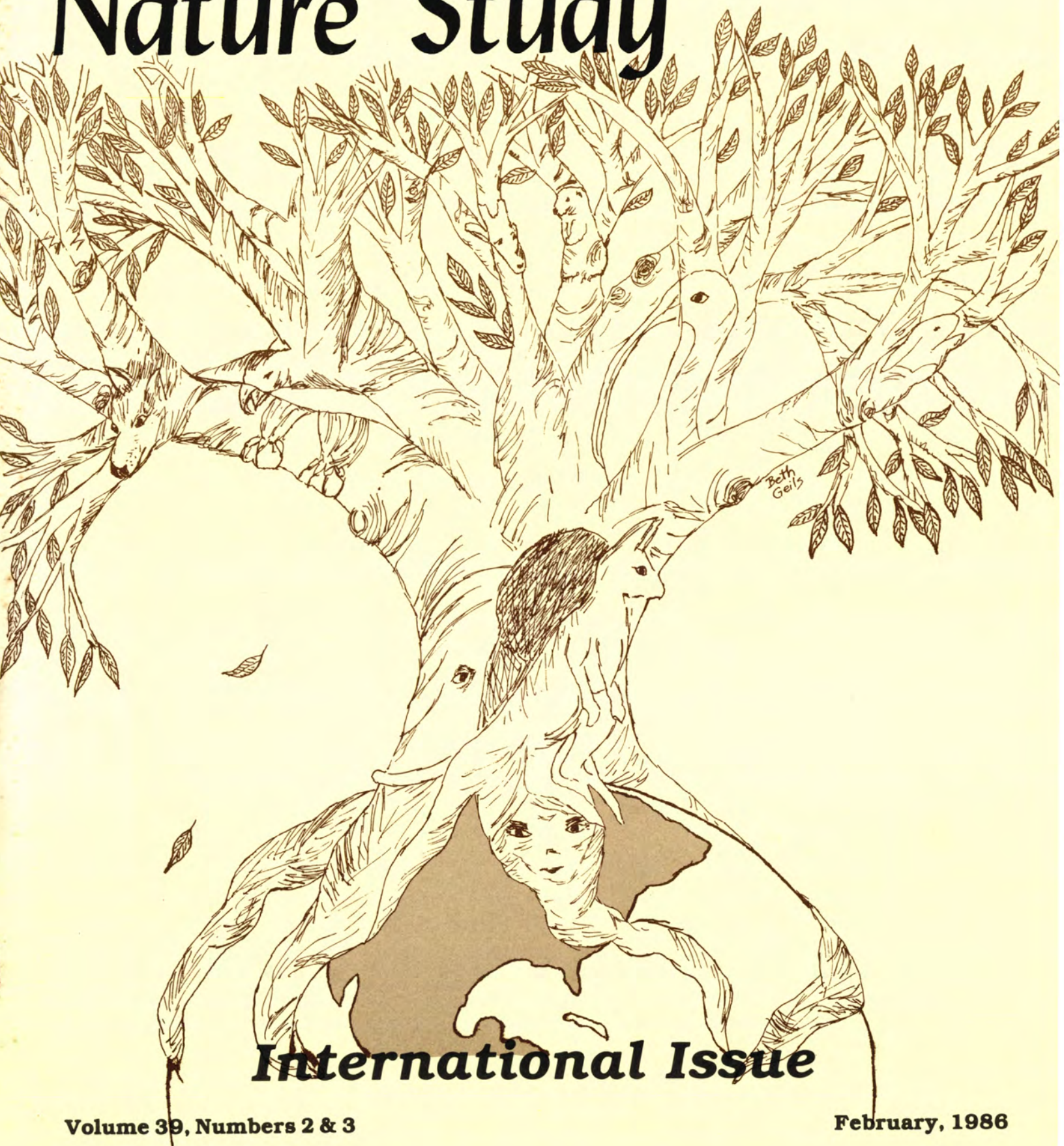


Nature Study



International Issue

Volume 39, Numbers 2 & 3

February, 1986

A JOURNAL OF ENVIRONMENTAL EDUCATION AND INTERPRETATION

Planet Earth—One World of Shared Air and Water

Introducing this international issue of *Nature Study*.

It is less than four decades since the DDT that washed from North American fields was discovered in the bodies of the shrimp-eating penquins of Antarctica; while high concentrations of strontium 90 were found in the bones of Eskimos and Lapps who ate caribou which ate lichens which had taken up wind-borne radioactive substances. Since then we have watched acid rain destroy human structures and plant and animal habitats; seen carbon dioxide levels go up at an alarming rate worldwide, and worried about the decrease in oxygen-producing plants when tropical rain forests were cut down to make way for farms as undeveloped countries struggled to give their citizens a better economic base.

We have come to realize that regardless of natural resources, language, ideologies, and political divisions, we are one world; and survival for all of us is dependent on living in harmony with the natural environment.

Increasingly international organizations are springing up to unite people in the battle for a healthy planet. Some of these programs are reported in this Journal. Others include:

IOSTE - The International Organization for Science and Technology Education is comprised of individuals with the common aim of advancing education in science and technology and developing an awareness of the interrelations of these topics to society and the quality of life. They will hold their fourth international symposium in Kiel in August 1987. Inquiries should be directed to Dr. Kurt Riguarts, Professor, Institut für die Pädagogik der Naturwissenschaften, D-2300 Kiel 1, Oishausenstr. 40-60, Federal Republic of Germany.

ANSS member Richard Pough has been active in

the World Wildlife Fund. Information on this program is available from: 1225 Twenty-third St. N.W., Washington D.C. 20037.

One project funded by the World Wildlife Fund has been the U.S./Canada Seabird project conducted by the Atlantic Center for the Environment by ANSS president Kathleen Blanchard with her husband and other co-workers. (See *Nature Study*, Vol 36 Number 3 and 4)

Conferences - research - education - publications: all are important. *Ceres* is a magazine published six times a year in English, French, Spanish, and Arabic by FAO (Food and Agriculture Organization of the United Nations). Each issue focuses on a specific aspect of agriculture and development and is written by internationally respected agronomists and economists. Information on this publication is available in sales centers in 58 countries. The U.S. address is UNIPUB, P.O. Box 1222 Ann Arbor, MI 48106. The cost is \$15 a year.

An International Symposium on Ecology and Management of Wetlands will be held June 16 to 20, 1986 in Charleston, S.C. Anyone interested in setting up an exhibit, participating in, or attending, the symposium should contact: Donal D. Hook, %Department of Forestry, SE Forest Experiment Station, 2730 Savannah Hwy., Charleston, S.C. 29407. Phone (803) 669-5203.

Four themes will be explored:

1. The Resource, 2. Wetlands Ecology, 3. Use and Management, 4. Values. Topics will include biology, ecology, forestry, agriculture, soils hydrology, geology, timber production, farming, watershed management, natural areas protection, and wildlife management.

H.R.R.

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ABOUT THE COVER: Yggarasil, a tree in Norse mythology, held the earth in its roots and represented the Universe. The tree grew from the earth and held the life of the earth within its branches.

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Good Reading...

Star Gazing, Comet Tracking, & Sky Mapping by Mervin Berger, G.P. Putnam and Sons, NYC, 1985, \$7.99.

For the amateur star-gazer, Melvin Berger has presented a most informative description of the location of the stars in their various constellations. His month by month outlines of the stars' visibility in the sky are fascinating, informative and easily understandable. The charts and individual illustrations would be most helpful to the novice astronomer, and Berger's skillful

blending of Greek mythology adds much interest to the book.

The author makes comet tracking sound like an interesting hobby. His descriptions of Halley's comet and his careful outline with suggestions for a layman's viewing make this book particularly valuable at this time. "Falling stars" will take on new meaning too, as you read about these heavenly bodies that invade our atmosphere. Your observations may be of value to astronomers, and Berger explains how this help may be given.

The interesting activities outlined in Chapter 3 will enable the reader to do such things as making his own sky maps, counting stars, measuring the sun, and telling time by the stars.

I would recommend this book to young would-be astronomers and to older beginners. It is an excellent introduction for anyone. It would be useful in elementary libraries, science classrooms and nature centers.

Dorothy Yeager

Environmental Education, the Norwegian Way

Anne Martinsen

The use of resident environmental field centers has become an established pattern in Norwegian education. Today, there are approximately ninety resident centers throughout Norway. They are located in a variety of environments throughout the country. Some are located in the eastern mountain region. Thus far, there are no urban environmental centers in the country. Most Norwegian field centers are relatively small, serving a student population of between thirty and forty each week. The students do remain for an entire week. Before a center may go into operation, approval is required by the County School Board. When the center receives approval, the teachers at the center are hired by the township and their salaries are paid by the Norwegian government.

Therefore, field centers become an integral part of the official school program in Norway and are obliged to carry out the goals of education as established by the Ministry. In some cases, however, the buildings may be privately owned and leased and the support staff, such as kitchen personnel, may be under contract with the county school system.

Environmental Education in Norway is not taught as a separate subject, but rather, serves as a fundamental base included in most areas of the curriculum. It becomes a method of focus within the educational system. Environmental Education is, by this, an important part of total education, whether it takes place in the classroom, on the school



Social studies at the old cemetery in Norway.

grounds, in the home community, or at the field center. It is an approach dealing with the total educational experience.

You may ask, why are resident field centers needed in Norway? What role do they play in Environmental Education? The purpose is clear. According to the national teaching plan, the overall perspective is to teach the students about a new and different environment and, in addition, to instill the social values of living and learning together. The plan says, "The chosen field center should be located in an environment different from the student's home area." The purpose of this stay is learning about this environment and experiencing this together with other students in a total interaction for several days. Three nights are suggested as the minimum period of time for a resident experience.

Two things make the centers very important in Norwegian Environmental Education:

1. The focus on providing a totally different environment for the students.
2. The living together situation.

Norway is sparsely populated with wide changes occurring geographically and socially within short distances. Economically, there are not as many differences between the people and regions. However, ways of living, today and in the past, can be of significance even to students in the lower grades.

Environmental Education touches questions of political and social areas. There is a clear connection between environmental knowledge and the political development in regions and countries. Therefore, it is necessary to develop attitudes concerning social and political behavior among the students.



An all day hike - Environmental Education is for all. There are no limits at residential centers in Norway.



Attending the service in the old church in use 1100-1590 A.D.



Tracking the old way.

Here, the resident field centers are playing an important role. They help to make students aware of attitudes and the struggle for survival. Some basic questions are raised for the students to consider. Is this area which we study suitable for people to live, or, may it be used for a better purpose?

The setting for the education is completely different in the center from the home. By living, eating and working together, the students are becoming aware of democratic ways of solving problems. Through cooperation, they see values and attitudes from different angles. They are getting an understanding for the relationship between people, both socially and ecologically. In the field center, Environmental Education is not only the content of the educational program, but Environmental Education here becomes the total living situation, the working methods, the socializing process, and the textbooks used. Resident field centers strengthen the effects of the education through group socialization.

Several of the Norwegian field centers are operated specifically for the purpose of integrating physically and mentally retarded students with the ordinary

groups. In fact, the government only covers salaries for the teachers of the field centers that are designed to welcome all kinds of students.

In Norway, we feel that it is important to make the students realize that towns, counties, countries, and all kinds of environments depend upon an interaction, as people must depend upon each other. The integration of handicapped and non-handicapped students gives an excellent opportunity to become aware of the fact that we all are handicapped in one way or another and we all are dependent upon each other.

The importance of resident field centers is becoming clear to the educational profession. Teaching methods used in the centers are frequently used by all teachers. Environmental Education is not only integrated into the content of the curriculum but it is also making changes in the methods used.

Environmental Education is even more encouraged with the new national teaching plan that will come into use in 1986. The effects of the resident field center's role in Environmental Education will be strengthened with this new plan.

