers and spiders like vacant lots, ants and worms burrow into the dirt, asphalt is pretty sterile except for flies and an occasional ant where there was a crack but that sowbugs (they are *not* insects) were the most numerous animal found on the lawn (under litter).

Armed with cameras we set out to photograph the ugly and the beautiful in the school neighborhood so as to show where changes were occurring. Each class had its own boundaries. When we were through the local library displayed our pictures with explanatory labels by the children.

We discussed "What good is a vacant lot?" The teachers wanted to blacktop it so that they could park their cars off the street and thus quiet the complaining neighbors. The classes voted overwhelmingly to keep it as it was so they could use it as an outdoor classroom. Thirteen egg cases of preying mantis may have helped them to reach this decision.

I worked also in Cambridge with first grades with reading problems. Using books and live or mounted specimens I taught them about the gray squirrel, mallard duck, painted turtle, and pigeon. Then we took a subway ride to Boston Common to see all of them in real life. A ride on the Swan Boat was no more exciting to them. We walked up Beacon Street fascinated by the big houses with their beautiful doorways and mud scrap-

Pigeons are the most beautiful birds in the world. Beautiful colors adorn them, there are few birds that fly more gracefully and they are faithful to each other. They give us a unique opportunity to become ornithologists without scaring our subjects away with each move.

ers (all of which were tried out).

I visited a Camp Fire Girl's Day Camp once a week to help with their nature study. We met near City Hospital and a large housing project. A census of the vacant lot produced 22 animals (this ladybug doesn't look like the other two) and 21 plants. Who says "there's nothing here." I was not prepared for the rooster kept in a coop by a neighbor. We grew beans and corn, too. One girl asked to take hers home and plant it in the dirt in the yard. I met her and her mother later in the summer. The plant had produced 7 beans — there were 7 members of the family! They were the best beans they ever ate!

Boston had a *Summerthing* program with a *Plantmobile* which went to vacant lots and community centers with plants donated by garden clubs. Children and adults were hungry to grow something. One group of children had to be taught that laying the plant on top of the soil is not the way to plant it. Follow up showed that a neighborhood group took the plants. A second follow-up to see how the replaced plants were doing found them pushed out so the youngest children could play in the dirt (the dirt in these 2 large planters in front of the apartment was the *only* dirt on the street). We took a third set of plants and *window boxes*. Each family of children planted one and carried it to their window sill much to the joy of the parents.

Another *Summerthing* program was a scheduled "nature" walk in the playground or city park. Some of these places were pretty sterile and dirty but we almost always found Peppergrass (had to taste), *Lady's Thumb* (do you ever have dirty fingers?), *Burdock*, *Chicory*, *Tansy*, and *Queen Anne's Lace* which are beautiful together. Sometimes we find a four-leaved clover. We could carefully tear a plantain leaf to see how the water gets through the leaf. And there are always *dandelions*. All have an interesting story to investigate.

Nothing is here? No ladyslippers or Scarlet Tanagers but what we find is just as interesting. Is a dandelion a wildflower? Or is it a weed — something growing where we don't want it to? Perhaps it's a flower we haven't learned to love yet.

They come readily to food so that we can observe them at very close range.

While there are many different pigeon (or dove) breeds for the pigeon showman, city pigeons come in many colors. Grey birds with iridescent green mantles predominate but various browns, whites, blacks and greys in many patterns are common. For the most part they are born wild and live wild though flocks in urban areas are often joined by banded, hand raised individuals that have strayed from a race to a faraway place.

If you have never watched a pigeon fly, you have missed flight at its best. They are fast, sleek and agile in the air. From straight line flight to the formation flights of a flock, even most bird watchers will agree they are beautiful, though the same observers turn up their noses at the mere mention of a pigeon among the ranks of native birds.

Pigeons, by adapting themselves to the ways of man, are among the most successful of animals. They use buildings as a substitute for nesting cliffs, eat preferred bread or dump pickings and live in an area where there are few predators to control their numbers. Several broods per year are raised by parents that share equally in incubation, brooding and feeding. The adults are said to mate for life though if one mate perishes, the remaining one may choose a new mate. Pigeons walk by placing one foot ahead of the other while most other birds hop. And when you notice a pigeon drinking water, you will see that they do not drink in the manner of most birds, but drink by swallowing with head outstretched.

Pigeon enthusiasts abound in public parks doling out bread, cracked corn and other delectables to the gathering flock. Pigeons are so gregarious that they may be seen perching on a person to get closer to the food supply. The person feeding pigeons at these close quarters is often regarded with disdain by other people, though the feeder is the compassionate one, seeing life as the most precious element of our earth. Injured doves are easy to care for as more and more people are realizing.

We should miss no opportunity to learn and appreciate our fellow creatures. Learning about our environment is the only way to truly understand our world. Disregard of its creatures and ecosystems leads to deterioration of our stability as the world's most intelligent animal. The bird we have chosen as our symbol of peace has many other lessons to teach us.

Aullwood Audubon Farm

Aullwood Audubon Farm, administered by the National Audubon Society, is a 120-acre "working farm," typical of small farms in the midwest. We raise all of our livestock food: oats, corn and hay; and maintain a variety of livestock in our barns and pastures. In addition to croplands and farm buildings a portion of the farm's acreage has been left in a natural state. Included is a stand of century old maple trees which we annually tap to make maple syrup. The farm also maintains a fruit orchard, herb garden and a beeyard. One of our fields is used by local school children to grow Christmas trees.



Aullwood Farm produces all of its own livestock food – corn, oats and hay

Although most of our contact with school children is in the form of 1½ hour guided visits, we continually experiment with new ways of using the Farm's resources: all day classes, classes that meet at the Farm all day for several weeks, special weekend programs, and in cooperation with local school systems a summer school program for children and teachers.

