

# Nature Study



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Photo by Wadsworth — see p. 4

## Youth Returns . . . to the Earth

The American Nature Study Society

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# Man-Disease

*The earth and its life and its organic and inorganic base functions precisely according to fixed laws of action and interaction. The early Polynesians had a view of the universe which implied that the universe had rules of its own, and if man respected them, nothing went wrong.*

*There has been an awakening among people in many parts of the world that our land, our air, our lakes and our streams, and even the immense oceans, have become sick. This sickness is a disease caused by the organism, man, and is no less a disease than one caused by such organisms as bacteria, protozoa or virus.*

*This Man-disease has immense impact. Its cure is difficult because the organism must exercise restraint upon itself. Whether such restraint will be put upon man voluntarily is a debatable problem. A disease which destroys its host likewise destroys itself. The good earth has been host to mankind for many millenia, but the complexity and detailed interaction characteristic of it is being destroyed. Man has not respected the environmental laws under which he must operate. He has violated these laws and made changes in his air, his water, his solitude and his land. The resulting environment does not fill his needs. Much has gone wrong.*

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# An Ecological View of the Educational Environment: A Geographer's Perspective

JOSEPH PATRICK SULLIVAN

In recent months the terms and phrases ecology, environment, environmental quality, environmental perception and planning have been spoken, heard, written and read with increasing frequency. What do these words and phrases mean and how are they related to the educational process?

The meanings of words (terms) and phrases vary greatly depending upon many factors including the context in which they are used and who uses them. In any case, definition of terminology is a fundamental prerequisite for effective communication. Words and phrases merely serve as vehicles for the exchange of thoughts.

Ecology is the science concerned with the relationships that exist between living organisms and their environment (surroundings). Environmental quality is a vague phrase which suggests some concept of excellence (or lack of it) in one's surroundings. Assessments of environmental quality are relative to such factors as one's cultural background and one's environmental perception (sensory awareness or consciousness of surroundings). What constitutes environmental quality? If a systematic inquiry were conducted to determine what Americans perceive when they hear or use the phrase environmental quality, the survey would probably reveal that most Americans have not formulated a clear image of what they mean by a quality environment. Furthermore, such a study would probably show that those who had formulated an image of environmental quality would differ sharply regarding the components of their images. And so it should be, because the world is a composite of individual people and places.

Planning means that people devise ways of giving direction to change in order to achieve some agreed upon goals or aims—in this instance—quality environments. In theory, the methods and aims of planning should reflect the wishes of the people who inhabit a particular environment. In reality, planning efforts in the U. S. today are largely in the hands of a small number of persons who have either been appointed to, inherited, or assumed the role of leadership in giving planned direction to change. Most Americans appear neither capable nor willing to

assume their responsibilities in the planning process. They seem content to ignore or criticize the few who are vainly attempting to chart the destiny of the many. On the other hand, those who are doing the charting often appear unconcerned about the desires of those for whom they plan.

There is little doubt that giving planned direction to change has become a prerequisite to survival in the world where a rapidly exploding population and a growing urbanized, industrialized culture threatens to devour the very earth itself. And there can be little doubt, if one believes in democracy, that the planned direction which is given to change must express the desires of the people as well as having the consent and cooperation of the majority of the people. How can people prepare themselves to assume their responsibilities to become informed and capable participants in planning the development of the environments in which they live? The answer lies in the educational process.

Education is a continuing process of preparation for life (participation) in a particular society. The form and content of an education will vary according to such factors as the time in which a person lives, where he lives, the cultural setting in which he lives, and his personal capabilities and aspirations. In any case, the aim of the educational process is not merely to inform. The ultimate aim is to assist the learner to develop into an independent individual. Such an individual knows himself—recognizes his own capabilities and limitations—has formed an image of the world in which he lives—and is able to make a place for himself in that world. In short, he is able to relate to the world in which he lives in a productive, satisfying way.

In America the formal educational environment has traditionally consisted of a highly structured curriculum administered in artificial classroom situations. Teachers have served as dispensers of factual knowledge, while students have absorbed and retained that knowledge in order to periodically discharge their minds on objective (Mickey Mouse) examinations. Such exams are definite, easily scored and serve as convenient indices for deciding who shall

pass a course, who shall be admitted to a particular school, who shall receive a scholarship, and who shall receive a diploma.

However, more significantly, this approach to education has resulted in students becoming turned off, tuned-out, and dropped-out. For those who have persisted to the culmination of the experience it has produced the equivalent of false labor pains in the brain and ultimately it has resulted in mental abortions rather than in the birth of original thoughts and the growth of independent minds. The end product is a bewildered, acquiescent human who neither understands himself or the world in which he lives.

Our formal education process is in need of drastic reform from kindergarten through graduate school if we are to adequately prepare children and young adults for life in our complex, rapidly changing world. It has been a number of years since Jerome Bruner, a Harvard University psychologist, first began to advocate the "discovery" approach to learning.<sup>1</sup> Essentially this method consists of teachers guiding students to formulate and ask questions, seek and evaluate answers, and to draw conclusions of their own concerning specific issues, questions, and problems.<sup>2</sup> The classroom experiences become joint learning experiences—cooperative quests for new knowledge and ideas and for new ways of viewing old knowledge and ideas. Bruner emphasizes that students should inquire into the conceptual structure and methodologies of the various academic disciplines. In the end, the task of the student is to synthesize and integrate what he has learned into his own image of the world.

Ideally, in this writer's view, the basic elements of the educational process in America should include: 1) learning to think critically; 2) learning to communicate effectively; 3) learning to get along with others; 4) acquisition of a basic academic background emphasizing Bruner's ideas; 5) learning one or more economic skills which enable the learner to earn what he considers to be an adequate living; 6) developing an appreciation of some form of art or beauty which can serve as a source of inspiration in life; and 7) learning to use one's working and

leisure time in a productive, creative, satisfying manner.

In order to become educated one must want to learn, try to learn, and put into practice what is learned. An educated person can not be recognized by his occupation, nor by the number of school years that he has completed, nor by the types and numbers of diplomas he may hold. Rather, the degree to which a person has developed through exposure to the educational process will be reflected in his behavior. An educated person should, ideally, exhibit the following qualities: 1) a capacity for critical thought; 2) skepticism; 3) an inquiring mind — able to formulate and ask questions and willing to seek for and evaluate answers; 4) some degree of originality, imagination and creativity; 5) flexibility; 6) tolerance of others; 7) courage to stand up for his convictions and the willingness to modify them if new facts and ideas suggest that a change may be desirable; 8) a capacity to organize time and energy effectively; 9) forthrightness and sincerity; and 10) knowledge of himself and the capacity to relate in a meaningful way to the world in which he lives.

What role does environment play in such an educational process? The local environment where a student lives provides an excellent laboratory for direct, first hand experiences in the real world. Under the guidance of teachers who employ the inquiry approach students can inventory and analyze the form and content of their local environments and explore the relationships that exist between the various physical and human elements which comprise their surroundings. They can, to use a geographic viewpoint, pose the question — How has man modified the landscape of the local environment through time and what are the consequences and implications of those modifications? Within this broad question are an infinite number of specific questions and problems which are ideally suited to independent investigations and reports by individual students. In short, the student can learn basic geographic concepts, and acquire skills used by professional geographers. More importantly, such an approach will make learning fun and the learning experience will be more relevant because students will be developing an awareness, concern, and involvement in the real world where they live and which they must one day govern.

1. Bruner, Jerome S. *The Process of Education*. New York: Random House, 1963.

2. Long ago, a man named Socrates successfully employed this approach.

# A Term of College in the Field

CATHERINE DOBBIN EVENSON

*Lewis and Clark College, Portland, Oregon*

Students and instructors of natural history who can have the natural environment as their classroom for a whole term of study are most fortunate. Such a group from Lewis and Clark College have enjoyed this privilege during the fall term of each of the past four years. The plan, which was originated and has been directed by Dr. James Stauffer, was at first called "The Off-Campus Oregon Program." In the fall of 1970, it was expanded to the extent that it was entitled "The Northwest-Hawaii Program."

The twenty students who participate in the program are able to receive credit for a full term of work in courses which are essentially geology, field biology, seminar (the reading and discussion of certain books assigned by different members of the staff), and physical education (hiking). There is little formal lecturing in the courses, but a great deal of learning "on the spot" takes place. Tests are given at intervals to check students on their reading assignments and over-all acquisition of knowledge.

The problem of staffing the program takes some juggling and a little extra work on the part of all five members of the biology department, but all enjoy it, and are amply rewarded by the enthusiasm of the participating students. Dr. Stauffer, the director, is with the group the greater part of the time and teaches all of the geology and some of the plant study. The other four members of the department go into the field for a period of one or two weeks each, to initiate studies in their fields of special interest. As the off-campus program usually begins either one or two weeks earlier or later than do the courses on campus, some instructors may go out either before they are needed on campus, or afterward. If one goes during the term, however, his classes on campus are taken care of by the other faculty members and student help.

The state of Oregon has a great diversity of topography and of ecological regions which make it an excellent area in which to carry out a study of this kind. The northeastern corner of the state, with its high Willamette Mountains and deep canyons of the Snake and tributary rivers, reveals exceptional variety of geological formations and of ecology.

The John Day country of the central part of the state is famous for its fossils. The Cascade Mountains are superb examples of past vulcanism, and the coastal region is an excellent place to study intertidal and sand dune ecology. This past fall a two-week sojourn at the marine biology laboratory at Friday Harbor, Washington, gave an opportunity for much extensive study of invertebrates. The final three weeks spent on the four main islands of Hawaii opened up a very different, but beautiful and exotic, area of the world.

The cost of the program for the student is no more than would have been his tuition, board and room on campus. Economies are effected in a variety of ways. Transportation on the mainland is by cars owned by some of the students who are given a certain mileage allowance. In Hawaii, rented cars, three of which are usually campers, prove a rather expensive item. Air fare to Hawaii is also a considerable sum, even though the tickets are purchased through an educational travel service. Lodging in mountain areas is in resort cabins, which in some cases are obtained at a reduced rate because it is out of season. On the coast, marine biology laboratories with their dormitory facilities are utilized. In Hawaii cabins in state parks, and a church camp on the island of Maui, provide shelter. Meals are provided in different ways. During the first few weeks of the trip, breakfasts and dinners are usually procured at certain restaurants through special arrangements. During the last five weeks, at Friday Harbor and in Hawaii, student teams cook the dinners. A "do-it-yourself" policy prevails at breakfast, and lunches, whether in the field or at camp, are always the sandwich type.