The living together situation is a unique link in our school system and is valuable for all students. Living together, the students not only learn how a small community works, they experience the community as a part of the environment around them. An understanding for local needs and problems is increased, and the understanding of larger environments with their needs and problems also is strengthened. It is easier for the students to see why and how conflicts arise between different areas and how we, as individuals, can take part in the solutions to these problems. Problem solving in the local community may be a model for problem solving in the bigger environments in Norway and the world.



Anne Martinsen is a teacher at the Haalandsdalen Environmental Education Center. She also served as a resident Teaching Fellow at the Montclair State College, New Jersey School of Conservation, 1980-81. She is currently serving as a member of the Board of the Norwegian Outdoor/Environmental Education Organization, and has represented her country at several international meetings.

Saving the World's Crocodiles



Hatchlings of three endangered crocodilian species (left to right): the Chinese alligator **Alligator sinensis**, the Siamese crocodile **Crocodylus siamensis** and the Cuban crocodile **Crocodylus rhombifer**. (NEW YORK ZOOLOGICAL SOCIETY PHOTO)

Myrna E. Watanabe

Of the 22 species of crocodilians listed in the *Red Data Book*, of the International Union of Conservation and Natural Resources, (IUCN) 12 are endangered. One, the Orinoco crocodile, *Crocodylus intermedius*, native to Venezuela and eastern Colombia, was included in IUCN's list of the 12 most endangered animals this year. The Chinese alligator, *Alligator sinensis*, the closest relative of the American alligator, whose range is limited to a small area in the eastern portion of the Yangzi River basin, was a close runnerup for the most endangered list.

Thus, the work of the IUCN Species Survival Commission's Crocodile Specialist Group (CSG) is most urgent. The group, which is one of more than 25 Specialist Groups created as part of IUCN's Species Survival Commission, has 30 members worldwide and more than 200 consultants and correspondents.

According to Dr. F. Wayne King of the Florida State Museum, the CSG's Chairman, the CSG's primary function is to provide apolitical advice to governments

and international organizations, such as The Convention on International Trade in Endangered Species (CITES). This advice aids in formulation and implementation of laws regulating commercial and noncommercial hunting, rearing and trade in crocodilians and their products. This advice is based on research data provided by group members and other scientists in the field. A secondary function of the group is to provide a communications channel for researchers, many of whom work in remote areas of undeveloped or developing countries. To this end, the CSG circulates a newsletter in which scientists may exchange information about their work or even ask others for assistance.

The CSG's advisory function impacts crocodilians in a number of ways. In 1984, the CSG debated the issues concerning a proposed hunt of the endemic common caiman, *Caiman crocodilus crocodilus*, in Venezuela. The suggestions proffered by the CSG allowed the skins of the caiman, a non-endangered but vulnerable species, to appear on the international market. After

excessive numbers of animals were taken this year, vigilant CSG representation within Venezuela forced the government to suspend future hunts.

Research projects are being carried out by CSG members around the world. For example, CSG members in India are studying the reproductive biology of the rare gharial, *Gavialis gangeticus*. Their work, which has allowed them to record reproductive behaviors never before seen by scientists, was recently featured on a program broadcast by PBS. The CSG, along with the World Wildlife Fund, the U.S. Fish and Wildlife Service and representatives of the hide tanning industry, are supporting a study to determine the status of the four commercially utilized species found in central South America. This study is extremely urgent as several of these species, including the black caiman, *Melanosuchus niger*, and the broad-snouted caiman, *Caiman latirostris*, face extinction due to illegal exploitation.

Chinese CSG scientists are breeding the Chinese alligator,

Continued on page 11...

Report from Beyond the Mississippi

Nancy Franz



Naturespace – Having Fun Learning About Nature

PHOTOS BY NANCY FRANZ

If you wanted to learn about insects, which would be more exciting: identifying specimens that are preserved in jars, or going to a place where a type of insect lives, watching it closely and learning what it likes to eat, where it lives, how it reacts to other living things and to the environment? Youth Development faculty in Wisconsin believe you would learn more and have more fun if you tried the second way, and that's why NATURESPACE was started.

NATURESPACE is the new 4-H approach to environmental education. It's a program designed to combine fun in the outdoors while learning about important interactions in the natural world. The project is planned to allow participants to

see nature on the whole rather than separating it into small pieces.

The NATURESPACE idea has people select a spot of land such as a backyard, a city park, a fencerow or any other outdoor place. Participants in NATURESPACE may study all the elements in their spot of land or just one aspect such as wild flowers and how they relate to the space. Through this process, skills are gained in problem solving, decision making and responsibility. The environmental education concepts of conservation, preservation, adaptation and many others are also learned.

Designed in Wisconsin, the program has proven so popular

that it is now used regionally as a resource by 4-H and non-4-H groups. University of Wisconsin Cooperative Extension Service subject matter specialists in the natural sciences and 4-H faculty have provided expertise in putting together, piloting and revising the NATURESPACE program.

Basic leader-member-family guides are designed with lesson plans, "what and how to do it" suggestions, and supplemental information to make teaching and learning simple and fun. The guide is based on a NATURESPACE "road to success." The road involves organizing a group, planning a year of project work, inventorying the NATURESPACE, selecting activities for study and fun, encouraging good record keeping,



Adults contribute time and talent to the Wisconsin 4H Naturespace Program.

The University of Wisconsin conducts educational trips for youth on the L.L. Smith, Jr.

identifying and using project resources, sharing what's been learned, and reviewing, finalizing, and getting ideas for the future. NATURESPACE leaders find that people do best in the program if the road includes action in activities, interaction with people, things and ideas, involvement in setting goals, carrying out activities and evaluating efforts and help for participants in applying their experiences to their daily lives. All the NATURESPACE activities are appropriate for individuals, families and groups.

Learning activities in forestry, insects, birds, fishing, wildlife, ecology, wild flowers, astronomy and outdoor adventures revolve around four important concepts -- ecosystems, population, habitat and people-effect.

For example, youth interested in fishing might adopt a stretch of river or a lake as their NATURESPACE. To begin the study they might learn about fishing techniques, but the program will teach them much more than how to use a rod and reel, or which bait works best to hook a muskie. They will learn the proper method of filleting their catch, as well as mouth-watering ways to prepare it. From dissecting a fish, they will find out more about its diet. Chances are the participants will collect mud samples from the river bottom to examine the "creepy crawly" living links of an aquatic food chain. They will study the changes that different seasons bring. Before they're finished, they will stretch their observation skills to seek out visible signs of human influence -- litter, access points for boats, and fences constructed to keep livestock from damaging the shoreline.

A shoreline project also comes somewhere in the NATURESPACE project. These fishing participants might decide



to pick up trash near the water, or undertake a public relations campaign to promote shoreline preservation with guidance from the Department of Natural Resources.

Youth are not the only ones getting excited about NATURESPACE. Adult youth leaders and educators have taken advantage of a number of opportunities to improve their environmental education knowledge. For Wisconsin participants this has included fishing, forestry, outdoor adventure and basic ecology workshops at a variety of camps and nature centers. Adults have traveled hundreds of miles to attend these leader-training activities and 4-H agents throughout the state report that most of these people have returned home very enthusiastic.

One indepth NATURESPACE enrichment opportunity is the Superior Experience. This week-long camp teaches older youth and adults subject matter in aquatic and Lake Superior ecology, terrestrial ecology, outdoor cooking, and camping. Participants also learn how to improve their leadership and outdoor leisure skills. University faculty and natural science educators base their instruction

for this camp on the NATURESPACE concepts and framework. The high point of the camp session has been a three hour trip aboard a university research vessel studying the Lake Superior eco-system. One participant writes, "There are so many things I've learned about the Superior Region. I can't begin to tell you how worthwhile I think this experience was."

The NATURESPACE logo is a pine tree behind a wide-eyed owl in flight. It symbolizes a dynamic program aimed at encouraging an awareness of environmental concepts while fostering other attributes -- career awareness, personal resource management, life-long learning, and citizenship.

Youth will need all of these skills in their future years as they give leadership to the use and preservation of our natural resources. The NATURESPACE program hopes to help them do just that.



For more information on the NATURESPACE program contact Nancy Franz, 4-H and Youth Agent, University of Wisconsin-Extension, 203 Courthouse, Superior, Wi. 54880 or call 715/394-0363.

Nancy Franz has volunteered to write a regular report for NATURE STUDY on activities in the West. If you live west of the Mississippi and east of the Rockies, and have a program you would like to share with readers, please contact her.

Society for the Protection of Nature in Israel

Yoaz Sagi and Joe Shadur

From modest beginnings in the 1960's, a network of 25 Field Study Centers (FSC's) serving over 400,000 youth and adults each year has been developed by The Society for the Protection of Nature in Israel (SPNI). Located throughout Israel, these FSC's are unique in their combination of three different spheres of activity:

1. Education to impart understanding and to foster love of nature and the landscapes;
2. Nature conservation and environmental quality;
3. Research and data gathering.

The centers which operate as autonomous units within the SPNI generally provide on-campus accommodations and classrooms, lecture and laboratory facilities for 120 to 250 people, youngsters or adults, who come for periods of one day to one week to learn about the natural and historical attributes of the region.

Each center focuses on its immediate geographical area. This attachment to the particular region surrounding the center underlies all the work of the FSC's. Staff members live at the FSC or nearby. Their intimacy with, and knowledge of, their surroundings contribute greatly to implementing the education, conservation and research goals of the SPNI.

FSC's focus primarily on education; e.i., imparting the field knowledge of a region to a very broad spectrum of youth and adults. Most of the work involves guiding youth:

- School classes, elementary through high school, come to FSC's for day outings or study camps of up to six days. Almost every pupil in the Israeli school

system spends at least one week every year at a different FSC. Thus during their entire school career of 12 years, pupils become acquainted with all parts of the country;

- School outdoor clubs sponsored by the SPNI which meet on a regular basis to learn about their region and participate in nature conservation activities;
- Summer camps - day camps for local children plus hiking camps and special-topic camps (bird watching, archeology, nature photography, cave exploring, etc.), for youth from all over Israel.

Adults come to FSC's for day and overnight trips, hiking camps, special topic camps and family vacation camps offered to the public by the SPNI. Special interest groups also use FSC's for study camps which can provide a general orientation to an area from a variety of perspectives, or focus on a specific subject, such as botany, zoology, archeology or geology, in accordance with the level and interest of the group. Tourists and nature lovers from abroad also participate in the regular SPNI activities or in special programs set up for them, thus acquiring a deeper knowledge and appreciation of nature in Israel.

The educational activities of an FSC include work with diverse social elements, ranging from knowledgeable, highly motivated professional groups, such as university students and teachers' seminars, to problem youth from disadvantaged backgrounds. Each type of group requires special ways of relating and the development of appropriate working tools and techniques. Special nature tours have also

been devised for blind persons.

In general, learning takes place in the field during the day and by means of slide shows and lectures in the evening. Guiding may be combined with short practical tasks and learning games in the field, and in cleaning and caring for nature sites and trails. Depending on the group, participants may engage in directed, individualized learning and research projects.

All SPNI outings include at least some walking, depending on the interests and abilities of the group, this can vary from a few hours per day to difficult hikes for experienced trekkers.

Transportation can be entirely on foot, by public bus, by chartered vehicle or by private cars. Groups can bring and cook their own food in the FSC kitchen or order meals served by the FSC.

The main point is that learning about nature occurs as a function of the trip experience itself. To make this possible, the size of the group is usually limited to 25 persons per guide. FSC's also serve as information centers to advise and offer written material to the interested public about independent hiking in the region.

FSC's contribute considerably to nature conservation and environmental quality by creating consciousness and understanding of the subject. Each FSC, through its guiding, lends support to the work of the governmental nature and environmental protection bodies by instilling in the public an appreciation of nature and the need to protect it, and by following up on environmental

Continued on page 24. . .