We offer teachers and children the opportunity to become actively involved in learning by doing situations. For example, a teacher may wish to have her class participate in our Wool Program. This 2-hour-long activity affords children the opportunity to card, spin, dye and weave wool. Children are allowed free movements through these activities. Since we have 3 spinning wheels and 4 looms children have ample opportunity to stay at one task for an extended period of time. Dyeing wool is accomplished using plant materials, such as onion skins, walnut hulls, dandelion blossoms, etc. We usually end up this experience with a visit to the sheep barn. This is a time when lively discussions take place concerning breeds of

sheep, how much wool comes from a sheep and a multitude of other questions.

A second program that points out the kind of student involvement we like to have is our Milk Program. Since we have several dairy cows an interested class may study dairy cattle, milk and milk products. Although each student can try their hand at milking a cow the staff eventually ends up doing the serious milking. The milk is then carried to our classroom where the students have to clean and assemble a cream separator. The cream is separated from the milk and is then ready to churn into butter. A butter churn is available and butter can be made. Since we are dealing with raw milk the butter cannot be consumed. However, we sometimes substitute commercial cream for the class to churn which can then be consumed.

Such things as tie dyeing, churning butter, and cooking can be done in many classrooms. We try to act as resource people for teachers interested in these kinds of classroom activities.

Generally speaking, we make no distinction between inner-city children, suburban, or rural children. We want to work with children at a level that is most comfortable to them. All of our programs are structured in a way that encourages maximum individual participation and direct experience with materials. We try to be flexible and informal in our approach, allowing time for special interests and related topics to be pursued. Beyond the concepts and ideas developed during a class visit we believe an important value lies in the emotional impact, the enjoyment and sense of excitement which the children take with them away from the Farm.



This class of 5th graders watched a cow being milked, then separated the cream and churned butter.

Attention

Members:

Catherine Pessino, chairperson for the Eva L. Gordon Award Committee, is seeking suggestions for an author to receive this special award.

The award is made to an author (not a book) whose works represent the standards of excellence that Eva Gordon stressed – accuracy, readability, an invitation to adventure, a well-integrated presentation.

The recipients of the award to date are: Millicent Selsam, Edwin Way Teale, Robert McClung, Helen Ross Russell, Verne Rockcastle, Phyllis Busch, Jean Craighead George and Jeanne Bendick.

The presentation will be made at the annual meeting to be held in Boston in February. Please send your suggestions by October 1 to Catherine Pessino at the American Museum of Natural History, New York City, New York.

Ontogeny of an Urban Environmental School Yard Ecosystem

HERBERT H. WONG

The cry for increased use of school grounds and school yards as convenient, untapped public outdoor learning resources began with the focus on nature study and conservation education – historical antecedents of the environmental education of the 70's. This flow of pleas has developed into various semantical, philosophical and operational interpretations of EE and childhood culture.

Another set of variables spawned by the concept of environmental school yards deals with the geographical, socio-economic, political and bio-psycho-physical setting of the school. Thousands of schools, for instance, are endowed with natural or man-built environmental amenities with a potentially high EE quotient; these schools are usually adjacent to or are integrated into a matrix of natural, sometimes pastoral, assets, either by happenstance or by design, and these environmental conditions obviously exist in greater proportions in rural/exurbia, somewhat less in suburbia, and in a few urban areas. However rich these resources may be on the school site, they remain statically dormant in most situations because a pitiful minority of these school communities capitalize on these assets, due to lack of interest, understanding and commitment.

Granted that most of us, and maybe all of us, do not truly grasp Billings's "holocoenotic environmental network",¹ or McInnis concept of "humanenvironment" – people as environments,² or Charter's totality of man in a total environment³ or Fuller's metaphorical "Spaceship Earth".⁴ It may be more clear that the surge of humankind continues to swell the cities into blankets of megalopoli, which emphasizes the importance of EE in the cityscape, and the need to see our schoolgrounds as vital public domains for environmental childhoodness – open space for inner-self and external environmental perceptions, for understanding interactions, and for coping with shifts of environmental values and realities.

The School Yard As An Ecosystem

The schoolyard is a species of micro-ecosystem reflecting all the essential properties of ecological systems. Using the principle of holocoenotic interactions between environmental factors and an organism (the child), we find it hazardous to concentrate on any single factor because of the complexity of the interactions. We also discover that to focus on any isolated part of the system results in a fragmented view which takes

us away from the rest of the parts. A schoolyard as an ecosystem is therefore characterized by its parts and also by the interaction among these parts.

Next, ecosystems respond not only to current happenings but to those in the past. As an example, we might purposely lift off some asphalt from a schoolyard to establish a "succession plot." The objective is to effect an increase in the diversity of species, in the complexity of interaction, and to increase the resilience of the system. Assuming that relatively stable conditions can be maintained, a historical process is launched and continues through a series of successional phases to a stable climax ecosystem. Volunteer pioneer species appear first,

limited in diversity and complexity. These are hardy species of plants, well adapted to drought conditions: they are also high producers, especially under conditions of little competition. This high productivity accompanied by production of biomass via solar energy promote enhanced conditions, welcoming the addition of *Communities* of organisms. Consequently, more variety of plants and animals and more complex interactions will occur, contributing to more resilience in the ecosystem. This successional history in a brief way, shows how ecological systems evolve in time, cyclically and cumulatively and, in effect, illustrates a historical quality. Substitute people in a schoolyard for the



Photo: Drew Werby

WEY, 1974 In Progress. Gardens in foreground, ponds and developing natural resource area in rear. Inset: Before redevelopment started 1971.



Photo: Robin Moore

WEY: Children from Angela Wong's class work in their garden

plants and animals and many examples and implications come to mind.