In a college with many off-campus programs to various places in the United States and abroad, the one described above continues to be a very popular one, attested to by the many applicants each year who must, for want of space, be turned away. The staff members sometimes worry that the students are not gaining as much from the program as they would from more structured courses on campus, but the students quickly contend that they *do* learn a great deal, and that what they have learned they will never forget.

# Nature's Amazing Bogs

JOHN BURNAP

Insectivorous pitcher plants, a mat of vegetation growing over acidic water, pink orchids, tamarack trees all living within a one hundred foot radius . . . these are only a few of the characteristics of our many northern bogs that make them one of the most interesting places to study.

## The Formation of a Bog

Wherever there were glaciers in North America one finds bogs. About 11,000 years ago the last glacier receded. During its slow retreat the huge mass of ice, dragging many large rocks and soil debris, carved out valleys and lowlands which later filled with aquatic plants. In some places huge chunks of ice were left buried in rocks, sand, gravel, and other debris. When the ice melted, there remained deep circular depressions (called kettles), which later filled with water. Vegetation slowly grew over these small bodies of water and the characteristics common to many North American bogs began to appear. This process is very slow — during the past 11,000 years many bogs have filled in while others still have circular ponds in the middle.

## Characteristics of a Bog

Most bogs have neither an inlet nor an outlet. Water enters the kettle as rain or drainage from the high land which encircles the bog. As a result of this lack of drainage, bog water becomes stagnant and loses a lot of its oxygen. Normal life processes are upset by this lack of oxygen, and many strange things result. The murky bog water supports very little life. Without oxygen, most bacteria responsible for the organic decay of plants and animals cannot exist. Most of the nutrients (such as calcium, phosphorus, and nitrogen) are locked up in dead plant and animal tissue and are not available for plant growth. This sterile environment permits the accumulation of large amounts of undecayed matter, which forms a thick layer of peat underlying the bog. Humic acids from plant roots and other organic compounds also accumulate in the bog and add to its acidity. Plants and animals must have special adaptations if they are to live there.

Succession nevertheless occurs in this sterile habitat, but it is different from that which occurs at a normal pond or lake. There are no water plants (except maybe a few water lilies) growing in the shallow areas along the shore. Instead, a green mat of sphagnum moss

grows out over the surface of the bog pond, actually floating on the water. As the moss grows, it continually sheds lower portions of the plant and is the main contributor to the peat accumulation below. This layer of sphagnum forms the first semi-solid base for the other plants to grow on.

Many plants have unique characteristics which permit them to survive in the bog. For some strange reason plants are unable to absorb the acidic bog water. Even though this habitat is always wet, the plants are essentially living in a desert! Some plants, such as



Photo by Richard B. Fischer  
Pitcher Plants in a bog.

bog rosemary, have waxy leaves with curled edges, which conserve water because the stomata (small air holes on the underside of leaves) are exposed to fewer air currents. Water loosestrife is one of the first plants to grow over the water, with its buoyant, air-filled tissue in the submerged parts. These stems may be four times the thickness of those above water.

## Exploring a Bog

Now that we understand a few of the basic facts about bogs, let us visit one of these strange habitats. As you descend into the circular kettle, see if you notice a temperature change, because cooler air (which is dense and heavy) commonly settles in these bog

depressions. The sphagnum, acting like a sponge, evaporates large quantities of water, helping to keep the air moist and cool. As a result, many northern plant species such as cranberry, black spruce, or tamarack may be living in bogs far south of their normal range. Beech and sugar maple (common in the surrounding forests) are replaced by red maple (swamp maple), white cedar, black spruce, and in the center, tamarack. These trees tend to form distinctive bands circling the bog. Tamarack trees require lots of sunlight and are one of the first trees to grow along the edge of many Adirondack bogs. In the south red maple is one of the first trees to invade the bog. These swamp maples send their roots out horizontally just below the ground, which prevents them from drowning in the soggy substrate. Black spruce, being more shade tolerant, grows under the tamarack trees and commonly forms the next ring of trees. In this strange habitat black spruce trees only a few inches in diameter can be 50 years old! Eventually these trees will grow over the entire bog. Nutrients remain locked up in the peaty soil for many years, making it difficult for hardwood trees to grow over the bog. If this happens, succession may end up with a spruce forest interspersed with a few other swamp trees.

## The Bog Mat

Upon entering the open bog you will probably discover where the name "quaking bog" comes from. Both feet will be immersed in the wet moss, and if you jump up and down the whole floating mass of sphagnum shakes! Most of the plants and shrubs you are looking at are specially adapted to survive in this inhospitable environment. Shrubs living along the edge of the bog include high bush blueberry, leatherleaf, Labrador tea, and other wetside bushes. As the name Labrador tea implies, the dried leaves of this shrub make a tea when boiled in water. A fuzzy underleaf with curled edges quickly identifies this plant. Why do you suppose it has these odd leaf characteristics?

There are other plants growing on this wet mat of sphagnum. Bog rosemary is commonly seen, with its bluish green leaves with snow-white undersides. Leatherleaf is easily recognized by its smooth, leathery leaves with minute yellow dots on the underside. This plant's highly branching roots and stems often help form the supporting network that holds the vegetation together. A very



Photo by R. B. Fischer

THE RARE BOG TURTLE (*Clemmys muhlenbergi*) grows to about 4" in length.

interesting plant in the bog mat is wild cranberry which creeps over the mossy sphagnum. Our commercial cranberries also come from bogs. Its small narrow leaves and, in autumn, its fruits can be seen on the creeping stems. Cotton grass, actually a sedge (notice its triangular stem), is easily recognized by its stems topped with small balls of cotton in early fall.

The two most interesting plants living on this floating greenery are the insectivorous pitcher plant and sundew. How do these plants capture insects? The large, conspicuous pitcher plant (as its name implies) has specialized leaves which hold water. At the base of the leaf, enzymes are released which digest the unwary insects trapped as they fall into the plant's reservoir. Tiny sundew plants catch flies on the sticky red hairs on the leaves, in much the same manner as fly paper. Slowly the little creature is enfolded by the leaf; its valuable nutrients are then extracted by enzymes.

#### Animals of the Bog

Many woodland creatures often visit the bog. Wood frogs may live among the surrounding trees, preferring the dark shaded forest to the open marsh. Leopard frogs, on the other hand choose the open sun and nearby water. They live in the moist sphagnum moss or underneath nearby spruce trees. Northern bogs provide an ideal habitat for the snowshoe hare, who feeds mostly on the conifers which often surround these bogs. The hare's snow-white winter coat provides excellent camouflage during the long winter months. The bog turtle, recognized by its conspicuous orange ear patch, finds its home only in bogs. Man's destruction of many bogs has made this creature very rare.

#### Bogs Record History

Have you ever heard of bogs referred

to as "nature's timetable"? During the past 11,000 years the layers of peat beneath the bog have trapped many facts about our past world. These stories are revealed to us in the pollen grains that lie buried in the bog. Scientists sink hollow cylinders deep into the bog and remove samples of peat from below the surface. By examining the many different types of pollen grains (preserved in the sterile peat), scientists can tell what trees lived nearby. Many of these distinctive layers have certain pollen grains that typify a special climate. If, for example, at the bottom layer of peat fir and spruce pollen grains are abundant, then we know the climate was cold and moist. On the other hand oak and hickory pollen grains typify a warm dry climate. With the aid of carbon 14 dating, scientists can tell when each of these climates existed. Beneath the bogs the story of our past is recorded for us! Even prehistoric men have been found preserved in Europe's bogs.<sup>1</sup>

#### Man Versus Bogs

Bogs also serve man in other ways. Many people dig up peat and sell it as fuel or a valuable soil mulch. This can be profitable business, and has led to the destruction of many bogs. It is alarming to know that man can destroy such fragile environments that have taken nature thousands of years to create. Once a bog is drained it is lost forever. The rare pitcher plants nestled among the bog rosemary and sphagnum cannot grow back again. Man's quest for technology has made great progress; but is it progress when nature lovers like you and me can no longer experience the thrill of exploring a bog?

1. See "Lifelike Man Preserved 2,000 years in Peat," by P. V. Glob, *The National Geographic Magazine*, March, 1954, p. 419.

## YOUTH RETURNS TO THE EARTH

America has awakened to the earlier pleas by environmentalists that something is wrong with the environment. The awakening has come strong to the youth who feel that the older generation has done nothing to bring about a cure to the disease characterized by chemical-loaded foods, swordfish carrying excessive loads of mercury, or the DDT loaded Coho salmon of the great lakes.

There are suspicions based on reliable evidence that the excessive use of nitrogen fertilizers which are taken up by food plants has created clinical evidences of nitrogen poisoning in children.

Our foods are loaded with chemical additives — preservations, fortifiers, enhancers, and others. Besides this there has been a flood of food substitutes. One which many have been deluded by has been the half-and-half — supposedly half cream and half milk — for the breakfast coffee. There is no dairy product involved in most brands.

Young people have wanted something better than our highly chemicalized world and many have banded into communes for farming where foods would be raised by their own efforts and without the help of the multi-billion dollar chemical industry. University groups have been organized into gardening groups to learn growing their own vegetables. The cover on this issue of *NATURE STUDY* shows such a group at the University of Utah. Such activity will bring the group closer to the earth and build a deeper appreciation of its potential bounty.

There are 43 students in the group hoeing, weeding and planting beans, radishes and tomatoes. Their concern over the environment and ecology has sparked the group, according to Miles Labrum, the University arborist and instructor for the Free University class on organic gardening.

The group is learning methods of building compost and how to recycle grass cuttings, leaves, table wastes, wood chips and other materials often carted away to land fills.

The biological learnings are numerous. Marigolds planted among vegetables will drive away most insects; asparagus planted next to tomatoes will eliminate the asparagus beetle. Well decayed compost spread over a garden makes the soil more friable and a better holder of water.

Perhaps one of the greatest rewards these students will have will be the good fellowship and the therapeutic value of working in the soil. Mr. Labrum believes "It is a good tonic for mental health."

# Minorities Need Land

S. B. MULAİK

There are those who worry that the present excitement over environmental issues will detract from the problem of minority groups and of poverty centers. Ignorance of the basic causes of many minority group problems prompts such fears.

Science a century ago was looked upon as a blessing to mankind. Its handmaiden, technology, has devised techniques for using scientific discoveries intended to release the shackles of mankind and to develop a people free of what were considered the fetters with which nature bound mankind.