From Rural Studies To Environmental Education in the United Kingdom

Ann Trotman
photos by Ann Trotman



In England in the early 1960s, when I started a new job in the rural studies department of the advisory service attached to the education section of Hertfordshire County Council, the term Environmental Education was unknown. In state education, we had a two-tier system in secondary schools at this time, and rural studies was offered to less able pupils in the secondary modern schools. Students were selected who would not be examination candidates and who were considered to particularly benefit from outdoor physical work, and contact with animals and plants. The grammar school pupils were tied to the examination syllabus, and the only contact they had with the world outside the classroom were the courses in field geography and ecology—still a relatively new aspect of biology—which their syllabus required. These were pioneered by the Council for the Promotion of Field Studies, a privately run body later to be known by the less cumbersome title of 'The Field Studies Council'.

In the sector or primary education, most schools did

varying amounts of nature study, according to their teachers' ability and inclination. When I was working in a teacher training college in the 1950s, it was known for students to be advised by their tutors to 'leave nature study alone', because it opened up too many questions they would not be able to answer. So much for the skills of investigation and enquiry which form such an important part of primary education today! (This was not the advice given in my college, I hasten to add!) When an Inspector was visiting my class of students, I arranged for them all to be out sampling in the village pond, and the enthusiasm created by newtlets, water boatmen and beetles almost swept the good lady off her feet. Teachers of rural studies in secondary modern schools felt isolated and discouraged by the low priority placed on their subject by educationists. They grouped together in county associations to try to share ideas and experiences, and discuss ways of improving the impact of rural studies, the value of which they were convinced extended to children of all ability levels. In 1960 some of these county

associations became affiliated to form a national group known as the National Rural Studies Association. Activities were planned to focus the attention of government and educationists nationwide, as well as the local education authorities, on the value of rural studies to the child's development, and to foster greater recognition to improve its status and establish it as a subject equal to more traditional disciplines in the curriculum.

By 1967 NRSA had embarked on a program of 27 activities to promote rural studies. NRSA carried out a national survey of facilities in secondary schools, and presented it to the Ministry of Education, and to the Newsom Committee, appointed by government to report on the present state of secondary education. It also carried out a survey of 3,000 primary schools, and prepared evidence for the place of rural studies and nature study in primary schools, and it conducted nation-wide discussions or Certificate of Secondary Education (CSE) schemes. NRSA administered an experimental examination with



Primary school children learn about farm animals as part of environmental education in Hertfordshire, England.

Department of Education and Science experts to test the validity of teacher assessment and practical tests, and with the aid of Reading and Oxford Universities, prepared the first Advanced Diploma of Education in Rural Studies at those universities.

Although rural studies was still the accepted title, the wind of change was beginning to blow across the subject matter included in its syllabus. The editorial of the NRSA Journal of 1967 had this to say to its readers, "We are all agreed that the pattern of the countryside is changing, slowly in some counties, rapidly in others, and even within each individual county. We ourselves must be prepared for this, and in our teaching of rural studies encourage our children to know and love the countryside, the plants and animals by firsthand observation of living things in their natural environment...there will be no excuse for anyone to say 'People will not safeguard that which they do not understand. They will not protect and treat kindly that which they do not appreciate.'"

Two important points glimmer in this statement. First, the word 'environment' is introduced, later



Feeding lambs builds a bond between youngsters and animals.

to become so prominent. Secondly, there is an awareness of caring and responsibility in the face of change, which was to become the hallmark of environmental education in later years.

Encouraged by these developments, and realising more fully the potential of their subject, rural studies teachers in some schools started pioneering to extend their courses to include landscape studies, the ecological background to good husbandry, the interdependence of plant and animal life, and the delicacy of ecosystems. The advent of the CSE examination improved the status of the subject in the curriculum, but the major opportunity came with a national policy change which initiated the gradual phasing out of the two-tier



In England, as elsewhere, girls love horses!

system in favour of comprehensive education.

By 1970 the NRSA had changed its title to 'The National Rural and Environmental Studies Association,' in recognition of the wider range of interest. An NRSA Journal editorial says, "Taking our first steps on the road to the seventies, we have had European Conservation Year launched...with the official title of 'The Management of Tomorrow's Europe'. What are we in our Association doing about this plan in our own British countryside?" One of the answers was the calling of a conference to include educationists from Universities, colleges, and schools to discuss a wider application of environmental studies, which embraced both the impact of the urban on the rural, and the urgent need for conservation, a relatively new term born of the increasing pressures on the natural environment. The form this took was the extension of environmental studies to children of all abilities in the school, and the planning and setting up of examination syllabi for the Ordinary and Advanced levels of the General Certificate of Education. At first, these were pioneered by two counties,

Wiltshire and Hertfordshire, but were later accepted by examination boards as their own syllabi. If the emphasis seems to be on examinations, the reason was that this was the only way to attain the recognition and academic status necessary for promotion of environmental concern.

At first there was some resistance from teachers of the traditional disciplines of geography and biology, who saw the overlap of subject matter to be a threat to their subjects, and a bar was placed on the presentation by students of environmental studies with geography at 'A' level. Later when it was realised that their aims were different, the embargo was lifted.

In the mid-seventies, environmental education realised its fullest potential when the subject barriers assumed a lower profile in favour of a more integrated approach, based on the belief that a holistic view was more meaningful to the pupils, offering a better education, as well as drawing the staff of the school together in a common aim. This ideal did not work in all situations, being subject to many constraints, and a compromise was often reached, such as integration in the first three years of secondary school, or the

teaching of environmental studies jointly by the biology and geography staff. This has had the side effect of modifying some of the biology and geography syllabi to include a substantial environmental education component, so that even if environmental studies does not



Awareness of the needs for health and happiness for all living things grow out of classroom experiences.

appear by itself in the curriculum, it may now be introduced through traditional subjects.

And what of primary education? Here, the nature table and occasional nature walk has expanded to a full program. There is recognition that teaching through the environment is often the best way of stimulating skills of reading, writing and number, as well as those of observation and conversation. Some of our primary schools have been involved in the European Economic Community education project in the late seventies and

eighties, where themes of great depth involving skills unimagined a decade before have been achieved.

A final note: this article is intended as an overview of environmental education in England. Having seen it all happen and having had the privilege of being involved, I conclude with an extract from the latest journal of the National Association, now renamed the National Association of Environmental Education which still keeps its rural roots, while its members believe that environmental education is not a *subject*, but a *way of life*. This contribution comes from a primary school child in response to an assembly on the theme of the World Conservation Strategy: "Thank you Lord for making the world for us to live in. Help us not to mess it up and not to make animals extinct". Only a child could be so simple and so profound.

Ann Trotman, was educated at a farm school, where milking was as important as Latin, and at London University (B.Sc.). Her first post was with the Field Studies Council, then Lecturer in Natural History at a college of education, and finally as Senior Advisory Teacher to Hertfordshire County Council. Now retired, and working for a Conservation Trust, she enjoys sculpture, a lifelong hobby.

SAVING THE WORLD'S CROCODILES - *Continued from page 5.*

Alligator sinensis, in captivity in a last-ditch effort to save the species from extinction due to habitat loss and the local peasantry's dislike of the beast. In Zimbabwe and South Africa, CSG members are ranching the Nile crocodile. The species, which produces one of the highest quality leathers, has been endangered in the wild in most areas. In Papua, New Guinea, CSG members are working with the local populace to train them in

ranching techniques for the New Guinea crocodile, *Crocodylus novaeguineae*. Some of the aboriginal peoples depend on the sale of these animals and their skins as a major source of their livelihoods.

Through guidance by CSG members, field studies by scientists may lead to the development of ways in which some species may be exploited commercially while wild

populations are maintained. Other species will be protected and maintained, if necessary, through captive breeding programs. It is the hope of the CSG members that no species of crocodylian will become extinct.

Myrna E. Watanabe is co-editor of the Newsletter of the Crocodile Specialist Group of the International Union of Conservation and Natural Resources.

The Development of an Environmental Education Curriculum for Sudan, Africa

William B. Stapp

Governmental officials, educational administrators, and classroom teachers have participated in three environmental education workshops held in the Sudan between 1983-85. These planning and curriculums development sessions have been sponsored by the Institute of Environmental Studies, the University of Khartoum; International Development Program, Clark University; the United States Agency for International Development; and the School of Natural Resources, the University of Michigan.

The first workshop was convened in October of 1983 at the Institute of Environmental Studies, University of Khartoum, Sudan. This workshop was designed for high level administrators in the Ministries of the Environment, Health and Education. The content focused on the philosophy of environmental education, the methodologies of environmental education, strategies for the development of an environmental education curriculum, and teacher training in environmental education.

The second workshop was held for the school administrators and the trainers of teachers. The focus of this workshop was on increasing participant awareness and knowledge about critical problems of the Sudanese environment, and appropriate strategies for integrating environmental education into existing educational programs of the Sudan. This workshop was convened in November of 1984 at the Institute of Environmental Studies, University of Khartoum, Sudan.

The third workshop was designed to develop and evaluate an environmental education curriculum appropriate for the integration of various subject areas (science, social studies, religion, math, etc.). It was held at Bakht-Er-Ruda Institute of Education in Ed Dueim, Sudan.

Bakht-Er-Ruda Institute of Education was selected as the site for the third workshop due to its reputation as one of the premiere educational institutions in Sudan and on the African continent. The Institute was established over 50 years ago by its first Director, Dr. Griffith, who was a firm believer in combining classroom education with first hand learning experiences. The Institute is presently a community of over 4,000 teachers, teachers-in-training, and elementary and secondary students and has the proper educational climate necessary for the development and evaluation of a model environmental education curriculum program for Sudan.

The participants of the third Environmental Education Workshop consisted of 20 selected trainers of teachers and administrators representing elementary, intermediate, and secondary levels. The trainers of teachers represented science, history, math, Arabic language, Islamic religion, English language, psychology, sociology, rural education, geography, music, audio-visual, and art. In addition, the registrar, principals of the elementary and secondary schools, and the Director of the Institute were in attendance.

The primary task of the workshop participants was to design an environmental education curriculum for Bakht-

Er-Ruda Institute of Education. The initial activities reviewed the recommendations of the first two workshops' goals and objectives, guiding principles, teaching methodologies, and concepts.

The next task was to develop a general curriculum structure. After due consideration, the participants decided to focus the curriculum around critical environmental issues of Sudan: desertification, famine and health. It was also agreed to have the elementary school units focus on the learner's *home or school area*, the intermediate units on the learner's *community*, and the secondary units on the learner's *region of Sudan*.

Following this decision, the participants directed their attention to a general format for developing unit activities

1. Concept to be developed:
Famine (example)

2. Understanding to be developed:

3. Time (number of class periods):

4. **Background Information:**
(Information for Teachers)

5. Reference to Course Curriculum:

6. Materials Needed for Activity:

7. Activity Procedure:

8. Follow-up Questions:

9. Additional Reference Material:

(books, audio-visuals, human resources)

In the development of the elementary, intermediate and secondary curriculum units, three interdisciplinary teams were formed for each of the three topical areas: famine, health, and desertification. Each of the teams then developed an elementary level understanding, intermediate

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Tips For The Traveling Photographer

Ray Pfortner

PHOTOS BY RAY PFORTNER

Populate your travel photos to breathe life into them and into your post-trip presentations. Get in close to add intimacy. Natural light is often the best light: unobtrusive, flattering and real.



For the majority of us, the most intense periods of photography are during our travels, especially during our major vacations. Our travels offer enormous picture-making opportunities, particularly for those of us who are educators: for do-it-yourself audio-visuals to accompany future lessons, for illustrations to accompany our own articles (and to enhance significantly their salability) or our institutions' publications, or for exhibit material. But to get the most out of these not-to-be-missed opportunities -- and the sizeable associated expenses -- we must pay careful attention to our photography before, during and after any trip.

Pre-Trip

In travel photography, "Be Prepared" is the motto. Begin at

the beginning, asking yourself why and for whom you are making travel photographs. The answers will determine what you take along in terms of both lenses and film. If your projected audience is a class, slide, not print film would be most appropriate. Besides, slide film is much less expensive so you can pack more and prints can always be made later from only your very best slides. Remember, nearly all major magazines are illustrated from slides, not prints. Or if birds are to be your primary quarry, a fairly long telephoto lens, not a wide-angle lens, would be your travel companion.