A third ecosystematic property is space. Just as environments change through time, they likewise change through space. Schoolyards are heterogeneous structures with seemingly infinite spatial and temporal interactions; they make up a time/space/objects/people mosaic of bio-geophysical and psycho-sociological ingredients, which can be made into environmental designs and curriculum interactions.

Lastly, there is a mixed bag of structural properties which relate to the presence of processes such as limits, lags and thresholds; these are processes which integrate and interrelate the various components of ecosystems.

Natural systems interface with urban systems. These systems share the four basic properties – the systems property, the historical property, the spatial property and the structural property. The equation of these characteristics produces resilience and stability. Since stability is delimited by upper and lower borders, we must consider the perspective of Holling and Goldberg,⁵ who point out that this boundary-oriented view of stability from ecology serves as a conceptual framework for human intervention into ecosystems. It deflects our efforts from increasing efficiency to *increasing resilience*. It emphasizes an examination of causes instead of symptoms. The transfer to environmental education is direct and zeroes in on the general character of urban school yards as ecosystems.

Child Environment/ Natural Environment

Studies of children's behavior in natural environments demonstrate that children take them over as child environments *per se*; children interact with a broad spectrum of diverse, dynamic elements, materials, places and situations. Experience in Project WEY (Washington Environmental Yard)⁶ in Berkeley, California emphasizes the consistency of children's reactions and notions, surveyed through observations, questionnaires and interviews. Ranking high in their encounters via data from WEY and other sources are the following:

1. *Plant life* – trees, shrubs, flowers, grass. These are things to cling to, to touch and feel, to smell, to hide in, to fantasize in and about, to measure and compare, to explore and use as macro and micro-habitats and for gross and delicate experiences. Vegetation serves as canopies, light filters, wind chutes, and screens, and animal niches – part of the endless network of discoveries children make.

2. *Soil, sand and rocks* – earthy and stony stuff. These are media that children love to rub, touch, sift, squeeze

and fling. Like tree trunks, big boulders are objects of hugging. Fertile use of imagination by the children, without any stretching, shows up in infinite varieties of infra and suprastructures – tunnel systems, forts, bridges, villages and animals all constructed with the natural resources at hand. Beyond these short term creative pursuits or interactions, *soil* is a prominent stage for the drama of growing plants.

3. *Water* – smooth and tranquil, trickling and seeping, roaring and churning. It matters little whether it be the seashore, a lake, a pond, a puddle or a few drops – water evokes an enormous interest. From feeling it bodily or making splashes or ripples with their hands or sticks or pebbles and rocks, to exploring aquatic plants and wildlife, children hold a positive set of values about water. Even mud puddles and a “dirty, messy pond” challenge and stimulate their creative resources. Children view water media as play/learning environments and as life support systems.

4. *Topography and terrain*. The more diversity in topographical scale and texture, the more children will respond to the geological and biological features. They have a natural hunger to climb, to leap, to crawl and slide in any setting, but the appeal of the special mix of elements in natural settings provides special fulfillment.

A resumé of the major components of the natural world with no human artifacts as they relate to and become child environments points out several environmental education imperatives for the urban child. The transactions children make in the natural sector are responses to the total environment and all the natural facilities and amenities it holds. When the same children go back into their urban domain, there is a significantly large loss of the sense of esthetics, values and stability. A tree “out there,” for instance, is really not like a tree “back here” along some boulevard. Obviously natural environments provide a wealth of rich, flexible, open and exciting fabrics of experience, and these experiences promote awareness and satisfactions in affective, cognitive and psychomotor dimensions; these multi-dimensional activities in the anatomy of the city and the geometry of city school yards present a contrasting picture . . . a picture of serious deficiencies.

We need to also recognize that play as a randomized experience is a laboratory for honing socialization skills. The child learns the needs to share, to interrelate, to cooperate and to compete, and to adapt to a multitude of changes. Connected to the concepts of diversity, adaptation, interrelationship and change – all basic concepts of the web of life –

we can extend them from the classical ecological context in the natural world to the context of the urban school yard. These overriding concepts, with the fundamental media of childhood/natural environments, plus the aforementioned ecosystematic properties, make up my compass for EE.

Urban School Yards

Consider the school playgrounds or school yards in your community. They are generally so familiar that people take them for granted. Physically, does it appear that the basic attributes of nature and childhood activities have been incorporated in their function and design? Or do they look like what 99 per cent of city school yards look like – flat, asphalted and aseptic, sprinkled with some fixed institutional-looking apparatus ordered straight out of a catalogue? If a few trees or shrubs abound in the periphery or a manicured lawn patch is near the entrance of the school, these would likely be unintentional “bonuses” since they probably serve only as amenities, and are off-limits to child interaction (“keep off the grass”).

These bleak black-topped urban deserts bordered by naked, high chain-linked fences hold city children in bondage much like penal compounds. These vestiges of a factory syndrome of yesterday are environmental “misfits.” This “approved,” standardized anti-people playground model exists for simple reasons. One concerns administration and maintenance standards and goals. I previously referred to the dichotomy between increasing efficiency and increasing resilience in natural/urban ecosystems. This is an overt example of man's planning to achieve more management efficiency through convenient measures. Viewed as an effort to enhance equilibrium by tension reduction (the principle of entropy implicit in the second law of thermodynamics), and thus gaining more “control” of the children's scale of activities and maintaining a “higher level of safety,” it is reasonable to expect this bureaucratic approach. The trade-off results in a huge debt for childhood/adulthood – the loss of guided/autonomous opportunity for children to use an inviting open space for creative play and learning.