The results have been entirely different from expectations. While TV has broadened man's contact with the world, it has chained millions to stare at the one-eyed monster for many hours a day to satiate them with much garbage and mediocrity. The people were told over and over again that the new model refrigerator, or mouth wash, or over-powered car, or soap will bring greater happiness and a fuller life.

The automobile has been a blessing in many ways, but it has become a monster demanding more and more level land for parking and for freeways. It has taken a toll of over 50,000 lives a year and millions injured while moving people at immense speeds, most of whom were rushing to unimportant places.

Most destructive of the way of life has been the gadgetry of producing food with greater efficiency. The machines which now pick cotton displace people whose simple needs had been satisfied even if they did not have affluence. Their only choice was to go to the cities. Are these machines labor-saving or labor-destroying devices? Potatoes are now dug and bagged by machines which need few people to direct them. The displaced have no place to go but to the cities to become the so-called minorities. At least there are relief checks for them in the cities!

In the last decade millions of acres of marginal land for farming have been plowed by immense gang plows. This land was supposed to add to the food supply for a burgeoning population.

Industries have grown into monstrosities of technological competence which scarcely need manpower except to man computers which direct most of the operation. Most destructive to mankind has been not alone the displacement of people, but the effluents of industry. These pollute the air, water and

the soil. These pollutants and the reduction of the workforce now driven into ghettos are destructive to the spirit of the people.

There is much dissatisfaction with the growth of affluence which many Americans share. On the other hand the affluent have become deeply concerned that the garbage of affluence is destroying the quality of their own life. There is a queer anomaly in the economic base which indicates that if the gross national product does not grow by about five percent, there will be a great increase in unemployment. Relief rolls will grow. The erosion of human values and the sense of helplessness of those in Central City breeds desperation and distrust of the affluent establishment even while the affluent sense that the nation is in trouble.

If the problems of the minorities are put into perspective, the current concern with the environment and its ecology through such activities as the Teach-In are closely related. The problems of the minorities and of the affluent are both the result of application of technology which has reduced infant mortality, increased life expectancy—in short—a population explosion and an explosion of the gross national product and all it implies in gadgetry of TV's labor eliminating devices, moon shots, growth of world starvation and malnutrition, and the crowding into Central City.

Answers to our problems are hard to come by when our chambers of commerce, economists, industries and the manipulators of stock markets strive to see growth in cities and industries and products and other objects of affluence. The following quotations from the National Rural Electric Cooperative Association bears careful evaluation:

"There is something we can do about the crisis which faces every big city in America.

"What we can do is use our greatest resource—space—to reverse the tide of unhappy refugees from the countryside (and slums and ghettos) to the city.

"Because these refugees are victims of a quiet revolution in agricultural technology rather than of war . . . because they travel by ones and twos and threes in cars and busses . . . because they disappear into city warrens, they are unseen and unheeded until they pour forth into the streets in violent protest.

"Riots in the cities begin with human children on land that has lost its prom-

ise. They and their parents move from the bleak areas of the countryside to the cities in search of another promise. But the cities are already over-crowded, straining to cope with their own growth. There is little room and less opportunity for those who are poorly schooled, without modern skills, unequipped to meet the city on its own terms."

Some answers to the problem of the rush to the cities have been developed. The Carolinas, Georgia and Tennessee have met the problem head on. Scattered over the countryside are thousands of small industrial complexes which use



U.S.D.I. Photo

local small town and rural people in these hometown industries with hometown payrolls. We have seen small industries located among farms around whose periphery may be several small communities. But people drive in from miles around where they live without the hectic crowding of cities and ghettos.

To quote further from NRECA: "We can—we must—restore the promise of the land. We cannot create job opportunities in the small towns and rural areas. We must develop the instruments of modern living—more decent housing, more hospitals and medical facilities, better schools and libraries, improved water supplies and sewage facilities, adequate public services that will attract and hold people who yearn for space to call their own.

"The answer to 'what will we do with the next 100 million people' lies in the

rural-urban balance.

"There is nowhere else to go."

In past centuries there were migrations of people. Religious and political pressures were often the motivating force. Nevertheless, these people moved from an agrarian culture to a new area to continue agriculture related pursuits. A migration of about 600,000 people a year in America from land which no longer provided them with a living, to a crowded, strange land of brick, mortar, cement and an air fouled by industry into which these migrants could not fit is a new phenomenon.

America today has greater areas which are uninhabited than there were in 1900. This vast resource of space, this uncrowded countryside must be evaluated for its worth. People must not be forced by technological advancement to treeless, flowerless and above all hopeless life. The crowding of 70% of our people into one percent of our land can hardly be accepted as offering a rich life. The result is clearly opposite.

Technology must tear itself away from the control of those who see only profit, progress and a growing national product. Technology must be applied to bringing to everyone including all manner of minorities as well as to disillusioned affluents, a life made richer and more meaningful. The promise of the good life from science and technology must be fulfilled. But perhaps it is a bit late; so haste is imperative.

Then too, we need to reconsider whether these teeming millions in our many Central Cities are really in the minority in numbers. And then again, didn't the seeking of affluence for America create these so-called minorities? Should these minorities be told to eat cake if they can't find bread? Should they be told to watch TV when they cannot find green fields to walk through? Shouldn't these minorities be given a dignity through contact with the good earth? Technology could do well to look for ways to bring back such land contact. It must be done soon.

If naturalists are going to teach their public about nature, then this is what they should do. They should lead them into the woods with the idea in mind, not to cover one specific subject, but to take things as they come and be ready for the unexpected.

If an owl is seen by the group, it should be worked into the program. It should not be "fluffed-off" because the program features plants that particular day.

— from William C. Wagner  
Canadian Audubon Mar.-Apr., 1968

## Who Is A Land Advocate?

From *For Land's Sake*, a forthcoming publication by Rutherford H. Platt, Attorney, Open Lands Project, Chicago, Ill.

"This chapter introduces the unsung hero (or more frequently, heroine) of the land use planning process — the citizen "land advocate." Armed with petitions, maps, photographs, and philosophy, the enlightened amateur can profoundly affect the seemingly inexorable course towards development. Planners' dogma, attorneys' maxims, and the city fathers' economics all may wither before the arguments of the aroused private citizen.

"The land advocate bears little resemblance to the traditional "dear lady in tennis shoes," except that some happen to be dear ladies who wear tennis shoes. While the legendary version was a caricature in kindly ineffectuality, her counterpart today cannot so easily be put off. All the techniques of political action up to and including lawsuits and constitutional amendments are within the competence of the astute conservationist today."

## Feelings

A flower pod there was —  
Heavy with seed  
That ripened full and burst  
Like those before  
In flowers past.

Some seeds found ground —  
Cement, man-made,  
On earth long dead for use.  
They had to die.

Some skipped aloft  
With careless winds  
And lodged within  
A place of rocks  
Where soil and water  
Restricted all to stunted growth.

And others, still,  
Found earth like sand —  
Devoid of land for life.  
They had no choice  
But briefly swayed and bent.

A few, a lucky few,  
Found soil so rich with earth  
The seeds sank deep  
To root full strong,  
And buds adorned the sky  
With color in blossom.

So, too, was there a family —  
Boys and girls together.  
What soil would they find?

## Welcome To New Members

ANSS has no concerted membership drive, perhaps by design. A vast impersonal organization might be built with practically none of the members being acquainted with others. New members now come generally from those who have an affinity with another member and who have developed a philosophy which the ANSS holds. The following members are welcome to the ranks. More like them are needed.

Dr. John H. Bailey, Johnson City, Tenn.  
Esther V. Bennett, Lincoln, Neb.  
Biology Department, Shattuck School,  
Faribault, Minn.  
Thomas L. Carrolan, Liverpool, N. Y.  
Dartmouth Outing Club, Hanover, N.H.  
Dr. J. Russel Gabel, San Francisco, Calif.  
H. C. Gardner, Racine, Wis.  
Dr. Alfred Hulstrunk, Albany, N. Y.  
Kendall Co. Outdoor, Edu. Center,  
Yorkville, Ill.  
Roy Lorenz, Editor, Voice of Ecology,  
Chicago, Ill.  
Phyllis Marcuccio, Editor, Science and  
Children, Washington, D. C.  
Marshfield High School Library,  
Marshfield, Mass.  
Terrence T. McCormick, Binghamton, N. Y.  
Charles Milmine, Philadelphia, Pa.  
Jeane Milmine, Philadelphia, Pa.  
Rodney North, Peru, N. Y.  
Mrs. Marvin L. Pitt, Evansville, Ind.  
Thomas W. Sacher, Stroudsburg, Pa.  
Wayne H. Schimpff, Chicago, Ill.  
Helen Skelton, Fremont, Ind.  
Southern Cayuga Central School,  
Aurora, N.Y.  
Joan E. Viden, Glassboro, N. J.  
Robert A. Wiggs, Lafayette, La.  
Sam Zilke, Fairview, Alberta, Canada

"Development is not inherently bad. The President's Commission on Urban Housing calls for 26 million homes to be built in the next ten years to replace our aging housing stock. Industrial and commercial development provide jobs and indirectly support the local school budget through their tax payments. Even highways, the scourge of conservationists (including the author), facilitate both economic and recreational mobility.

"But while development frequently serves the public need for homes and jobs, nondevelopment sometimes serves the needs of the spirit. Man-made facilities can be placed almost anywhere; unusual natural phenomena must be enjoyed where found. The former are transient; the latter eternal, if left alone. To obliterate a unique natural area for the sake of an artificial thing therefore is utterly senseless.

"The land advocate is a citizen who recognizes this senselessness and takes action to prevent it. Rallying others to the cause, the land advocate is the prime mover in any conservation effort."



# Will You Help Reduce Pollution

GEORGE J. KNUDSEN

*Chief Parks Naturalist, Department of Natural Resources, Madison, Wisconsin*

Pick up any newspaper nowadays and you will see article after article relating to the mess we are making of our environment through pollution. Magazines, TV, and radio are concentrating more and more on environmental issues. Scientists, educators, senators, editors, and reporters are incessantly calling attention to the many threats to our environment. Some scientists are even trying to predict when our earth may become devoid of most life because of pollution.

Our air, water, and soil *are* being fouled by industrial wastes, sewage, exhausts from at least two hundred million gasoline and fuel oil burning engines, pesticides, herbicides, fertilizers, and salts. We are all aware of this because we are constantly being told about it, but *more importantly* most of us know about pollution because we have smelled it, seen it, tasted it, and felt it irritating our eyes and nasal passages.