Start planning early. Allow enough time to stock up on what you want, not what the store happens to have available the day before your trip. Test new

equipment before you leave, not by shooting blind during an entire trip. Register your equipment with U.S. Customs before you leave. This gives you an additional record of exactly what equipment you own, and it minimizes the hassles on re-entering the United States. And take out an insurance rider for your camera equipment while away from home; don't wait until after the first theft as so many of us have.

Buy lots of film -- up to half again as much as you estimate you'll actually need. Any you bring home again unused can be refrigerated for future use. Buying film abroad is costly and usually risky: film is always hard to come by just when you need it the most, and the film you do find may be stale or damaged. Stock up on camera and flash batteries for all

the same reasons.

As a camera bag, use something inconspicuous like a day pack. No use advertising what you're carrying and where you're carrying it any more than you have to. Just pad everything well, put lenses in individual cases, and never risk checking your equipment or your film as baggage. (No use testing just how well padded everything really is.) Pack your film in a separate bag within the main bag to expedite handchecks at airport security points. Security devices can damage film, and, of course, on long trips repeated stop-overs amplify the risk greatly. You have a right to a handcheck. Just try to cooperate by getting to the gate early and by having your film out and ready for a separate check.

During the Trip

The name of the game is "minimize the competition." So many people have so many good and usually fully-automatic cameras today, that making really unusual shots is getting more and more difficult. The key lies behind the camera in the visual sense of the photographer. So avoid postcard views, the eye-level shots made at high noon. Go out early before breakfast while most of the other travel photographers are still in bed. Go out late in the afternoon and just after dusk while most are shopping or snacking. Get the unusual qualities of light that both times of day offer. And shoot at night. And don't moan over rainy, misty, or hazy days. Leave the moaning to your uninformed competition. Get out there and make the most of the unusual effects such days afford. Always shoot lots of photos when you feel that you're on to something. Don't be stingy with film (just keep comparing the cost of your film with the cost of your transportation). Bracket -- over and under-expose slightly to protect yourself, especially in unusual light. Remember, your

Continued on page 18...



Don't moan over rainy, misty or hazy days. They are your best bets for the best picture-making.



Shoot details, they add the spice to your post-trip presentations. Make the most of available light.



Remember - Closer is almost always better. Fill the frame!

Winging It In Edmonton

Joy Finlay

PHOTOS BY J. FINLAY

There is a catering service for the birds in Edmonton's River Valley parks! Large bird feeders have been placed in over a dozen major parks in the valley. The John Janzen Nature Center in Edmonton, Alberta, has been building them with funds provided by Alberta Fish and Wildlife (Alberta Government). The feeders are being manned by volunteers and supervised by members of the Edmonton Bird Club. Bird seed for winter feeding is supplied from a grant from the "Bucks for Wildlife" fund of the Alberta Government.

More feeders are being built and will be placed at all the senior citizens homes, homes for the handicapped, and nursing homes within the metropolitan area which houses over half a million people.

The products of this project are being shared with six other major cities in Alberta. Bird houses are also being built under this project. They, like the feeders, will be distributed 60 percent in the Edmonton area and 40 percent to other communities in the province. It is expected that by next summer over 300 large feeders and 5000 additional bluebird houses will be erected across the province under this program.

This impressive project has its origin in the mid-1960's when Edmonton Parks and Recreation sponsored the first Junior Naturalist program. We started a bird house building project for young people and their parents. By ingenious methods of scrounging we were able to gather enough materials for our bird house building project. It was a proud day in March when our Lieutenant Governor, Grant McEwan, ceremoniously nailed the first house up on the Bluebird Trail in Alberta. We climbed over snow banks to put 125 houses on fence posts east of the city. We later watched the bluebirds return. Now there are bluebird

trails throughout Alberta, and the population of these beautiful insect-eating birds has grown proportionally. So has the population of bluebird watchers!

In 1975, the John Janzen Nature Center opened, distinguished as the first major municipal nature center to open in Canada. Whenever there were funds, bird house building groups moved into the basement of the Center. Soon bluebird houses were appearing all over the province. In the first two years over 10,000 houses were constructed and distributed. Not only bird house builders pass



Demonstration on making bird seed mix.



Banding "Big Bird" at the bird feed and seed days.

through the Nature Center; visitor attendance has grown from 33,000 to nearly 100,000 in 10 years.

Nature education and interpretation programs had been operated by the City of Edmonton since 1965. When the John Janzen Nature Center opened its doors a decade later, creative staff began a new era in environmental education. The "Bird Seed and Feed Days" with a "Bird Seed Shelling Contest" grew into a national competition. Participants shelled sunflower seeds with their hands behind their backs simulating an evening grosbeak. An elaborate set of rules was developed with the national winner "Flying to Hawaii with the Birds" on a hosting airline. Later, a new media contest was added with a large trophy as the prize. Banding demonstrations were added, as were talks on local birds, bird feed mix making demonstrations and even painting faces like birds for children. A "Giant Bird" flew in from the north to help in making the weekend a fun event. Each year over 2000 people come to the Center to participate in the "Bird Seed and Feed Days".

An added bonus to the event is the sale of bird seed. The Edmonton Nature Centers'

Foundation, a nonprofit organization set up to raise funds for exhibits and other amenities for the Center, sells bird seed including a special mix designed for the wild birds of Edmonton. This year they sold over \$20,000 worth of bird seed in one weekend. The sunflower seeds are still being sold, and the foundation will probably net at least \$25,000 over the full year.

With the monies and several grants the foundation has provided for the installation of major exhibits in the Center. A new flight display portrays birds, insects, and other flying animals of the area through a participatory mode of exhibits. To encourage further involvement in birds, the foundation secured a grant to prepare a book on the more common birds of Edmonton. They used funds from the sale of bird seed to publish the booklet. Now they are recovering a profit from sales which will in turn be used to reprint the book as necessary.

Yet another example of using a bird theme as a vehicle for environmental awareness is the peregrine falcon project. The Nature Center assumed the role of catalyst, stimulator and program coordinator for the activities surrounding the peregrine falcons that have nested in the downtown area. Peregrines which had been

released in the wild returned to nests on the Alberta Government Telephone (AGT) cliff, a high-rise office tower in the city. AGT prepared a special display, provided a remote television camera and a monitor so that people watched what was going on on the peregrine eyrie. Alberta Fish and Wildlife contributed greatly in the project as well. Each year interpreters talk to over 10,000 people at the television monitoring site downtown. Bank managers and sales clerks alike have come at lunch hour to watch the birds in action at the nest. In one year, a special drama about the Edmonton falcons and their problems on migration was written and performed at the Nature Center for over 2000 school children.

A spin-off of public involvement in the bird programs has resulted in the parks department crews no longer cutting dead trees in the natural areas of the parks. There are now more food and nesting trees for the bird population.

The birds and people of this urban community are all in it together, thanks to the cumulative effect of individuals and organizations sharing in the work and the wonder of nature in our midst.

An old Chinese proverb states that "Women hold up half the sky." In modern Asia, however, women hold up their half with one hand tied behind them. Asian women in rural areas are locked into a subsistence economy despite the programs and technological advances of the past decade. The Asian-Pacific People's Environment Network stated in a recent news release that new farming technologies have not advanced the status of the rural Asian woman. Despite the United Nations Decade for Women entitled "Equality, Development & Peace", the group contends that women are left out of all phases of programs designed to provide advances in agricultural technology.

In their view, most development plans and programs are designed, accepted and implemented by males, despite the fact that in agrarian regions females spend the majority of their working time producing and processing food. One of the first effects of current development programs is the obligation to provide raw materials for the market. This shift in the emphasis of economic activity has made profound changes in the way in which production is organized. Men, who hold sway over the land, are drawn into the market sector leaving the women to maintain basic subsistence production.

As technical development progresses, women are pushed further to the fringe of activities. Rural modernization programs, agrarian land reform and the establishment of cooperatives aim at improving productivity and trading systems for market produce. These programs are directed at men who traditionally maintain outside contacts in the majority of established Asian societies. In this process women are not only deprived of all decision-making powers over the land but are also excluded from

technical training and from access to modern credit and marketing facilities.

New farming technologies are of no benefit to Asian women. Where rural development is concerned, a United Nations senior official has correctly stated that "despite some progress in rural development, most Asian women have no chance to use farm tools to help them generate large incomes. The great majority of the 983 million women living in Asia's rural areas have no access to new farm technologies and reap no benefits from mechanized farming.."

This has occurred despite the fact that women play a significant role in development, play a major role in agriculture, are responsible for producing much of the food eaten in the world, work on the land and harvest the crop, prepare and sell the food produced, endure long working days during which domestic chores are combined with fieldwork and childcare.

The Asian-Pacific People's Environment Network suggests that Asian women can assume a more influential role in food production and can also be assisted in reaching their own full potential by: a. increasing their participation in the development agencies, b. examining, identifying and assessing the needs of women in the preparatory stages of a development project, c. providing access to education and training, and d. improving access to credit and other monetary resources.

The Third World's need for increased food production has never been greater. The food needs of these areas will not be met until all available human and material resources are realized.

Sandra Burns is professor of science education at Central Connecticut State College.

Holding Up Half The Sky

Sandra Burns



H. Burdsall
CWS/Crop

Traveling Photographer - *Continued from page 14.*

meter is not preaching the gospel all the time, just giving a little good advice.

Don't forget the answers to your "why" and "for whom" questions posed at the outset. Pursue personal themes, for example, weathervanes, weeds, clouds, birds, manhole covers, children, and dogs. Such themes can unify your picture-making and your subsequent slide shows or photo exhibits. Be sure to shoot details of whatever you do shoot, not just broad panoramas.

And populate your photos by including people, perhaps the biggest challenge of all. How to capture the "natives" without intruding -- and without posing? The question has been asked just about as long as there have been traveling photographers and even longer among traveling painters. To pay or not to pay your subjects? Very long zoom lenses from a block away versus wide-angle lenses from only a foot away. Sometimes you pay, sometimes you don't. Sometimes you use zoom, often you don't -- at least not from a block away. Just try to be reasonable and sensitive. Perhaps travel with an instant camera and offer instant "thank yous." And if you offer a copy of the slide you're making to your subject, don't ever neglect to send it along. Each year's traveling photographers make it more difficult for the next year's by leaving promises unfulfilled. That's not the way to eliminate the competition!

If you are shooting a lot of film as you should be, you might consider labeling your rolls. This might prove to be invaluable if, upon your return, you find it necessary to prioritize your processing. Try attaching gummed labels to your plastic film canisters before you leave. By the way, throwing the film boxes away at home before you

leave saves valuable space in packing and often eases tensions that can arise in handchecks; but always keep your film in the canister, because it provides the best protection from light and moisture. Also, leave exposed film behind in your hotel. It in itself is not a major target for theft, but might be stolen along with your camera equipment in the field.

Remember, exposed film in many ways is the most valuable item in your luggage, for it is truly irreplaceable, and security point handchecks are as important coming home as they were on leaving.

Post-Trip

Don't lose your enthusiasm now. Process your film promptly, and, where large quantities are involved, in separate batches to guard against processing or shipping errors. And label your finished slides or prints promptly before details fade in your mind.

Store your photographs carefully. This is not the time to become either stingy or careless. Perhaps you can store selects in archival slide sleeves or print albums, and seconds in enamelled metal boxes in your regular living spaces at home, not in your attic or basement.

After several trips, consider having your equipment checked and cleaned well before the next trip. Most of us completely ignore preventive maintenance of camera, lenses and flash.

And share the products of your labors. Do slide shows, but use duplicate slides not originals as much as possible. Projection is the harshest treatment most slides ever get -- and don't underestimate just how harsh the treatment really is. To avoid the "lights-out, slides-on, eyes-closed" phenomenon that has swept the nation, edit ruthlessly. Leave no slide in the show for

which you will want to apologize during the show, usually show one instead of several photos, tailor every show to your audience's interest, and always encourage multi-photographer shows where everyone contributes some slides to share so no one runs out of interest.