Asphalt, by the way, is not being condemned *per se*, but it is my target when it is the dominant environment. Asphalt is a vital part of the balance and diversity of urban and rural environmental education/recreation. In his call for the need for environmental complexity in man's striving for order instead of moving toward the state of simplest structure in physical systems, Arnheim⁷ asserts “homogeneity is the simplest possible level of order because it is the most ele-

mentary structural scheme that can be subjected to ordering." He also indicated that mere orderliness results in more impoverishment and ultimately to the lowest structural level, impossible to separate from chaos. His case rests on the principle of complexity/diversity, which is equated with richness and stability, even though his context is psychology of art in relation to a state of balance and order.

The range of choices or options is dependent on complexity. Complexity in an environmental yard should be a multi-dimensional system of many themes and their variations. This flexible orientation of complexity opens up a world of meaningful, challenging options for children. In Project WEY there is a set of criteria supporting its developmental framework. Early in the project these guideposts were used as strategies to plan and implement the fusing of process and product. The following are the spatial/physical criteria flexibility, open-endedness, change, range of permanence, access, protection/human nature interface, social interaction, privacy, safety, ease of construction, and choice and diversity . . . this latter is the primary coordinating principle.

Genesis of Project WEY

Project WEY – Washington Environmental Yard – is an open, never-to-be-finished EE process-oriented model, located at Washington Primary School, a University of California Laboratory School in Berkeley. It is a joint school/community/university project using a people-problem approach. The school has the highest urban profile in the city, located a block from City Hall and four blocks from the U.C. campus. It is not a school nestled in the hills but one located near the downtown shopping area and across the street from Berkeley High School. With a daily average auto traffic flow of 20,000 vehicles on the street next to the yard, it serves as a "message center" broadcasting whatever changes are occurring in an open manner. And the messages have indeed been garbled as far as the non-environmental education/childhood passersby are concerned.

The aim of Project WEY embodies a change of value systems for all the people toward an ethic reflecting environmental literacy while physical environmental changes are being made. The vehicle is the conversion of 2½ acres of asphalt into a transdisciplinary, intercommunal environmental education resource. Moreover, it calls for a gradual re-oriented perception in which the existing traditionally-designed school building becomes an adjunct resource facility for EE; i.e., a system of indoor learning labs complementing the dominant learning sites – the outdoor environs of the

school. The cycle of learning can be generalized as outdoor to indoor to outdoor (both on school site and off site) and back into the cycle.

It is not easy to articulate the rationale of EE to curricular aspects in the above cycle. I maintain that getting the indoor learning environments to become genuine environmental classrooms is the first area of change for many people. Another step is to move to outdoor EE activities on the school site using whatever the existing given environment offers – asphalt included. It may be necessary to reject the given environs if it is mostly asphalt-paved or sterile, and embark on a process to redesign and change it physically. This last dimension involves an enormous amount of risk taking, energies, and the organization of a host of strategies to translate the objectives into realities.

Again, Project WEY gives some input on the approach and strategies. Since advocacy planning, involving all members of the community spectrum, is the mode of the project from the start, some information on the people is relevant. The 475 children, five to nine years of age, make up the student population; they mirror the cosmopolitan complexion of Berkeley with over thirty nationalities represented. Likewise, from university students and faculty and retired people to grass roots/blue collar workers, artisans, etc., they live in an admixture of homes, apartments and communes in the neighborhood. There are dozens of families who live beyond the boundaries of the immediate area who have chosen to attend the school. At the initiation of the project data was solicited from all sub-communities via questionnaires, interviews, and graphic/audio techniques; data included responses to what they thought of the yard, how often they used it, purpose of their usage and what changes they would welcome. This input was reflected in conceptual design of the new environment, with opportunity for all groups to offer feedback via drop-in clinics, seminars, map write-ins – all conducted during the course of many months.

Data from photographic surveys (still and time-lapse movie and video) added to the planning of physical/behavioral aspects. A control behavioral survey on a twelve hour/day period spent in observing user activity provided comparative data as changes were made in the yard. Also, changes in all user groups were re-surveyed to give us the pulse of the impact of small scale changes.

Most of this was coordinated by a core of school/community people serving as a technical strategy group with a wide range of roles and functions crucial to the momentum and flow of activity. As

an example, beyond the usual needs of digging up all kinds of human and material resources, this group was immersed in a long, draining series of presentations to the various municipal bodies/commissions/councils/boards in order to get their endorsement, and most importantly, to transfer a threshold EE consciousness. Success with bureaucrats was definitely variable. It emphasizes how difficult it is to modify attitudes. Commitment by public utility companies, regional park districts, private industry and businesses are secured much more rapidly in terms of understanding and concrete help.

This broad range of assistance and attitude exists in every school district. My suggestion is to sniff out those who will most likely get turned on and involve them if possible; as for the antagonists and destructive critics who seem permanently encrusted in their non-environmental positions, deflect them from any on-site activity by getting them so turned off that they ultimately assume a more passive, innocuous role. As a matter of fact, we met this challenge so successfully that these forces absolved themselves from any responsibility for the project. I point this out in special reference to the earlier phases of physical changes in the yard when it is naturally "very messy." Tactical armament is essential in these periods of negotiation. I hasten to add that there is no cut-off point – further changes bring more frustration to go with the pleasures. We continue to hope that as people realize what really is taking place they might change their orientation and become benefactors of the project.

Yard Fests

Weekend school community affairs that encompass a great diversity of senses and interactions are extremely useful as harbingers of the conceptual and operational dimensions of the project. Project WEY has used these periodic festive gatherings for recycling feedback, engaging in a shared use of the yard facility, and for a communal atmosphere of stewardship and celebration. From information and recruitment booths, ethnic food potluck preparations on the yard site, student and faculty jazz groups, adventure play components, habitat construction for plants and animals to just plain dialogue . . . all generate a kind of group energy EE projects need. Unexpected spinoffs of a creative nature always happen and these should be documented as possible new catalysts and as part of the journal of the yard ecosystem. Different themes have been used from fest to fest as they correlate with needs of the time, but environmental values are consistently a part of the rationale.