Public concern over pollution is increasing and so is public alarm because of the daily messages of impending disaster. There just seems to be too many pollution problems publicized and too few immediate solutions offered. Many of the solutions will not be easy to find since the total pollution problem is so complex and massive.

We are all shaking our fists at industry, sewage disposal plants, heat and electricity generating plants, jet aircraft, and many other sources of pollution and asking when *they* are going to stop polluting air, water, and soil. We certainly have every right to expect, and to demand, that they face this problem squarely and as soon as possible. We also have every right to expect our Federal and State Governments to place the highest priorities on anti-pollution legislation and funding of pollution abatement programs. The "big guns" of industry and government *are* beginning to take aim on the pollution problem. Let's hope they aim well and have plenty of ammunition!

Now for the question that relates to the main purpose of this article. Do we, as *individuals*, also have the right to stay out of the pollution battle? I do not think so! It is our demand for *products* that is the main cause of pollution in the first place; therefore, I feel that everyone should begin doing what he or she can to help win the pollution battle. My feelings regarding the in-

dividuals' role in the pollution battle led my family and me into doing something to help lessen *our* contribution to pollution. We have shown ourselves that we can do many things to help reduce pollution and we have derived much satisfaction from our efforts.

## Your Car and You

There are many ways to reduce your car's gas consumption and if practiced regularly they become habits and pay off both in money and reduced air pollution. Here's what you can do:

1. Do not race your engine at stop signs. Let your engine idle until you *need* the power.

2. Avoid "jack rabbit" starts, or in teenager language, "don't lay a patch." Start up gradually. It's easier on the car; safer too!

3. Maintain constant speed, matched to traffic, whenever conditions allow you to do so, both in the city and on the highway. This too is an excellent safety practice. High speed really eats up gasoline, is tough on the engine and tires, and above all is too dangerous.

4. Time your approaches to stop lights to avoid having to stop so often. This is not always possible, especially in heavy traffic. It takes a lot of gas to get the big cars rolling again once they are stopped.

5. Let gravity help you save gas when going down hill. You can almost coast down steep hills. On less steep hills strive only to maintain constant speed. When opposing hills lie ahead gradually accelerate down hill and decelerate gradually when going up hill. This is a good gas-saving technique, and gradual deceleration as you approach the "blind" crest of a hill is recommended by highway safety experts too!

6. Keep your engine tuned up, and while the mechanics are working on your engine have them check the anti-pollution devices on your newer car.

7. Do not idle your car so long on those cold winter mornings. You don't have to be toasty warm on the way to work. A parked car with an engine running and no one in it is easily stolen. A parked car with an engine running and someone in it is a perfect setup for a case of carbon monoxide poisoning.

8. Walk on those short shopping trips and countless other little trips. The exercise will do you good. Remember the kids can walk too! Try them! When longer chore-type trips are neces-

sary, use your smaller car.

9. Share rides to work when possible and take turns furnishing the car.

10. Plan ahead to avoid those extra trips to pick up something forgotten on the first trip.

With a little thought you can certainly come up with some additional ways to save gas, suited to your own particular day-to-day car needs and driving habits.

## Your Home and You

There are many things you can also do while at home to help reduce pollution. My family has been in on the following "experiments" around our home and they want to continue these practices. If you want to "get in the act" you can:

1. Keep your daytime house temperature at 70 degrees or a bit lower during the cold months. Too many homes are needlessly heated to 80 degrees or more. We commonly set our house temperature at 65 degrees.

2. Cut your night-time house temperatures to 60-65 degrees. Too cold? Alright, put on another blanket! You will feel better the next morning too!

3. Avoid wasting water, especially hot water. It takes energy derived from oil, gas, coal, and atomic fuels *to pump it and to heat it*. The same holds true for electric lights and other electrical equipment. How many times have you switched off lights or the TV that had been left on, often for hours, in unoccupied rooms?

4. Use that gasoline-powered lawn mower less frequently. We're letting our grass grow a lot longer nowadays and have thus reduced the number of cuttings with our power mower by *at least* one-third. Those of you with small lawns *could* push the old-fashioned muscle-powered mower.

Just imagine how many hundreds of millions, perhaps billions, of gallons of petroleum fuels would be saved annually if everyone practiced the above fuel-saving techniques. Each gallon of burned fuel pollutes a great volume of air and burns large amounts of oxygen. It shouldn't be difficult, therefore, to realize the total pollution reduction effect of a nation-wide fuel-saving effort. In relation to the above there would be the additional advantage of having to refine less gasoline and fuel oil (refineries also discharge pollutants). And, finally some of our finite petroleum re-

sources could be preserved for future generations!

5. Those of you in suburbia and in the country that own large lots with trees, shrubs, gardens, and weed patches can stop burning leaves, grass, brush, tree prunings, etc. Pile your leaves in an odd corner of your lot (we're going to build a corral for ours). Cut your brush smaller so that it will lie in a more compact, therefore damper, pile. This material will rot down faster than you think! The rotted leaves will furnish compost for shrubs, flowers, ferns, lawn, and garden.

6. Cut down on the volume of paper, cardboard, and other trash that you burn. We're down to about two peck sacks a week for our family of five and we're going to reduce this. Of course, many cities allow no burning of trash whatsoever.

If you have watched burning trash you've seen the great volume of billowing smoke and ash produced by even a small pile. Many of you have also seen the dangerous brush, grass, and even forest fires that started accidentally from trash fires. No more need be said about this!

7. Use garden and lawn fertilizers according to directions on labels. Do not over-fertilize. It's unnecessary and wasteful; and excess fertilizers travel down hill to the nearest streams and lakes during rainstorms. We've cut our lawn and garden fertilizing to one light application a year. If your grass grows somewhat slower you will not have to start that power mower as often!

8. Use herbicides and insecticides according to instructions on labels, and then only when really necessary. These chemicals are too often over-applied. We've cut our use of both to a bare minimum and our lawn and gardens haven't suffered too much.

9. Make a pit in which to dump your vegetable garbage if you have gardens. We use our pit mostly in the cold months. In spring we move the collected material from the pit into our gardens and dig it in. During the warm months we cover our pit garbage with earth or bury this material well-spaced in the garden to keep down odors and eliminate the fly problem. Utilizing the garbage in this way will take a load off the sewage system, reduce water pollution, and help your garden.

10. Use soaps and the newer biodegradable detergents, and watch for new developments in these cleaning chemicals.

There you are! I'm certain that if you use these methods regularly you will soon discover that they become habits. I'm equally certain you will feel proud

# Careers in Conservation

PAUL M. KELSEY

Every few days someone knocks on my office door to find out about the possibilities of a career in Fish and Wildlife Management. Generally they fall into two classes; first are high school students who are looking toward the future and are anxious to learn not only what type of work is available, but what kind of training is needed to prepare themselves for it. It is a pleasure to give these boys and girls what help I can.

The second group I dread, by comparison, for they are men who have been out in the world for several years and have gotten tired of the routine of an inside job. Their primary qualification is that they love to hunt, fish and do related outdoor activities.

Love of the outdoors is a vital qualification for a Fish and Wildlife Management Career; however, it has to be backed by some other training or experience. Many of these men are well qualified to do the heavy work of conservation connected with land management. Farm work, construction work, logging, surveying, machinery maintenance, all have direct values in conservation work. The men already doing these jobs for conservation agencies like their work so the turnover is very slow. Under the reasonably stable budgets that have been maintained in recent years, this means few openings.

To get into the professional or technical level of employment, one must have some advance training, pass a civil service exam, and be in a reachable position on the civil service list. A boy or girl interested in a conservation career should start his planning early enough in high school so that he can get into the best school to continue his training.

Not everyone can make it into one of the colleges like Cornell or Wisconsin which have four-year courses in some type of natural resource conservation. Two-year schools have good programs to turn out well-qualified technical graduates. Proof of ability at one of these schools is another avenue to the four-year college.

Often the high school student is surprised to find how relevant are some of the courses that had appeared to him to be of no value in an outdoor career — such as mathematics, chemistry and, particularly, English. Without good understanding of math, a boy is a dead duck trying to understand surveying, the dynamics of forest growth and mensuration or interpreting the data gathered about fish and wildlife populations.

of your part in pollution reduction. Once you begin proving these things to yourselves, I sincerely hope you will try to get your friends to join the pollution battle. I can promise you that everyone in my family will continue their efforts to reduce pollution!

Fish management has graduated from dealing only with fish and now one of its most important aspects is the protection of the total environment in which fish live — the water. Chemistry is vital to determine the quality of water both for fish and man, and in pinpointing sources and causes of pollution.

English? What use could that be? The day has passed when a worker in the field of conservation can keep his nose to his own little grindstone and not get out and meet the public and try to sell environmental preservation. Along with writing and public speaking are other means of getting the word across, such as photography and making exhibits. One manifestation of this change is that a new Conservation Officer now must have two years of college training. No longer is he just a "game cop." More and more of his time is spent explaining laws so that the public understands "Why" and cooperates voluntarily.

Definition For Environmental Education Proposed

A definition of "Environmental Education" proposed by B. Ray Horn has been accepted and recommended for wide use by the participants of the international working meeting on "Environmental Education in the School Curriculum." The meeting, organized by International Union for Conservation of Nature and Natural Resources (IUCN) (with which ANSS is affiliated) under the sponsorship of UNESCO, was attended by twenty delegates from fourteen countries.

## Definition For Environmental Education Proposed

The definition reads: "Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision making and self-formation of a code of behavior about issues concerning environmental quality."

EG INDEX

NATURE STUDY

# TIPS for Environmental Education . . .

## SNOW and SNOWFLAKES

HELEN ROSS RUSSELL

Snow is the magic of winter. Even though it may stall traffic and cause serious problems of removal; for a short time it creates a world of beauty and cleanliness.

Dirty streets are covered with a blanket of white. Ugly shapes are softened, dumps, erosion and other symptoms of man's mismanagement are temporarily obliterated. For a few hours we see a better world.

Children respond to this enthusiasm. It's a perfect time to challenge them to creative expression; a time for drawing the beauty they see, for expressing pleasure in a poem or a story or essay. It's a good time to look further: to discuss the beauty and to look for implications. We can't keep snow on our ugly places—but what things could we do to create a more permanent beauty?

In addition to the beauty created by masses of snow, individual crystals are very exciting. Again they are special, something distinctly different.