Much of the same holds true for bulletin boards and print exhibits. Show only the best, and usually focus on some unifying theme.

From the outset you planned to share your work, so don't chicken out after the trip. Don't lose your momentum. Force yourself to seek out opportunities to use your travel photos in shows, exhibits, your own articles, and newsletters. Try to spread the word about the most recent places you've been and the availability of your photos. And never let a photo be used without at least a photo credit if not also some remuneration. The photo credit is one of your best promotional tools. Be sure to promote your work a bit or you just might lose the momentum needed for your next trip.

And whatever you do, don't leave home -- at least for any major trip -- without one of the best companions a traveling educator could ever ask for: your camera.

Ray Pfortner is vice president of Peter Arnold Inc., a stock agency specializing in science photography.



BIRDS OF A FEATHER

Charlotte McCabe

You could do more than ruffle a few feathers when landing at an airport in India. It seems that flocks of birds pose a very real aircraft hazard in this country. A regional scientific society, however, is attempting to do something about this dangerous, if amusing, problem.

For the past five years, the Bombay Natural History Society has been conducting an ecological study of bird hazards at Indian military airports. Funded by the Aeronautics Research and Development Board of the Ministry of Defense, the Society's research team has done considerable work in the field and in the laboratory.

The Society plans to publish a guide booklet on the identification of the problem birds. Recommendations have also been made to the Government of India on actions to help eliminate the hazards posed by these aviators.

Founded in 1883, the Bombay Natural History Society is devoted to the advancement of the study of zoology and botany. The Society also promotes measures for the conservation of nature. Its publications include the *Journal of the Bombay Natural History Society*, recognized throughout the world as an authoritative source of information on the fauna and flora of India, and *Hornbill*, the Society's popular



publication. It was in the latter that I read of this project.

Charlotte Baybutt McCabe is a member of the Pocono Environmental Education staff.

Vicki Cobb, Eva L. Gordon Award Winner



Vicki Cobb, winner of the Eva Gordon Award, ANSS. November 21, 1985.

The Eva L. Gordon Award for Children's Science Literature was presented to Vicki Cobb at a reception held at the National Audubon Society in New York City on November 21, 1985.

We are sharing Vicki's remarks with the many members who could not be present at that time as an effective way of introducing her and her ideas to us.

As she accepted the framed certificate she said, "I'm deeply honored to receive the Eva L. Gordon Award partly because it's always gratifying to be recognized for one's work, but mostly for the values that this award celebrates. These values, unfortunately, are not particularly high among those of American society.

The first is *science*. In many ways it seems as if people think of science the way they used to think about women. Science has been put on a pedestal as something to be worshipped. It has also been thought of, conversely, as the scourge of mankind. We can blame the evils of the world on science. And then there's a sizable majority who throw their hands up in the air and say "I never did understand it, anyway." Of course, science is none of these things. It is simply a creative way of understanding the natural world. There should be no mystique associated with it.

The second thing this award celebrates is *children*. Again, in our society, children are not highly valued as they are in others. Lip service is paid to the importance of the next generation and

FRIENDS OF UNEP

Friends of UNEP (United Nations Environment Programme) are conducting their first annual Youth Poster Contest with the theme:

A Better Environment For Tomorrow

Categories (Age on June 5, 1986):

1. 5 Through 8 Years Old
2. 9 Through 12 Years Old
3. 13 Through 15 Years Old

Deadline: Entries must be postmarked by May 1, 1986.

Winners will be publicly announced at World Environment Day festivities in Washington, DC on June 5, 1986.

Rules:

1. Contestants can use any medium (crayon, water color, poster paint, magic marker, etc.).
2. Poster can be no larger than 22 inches x 28 inches.
3. Name, address, phone number and age of contestant must be clearly marked on the back of the poster.
4. Entries must be postmarked by May 1, 1986 and mailed to:

Friends of UNEP Poster Contest
2013 Q Street, NW
Washington, DC 20009

Prizes: A panel of judges will make three awards in each category:

- First Prize - \$100
- Second Prize - \$75
- Third Prize - \$50

All posters become the property of Friends of UNEP and may be used for publication or other purposes at their sole discretion. All posters will be sent to UNEP headquarters, Nairobi, Kenya, for display and for inclusion in UNEP's library.

Vicki Cobb - Continued from page 19.

certainly advertisers worship youth and the money spent on their behalf. But valuing children as people is the way you create quality in the next generation. We must give children the kind of respect my sixth grade teacher gave me, and I'm happy that Louis Sarlin is here tonight. He made me realize that I was indeed a person of value, regardless of the roles society might suggest for me. The way to communicate with children is to give them respect for their individuality, to allow them room to make judgements and decisions for themselves.

The third thing that this award celebrates is *books*. Again, in our society, their value seems diminished when compared with the attention paid to television and movies and audio. Books are still the best random access information retrieval system yet invented. Despite the rise in popularity in computers, books are still the best way to discover the workings of creative minds.

The world needs to be reminded of the importance of science, children and books. The American Nature Study Society makes a statement on their behalf by giving the Eva L. Gordon Award. I feel fortunate to have been its recipient this year.

This award gives me an opportunity to thank many people who have contributed to my life. I would like to thank my parents. I'm sorry my mother is ill and couldn't be here tonight; my father is here, my friends and my publishers, past, present and future, my agent, Chris Tomasino, who makes me seem sane to my publishers. And a special thanks to Frank Trumbower who has been behind me in many ways. And I want to thank all of you for coming."



Joy Finlay, of Edmonton, Alberta, Canada, is a recent addition to the ANSS Board of Directors. She is an educator and naturalist, as are so many ANSS members. She is author of "Winter Here and Now", this popular book is widely used in the prairie provinces and all across Canada. (Available from Box 8644, Station L, Edmonton, Alta, T6C 4J4, Canada)

Joy writes a weekly column on nature for the *Edmonton Journal* and *Calgary Herald*, a task she shares with her husband. She has pioneered environmental education programs in Edmonton and beyond, conducting the original Junior Naturalist programs. She is in demand for workshops for teachers and nature interpreters.

The Joys of Teaching Nature In Camp

Lenore Hendler Miller

Investigations into the wonders of the natural world occur in a variety of settings; schools, nature centers, farms and (sometimes!) in summer camps. As an environmental teacher, I have had the privilege of teaching nature in all of the above. I can attest to the fact that of them all, the summer camp setting is the best.

First of all, most camps are in a country locale and for our increasingly urban population, this may be the only opportunity youngsters have to observe nature first-hand. Camp is more relaxed than school. The emphasis is on fun and recreation. The teacher needn't worry about discipline or tests or marks. In camp, nature is all around and happening everyday.

Moreover, camp is not a one-shot excursion. Kids are there for an extended period of time, at least two weeks for some, as many as eight weeks for others. The instructor has the opportunity to build and follow up. And if children return to the same camp year after year, as many of them do, there is an even greater chance to build on what was learned before. Many camps also provide an optional time when campers can pursue their interests more deeply.

For the person who carries out the job of nature specialist in a camp, the experiences can be rewarding. In camp, children are

receptive to the ideas one imparts; they listen eagerly, finding fascination in the teacher's "lessons". In this role, the nature lover can be amateur scientist: botanist, ornithologist, ethologist, entomologist, zoologist; for a few weeks every summer and have the time of one's life while doing it!

One would assume that *every* camp would have a nature program, that nature would be a part of every child's summer experience. Unfortunately, this is not true, especially in the Northeast. Despite the fact that there are thousands of fine camps all over the country and abroad, fewer than 50 percent offer a nature program. For many others, the camp nature program consists only of "nature hikes" or a person who collects and keeps a few animals.

Many camps would like to provide a better nature experience for their campers, but it is difficult to find good nature specialists. On the other hand, there are many fine potential summer nature teachers, mostly nature lovers, many for whom nature is a consuming avocation, who would like to share their love and knowledge with youngsters. Perhaps just a bit of encouragement is needed to translate that desire into action.

How sad it is when there is no one to interpret the natural scene for curious children; no one to answer their questions, to

stimulate their thinking, to seize the opportune moment when nature is at its most glorious, and to create within our young people a conservation ethic by means of experiences that leave a lasting impression!

For that reason, I have embarked on an ambitious crusade to encourage as many camps as possible to introduce a quality nature program into their camps, and to improve the existing programs so that they become more than "taking a walk" around the campus. Part of this crusade must also concentrate on encouraging people who appreciate nature and who have the available time in the summer, to devote their efforts as nature teachers in camps.

It is a difficult task I have set for myself, but one that must be attempted so that the next generation of youngsters grows up with an understanding and appreciation of the forces that shape our lives, and their own role in preserving and maintaining the natural systems of our world. I ask you to join me in my crusade.

Lenore Miller conducts a recruitment service for nature specialists. Camp directors and interested persons can contact her at 296 Arlene Street, Staten Island, NY 10314. Her book, *The Nature Specialist in Camp*, published by The American Camping Association should appear in bookstores in 1986.

The Influence of a Local on Nature Study and Education

Organized study of wildlife in the Sheffield area of northern England is carried out by a group called The Sorby Natural History Society. Now with around 700 members, the Society is thriving with enthusiastic and expert amateurs, and professionals in a range of subjects from general natural history to highly specialized areas. We can boast national experts in the fields of lichens, bryophytes, fungi, flowering plants (including grasses), birds and other vertebrates, spiders, hoverflies and related groups. We also have a number of publications about the area's natural history which stand as being unique in their scope and depth. How this has developed in one of Europe's foremost industrial cities, with a reputation for making steel, cutlery and silver-ware, rather than for wilderness and wildlife, is a paradox linked to Sheffield's unique situation.

A large, industrial city situated approximately in the very middle of the United Kingdom, Sheffield nestles into the south-eastern corner of the Pennines. These are a chain of hills running down the center of northern England from the Scottish borders.

The area has a rich variety of land-uses superimposed onto a range of geological, topographical and vegetational types. It is this variation within only a few miles distance, that creates much of the natural history interest. The growth of Sheffield, its university, its museum, and the designation in 1951 of 400 square miles of relatively unspoilt countryside to the west as The Peak District National Park, have all helped the blossoming interest in local wildlife.

Notable naturalists associated with early Sheffield included

Charles Waterton. His clashes with John James Audubon, his foreign travels and the invention of the first nature reserve anywhere, are a few of his better known exploits. Along with the other influential Victorians John Ruskin (literary critic, artist and botanist) and Charles Dixon (pioneer of modern ornithology), was Henry Clifton Sorby.

Sorby was one of that Victorian breed of men who were amateur general scientists of independent means. During his life he developed interests and expertise in a number of different disciplines. In the early part of this century, when Sorby died in 1910, the generalists were becoming unfashionable and being replaced by specialists. Despite making important discoveries in the fields of petrology, metallurgy, spectroscopy, pigment-chemistry and marine biology, Sorby has tended to be neglected by later generations. However, his achievements have been acknowledged in the field of natural history. The natural history society for the Sheffield area is named in his honour.

On December 14, 1917, a combined meeting of the Sheffield Naturalists' Club and the Microscopical Society was held in Sheffield University. It was decided that these two societies should amalgamate on January 1st, 1918 as The Sorby Scientific Society.

The Society did well and almost a hundred members would be present at field meetings and indoor lectures during the 1920's. It was felt however, that the name *Scientific Society* might deter

some people otherwise interested from attending. So in 1932, the name was changed again to *The Sorby Natural History Society*.



Ian Rotherham teaching in Sheffield Botanic Garden.

Despite the Second World War, the Society flourished, with between two and three hundred members in 1946. During the period 1950-1970, the membership remained steady at around two hundred and fifty. The number of active field-workers was rather small, but what they lacked in numbers they made up for by enthusiasm. The botanists of the area were active in field survey work for the 'Flora of Derbyshire', edited by Professor Clapham of the Department of Botany at Sheffield University, and a member of the Society. First attempts were being made at drawing up species lists for the areas around Sheffield, for groups such as the birds, mammals, reptiles and amphibians, and various groups of invertebrates.