Curriculum Aspects

Concomitant to the developmental

strands of the project, there has been a growing curriculum in direct response to the ongoing construction/promotion activities. Our curriculum orientations have been guided by the following traits: whole earth, interdisciplinary, problem-oriented, process-oriented, ecological, action-oriented, values-oriented and current/future oriented. These curricular themes have helped us to organize concepts and strategies in our systemic patterns of indoor/outdoor curriculum involving open and closed approaches and autonomous and instructed learning.

Curriculum "packages," as outstanding as many of them are, cannot bring about changes without adequate teacher preparation. Although the staff has served as curriculum reform/development teachers and trainers in a number of the "alphabet" programs, and this has been a bonus for precipitating EE, there existed a need for the holistic perspective of the curriculum. I conducted a number of staff development courses for two years with a heavy focus on connections, systems, and the welding of outdoor/indoor environments, hoping to turn on a few very strongly environmentally inclined people along the way.

This core of teachers has continued to explore and refine their EE work. Among grants we have received that deal with yard resource development, some have been concentrated on curriculum *per se*. The latter evolved into Environmental Learning Stations (ELS) which are flexible systems integrating a diversity of instructional components, and includes some management subsystems. ELS's have a spectrum of foci with interdisciplinary constructs and resources. They are indoor/outdoor and vary in size and complexity, endowed with natural/man-made materials. Teachers and/or children can create their own ELS's with a wide degree of permanence. All of the aforementioned curriculum pathways are included. A particular emphasis has been given to the potential of enhancing basic skills, recognizing the heavy pressures on achievement in reading, math and language skills and the attendant accountabilities by all staff members. This point is related to the expectations of funding of skill-oriented programs. ELS's simply incorporate them into their total purview.

Specifically, our first generation of ELS systems brought some familiar sounding themes dealing with land use and city planning, use of metric system in environmental comparisons, micro-habitats, food resources and planning, organisms, etc. One of the most successful ongoing networks of curriculum subsystems is the urban garden project which connects an environmental classroom with the environmental yard by

dozens of interdisciplinary strands. It is a longitudinal model which the current 7 and 8 year old children began with as kindergarteners. Their collective environmental impact as human environments with a growing (but already quite high level of refinement) consciousness is remarkably manifested in their stewardship, linking of chains of learnings from school to home, and their natural ease of adapting to a variety of space/people/time/objects networks. They have constructed composting storage areas (a three compartment version) in the yard to which they supply materials from home kitchen waste and school cafeteria waste, leaves and grass clippings from the City Parks Department, and droppings from rabbits they raise and maintain in hutches in the classroom. They measure the growth of rabbits per food and water ration weight, body weight and excremental weight; temperatures of compost layers are measured and recorded.

The compost is turned by teams of children and used for nurturing the soil outdoors in preparation for the cultivation of seedlings of various plant crops propagated in indoor greenhouse shelters in classrooms. The economics of harvesting and preparing the crops for consumption is investigated to compare service expenses of commercial crops at supermarkets with the energy/time output children give in labor at school. The last part of the cycle deals with recycling the remaining crops and weeds to the rabbits thereby completing the cycle.

As a graphic feedback system on their conceptualizations, the children painted a portrayal of the complete urban garden ecosystem with all its subcycles and components on a wall in the yard adjacent to the compost/garden tract. It also serves as a teaching/learning device for new consumers.

Other major biotic components which have replaced asphalt and revived the substratum in the yard provide an ongoing pattern of discoveries and connections daily and seasonally. These include two ponds, riparian borders, a small meadow, a threshold marshland, coast redwood grove, moist woodland strip, and a chaparral habitat with sclerophyll vegetation—an area designated as a water conservation plot by the local water utility company which has donated water meters to provide a comparative study of water requirements and consumption of varying mini-natural communities.

Numerous other activities deal with the anthropology of plant/man interfaces, variations in wildlife habitats during the day and evening hours and with other climatic changes; using the yard as an overnight camping area (small as

it is), bringing families and school people together in yet another set of rich, stimulating circumstances. A trip and campout on an environmental yard in the middle of the city also reduces gas/oil/human energy consumption. These on-site activities extend via field trips into the other subsystems of our environment . . . transportation, communications media, agricultural, industrial and natural subsystems, which are all tied back into the nerve center of the school yard.

Epilogue

Human rights have become an important societal issue and children's rights have melded into the mainstream of the movement. Since no human being, child or adult, is exempt from the responsibilities of maintaining our planet for survival, I recommend that freeing the urban child from the incarceration imposed by the typically dehumanizing nature of urban school yards is at least one urgent project that requires citizen action. Political action to support the resurrection of these public child environments will give environmental education a vehicle to run with in every school community. Start with a few, and perhaps the rippling effect will make a difference for the total ecosystem. Ontogeny recapitulates phylogeny? What about environmental yards?

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ANSS *Summer Urban Institute*



Helen Ross Russell taught a fantastic course in urban environmental education. Assisted by ANSS members Miriam Dickey, Harry Betros and Marshal Case, Helen managed a very diverse group of students. Cities represented included New York City, Chicago, East Lansing, Boston, Bridgeport and New Haven (Conn.) and Englewood (N.J.).

One vacant lot in the inner city produced a list of more than 50 species of plants during an afternoon of exploration. Insects were so plentiful that time did not allow a thorough study on the same afternoon. Students quickly learned that "nothing grows in the city" is a statement made by people who may have looked at but have never observed the great variety of life in the inner city.

Helen Russell has a deep well of knowledge that will never run dry. If you feel your grasp of the natural sciences is good, go on a field trip with Helen Russell. I guarantee you will be spellbound. Thanks, Helen!