It is not frozen rain or frozen water but frozen water vapor: a gas going directly to a solid without an intermediate liquid state. Under favorable conditions snow forms in crystals. As in all crystal formation the size of the crystal is influenced by the temperature at which it forms, but the basic shape is determined by the material.

Basically snow crystals are built on a plan of six. Snow crystals that form in the lower cloud levels where the temperature is warmer are larger and feathery. Snow crystals from cirrus clouds and other high cold regions are smaller and tend to be hexagonal without any feathery projections. Some of the small high cloud crystals are three sided or even needle shaped. But snow flakes are never four sided except in grade school classrooms.

Collecting snow flakes on coat sleeves or dark paper and examining them can be exciting. Large flakes can be appreciated with the naked eye. A hand lens helps in examining small flakes and even in discovering some of the delicate tracery or fine decorations of the large flakes.

As the snow crystals are examined children can begin to appreciate the great variety of forms these six sided crystals take. In fact, no two identical snow flakes have ever been discovered,



Low altitude flake patterns

even though we have many thousands of photographs of flakes from many different snow storms in many different places.

The potential for this great variety can be explored by having children make snow flakes. Cheap, white paper napkins in quarters are excellent for this purpose.

1. Have all the children put the napkins on their desk so the fold is at the bottom and the cut edges are on the top and the left.

2. Have them put a finger of their right hand on the lower right hand corner where the three folds come together.

3. Now they are going to form two triangles ("arrow heads"). These will be made by holding on to the right hand corner while they lift the left hand corner almost up to the upper edge. What had been the bottom folded part of the napkin will now be a slanting line forming two triangles. One triangle is double, the other is the uncovered upper part of the napkin. These two triangles should be exactly the same size. When they are, having the child push the new bottom fold down hard.

4. Now he is ready to lift the napkin and fold the upper triangle back so it fits against the lower one. He will now have a single triangle or arrowhead made of three layers.

5. The hard part is over. You are ready to make the snowflakes. These may be torn or cut with scissors.

The children should hold the triangles with the sharp point toward the bot-

tom of the desk and start to cut or tear on the right hand side at any place where the triangle is three layers thick. The cut or tear is made toward the left side. It may be almost straight across, or zig-zag or curved. It may slant toward the bottom point.

6. After this they are ready to make holes in the snowflake. These can be triangular or irregular, round or square. They can extend almost across the flake or down along an edge. They can start from the right hand side or the left hand side or both sides. The more that is cut or torn away the more feathery the flake will be.

If the original cut goes straight across and few holes are made the resulting flake is a cold temperature—high altitude flake. If the original cut slants sharply and intricate cutouts are made, a warmer temperature—low altitude—flake will be produced.

Children can decide whether they have a high altitude or low altitude flake. They can make a circle and admire the variety of flakes they have produced. (Like real snow, there will be no exact duplicates.)

Or each child may make two flakes—a high and low altitude one.

Needless to say snowflakes can be made from other paper besides paper napkins. The napkins have the advantage of being square, being already folded in quarters, and being soft enough to be torn. So, younger children can have the satisfaction of making flakes that reproduce the beauty and the uniqueness of the 6-sided crystals.

# A Prophecy To Fulfill

A little over 13 years ago the theme of the ANSS meetings at the Seventh Washington, D. C. meeting was *Fifty Years Ahead*. Some ideas presented at this meeting looking to the future have borne fruit.

We see that "Taking the School Out-of-Doors" as John Brainerd presented it, has now become the "in thing." While it took an April 22, 1970 Earth Day to trigger action, such thinking as Brainerd's had put an explosive pressure on a movement which Earth Day released.

At this Washington meeting Joseph J. Shoman pointed to a need for "Education for a Better Future of Conservation and Nature Study." Lester Giles recommended "Summer Workshops for a better Future" aiming at teachers in service whose excellent book learning as we see it today gave little skill at interpreting the dynamic world in which we live.

There were and still are some college and high school teachers who feel that Nature Study is literally *for the birds*, and for little old ladies with tennis shoes. Yet at this meeting Rex Conyers recommended "Improved Nature Study at the High School Level."

No subject can be taught with any marked success by those who know little about it. This applies alike to physics, mathematics, chemistry, and history as to nature study. There must be prepared teachers. Verne N. Rockcastle strongly recommended "Better Teacher Preparation for Nature Study" and Verne Fuller spoke forcibly for "Better Nature Study in the Elementary Schools."

There has been a deep sense of human relation to the out-of-doors through which man in many millenia evolved. It is only within this century that the earth's people have become an urban species scarcely fitted psychologically for his separation from the good earth. Millions of Americans have discovered that there is added zest to living when an outing to the woods, and stream or lakeside intersperses the deep tensions of the city. Yet an outing is not enough. There must be added meaning to these excursions. C. W. Mattison presented a paper recommending "Better Nature Interpretation to Visitors in National Forests and Parks."

The four walls of classrooms are a far cry from the child's world when he leaves the school at the end of the day. Many modern schools which are the dreams of textbook bound educators do not have windows supposedly to avoid the distraction of the clouds drifting

through the sky outdoors, or of a storm which roars across the playground. His world is the caterpillar in the back yard, the trails through the woods and vacant lots, the ponds where tadpoles and minnows play, and the squirrels which steal food from the bird feeders, and many more rarely touched upon by the four-walled school atmosphere. Edith Curry, speaking with conviction born from experience, recommended "Minimum Equipment for the Nature Room."

Even better as an enforcing supplement to the nature room is the "Improved Field Trip in the City and Country" which Roland C. Ross strongly recommended.

All this sounds familiar today when we see individuals and whole schools heading to the outdoors for nature study, or as some now dub it, "ecology." But the best of intentions may be meaningless for giving children a better view of their abused natural world, unless there is knowledge gained through rigorous study of the environment in all its manifestations.

There are vast gaps in knowledge of the complex out-of-doors and man's relation to it. Ira Gabrielsen presented a paper at this Washington meeting with ideas on this gap. He pointed out that "A major part of the job of the modern nature teacher is to bridge this gap of understanding . . . Aside from the fundamental needs of food and clothing, America is losing many of the spiritual and esthetic values of natural resources, and these values are assuming increasing importance as population pressures build up. A major part of the present suburban movement is a somewhat futile attempt . . . to escape from the crowding of city life and to get closer to nature. The preservation of the outdoor recreation these people want — whether it be bird watching, boating, hunting or fishing — will depend upon how well we manage to preserve some of the natural areas which must provide the environment for these sports in future years.

"Few greater or more important tasks can be performed by the members of the American Nature Study Society than to impress upon the pupils the values of remaining natural areas and the importance of managing the land to produce maximum materials and recreation values consistent with essential material needs."

Gabrielsen continued further with additional comments which were prophetic of newly expanded interest in ecology.

Since his talk, recreation became recognized as a national "resource" with the passing of the Multiple Use Law, and even more recently with the creation of the Bureau of Outdoor Recreation.

Gabrielsen also stated that "During the coming years it will become increasingly necessary for teachers of biology and nature study to drive home the facts concerning the interrelationships of living things — including man — with one another. We have specialized in every field, even to the extent that some foresters see woodland values only in terms of saw logs; some agriculturists regard any plot of land not producing corn or soybeans as wastelands, and many engineers consider any water area whether marsh, stream or lake, as worthless unless filled, channelized, leveed or drained."

ANSS has seen change in the environment which is definitely related to the population explosion, and to the impact of technology which has given affluence from its consumption of raw resources at a rate much faster than the population grew. The affluent life would have been well to enjoy, but the obsolescence of goods for affluence, and the waste products in their manufacture, have fouled the land, the air and the waters even to the mass of the oceans.

A re-evaluation of our education is in order. The recent Earth Week brought to the front talks and some action. In some areas there seemed to be what some called apathy. It was more a sense of futility. People were looking for leaders not with words, but with concrete examples of readily accomplishable improvements in the environment.

Even for the success of Earth Day, industries continued to belch pollutants from its smokestacks. Highways in some states had a growth of billboards. The automobiles we have available still add to the degrading of the environment. The chemical industry still has its defenders who say that the damage chemicals do to our environment are exaggerated.

Some point to the possibility of industries leaving areas which apply strict effluent standards. "Do you want jobs — or do you want clean air? You can't have both."

It is possible to have both. The consumer of industrial products must share the cost of cleaning up, but no less than the receiver of dividends. A one sided burden will only bring us to a deepened crisis of environment. The message presented at Washington thirteen years ago must be fulfilled.

# GOOD READING

Edited by ROBERT M. McCLUNG

*Science Looks at Itself* by National Science Teachers Association. Charles Scribner's Sons, \$5.95.

This brings together the writings of distinguished scientists and educators. It indicts the anarchy of technology, the power and self-interest of private enterprise and the apathy and perhaps the sense of futility of individuals for many of the present environmental crises, and explores new courses of action to safeguard the natural world.

Rene Dubos in the introduction states that "If populations continue to increase beyond the capacity of the earth to support them adequately and to absorb their waste products, if modern man expands still further his apparently insatiable appetite for the creations of industry, then disasters are inevitable because scientific knowledge cannot possibly provide methods to cope with such human excesses. In the final analysis, the future of civilization depends upon man's ability and willingness to formulate goals that are both desirable and attainable."

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*A Field Guide to the Insects of America North of Mexico* (A Peterson Field Guide) by Donald J. Borror and Richard E. White. Houghton Mifflin Company, Boston, 1970. 404 pages. \$5.95.

This long-awaited book continues the consistent high quality and usefulness which mark all of the Peterson Field Guides. Written by a Professor of Entomology at Ohio State University and a research entomologist at the National Museum in Washington, the book covers 579 families of insects. It is illustrated with more than 1300 drawings, most of them line drawings by the authors, but also including 142 full-color illustrations and many shaded drawings by artist Richard E. White. All illustrations are of high quality.

All in all, this is the most detailed, up-to-date, and useful pocket guide to North American insects ever published. You will find it very handy to own whether you know a great deal about insects, or practically nothing at all about them.

For the beginner, introductory chapters explain the fundamentals of insect structure, growth, and development, and also describe how to collect and preserve specimens. —RMM

\* \* \*

*Clarion the Killdeer* by Helen Ross Russell. Illustrated by John Hamberger.

Hawthorn Books, Inc. New York, 1970. 60 pages. \$3.95.