Since 1958 the Society has published a journal, 'The Sorby Record', and since 1965, a regular 'Newsletter'. These have provided a vehicle by which to publish, communicate, interest and inform. In doing so, they have stimulated further work studying species, groups of species, habitats or particular sites of interest.

PHOTO: H. R. RUSSELL

Natural History Society in Sheffield, England

Ian D. Rotherham

During the 1960's awareness increased of our fragile environment ever more threatened by human activities. Television allowed natural history to be brought directly into the homes of millions of viewers. The resulting interest and enthusiasm for wildlife, and concern for its well-being, has been reflected in the membership of groups like The Sorby Natural History Society. Numbers soared to over seven hundred, with another two hundred and fifty or

Informal connections with the University are still close. One interesting development of recent years has been the growth of an active Biological Sciences Section in the University Division of Continuing Education, often tutored by experts from the Society, the Museum and the University. This provides an educational resource of the broadest kind. It benefits both the University and the Society, stimulating informed interest in local wildlife, its study and

group of this type. Some of the 'Special Series' such as 'The Freshwater Invertebrates of the Sheffield District' (Sorby Record Special Series No. 4) and 'The Mammals of the Sheffield Area' (Sorby Record Special Series No. 3), are probably unique throughout Britain.

This work provides the background material both for education and for conservation. Indeed in recent years, the Society has appointed an Honorary Conservation Liaison Officer to help in such matters. In 1984 a special group, 'The Conservation Liaison Support Group' was set up to further this work.

We regard our Society's future as being based firmly on the enjoyment and study of natural history, its conservation, and education towards these ends. This includes encouraging young people to take an active interest in wildlife and the environment. Just one example of current trends is the forming of a 'Sheffield Bat Study Group'. This aims to further the study of these endangered and much-maligned mammals, to educate the public and to help bat conservation. The study of such crepuscular creatures is now becoming easier thanks to the development of rather sophisticated audio-detector equipment, translating the scarcely audible calls of the bats into a frequency that we can detect. This development has revolutionized a whole area of nature study. A far cry perhaps from Sorby's Sheffield Naturalists' Club of the 1870's. Who knows what developments the future might bring?

Dr. Ian D. Rotherham is an ecologist, lecturer and wildlife artist living and working in the Sheffield area. He is the Honorary Conservation Liaison Officer of The Sorby Natural History Society.

Peak Park, Sheffield - a wonderful place to study, geology, botany, birds.



PHOTO: H.R. RUSSELL

so in the Society's sister organization, 'The Sheffield Bird Study Group'. The latter was formed in 1972, from members of the Society, to foster the study and conservation of birdlife in the Sheffield area.

The Society's links with the City, the University and the Museum, have varied over the years as different individuals have influenced its development. Links with the University were close during the 1960's, with the influence of Professor Clapham (co-author of 'The Flora of the British Isles'), and others in the Department of Botany. Since then, the Society has worked more closely with the museum.

conservation. Quite often this pulls in people who have been missed by the net of the formal education system. Despite the shortage of funds in the present economic climate, this remains one of the most exciting developments of recent years.

This educational function goes hand-in-hand with the increasingly respected and popular publications by The Sorby Natural History Society ('The Sorby Record' and 'The Sorby Record Special Series') and by The Sheffield Bird Study Group ('The Sheffield Bird Report' and 'The Magpie'). The standards and scope of some of these publications are remarkable for a

Society for Protection of Nature in Israel- *Continued from page 8.*

abuses. A "nature protection" person on the staff of each FSC makes it his or her business to be up-to-date on the latest situation in the field and to coordinate conservation activities in the area.

FSC's serve as regional centers for public action and protests organized by the SPNI to protect the environment. Conservation of nature and the environment is of special importance to the FSC guides because of their personal ties to, intimate knowledge of, and regular activity in their particular region.

Each FSC also engages in research and the collection of data on the nature and landscape of the region. The information gathered serves scientific goals as well as nature conservation goals, and helps set the development policies and educational aims in and outside of the FSC itself.

The FSC staff conducts the work in this sphere while guiding, as well as during time especially set aside for research. The research and data gathering is done with the support of and in conjunction with university institutions.

Staff members include both university-trained experts in the natural and life sciences, archeology, education, etc., and high school graduates with experience and interest in field studies. These include young women detailed by the army to do their national service as SPNI guides. Some staff members combine field research and conservation work with their guiding duties. After stringent selection procedures, guides qualify for work through an SPNI training course. Four months of their first half-year of work are spent in this centralized course; they then spend an additional 2-3

months gaining experience and doing independent study at their FSC. Ongoing in-service training programs and staff hikes enhance morale and expertise.

FSC's activities are supported financially by income received for services provided and by private donations. The Israeli government supports a portion of the building costs of FSC facilities and allocates partial subsidies to students to enable them to participate in SPNI programs. Basically, however, establishment of a new FSC, or additions to existing ones, are limited by lack of available funds.

Yoaz Sagi is Secretary General of the Society For The Protection of Nature in Israel. This organization has been instrumental in developing environmental education programs and major resident centers for environmental education. He is also a member of the Education Commission for the International Union for the Conservation of Nature and Natural Resources with headquarters in Gland, Switzerland.

Joseph Shadur is a member of the professional staff of the Society For the Protection of Nature in Israel and serves as editor of the Society publication, "Israel - Land and Nature". He has published articles relating to conservation practices.

Environmental Education in Sudan- *Continued from page 12.*

level understanding, and secondary level understanding. The understandings were developed in a manner to achieve a desired "scope and sequence" progression -- each activity building upon the understandings developed at the earlier levels. The activities also provided a background on the specific topic and emphasized attitude formation, valuing, and problem

solving. It was realized that the initial effort of the workshop would provide only one comprehensive activity at each of these levels in the areas of famine, health and desertification (nine activities in total), but in future years multiple activities would be designed around the models developed in this first workshop. Additional topics could also be developed.

Each of the six-member topical teams (famine, health and desertification) worked together to develop an elementary, intermediate, and secondary level activity. Each activity was designed to be a relatively comprehensive unit involving one to several weeks to complete.

On the afternoon of the final workshop day, each of the three teams presented their three activities and received valuable comments from other class participants.

The activities will be revised by the workshop participants and tried out in Bakht-Er-Ruda by the classroom teachers this year. The teachers at Bakht-Er-Ruda trying out the activities will then evaluate the activities and modify them according to their experiences.

As the workshop was brought to a close, the participants expressed their desire to participate in a fourth workshop to develop additional activities around each of the three topical levels (famine, health, and desertification) and potential new topics such as population, energy and housing.

In summary, this workshop on "Environmental Education of the Trainers of Teachers and the Initial Development of an Environmental Education Curriculum for Bakht-Er-Ruda Institute of Education" served as a culmination of the first two

Continued on page 32. . .

Recently, a one hour television documentary entitled, "I Can See Clearly Now", was aired across Canada on the Canadian Broadcasting Corporation Network (CBC). The program filmed and produced by the CBC over the past two years was devoted to two of the Toronto Board of Education's Outdoor and Environmental Education programs. The show has been nominated in one of Canada's most prestigious film festivals in the field of documentaries and has drawn a lot of positive response from viewers across Canada.

The program showed people across Canada that it is necessary for urban students to come in contact with their natural roots. It is necessary for them to learn about the basic concepts that will ensure the continued functioning of water cycles, food chains and the preservation of our natural resources for years to come. It is necessary for them to be environmentally literate, caring and willing to act on behalf of the environment both locally and globally if we are to have a planet worth living on.

It is the crucial belief of the Toronto Board of Education that it is their responsibility to provide environmental education programs to the city's students. This may sound simplistic but when one considers the stand taken by most school boards, i.e. that they would share in this process by providing textbooks and classroom times so that students may read, discuss or view films regarding their environment, but leave the contact with reality to other community service groups, one begins to see the philosophical difference.

The Toronto Board of Education has been willing to share this responsibility. It has entered agreements worth hundreds of thousands of dollars with the

For \$2 and Change -

Environmental Education Programs in Toronto

Charles Hopkins

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Metropolitan Toronto and Region Conservation Authority to provide both day and residential programs for its students but originally when others were not coming forward, the Toronto Board pioneered and went on its own.

Today the teachers and students of the city of Toronto have the nucleus of the program - one worth televising to the rest of Canada.

The program has evolved into two major thrusts, the first is teaching about or for the environment. Topics such as science and geography are predominant in this field. The second major thrust is teaching in or from the environment. Examples here would be history, art, physical education and gardening. In our programs, these two basic thrusts are only separated in the teacher's mind. To the student or observer these distinctions are obscure and irrelevant. The result is a program that will facilitate learning about forestry as a part of science or



*Caving, geology, experiencing
Boyne River*

geography by first-hand encounters with forests. At the Urban Study Centre, for example, it could be students learning math concepts through an urban planning exercise involving the relationships between density and utility costs. A wide range of programs have been built on this multi-disciplinary approach.

BOARD OWNED FACILITIES - The first of the formal programs was the construction in 1960 of the Toronto Island Natural Science School. The facility was designed to accommodate two classes of grade six students for a five day program. The curriculum was based on the grade six science program and initially focused on weather studies, geology, water studies, bird banding, conservation, orienteering, plant studies and a farm visit. A resident staff of a principal and four teachers, with the aid of six student teachers, assisted the students' classroom teachers in delivering the program. In later years, the staff expanded to six teachers and the

program changed to incorporate new thrusts in the grade six curriculum. Energy and neighbourhood studies are indicators of change in the original science thrust while life skills such as skiing, canoeing and tennis have pioneered a new thrust in physical education.

Language development is also focused upon as an extremely important by-product of the resident school's program. So, too, the maturation of social skills is a desired outcome carefully constructed into the program.

What was rather unique about this program, was the desire of the Toronto Board of Education to provide this program at an extremely low rate where fees would not be seen as a deterrent. The initial charge of \$2.25 per week has been maintained.

It was also a strong desire of the Toronto Board to provide this program to every grade six student in this jurisdiction. With a capacity at the Island for only one third of the students, the Board began a search in 1962 for property to build a second resident program. In 1973, the Board opened a second resident facility called the Boyne River Natural Science School. This facility is designed to hold four classes, has a principal, ten and a half teachers, ten student teachers and is complete with cooks, caretakers, secretary, resident nurse and tradespeople.

The new facility had three mandates. One was to deliver a resident program for the remaining grade six students who could not be accommodated at the

Island Natural Science School. The second mandate was to provide secondary school facilities in history, geography, science, physical education and art. The third mandate was to provide a program for our senior school students in grades seven and eight. Located approximately



Opening bee hives, Boyne River Natural Science School

sixty miles north of the city on three hundred and eighteen acres of wilderness, the Boyne complex is comprised of a host of educational facilities, including a water studies building, a greenhouse, a library, a maple sugar operation, a ropes course, a craft shop, a bee apiary, an archery range, playing fields and even a demonstration saw mill that is utilized by secondary school industrial arts groups.

In addition, the school has access to an area of over seven thousand hectares which includes wilderness, modern farm operations, historical sites and museums, and the workshops of numerous artisans in the area. It is a truly remarkable facility where over a hundred and fifty options in various disciplines can be offered to students.

It was felt by the Board's environmental educators that students should get to know their

own environment as well as the natural. There was a feeling that when individuals lack understanding of how their community functions, or more importantly how to make their feelings and voices heard so that they may participate in shaping its future, there results a sense of

despair, helplessness and cynicism. The stage is then set for the degradation of our city and the quality of life of us, who are the City.

Hence, the third facility established by the Board in 1978 was the Toronto Urban Studies Centre. Begun originally as an outpost of the Boyne River Natural Science School, the Urban Study Centre was located in the

heart of downtown Toronto. While not a residential facility, the program offers assistance to classroom teachers in five days of urban programming. The city is both the subject and the setting for learning.