MTC



(Photos by Marshall T. Case)



Coordinating Science and Other Subjects

HELEN ROSS RUSSELL

In 1968 when concerned citizens were fighting to save Jamaica Bay from draining, dumping and development as an extension of New York City's Kennedy Airport the only statistics available were from marine studies made under the direction of Maxwell Cohen at Far Rockaway High School. Those statistics presented by Mr. Cohen and his students were tremendously important in turning the tide so that the area was finally set aside in 1972 as a part of Gateway National Recreation area and Gateway National Wildlife Refuge.

At about the same time students at the Thomas School in Rowayton, Connecticut, discovered that the marshland that they were using as an outdoor laboratory under the direction of American Nature Study Society member, Joy Lee, was soon to be filled unless a bill then in the legislature could be passed. Since the Save the Marshlands committee had been trying to have this kind of legislation passed for ten years the outlook was not hopeful; but Mrs. Lee and her students rolled up their sleeves and went to work. They formed a club called PYE - Protect Your Environment, sold PYE buttons to raise money, collected signatures on petitions, enlisted the interest and help of other schools all over the state, cooperated with adult groups, attended legislative hearings, and finally saw "their bill" passed. After that they turned their attention to seeing that the law was enforced since the first reaction of would-be developers was to ignore the legislation and to go ahead with plans.

In each of these instances a science unit started by an enthusiastic teacher so caught the imagination of students that they became deeply involved. In each instance the project went far beyond the laboratory. To a large extent the resource people who provided additional guidance and knowledge in fighting legal-political battles were persons outside the school.

Sometimes the development of an inter-disciplinary unit involves two or more teachers within a school. Last fall Frances Lamey Ludwig, a new ANSS member, started a science unit on food and nutrition with her eighth graders in Lexington (Massachusetts) High School. At the same time the social studies teacher was dealing with the topic of world hunger. Obviously, combining their efforts was going to make both classes more meaningful. Together they sponsored Hunger Day and culminated it with a hunger banquet.

The idea of a hunger banquet originated in California under Jerry Conway. After 24 hours of fasting students were taken to the gym for a "banquet." The first person in line received a plate heaped with rice and chicken and gravy. The second person received only rice. The third an empty plate. Each group of three went through this pattern. It is not hard to imagine the protests of the second and third "banqueter," as they were told to "move along," "sorry that's how it is," "there's none for you." Nor the dramatic realization of what the world food picture is like for all concerned.

These three projects were unusual experience for they provided the learners (students and teachers) with a feeling of worth and accomplishment. They also provided a base for future activities: The Thomas School moved into the area of law enforcement and administration; at Lexington students are

conducting a questionnaire at the cafeteria on food habits and attitudes and spearheading a school project of dessert-less Wednesdays (on an individual basis) to raise \$300 for the CARE food program.

These are obvious exciting gains but of equal importance is a new feel for science itself.

Humans have always looked on science with a kind of awe. From the days of witch doctors, medicine men and prophets to E-MC² science has been a thing apart, something too sacred or much too difficult for "the average person." Even today many teachers shy away from teaching it; kids often think of it as a magical thing where you put two chemicals together and get an explosion or at least a lot of foam and a color change; and laymen look on it as a magical solution or a wicked force. Yet science, by definition, is simply the accumulation of knowledge about the Universe and our techniques for discovering this knowledge.

What happens with that knowledge is the responsibility of citizens. Increasingly we realize that change occurs through political action, and through presentations of the mass media. People who care need to know techniques of communication, and they need to know facts.

The best trained ecologists have an inter-disciplinary education in the many branches of science and in mathematics. If they are going to be effective agents of change they also need a background in economics, sociology and psychology, and some college and university programs are stressing this kind of preparation. Since we are aware that every citizen should be an ecologist at heart the questions are how do we structure this kind of education? What topics lend themselves to this?

Structuring Interdisciplinary or Multidisciplinary Projects

Elementary teachers in self-contained classrooms have the opportunity to carry on many multi-disciplinary activities. Units often involve reading, social studies, current events, language arts and art, and sometimes mathematics, science and music.

Actually the limiting factor in elementary school is often the teacher's lack of scientific knowledge.

Pre-service and in-service courses can be extremely helpful in training teachers to obtain and use much of the available material. A school library file or a file in a teacher's room can be a tremendous asset. A file of resource persons and potential field trips can do a great deal to assist teachers. This file should contain names, distances, strong points, problems, age range, cost, etc. Teachers using the resource should add specific comments so that the information is as inclusive, up-to-date, and meaningful as possible.

Secondary school multidisciplinary programs generally involve several teachers, or are carried on outside of school hours once the initial research is done in the science class.

Sometimes we are so protective of our territory or our prestige that we are reluctant to share honors. I recently lis-

tened to a young man in the audience of a conference where developing programs to attack urban problems was being discussed say, "We have a really good science program but social studies don't do anything. I think that it is disgraceful with all the social and financial aspects that *they* ignore all these topics. *They* have plenty of material to turn to but *they* just don't care. What can you do about *them*?" And as I listened I wondered how much effort had been put into making "we" and "them" into "us." Sometimes we enjoy being the good guy and we aren't too anxious to share honors.

Perhaps the first step is reaching out. Sitting down in the cafeteria with one or more of "them" and breaking down barriers, even asking for advice. Once the concept of team work takes hold there's real enjoyment from sharing headaches as well as ideas and successes.

Scheduling may present problems in secondary school but again if two or more teachers are working together they can often come up with imaginative solutions and, of course, if they can hook their administrator no problems are unsurmountable.

Maxwell Cohen is now principal of Beach Channel High School in Brooklyn. This school with the ocean in its front yard collects all its biological specimens from the sea, has electives in marine biology and ecology, takes apart and repairs boats in shop classes, studies marine laws, finds a lot of reading and writing to do in this area for English and Social Studies, along with studies of current marine problems like pollution, depletion, international relationships.