A very well-done account of the first year in the life of one of America's best-known shore birds, *Clarion the Killdeer* begins with the hatching of the young bird in a farmer's field. The author describes simply and interestingly how Clarion grew, how he learned to hunt for food, how he learned to fly. He survives many different dangers as he grows — storms, the crippling effect of clay balls on his feet, trigger-happy hunters.

In the fall Clarion migrates to Florida for the winter. On his return north the next spring he escapes various other dangers. Finally he challenges his father for a territory in the same field in which he hatched and grew up.

Throughout the story the author skillfully interweaves the themes of natural history and conservation, the various attitudes toward wildlife and environment that are of such vital importance today. The soft and sensitive half-tone drawings by John Hamberger gracefully supplement the text. —RMM

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*The Crab From Yesterday: The Life-Cycle of a Horseshoe Crab* by John F. Waters. Illustrated by W. T. Mars. Frederick Warne & Co., Inc. New York and London, 1970. \$3.95.

Clearly and simply written, this interesting short book of 36 pages is aimed at readers from 7 to 11, but can be appreciated by much older readers as well. Very attractive illustrations, half of them in full color, are to be found on nearly every page.

The story recounts the details of this "living fossil's" life history, from development of the eggs laid on the beach, through hatching, growth, and molting, to full maturity. Many dangers are part of the story, and man's prejudice against horseshoe crabs is vividly shown as well. The book ends with a moving account of a boy's growing appreciation for this interesting creature, and how he rescues it from destruction. Thus, another dimension — a feeling for conservation of wildlife — an appreciation of the wonder of living things, is added to the story.

Two other books on this interesting animal are *The Crab That Crawled Out of the Past*, by Lorus and Marjorie Milne (Atheneum, 1965); and *Horseshoe Crab*, by Robert M. McClung (Morrow, 1967).

\* \* \*

*Animal Partnerships* by Maurice Burton.

Illustrated with photographs, and with text drawings by R. B. Davis. Frederick Warne & Co., Inc. New York, 1969. 107 pages. \$4.95.

A convenient guide and reference work for students, this book discusses and illustrates the many different kinds of animal partnerships. It begins by explaining the differences between such terms as commensalism, symbiosis, parasitism, inquilism, and mutualism. Food is the basic ingredient or attraction which forms most of these partnerships, but in many cases other advantages come to one or the other of the partners as well.

The partnerships of many ocean animals — from whales, seabirds, and fish to various marine invertebrates — is covered in most detail. Separate chapters tell about "Ants and their Guests" and "Termite Nests" and the other animals that use these as nests too. Other chapters discuss many other partnerships, such as the honey guide and the honey badger, the crocodile and the plover, and the cattle egret and various hoofed animals. —RMM

\* \* \*

*Earth's Cooling Climate* by Kendrick Frazier. Science News, Nov. 15, 1969. Vol. 96, No. 20, pp. 458-459.

Figures are given on changes in temperature, CO<sub>2</sub> and particulate matter in the atmosphere and on other features setting the stage for the question: "Are we headed for another ice age?" This item was prophetic and should be evaluated for what it is worth.

\* \* \*

Donald Kirk has produced a much needed book dealing with *Wild Edible Plants of the Western United States* published by Naturegraph Publishers, Healdsburg, Cal. 95448.

Kirk recommends that the book be taken along on field trips for hiking, camping and other activities. This author cautions against following old wive's tales about what one may or may not eat. If a small sample of a plant is first tried and it has no harmful effect, then the plant should be good to eat. However, a sample of water hemlock root the size of a peanut may likely be fatal.

This reviewer suggests that experimentation be done with some caution in groups which have poisonous forms such as the parsleys. The book deals with only one species in a genus, though some reference to other forms is indicated by common name. The book has over 300 plants illustrated by line drawings. Paperback 312 pp. \$3.95.

\* \* \*

*Source of The Thunder* by Roger Caras, Little, Brown and Company, 34 Bea-

con St., Boston, Mass. 02106. 181 pp. \$5.95.

This is another in the series of portraits of threatened creatures which Caras has fictionalized yet with factual accounts. The Foreword to this book is by Roland C. Clement, V.P. of the National Audubon Society, and is quoted here:

"More than we know, we are forced to live by symbols because the total reality of this wonderful, dangerous world we live in is too complex for us. The California Condor, long with the Thunder Bird of American Indians, has in our day become a symbol of the pitifully reduced inheritance of wilderness that earlier, profligate generations handed down to us. There is a hint in Mr. Caras' insightful account of a big bird's journey through time-space that our survival may depend, like the condor's, on forces within ourselves we have not yet mastered, nor even grown fully aware of.

"This sensitive, necessarily fictionalized but honest reconstruction of a condor's life history, is both delightful reading and a rare excursion behind the mask of our self-conscious pretensions.

"Unlike Mr. Caras' condor, we can reflect that Nature may indeed have 'many things on her mind,' and that it will pay us to slow down in reshaping the only planet we have, treasure our few remnants of wilderness for mind and soul stretching, and insist that the condor be preserved as a symbol of Nature's way. It will then also serve as a monu-

### New Magazine

*Wilderness Camping* is a new magazine for the self propelled wilderness enthusiast who wants to get away at least occasionally from the noises of man's gadgetry. This is Vol. 1, No. 1 of a dream magazine.

Paul Caldwell, Jr. wrote the kick-off article titled "Dream Magazine" in which he sets the stage with what he calls the view of "An Opinionated Fanatic." He feels: First and Foremost, it should be crusading. Too many magazines of all subject matter are more concerned about offending an advertiser than in giving the customer a good product . . .

"One of the essential parts of my dream magazine is an up-to-date report on the status of legislation concerning the environment . . .

"One method of securing this information would be to use people already watching these things for Sierra Club, Audubon Society, Nature Conservancy, Wilderness Society, etc.

ANSS members might profit by looking into this magazine which is available from Fitzgerald Communications, P.O. Box 1186, Scotia, N. Y. 12302.

ment to the day of our own reawakening to the fact that man and nature are one."

*Highways and Our Environment* by John Robinson. McGraw Hill Book Co., 330 West 42nd St., New York, N. Y. 10036.

This book is a must for those who have passed the talking and carping stage and want ideas for action against the insidious expansion of cement ribbons built for cars and not for people. This book provides a sharp focal point against which citizens and groups can act more intelligently and forcefully than they have in the past against those who are forging ahead to cover America with ribbons of concrete. If you can't afford to buy this well illustrated book (about \$25) get your library to get one.

### Write The Editor . . .

We would like to have evaluations of the efforts of the Boy Scouts of America working with KEEP AMERICA BEAUTIFUL in the cleanup on June 5. Perhaps you were involved.

### Conservation Commandments

1. STUDY the land so that each acre may be used wisely according to its capabilities and treated according to its needs.

2. GUARD well the living soil, that it may continue to nurture man:  
Clothe it lovingly with vegetation.  
Hold its fertility and organic content,  
Improve it as a legacy for posterity.

3. REVERE water, the lifeblood of civilization:

Retard it on the surface,  
Trap it in the soil,  
Guard its purity zealously.

4. CHERISH forests that they may —  
Conserve water,  
Shelter wildlife,  
Provide for our needs,  
Restore our tranquility.

5. RESPECT all living things as having a role, however humble, in the balance of nature.

6. PROVIDE living museums, samples of primeval America, to be managed by nature alone, so that they may —  
Serve as reservoirs of wild species that may be needed tomorrow; provide control areas against which man's efforts at management may be measured.

7. LEARN to live in harmony with nature in an ecological symphony, a mutually beneficial dependency.

By M. Graham Netting, Director, Carnegie Museum, Pittsburgh, Pa. 15213, Powdermill Nature Reserve and Bioscience Center in Ligonier Valley.

### Mealworms For Classroom Study

Verne N. Rockcastle of Cornell University has been a staunch supporter of the idea that biology and its related field, nature study, should include the study of real live things. Concerning the care of mealworms he has the following to tell which is what his students who will be working with children learn:

"Mealworms are elongated, buff or tan larvae of a black or dark brown beetle. They can be obtained as cultures from any biological supply house, or as samples from an established culture at a local high school (biology department) or college. They live comfortably in a cardboard carton such as an ice-cream carton, with a tight fitting cover in which is a screened or gauze-covered window to admit air. Fill the carton about half full of oatmeal flakes and add a layer of paper towel discs before introducing the mealworms. Every two or three days put a few slices of apple or potato on top of the meal as a source of moisture or add a few drops of water to the paper toweling. The insects will carry on their entire life cycle within this box of meal, and will provide a ready source of food for lizards, larger insects such as preying mantids, and for some snakes, turtles or chicks. Mealworms are ideal for certain animal behavior experiments."

### Our Will

A pillar stands by ferny growth,  
And ponders on its fate.  
The giant redwood, god of trees,  
Can only stand and wait.

The daily buzzing saws of man  
Rising to a roar,  
Consume a thousand years of growth,  
And on, and on for more.

While fat and smooth and unconcerned  
Behind a redwood desk,  
Our man is there upon the scene  
To alter our request.

While in the groves down by the sea,  
In silence, deathly still,  
The last remaining redwood stands  
Await upon our will.

— Mike Provencher

The development of biology during the half century just past has led farther and farther from the methods and concerns of natural history. It has made the biologist less and less a man of the out-of-doors, more and more a man of the laboratories. And in the laboratory he has been led farther away from everything which tends to establish an empathy between himself and the subject he studies.

— Joseph Wood Krutch

# NEWS and NOTES . . .

## on Environmental Education and Action

### News From The Ford Foundation

"The science of ecology shows promise of providing some of the techniques and insights necessary to the solution of many of our environmental problems," said Gordon Harrison, program officer in charge of resources and environment for the Ford Foundation. "But to develop and express this promise there is need to train enough ecologists so that it is possible for them to touch hands intellectually throughout the range of theoretical and practical interests and to sharpen the focus of ecology on human problems.

"At least from the time man first let a cultivated field lie fallow he has recognized some limitations on his freedom to exploit the environment. A farmer obviously wants maximum biological production—a complete cycle in one season from planted seed to crop and back to bare earth. Nature let alone abhors such a rapid single-minded turnover and seeks to restore an equilibrium with a variety of plants and animals in a system where the material is recycled, reused, and reconstituted and there is no net biological output at all.

"Such conflict between the needs of man and the needs of nature is, of course, inevitable. The point is that if the terms of the conflict are known the outcome is largely predictable. Instead, then, of learning ecological lessons the hard way by blundering and suffering, we may begin to deduce principles in advance whose violations can be expected to lead to trouble.