While participating in T.U.S.C. programs, students from all schools are provided out-of-classroom opportunities to pursue formal field studies in Toronto ravines, streets, neighbourhoods and businesses. Multiple day programs are offered in three major areas of explorations of Toronto: the Urban Natural, the Urban Built, the People and their Quality of Life. The essence of T.U.S.C. programming is to provide a facility where students can learn geography, history, science, guidance and other components of the school curricula through direct experience in the urban environment. In addition, T.U.S.C. will assist schools in



Toronto inner city youth exploring a water fall near the Boyne School.

special programs and gifted and special education.

The Urban Study Center Complex is located in an existing public school where declining enrollment has enabled the staff to occupy several classrooms. It includes a model of the old city and a projection room, audio-visual equipment and a resource library. A greenhouse facility is currently being developed in conjunction with a group of senior citizens who will work closely with inner city youth trying to improve the city's green space. The centre also uses many areas of industry, commerce and government and the city itself is its classroom. The permanent staff assisting visiting classroom teachers consists of a principal, shared with the Boyne River Natural Science School, two secondary school teachers and four teaching technicians. Specialists from related professions are used on a consultant basis. On occasion, student teachers also assist with this program.

LEASED FACILITIES - In addition to the three facilities owned and operated exclusively by the Toronto Board of Education, arrangements have

been made with the Metro Toronto and Region Conservation Authority to lease time at four of their resident centres. This opportunity is utilized primarily by the secondary school students in our system and programs are normally related to resource management. Geography and science departments make a great deal of use of these modern facilities located on the outskirts of the city.

The lease arrangements are in excess of \$250,000/year but, as is the case with the Urban Studies Centre, these opportunities are also provided free of charge to students.

On the average, students within the Toronto Board spend 2.5 weeks during their education in the public school system in outdoor or resident facilities.

OTHER OUT-OF-CLASSROOM PROGRAMS - As well as the resident program, the Board strongly encourages field tripping. This may be to other urban centres, to agrarian settings outside the city, to business and industry within the city or on wilderness and camping trips. Students from the Toronto Board

of Education have camped in the high Arctic, Iceland and all across Canada and the United States. While these programs do not reach nearly the numbers of students that our resident facilities do, they are still an intricate and extremely important part of the education of today's Toronto youth.

SUMMER PROGRAMS - In addition to the High Peak summer program, both the Boyne River and Toronto Island Schools provide free resident summer courses as well.

In 1985, for the first time, the Boyne summer program included computer programs based on data from "The Club of Rome" model prepared by Prof. Michael Mesarovic. This exploration into the world of computer-oriented environmental education marks an exciting innovation for the centre's staff.

When one considers the vast array of programs available to Toronto students at either no charge or a nominal charge of \$2.25 per week, one must agree that the Toronto Board of Education is certainly trying to fulfill its mandate of delivering a first class environmental education to its students.

Charles Hopkins is recognized as an international authority in the field of environmental education and environmental curriculum development. In his native Canada he has served as Principal of the Island School of Natural Science and the designer and Principal of the Boyne River Natural Science School, both operated by the Toronto Board of Education. He is the author of several articles and has produced several television documentaries. He is currently serving as a member of the UNESCO Man and Biosphere committee for Canada.

Residential Environmental Education in Japan

Shinshiro Ebashi

BACKGROUND: Outdoor education and environmental education are rather recent developments in Japan. Of course, YMCA and YWCA made a great contribution in this field. For instance, the first YMCA resident center was established in 1930 on the lakeside of Yamanaka, Yamanashi prefecture and a YWCA resident center was established in 1932 on Nojiri lakeside, Nagano prefecture. Moreover, YMCA established International resident center for youth in 1965 at Gottenba, Shizuoka prefecture and in Kiyosato, at the foot of Mt. Yatsu in 1970.

In the 1930's, industrial structures changed rapidly. The farming population decreased because of the country's industrial development and this started the movement of population towards big cities such as Tokyo, Yokohama, Nagoya, Osaka, Kobe, Hiroshima and Fukuoka, etc. Along with the expansion of cities, natural environment has been destroyed rapidly and at the same time, environmental pollution has harmed the public, especially in big cities.

The importance of conservation of natural resources and natural environment and the measures taken against environmental pollution are a serious concern to the Japanese government as well as to the general public.

SHORT HISTORY: As a result of these changes the following measures have been taken concerning outdoor education and conservation education:

1. The Bureau of Physical Education, Ministry of Education

has provided financial aid for constructing outdoor activities centers for the local governments beginning in 1955. Through this aid, four new outdoor education centers have been established each year. Osaka Prefectural Outdoor Activities Center, which is the largest in Japan and the Kanagawa Prefectural Outdoor Education Center, which has unique buildings, were constructed through this type of government subsidy combined



with prefectural government funds. 2. The Bureau of Out-of-School Education, Ministry of Education provided financial aid for constructing nature education centers for youth in 1970. 3. The first National Nature Education Center for Youth was established at the Muroto, Kochi prefecture. There are 10 such national centers in Japan now. 4. The Environmental Agency was established and the General Secretary of the Agency has been appointed as a cabinet member. 5. The Environmental Pollution Prevention Act and the Law for Preserving Natural Environment was promulgated in 1976. 6. The Green School Program for 4th to 9th grade children in the big cities was started in 1976 utilizing established public resident centers using funds from the Government subsidy. 7. There was a revised Course of Study of Science and Social Studies for elementary school and junior high

school students published in 1976 and the importance of conserving natural environments has been more emphasized in these revised courses of study, issued by the Ministry of Education. 8. The Charter for Preserving Natural Environments was published in 1979 by the voluntary organizations related with nature studies, nature conservation and anti-pollution.

Looking back to the past, there was more emphasis on outing activities such as hiking, camping, cycling, orienteering, hosteling, etc. In the 1960's and later on, outdoor education, and environmental education stressed the importance of conserving natural environments and preventing environmental pollution.

PURPOSE OF THE RESIDENT CENTERS: The National Nature Education Resident Centers for Youth established the following objectives: to foster a feeling of reverence for nature and to commune with nature through activities in the natural environments; to foster spirit of self-discipline, partnership, friendship and devotion through cooperative group living; to cultivate sound mind and body and foster creativity and practical ability through direct experience.

To obtain above mentioned objectives, the National Nature Education Resident Centers should provide the following activities: outing activities such as hiking, camping, cycling and orienteering; nature study and conservation projects and nature observations; training programs for outdoor education leaders; other activities related with



YMCA International Youth Center, Main building, office and dining room and meeting rooms, Japan.

nature conservation and youth work. Most of these public resident centers are utilized for public school children grades 4 to 9.

MAIN FACILITIES: Generally speaking, these National Nature Education Resident Centers have the following buildings and facilities: 1. Main Indoor Facilities: Dormitory type building has 270 beds in large buildings and 140 beds in smaller buildings, Administration office, meeting rooms, dining room and kitchen, teaching rooms, nature study room, storage rooms and gymnasium which has fire place etc. 2. Main Outdoor Facilities: Organized Camping Site (about 200 capacity) which has cooking place, activity building, fire places, nature trail, hiking course and fitness course plus small type of farms and pasturelands.

Each national center has about 20 full time staff including 4 program coordinators. Kitchen staff and maintenance are excluded in this number.

According to the recent survey, there are about 137 public resident centers in Japan as follows: 10 established by the national government, 65 established by the prefectural government and 63 established by the cities and towns.

Besides these public resident centers, voluntary organization such as YMCA, YWCA and other youth organizations have similar type of resident centers in the natural setting.

NUMBER OF USERS: There are great differences in number of users among these resident centers. Following is one example of the Nasu-Kashi National Nature Education Center in Fukushima Prefecture, northern part of Japan. It was opened in May 1972, since then almost 100,000 school children have attended this center.



YMCA International Youth Center, Lodging quarter, Japan.

EXAMPLE OF PROGRAM: Contents of program are diversified according to the age of children, leaders experiences, purposes, seasons, etc. Because of the shortage of these types of resident centers, most school groups can stay only two nights and three days. It is not enough time for achieving educational goals. However, it is the typical approach used in Japan. In the case of "green school" programs, the school children spend a week, as it is a government supported program for highly polluted big cities. According to the recent survey by the Nasu-kashi National Nature Education Center, about 60% of the children who visited this center had no previous outdoor living experiences. Officials of this center pointed out the great need for experiences in group outdoor living, creative activities, and development of independence.

CONCLUSION: As the photographs show, many unique resident centers have been established. These centers are well utilized and educational

purposes are achieved to some degree. However, the following matters should be pointed out. because of the lack of resident centers, total length of staying in these centers is limited; lack of recognition for the importance of integrated environmental education; lack of qualified leaders in the field of outdoor and environmental education; lack of professional training in this field at University level, i.e. like the one in Tsukuba University which has outing activity course in the College of Physical Education, another one is National Institute of Fitness and Sports in Kanoya which has outdoor education courses and a Department of Outdoor Recreation.



Nagasaki Prefectural Outing Activity Center, Lodge type, Japan.

Professor Shinshiro Ebashi is recognized as a world leader in outdoor education and outdoor recreational activities. He has lectured extensively on the subject of outdoor and environmental education at international conferences in Australia, Republic of Ireland, Mexico, Taiwan, and the United States. He is the author of several text books and articles on the subject of outdoor/environmental education. He is Professor Emeritus of Physical Education, University of Tokyo, founder and designer of the National Institute of Fitness and Sports in Kanoya; he is currently serving as President of the National Institute in Kanoya.



Fishing, Tourism in the Caribbean

*Daven Joseph is Research
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It is quite clear today that the Caribbean Region is firmly committed, both in philosophy and practice, to the most rapid development of its resources and its people.

The ability of any country to optimally exploit its natural resources is that country's highway to total economic development. A country's economic development is the cornerstone to the cultural, social and psychological independence of its people.

A nation experiencing growth within its economy usually experiences a number of morphological changes: a. increase in population; b. demand for housing; c. increase in tourist visitors; d. increased industrial activities; e. increased pollutants; f. increased environmental problems.

Through the expansion era of the 1960's and '70's, economic planning was based on agriculture and tourism. However, comprehensive economic planning appears to have been done on an *Ad Hoc* basis resulting in unplanned developmental activities such as unrestricted construction of structures along the coastal areas to facilitate the tourist industry, and the development of agriculture, based upon the replacement of natural fertilizers with synthetic fertilizers, pesticides, herbicides and fungicides. Both the tourist and agricultural industries are major contributors to the potential pollution problem that is affecting the marine environment. Such environmental strain can have far-reaching consequences on the future of the tourist and fishing industries that depend heavily on a natural, healthy, ecological environment for their long-term survival.

Because of this there has now emerged a recent awareness that environmental planning must be an

integral part of industrial development in the Caribbean region. To ignore environmental implications in the development process spells disaster to these island states.

With economic growth and development as a prime objective of the Caribbean Island communities, it is expected that major consideration will be given to the limitations of development that are dictated by physical size, availability of natural resources, and the carrying capacity of the environment as far as pollution is concerned.

The costs of development weigh the short-run benefits that might be achieved by a certain pattern of growth against the longer-run costs which, in turn, will eventually limit the process. In an environmental context, there might be a tendency to ignore the concerns in the short run, but, continued insensitivity to environmental concerns will lead to an eventual manifestation of this problem on a scale that will directly inhibit the long-term process of national development. Indications of the potential threat of pollution to the marine environment are already being manifested in many Caribbean Islands.