It is the High School for students in the city of New York who have an interest in the ocean.

If they are going to be fishermen they will be far ahead; if they are going to college to specialize in marine biology they will have an excellent background. If they just become interested hobbyists they will bring to the polls and to their community vital knowledge of the many relationships which must be understood for wise decision making.

Not many schools have the ocean in their front yard but there are equally many topics that can be approached from many angles.

Some Ideas for Multidisciplinary Studies

1. Current events on world hunger — food and vitamin testing — study of own food habits — role of nitrogen-fixing bacteria and proteins — plant studies — gardening — raising money for self-help programs.
2. Population — population explosions of pigeons, rats, sparrows, starlings. Role of predator and parasite in animal populations. Role of available food and shelter in city animals — human populations — removal of checks and balances — geometric progression.
3. Solid Waste — Many schools have had experience with cleaning up an area only to have it a mess within days. Why is the area a mess? Does it need litter containers? Does this involve letter writing, visiting city hall, petitioning? Is an educational program needed? Many block associations have created islands of beauty in the inner city.
4. Some schools have sponsored vest pocket parks. What kind of a community study do you need to include in your petition for the land? How do you approach your local government? What about the rocks, the soil, the drainage? Mapping and surveying? Planning for uses appropriate to the users and the site. Letters. Murals.
5. If you have a vest pocket park or a school outdoor labora-

tory, can science and English classes cooperate in developing self guiding tours or writing an informative booklet?

6. A High School at Wykeham Rise, Connecticut located next to an Indian site, has turned its attention to archeology under the direction of Edmund K. Swigart. As the class uncovers the various horizons they are reconstructing both the history and natural history of the area. This has led to a different kind of outdoor laboratory — as they plant areas of trees and other plants representing the periods they unearth. It also leads to a greater understanding of the interdependence of humans and their environment as they note the way the environment changed as a result of human habitation and the way humans responded to the changes that they caused and the ones that were natural succession.
7. Actually any Indian study can bring together aspects of history and natural history, art, drama, and English.
8. And what of the history/natural history relationships of the city or community you live in?
9. Energy — Certainly there is no better place to develop an understanding of energy and matter than in science classes. Applying that knowledge to city problems like mass transportation, highways, streets, etc. again may involve cooperation with courses in civics, urban ecology, mathematics and law.
10. The Parks Committee of The Bronx Council for Environmental Quality under the leadership of Florence Gallagher, has invited all students to participate in "Discover a Park" — studying a city park (preferably near at hand) and submitting a report including description, history, use and recommendations for improvement. The committee suggests that studies could include — biology, geology, history, mathematics, photography, mapping, horticulture, reporting, creative writing, poetry, and music. Cash prizes are being offered to the three schools submitting the best studies AND even more important, recommendations for improvement will become the focus of Bronx Council for Environmental Quality work with the City Department of Parks in 1975-76. Students will be invited to participate in the presentation of ideas to the Department of Parks and to work for their implementation.

Some Sources of Material

Use your school ground as a starting place for moving science out of the laboratory (or moving the environment into the laboratory).

Read Mark Terry's, *Teaching for Survival*, Ballantine Books, Inc. 1971.

Write to your state department of natural resources, or conservation or the environment and ask for their list of free and inexpensive publications. Write to your State University for their list.

Subscribe to Eco-News, a Young People's Environmental Newsletter, 235 E. 49th St., New York, N. Y. 10017.

In New Jersey (multidisciplinary) curriculum based resource materials have been prepared by the New Jersey State Council for Environmental Education under the direction of ANSS member Edward Ambry. These materials are read out by a computer after it has been fed the necessary information on goals of the unit, age of students, subjects involved, etc. Other states are looking into using these materials.

National Environmental Education Planning Conference Scheduled

A coalition of conservation groups representing the environmental education interests of 28 private associations and 26 state governmental agencies planned a national conference to identify problems and concerns in the environmental education field and to develop action alternatives for solving them. Drawing on a wide variety of agencies and individuals, a series of pre-conference studies was developed on general and specific concerns in the field. These studies formed the basis for a national status report with action recommendations to be developed at a conference held July 7-10 in Denver.

The project was sponsored by the Alliance for Environmental Education and the Western Regional Environmental Education Council. The Alliance is a national consortium of 28 private conservation associations including the National Wildlife Federation, League of Women Voters, the American Nature Study Society, National Audubon Society, and National Education Association. WREEC represents state education and resource management agencies from 13 western states. Additional support was provided by the Weyerhaeuser Foundation, U.S. Office of Education, U.S. Chamber of Commerce, Minnesota Environmental Sciences Foundation, American Association for the Advancement of Science, and others. Rudolph J. H. Schafer, a member of the Alliance Board of Directors and Chairman of WREEC, will serve as general chairman.

The widest possible input from people active in various phases of the environmental education movement was sought in developing a report which details the present status of programs and activities throughout the nation (what is) and recommends goals and objectives toward which we should be working (what ought to be). These findings and recommendations cover the concerns of a number of specific interest areas — the work of federal and state governmental agencies, state education agencies, business and industry, private conservation associations, higher education, elementary and secondary education, and state plan organizations — as well as the major or overriding problems of the field. An attempt was made to prioritize the recommendations, and to suggest possible courses of

action for remedying the problems identified.

The resultant report will be widely distributed and publicized and will hopefully serve to provide direction for programs at all levels, pinpoint problem areas needing attention, and serve as a means of developing a strong base of public and professional support for the movement.

A three-day writing conference for approximately 50 invitees was held in Denver, Colorado during the second week of July, 1975 to produce the report.