"For example, as a result of the construction of a sea-level canal into the upper Great Lakes, the lamprey reached previously inaccessible waters and destroyed a multi-million dollar fishing industry. This occurred because no one was paying attention to the lamprey as well as to the principle that when you change the land even a very little, you alter the relationships of all living creatures who long ago achieved a stable adaptation to conditions as they were."

### Youth Groups Build Trails

"Located in the Front Range of the Rocky Mountains, the Mesa Trail is a 13-mile segment of the 30-mile Boulder Mountain Park Trail System. The major portion of this trail network is the result of 1899 and 1912 Congressional Land Grants to the city of Boulder.

"This trail, with its spur, provides a

wide spectrum of hiking challenges. These can vary from a leisurely stroll in a lofty mountain meadow to a scramble over rock formations which jut over 200 feet above the slope of the 7,000-foot range.

"The Trail is maintained by the Boulder Parks and Recreation Department. During summer months much of the maintenance work is done by local teenage boys who participate in Boulder's Ranger Program."

— Mid-Continent MEMO, Apr. 22, 1971

Activities such as the above for youth are among the finest which can be found. Many eastern members of ANSS have participated in hikes over portions of the Appalachian Trail which extends from upper Maine to Georgia. Perhaps some have made the whole trip through a series of summer hikes. We would like to hear from members concerning this activity.

### Natural Waterways Preserved

Many biologists and naturalists have often discovered to their great dismay that a favorite stream side, marsh, or creek has been drastically attacked by some agency intent on adding improvement to the natural area. These environmentalists discover all too late that there had been some kind of hearings prior to the alteration, but too often these hearings were formal statements of what was going to be done, and that was not too clear.

Such destruction of natural waterways will no longer be possible in Louisiana where the governor recently signed an act of the legislature which protects the state's remaining natural and scenic streams from channelization.

"The new legislation prohibits channelization, clearing and snagging, channel realignment, and reservoir construction on all of Louisiana's designated natural and scenic rivers and streams. A natural and scenic river is described in the act as any river, stream or bayou or segment thereof that is in free-flowing condition, that has not been channeled, cleared or snagged for the past 25 years and has a shoreline covered by native vegetation and has no or few man-made structures along its banks.

"This precedent-setting legislation allows landowners and the state to agree on scenic easements that preserve the natural landscape. Similar easements

allow contracts between stream owners and the state which relieve the landowner of liabilities and assure public access to the streams."

— Quotes from *Conservation News*, Jan. 1, 1971

### No Place For Morality In Science

Dr. Charles Schwartz, Physics Dept., Berkeley, California, tells of an encounter with a young physicist from the Lawrence Radiation Laboratory at Livermore, Calif., a place the radicals view with the same regard in which nuns view a house of ill repute. "I noticed," says Dr. Schwartz, "that his experiment had to do with plutonium." Dr. Schwartz says he asked why the physicist's interest was in plutonium of all elements and whether it had any connection with "the first experiment with plutonium, the one over Nagasaki." The speaker replied that a technical session was not a place to discuss such a question but would be willing to discuss it further outside. Dr. Schwartz says he asked whether questions of morality had no place in science, and the speaker said they did not.

— Science News, Mar. 6, 1971  
Vol. 99, No. 10, pp. 168

### Izaak Walton League Files Suit

The Izaak Walton League filed a law suit to the tune of \$1.5 million against New Jersey land developers in an attempt to stop dredging and filling of coastal wetlands in the Cape May, N. J. area.

This suit, filed by the Cape May Chapter of the League, also names the Secretary of the Army, the Corps of Engineers, the New Jersey Department of Environmental Protection and the Mayor of Middle Township, Cape May.

The suit, filed as a class action, specifically cites the destruction of Gravens Island, a coastal wetland area covering about 360 acres, 110 of which have been filled over with dredge material by real estate developers.

Plaintiffs contend that Gravens Island (including filled-in sections) is laced with navigable tributaries subject to the ebb and flow of the "ordinary high tide." Such waters are governed by numerous state and federal laws, many of which are meant to protect marine and marine-related resources.

— Outdoors Unlimited Sept. 1970

## Sea Otters and Economic Reality

There were once thousands of sea otters along the California coast. In 1958 there were an estimated 638. In 1964 there were 396 though some counts put them as low as 236. There are complaints among abalone fishermen that sea otters are depleting the abalone. Have these fishermen been taking illegal, surreptitious control in their own hands?

About twenty years ago there were only 11 abalone fishermen. Today there are several hundred. Have the fishermen indicated that the more than fifteen fold increase in fishermen might be a greater destroyer of the abalone population than the sea otter?

## Student Opportunities

The Student Conservation Association will have its fifteenth summer of operations in cooperation with the National Parks Association, the U.S. Forest Service and the Merck Forest Foundation. Actual field experiences for the participating student will expand their knowledge of man in relation to his environment.

One hundred seventy-seven positions are open to both male and female high school students sixteen years of age or older. They will live in primitive camps in park and forest areas where they will build shelters, construct and maintain trails, rehabilitate overused areas, and complete other worthy projects.

There will be well supervised and meaningfully directed pack trips into wilderness areas.

The Student Conservation Association may be contacted at Olympic View Drive, Route 1, Box 573A, Vachon, Wash. 98070.

## More Law Enforcement Needed

Times have changed the character of outings to the woods and streamsides. Where formerly these outings provided peace, quiet and serenity, there is now noise from motorcycles, blaring radios, hilarious parties, and certainly the general lawlessness among a small but obnoxious element.

Law enforcement problems in such areas in national parks has forced the Park Service to expand its police force. Park Service Director George B. Hartzog, Jr. said recruitment has already begun in filling 40 additional positions raising that force level from 371 to 411.

Hertzog pointed out that the park system includes 283 areas—some rural, some suburban, some an integral part of America's sprawling metropolitan complexes.

A record high of more than 172 mil-

lion visits was recorded in the National Park System last year alone. This pressure of people has changed radically what the activities of park personnel will be.

Hertzog indicated a need to staff park ranger ranks with personnel experienced in the social and police sciences rather than recruitment almost exclusively from the fields of history, archeology, anthropology, botany, etc. At the present time, the Service has some 800 permanent rangers and technicians, augmented in peak travel months by 1,300 seasonal rangers who are employed in duties which involve law enforcement responsibilities in varying degrees.

## USPIRG Formed

Several hundred students of the University of Utah with the help of Mr. Ralph Nader organized the Utah Student Public Interest Research Group (USPIRG) which will circulate a petition on all Utah College and University campuses asking the State Board of Higher Education to raise tuition by \$1 per quarter to fund a student attack on environmental pollution. This is similar to a group already functioning at the University of Oregon. The results from this effort, and especially if the money becomes available, will be looked at with considerable interest.

Through the decades since Liberty Hyde Bailey, people have jumped on the Nature Study bandwagon with little more background than a desire to teach children about the beautiful flowers and butterflies. Nature study suffered as a result. Chet Huntley recently remarked when speaking to a group of university students that we should "beware of some 90-day wonder ecologists who crop up here and there, with 100 percent zeal and zero substance."

We note a number of large corporations who are pinning the label of "Ecologist" on some of their engineers who are supposed to look out for the ecological well being of the community as it concerns the corporation. Some will work hard to discover what is meant by ecology in the broad sense of its bearing on human welfare and will do excellent work. We hope that there will be many of these. We hope they will all add substance to their efforts and will come to realize early that the human environment is exasperatingly complex.

Some self appointed ecologists might feel that the environmentalists are disillusioned and unrealistic. Others will argue that all industries must shut down when they contribute to destruction of the environment. There are ways to have a clean environment which environ-

## Nature For Small Children

Janet Nickelsburg offers some suggestions for "Nature for Small Children" with emphasis on the care of animals in the school room. Space will permit only a few of her suggestions to be printed at this time.

**Polliwogs:** Should be kept in a balanced aquarium. They will eat dead vegetation, dried fish food, chopped lean meat, cornmeal, cooked oatmeal, and cooked spinach.

**Salamanders:** Must be kept in a moist spot. Give them a rock to hide under if they are the land salamanders, or an aquarium with a place to clamber out if they live in water. Feed young snails, chopped earthworms, ground meat offered at the end of a toothpick or forceps. The water dwelling salamander should have a bit of fish or crayfish or some of the above.

**Earthworms:** Can be gathered from freshly turned soil, or by laying a piece of burlap under which is cornmeal on the lawn. Raise in a box with about 4" of soil loosened with peat moss and well watered. Cover box. Feed grass cuttings, cornmeal, and bits of food from table. Cover this food over every few days with layer of fresh soil.

**Snails:** May be kept in a well planted woodland terrarium. Feed lettuce, celery tops, spinach, etc., a bit of dry rolled oats from time to time.

## UN Plans Conference On Environment

Keep a lookout ahead for the 1972 Conference on the Human Environment which will be held by the United Nations General Assembly. Sverker Astrom, Sweden's UN Ambassador declared: "The risks inherent in the uncontrolled application of modern technology are very real and very frightening."

Rudolf D'Mello of India told the UN: "There is an environmental crisis."

Dr. Rene Dubos of Rockefeller University in a paper prepared for the UNESCO Conference commented:

"Loss of amenities and elimination of the stimuli under which he evolved as a biological and mental being may have no obvious detrimental effect on his physical appearance or his ability to perform as part of the economic and technological machine. The ultimate result, however, can be and often is impoverishment of life, a progressive loss of the qualities that we identify with humanness and weakening of physical and mental sanity . . ."

mentals want and still have our industries, even that which gives us the polluting automobile.



## Bounties — Wolves — Letters

The crisis in the environment is varied and ever present. New priorities must be set up. Alaska, which is a great wilderness for most of its area, has a need to review its program and its priorities with regard to the wolf which is an endangered species, and to its program of providing for camper units for family groups.

The state spends on an average about \$80,000 a year in bounty payments for wolves while it can not afford more than \$27,000 for the construction of camping units.

A recent T.V. program featuring The Wolf Men called the public's attention to the fact that Alaska still had a bounty on an endangered species and brought over 4,000 letters to the governor protesting the bounty.

It seems that Governor Miller sensed a conspiracy. He stated that "It wasn't what I expected. It lacked anything that would motivate the letter-writing campaign. The letters must have been generated by something more than the pictures. They were all addressed to

me personally and my name was always spelled right — which is unusual. They came in bunches from different cities. Many of them came from school children."

The Nome Nugget ran an editorial which was reprinted by the Anchorage Daily Times attacking the people concerned about wolves.