Uncontrolled disposal of agricultural, industrial and sewage wastes are destroying coastal and marine ecosystems that sustain coastal fisheries resources. Some examples: a. Antigua, the discharge of oil waste into the mangrove system at McKennon's salt pond, has resulted in almost irreparable damage to that ecosystem, and has caused some damage to the reef structure northwest of the salt pond. b. the disposal of cane sugar waste and sewage effluents have destroyed the mangroves at Fitches Creek, northeast of Antigua, and have also destroyed the coral reef

n and Pollution the ibbean

Daven Joseph

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PHOTOS BY H. R. RUSSELL



structures off the coast of Basseterre in St. Kitts. c. the Gulf of Paria off Western Trinidad, is heavily polluted by the oil refining industry, oil waste, mixed with other toxic industrial waste and sewage effluents from the Caroni Swamps, has damaged fisheries. The pollution problem poses concerns for public health in adjacent coastal waters and beaches. d. off the coast of North Andros, in the Bahamas, untreated sewage disposal in coastal shallows has almost destroyed the sponge and some mangrove populations. e. the discharge from septic tanks and package-sewage-treatment plants off the south, southwest and west coast of Barbados are causing severe damage to coral reef communities, with the erosion of some barrier reefs that prevent destructive effects of wave action on beaches and sea-front property.

It is recognised in the Eastern Caribbean that the pollution problem within the marine and coastal environment must be dealt with. However, it would be foolhardy for Caribbean Island nations to adopt expensive anti-pollution strategies as practiced by developed countries, who have virtually limitless financial and technical resources at their disposal. In consideration of the environment pollution issues facing the Caribbean, the basic problems that these small territories must face in sustaining economic growth must also be examined. These problems are related to the need for development programs that would provide immediate social and economic benefits to the population.

Many of these Caribbean Islands are of volcanic origin or have large deposits of volcanic soils, some loose and very fertile such as in St. Kitts/Nevis, St. Vincent, and parts of St. Lucia and Grenada. The mountainous volcanic islands in the Lesser Antilles are characterized by deep valleys through which

large streams and rivers support lush vegetation and forests. In Grenada, St. Vincent, Dominica, and St. Kitts/Nevis, the relatively higher rainfall in the uplands provides the major water-supply sources for these countries. The rivers, in recent years, have provided a vehicle for the rapid transport of soil due to deforestation for lumber or fuel. They have also served as a vehicle for the transport of residues from fertilizers and other agricultural inputs.

Throughout the Caribbean, the detrimental effects that the residues of pesticides, herbicides and fungicides have on coastal marine ecosystems are evident. There are now suspicions that pesticides, herbicides and fungicides may be greater hazards to marine and coastal ecosystems than domestic and industrial waste disposal. In the Windward Islands, in the South Caribbean Antillean Chain, pest-controlling agents used in the production of bananas reach the coastal and marine environment via rivers and streams; these pesticides are suspected of posing a threat, not only to coastal ecosystems, but to the health of persons who use these water bodies for domestic purposes.

Most residential and commercial urban centers are coastal in the Caribbean. During the early decades of this century, the region experienced significant population growth; new growth has been reduced during the last four decades due to the increase in emigration and the implementation of planned parenthood programs.

The deteriorating state of the coastal and marine environment has been greatly influenced by the increased pace and volume of coastal development. Therefore, the de-urbanization of some coastal areas on the larger islands, to reduce the likely adverse impact on the coast and their resources caused by staggered patterns of development,

might be in order.

The methods of domestic waste treatment and disposal in the Caribbean is largely unsatisfactory; waste treatment programs should be instituted on a community basis, the high cost of installing waste treatment equipment such as activated sludge plants and other high-energy sewage treatment facilities might make it economically unfeasible for some Caribbean countries to operate such systems. Archer (1984) suggested that collection systems with treatment of waste by lagoon systems (facultative, oxidation, and aeriated lagoons) before disposal into carefully selected ocean outfall sites might be a workable alternative.

Many countries in the region, as part of their public health programs, have given priority to improving the level of treatment and disposal of sewage. Presently, a large percentage of septic tank effluents flow into the sea, creating oxygen deficiencies in coastal ecosystems and contributing to the damage done to mangroves, salt ponds, and coral reefs.

Tourism has overtaken sugar and banana as the major foreign exchange earner in most of the Caribbean Island nations. The presence of clean white sandy beaches and clear marine bathing waters in warm, tropical conditions are the major attributes to the success of the region's tourist industry.

The adverse environmental impact of waste disposal from hotels, condominiums and other tourist amenities on the coastal and marine environments and ecosystems warrant in-depth investigation in the interests of the industries' well being.

Fisheries are being developed in most island countries as a subsidiary to agriculture. Fisheries departments and companies are being organized and equipped to improve upon the traditional small inshore catches with the larger deep-sea catches. There are also improvements in marine aquaculture systems in order to increase the availability of fin fish and shell fish in the region.

As is generally known, fish have the characteristic of bio-accumulation of numerous substances, including toxins, which can be ingested by humans while eating. It is therefore important that countries with large coastal development activities should take precautions and restrict the disposal of untreated and harmful wastes into the ocean.

As the world becomes more and more concerned about the state of the environment, there are some indications that the attitude of tourists, industrialists, fishermen, and development planners will be oriented more and more towards the enjoyment of the natural beauty of the islands rather than the mere wonders of gambling casinos, white sand beaches and tall palm trees. Visitors are increasingly interested in the phenomena of

ecological diversity of these islands. Tourists are becoming more enthusiastic about natural tropical ecosystems than by the pleasures of relaxing on the sunny beaches acquiring a tan.

To preserve this ecological characteristic; environmentalists must always advocate a firm concern for the orderly development and protection of the environment. Such a practice will ensure the continued existence of the unique but fragile ecosystems of these islands which constitute a complex community of many different populations with a diversification that is unique to tropical islands.

However, it is important to realize that as developing countries, our concern for the protection of the environment must be coupled with our aspirations for economic growth and development. As small island states, we can not afford our development objectives to be curtailed because of fanatical environmental concerns. Developing countries can hardly be considered as being responsible for the unfortunate state of the environment as far as environmental pollution is concerned. Developed countries have acquired the developmental edge over developing countries through an industrialization process that gave little or no concern for environmental protection since we, in the Caribbean, can not afford to ignore the consequences of development independent of environmental considerations, a realistic approach to development is necessary so that a level of environmental protection is achieved, while at the same time maintaining a satisfactory developmental pace. Many authorities, on the question of environmental pollution, believe that the Caribbean region has not yet reached its carrying capacity as far as pollution and environmental construction is concerned; and therefore the concern for environmental protection should not be a critical factor in the development strategy. This region must, however, be careful in its development approach so that maximum benefit can be acquired from every developmental effort, especially when the protection of the environment may have to be compromised.

SUDAN—Continued from page 24.

workshops on environmental education held at the Institute of Environmental Studies, University of Khartoum and opened the way for new opportunities of environmental education efforts between the Institute of Environmental Studies, University of Khartoum and the Bakht-Er-Ruda Institute of Education. This program could well serve as a model for developing an environmental education program for other nations on the continent of Africa or in the other regions of the world.

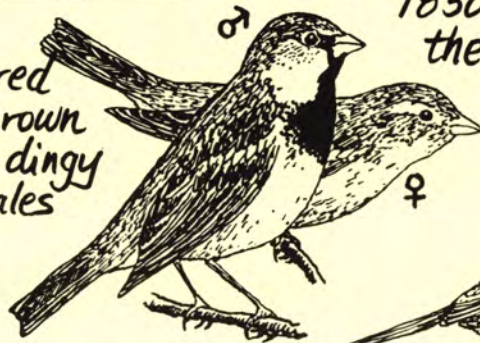
Dr. Stapp is a past president of ANSS. As a professor at the School of Natural Resources at the University of Michigan he has served as a consultant in many countries.

Naturalist's Sketchbook

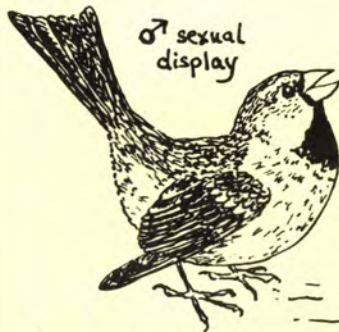
Winter 1985-1986

Native to Europe, Africa, and Asia, House Sparrows, also called English Sparrows, were released in Brooklyn in the 1850's and quickly spread throughout the United States and much of Canada

While females are drably-colored with streaked-brown upperparts and dingy underparts, males are easily recognized by their distinctive black bib

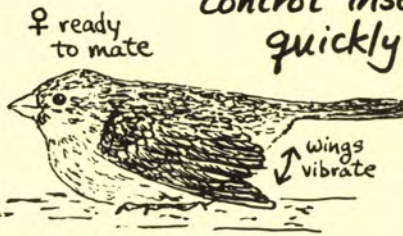


House Sparrow chases Chickadee from a potential nest site



♂ sexual display

It was thought by some that House Sparrows would help control insect pest populations. Instead, they quickly became a major pest themselves, eating the farmers' grain and aggressively competing with native birds for nest sites



♀ ready to mate

Wings vibrate

Sexual Behavior is easily observed during the warmer months. Males parade in front of females in a distinctive arched posture. Ready to mate, a female will crouch low, vibrate her wings, and make a rapid series of soft "tee-tee-tee-tee" sounds

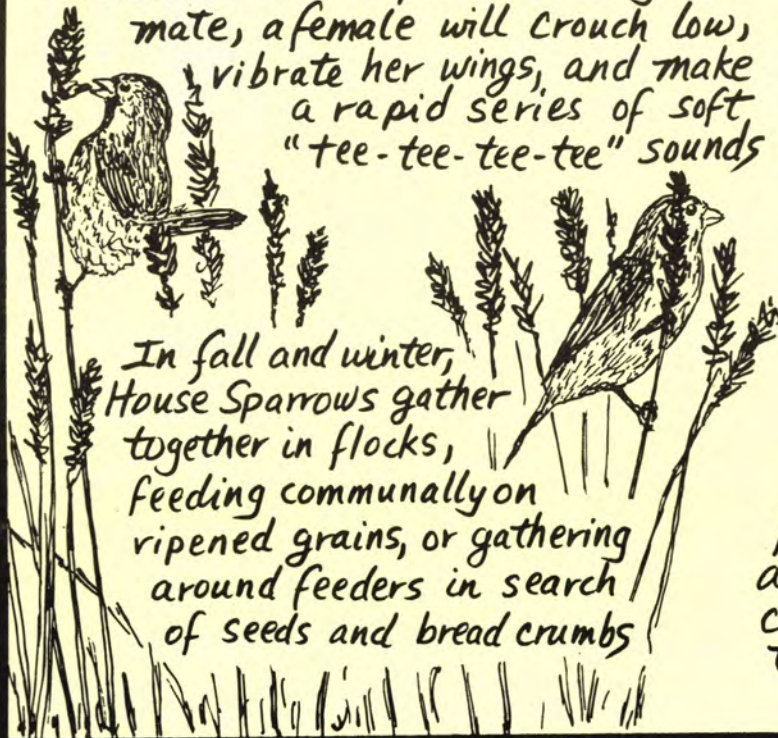
Youngster begging for food



Nesting in nest boxes, in old woodpecker holes, under the eaves of houses, behind shutters, and even on tree limbs, the birds produce two or three broods each year. Newly-fledged youngsters beg food from parents by assuming a posture almost identical to the adult female mating posture, crouching low and vibrating their wings.

©1985 Lang Elliott

In fall and winter, House Sparrows gather together in flocks, feeding communally on ripened grains, or gathering around feeders in search of seeds and bread crumbs



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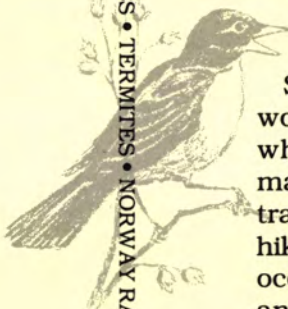
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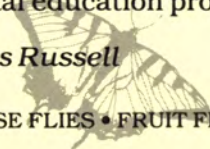
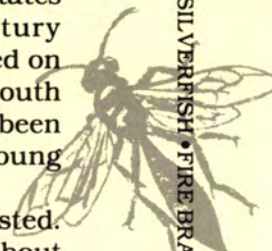
The history of these animals in the United States has been researched in nineteenth century periodicals. Their behavior has been researched on street corners and farms in North and South America and Europe. Many observations have been made with school children, teachers, and young people.

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