Prior to that, input on the conference issues was sought from a wide variety of people and this information will be used to prepare position papers for use at the Denver conference.

The material produced at the conference will be assembled and edited, and a number of individuals and groups will be provided an opportunity to comment. The completed report will be printed and distributed, and an informational campaign for press and media conducted.

Honorary Life Memberships

STAN and DODIE MULAİK
A Couple of Creeps

This is the first time that the American Nature Study Society has honored a team but then there aren't many teams like Stan and Dodie around.

For our purposes 1931 was the big year. It was the year when Stanley and Dorothea were married. It was the year Stan completed the work on his master's degree at Cornell. It was the year they started their work with American Nature Study Society.

In 44 years that have contributed a great deal to the society as members, as participants at annual meetings, as officers. Stan was vice president in 1958-1959. Dodie has been the representative to the western division of the AAAS for many years. Both were active in organizing the western division of ANSS and the Utah Nature Study Society. Both have

held positions of leadership in these extensions of ANSS.

These contributions alone are worthy of note. But in addition, Stan has been editor of the *Nature Study Journal* from 1954 to 1974. During that time the Newsletter, which Malvina Trussell had developed from a couple of pages published at irregular intervals to a well organized quarterly, grew into the *Journal* that we know and enjoy today.

Dodie has been there, too, often unsung and unnoticed being a full time partner in Stan's endeavors, sometimes making contributions signed D. M.

And throughout this they have taught thousands of persons to CREEP and to teach others to CREEP.

In fact the concept of creeping has become a trade mark for this couple: who don't mind getting down on their hands and knees, who find the earth good, who recognize the importance of little things, who observe carefully and share joyfully.

Election Results Announced

Ruth W. Melvin of Carroll, Ohio is our new ANSS president. Outgoing president Helen Russell turned the gavel over to Mrs. Melvin at the annual meeting and luncheon hosted by The American Museum of Natural History.

Other officers are as follows:

President-Elect Richard J. Baldauf
Kansas City, Missouri
First Vice-President Richard L. James
Philadelphia, Pa.
Second Vice-Pres. Millard C. Davis
Cherry Hill, New Jersey
Secretary Jean Milmine
Savannah, Georgia
Treasurer Crayton Jackson
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John Hug, Ohio
John Mulhall, Mass.
Christian Nelson, California
Catherine Pessino, New York
Esther Railton, California
Michael Shannon, Ohio
Martha Sykes, Connecticut

Jeanne Bendick Receives Eva L. Gordon Award

At the annual meetings in New York City, the ANSS was honored to present the 1975 Eva L. Gordon award to Jeanne Bendick, author and illustrator, who has enriched the field of children's science literature by her gifted, diversified, imaginative, scholarly, prolific and entertaining writing.

A sampling of the titles of Mrs. Bendick's nearly 50 works — *Television Works Like This, Electronics For Young People, Shapes, Science Experiences, Observation, Why Things Change* — demonstrates the difficult subjects she has selected to present to children. The dog-eared condition of Bendick volumes on library shelves attests to her success in producing books children want to read.

Mrs. Bendick was especially commended for her capacity to simplify complex subjects without being simplistic; to write to children of all ages without writing down to them; and to inspire her readers to experience for themselves the excitement and joy of scientific discovery.

Learning and Teaching Environmental Science in The City Environment

The first summer institute conducted by the American Nature Study Society and co-sponsored by the Connecticut Audubon Society and University of Bridgeport will probably be completed by the time you read this news item. A special flier was mailed to all of you and we would like to thank The Wahlstrom Foundation of Bridgeport, Conn. for helping with the extra expenses associated with the course. Helen Ross Russell volunteered her time as project director and the course received excellent response from New York, New Jersey, and Connecticut. A follow-up article will review the course for you in the summer or fall issue of NATURE STUDY.

Environmental Synopsis

Students and staff in Cornell University's Environmental Education Program have launched a publication called *Environmental Synopsis*. Copies will be sent to selected faculty and administration on the Cornell campus, and to individuals in important positions in the State of New York and nation. Dick Fischer reports that "reader reaction has been quick and highly favorable, encouraging us to plan for its continuation and improvement." Inquiries should be addressed to: Environmental Education Program, 10 Stone Hall, Cornell University, Ithaca, New York 14853.

Nature Conservancy

During 1974 the Conservancy saved 304,829 acres, comprising 210 projects, in 37 states and the Virgin Islands. At the end of 1974, the total number of acres "saved" since the Conservancy began its active land preservation efforts two decades ago was 741,883. Of particular interest during the year were two record projects, almost a continent apart. Early in the year Sevilleta de la Joya, a 220,000-acre property — once a Spanish land grant — in Socorro County, New Mexico, was purchased for a fraction of its value. During the spring in South Carolina, along the state's Atlantic coast line, the Conservancy received a gift of 25,000 acres at the mouth of the Santee River. With an estimated value of \$20 million and containing one of the nation's oldest undisturbed rookeries, the gift was the most valuable in the Conservancy's history.

May Thielgaard Watts Receives Honorary Life Membership

Mrs. Watts could not attend the annual meeting in New York City to receive her honorary life membership in person and, as a result, the award was read to the membership attending the AAAS meetings with ANSS. Douglas Wade has since followed up with a special event in Illinois to honor Mrs. Watts in person. A more detailed report will be presented in the next issue of NATURE STUDY.

Welcome New Members

Loren Amason, Centralia, Ill.
James P. Andrews, La Canada, Calif.
Stephen F. Austin State Univ. Library,
Nacogdoches, Texas
Baker School Library, Brookline, Mass.
William H. Baltzell, Sacramento, Calif.
Roger W. Barbour, Lexington, Ky.
Maureen Bartel, North Olmsted, Ohio
Nelson T. Bernard, Albuquerque,
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