"Now comes word that Gov. Miller has been swamped with 2500 crank letters from the lower 48. They protest documentary of 'The Wolf Men.' Can it be possible that the lower 48 can get together 2500 knotheads? Just imagine, 2500 people wanting to stick their collective noses into the business of Alaska!

"There appears to be some question whether the Governor should answer all of those letters, an expensive procedure to say the least. He really should ignore them, we'd guess. Why should he dignify those people by his recognition?"

"However, if the governor decides to answer, he should have printed for him a brief comment, a question: 'Whyin hell don't you mind your own business?'"

Other environmental issues get some editorial coverage. From the Anchorage Daily Times comes the following:

"The Governor was splendid this week when he took a forthright position in favor of moving ahead with construction of the \$900 million pipeline across Alaska.

"He contended, rightly, that the state government is ready and willing to take control for the purpose of protecting natural resources in the wilderness.

"He also took a swipe at federal delays making it possible for the state to get the pipeline project going.

"It is questionable that anything can be gained by delay, but it is known that much can be lost. There is only limited knowledge of all the ecological facts about tundra and delays in construction won't help overcome that limitation."

### THE MEDDLERS

(From the *Nome Nugget*)

"The Eastern obstructionists don't give up easily. Comes word that an official of the American Museum of Natural History is sticking her nose into Alaska's affairs which is none of her damned business.

"The gal wrote to House Resources Committee chairman Joe McGill of Dillingham and had the nerve to ask him to support removal of bounties on wolves.

"Joe penned the right answer, saying, according to an Associated Press Piece: 'If you are truly interested in the preservation of the wolf, please feel free to transplant as many Alaska wolves as you wish in New York.'

"He added that Alaska is capable of handling its own resources.

"Good Stuff, Joe.

"The gal made her appeal to McGill under the guise of being a conservationist. We shall, however, add her name to the list of Eastern obstructionists, those nosey people who are trying to tell Alaska how to run its own business.

"Every Alaskan should write the gal a letter, whether one believes in bounties or not. A flood of such letters probably would bring a halt to at least some of the obstructionism."

There was more to this article which included the accusation that these obstructionists are emotionalists, they sit on fat butts, and that they are a bunch of martini drinkers.

For himself, your editor will write to this gal and congratulate her. Why not?

Rats were first introduced in the early '40's to the island of Amchitka. In a few years not one of the many wrens and song sparrows remained. The introduction came with the military occupation of the Island.

## Prayer To The Prophets

(LOUIS BROMFIELD, RACHEL CARSON, ALDO LEOPOLD, PAUL B. SEARS)

We have trampled upon your dreams  
And torn them asunder.  
We have walked with our heads high,  
Unaware of the disintegration about us,  
Blindly oblivious to your warnings.  
What were we concerned with?  
Food came out of cans and life was better than ever.  
Technology, television — a miracle.  
And all the while the earth was slowly  
Sifting away from under our feet.

Yesterday we suddenly looked up  
And saw doom staring us in the face.  
It had crept up quietly, gradually.  
And with our stricken faces  
And mute voices we ask desperately,  
"Why weren't we told?"  
Forgetting the long years your reedy voices  
Cried out in the empty wilderness,  
Unheeded.  
Harsh names we called you  
And our tinny laughter echoed back  
From the worn-out land,  
Robbed of all fertility  
By us, greedy, selfish Man.

Today we see what we have destroyed  
And regret it, but remorse  
Cannot bring back all that we have lost.  
Today, tomorrow, we see  
What you meant.  
We realize now what you tried  
To save us from, too late.  
Forgive us, we beg of you.

— SUSANNAH WEST

## Environment and Human Values

Most biology teachers might point to themselves as environmentalists. They might believe that their students should be dedicated to the preservation of the natural beauty of their communities, and to the protection of America's natural resources. While they might have been disturbed in a desire to preserve the Redwoods, or the Alagash, there must be a growing concern for the environmental problems close to their homes. These relate to the school yard, the street they live on, and the neighborhood.

Teachers desire to develop qualities of good citizenship among their students. Attitudes must be generated such as the desire to make their communities more beautiful, comfortable and certainly more healthful. There must be a blue sky rather than an industry-grayed one; there must be green fields, roadsides, hill and mountainsides rather than barren, overgrazed, burned or over timbered areas to look at. There must be bird song rather than the silence resulting from an over efficient application of pesticides. Neighborhoods must be pleasant instead of devoured by the ugliness of traffic jams and noise. Goals for these better things can be achieved, but the teacher must also lead the way to discovering why they are worth achieving.

Value judgments about environmental concerns must be made sensibly. What judgments and values are made will determine to a great measure what kind of environment we will have, and what we do with it. Technology has given mankind the power to completely destroy his environment in less than a lifetime. He could cut every tree, make every stream and other body of water as dead as Lake Erie or worse, and to destroy every bird, insect and all other life. A judgment must be made whether we want an insect-free world and whether man could exist under such conditions.

A quality life with respect to what the environment provides involves many things. Certainly this implies an air fit to breathe which does not mean necessarily that it is not lethal in slow doses. It means air to see through where the distant hills and the clouds of the sky come to the eye sharp and clear.

Water must be of the best whether it is for fishing or for drinking. Even for drinking it must be more than sewage from which the particulate materials have been removed while the dissolved crystalline materials remain. We are reminded of the cry which perhaps facetiously was made but for a reason, that people upstream on some of the Ohio tributaries were urged to hurry and

## Dutch Elm Disease

I see the vases black against the sky  
And watch the dipper climbing out of one.

If this were filled as other dippers are  
And would the water not put out the stars  
That held it there, such a rain we'd see  
Come dripping off the handle to the hills.

But even such a rain from such a height  
Could do no good now for the trees tonight;  
The curled and yellow leaves will stay that way —  
No lack of water made them wilt today.

—ERNEST SPAINHOWER

flush to release water for communities down stream. Then a hasty removal of the particles which gave water its turbidity was made and the product was sent to our faucets. Strangely enough a glass of water drawn for a drink often had a head of foam. These were the detergents which with other dissolved materials escaped the filtering process.

A quality environment must have available areas where one may escape to such as a mountain stream where the noises of man's gadgets will be far away and not heard. Quality environment could be a mountain snowpacked ravine or windy ledge in winter with only one's own power and snowshoes or skis to bring one back to the hectic life we equate with civilization.

Seeing young hawks which hatched from eggs which were not over burdened with DDT and which will be able to feed on insects and rodents without fear of pesticides can surely be evidence of a quality life.

The great urge to cut every tree which could be turned into lumber is not healthy for society, though it might be economically desirable for the profit it can bring to the lumbering community. We have the power to cut every tree, and we have the power to grow trees where none had been present for years. We need an understanding of why we like to go walking in the woods as we escape the hectic crowding of the city masses.

Perhaps it might be easier to teach from a text book or to conduct some experiments which are entirely unrelated to community or individual needs, but which the teacher feels would be good for the students because someday they might find that the material is useful. It must never be forgotten that education must have relevance to social needs. Since technology has so far run away from social reality, it might be worthwhile to slow up feeding students into the technological mill and to develop a sense of the worth of the individual and his social needs.

Can we meet the challenge?

## Regard For Environment

(In 1958, Reed Bailey of the U.S. Forest Service wrote in an article entitled *Living in Harmony With the Land*, the following quotes which are appropriate for today.)

"Because it is difficult to see these insidious, long-range effects of resource abuse, people did not heed Plato's advice or respond to the ideas of Isabella and Napoleon. For the same reason we as a nation still lack a feeling for our environment. When regard for our environment becomes a real conviction the engineer will think of more than costs and curves when he builds a road. The farmer will think of something besides this year's crop yield. The rancher will look beyond the matter of how many more cattle or sheep can be put on the range. The sportsman will know there is something more important than whether he gets a deer this fall. The logger will be concerned about sustained yields of timber. Each of these individuals will ask himself how will my plans and actions affect the soil, the streams, the productivity of the forest, and so on.

"If we can develop a true feeling for our environment, we will accept it as a matter of course that no one has the right to destroy resources just as today we take for granted that no one has the right to destroy life in more immediate ways. As a nation we will recognize that conservation is just as important to national security and welfare as guns and foreign aid, and we will see that it is financed as well."

— Reed Bailey  
Utah Educational Review, May 1958

## Position Wanted

Mr. Gary Randorf expects to finish work towards a masters degree in environmental education at Cornell University in August 1971 and will be available in September for an Interpretive Naturalist Teacher's position.

For further details, write Mr. Randorf, R. D. No. 2, Freeville, N. Y. 13068

# Nature Study

## The journal of the American Nature Study Society

*Editor:* STANLEY B. MULAİK, 1144 E. 3rd So., Salt Lake City, Utah 84102.

*Associate Editor:* JOHN A. GUSTAFSON, R. D. 1, Homer, N. Y. 13077.

*Audio-Visual Editor:* Paul V. Webster, Bryan City Schools, Bryan, Ohio 43506

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Carlita L. Snygg, R. D. 6, Oswego, N. Y. 13126

*President, Western Section:*

Dorothea Mulaik, 1144 E 3rd So., Salt Lake City, Utah 84102

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John J. Padalino  
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## July Days

Little by little summer gains a foothold. Long cool days seem to be holding back the season this year. Those drowsy, steamy days of locust-trilling summer are yet to come. Corn grows taller with every solar circuit and ragweeds compete with each other for a place in the sun. Mornings are misty cool and grass is cold and wet until the dew flees on silent wings.

The growing season races full speed ahead to make up for the long silent winter. Ponds and swamps are richly decked with blankets of tiny leafed duckweed. Even mosquitoes make up for lost time by laying eggs in every available cache of quiet water. Birds are so intent on feeding their young and starting a second brood they have little time to squander on lengthy morning choruses as they did a month ago.

Roadsides are radiant with the golden faces of brown-eyed susans while pastures resplendent in bright yellow of mustard, vie with the sun for brightness. Humble weeds these, yet each one is a delicate thread in the tapestry of a July day.

At dusk the wood thrush fills the shadowed forest vaults with a concluding roundelay of liquid notes. The woodcock silently wends its way amid lush stands of bracken and royal fern busily engaged in hunting earthworms from the rich humus. At daybreak a song sparrow, that first harbinger of spring, still sings its rollicking melody but with a shade less vigor now that summer has been declared in so many other ways.

The good days are here. Long afternoons, deep shade of maple, heavy white bloom of catalpa tree, and the incomparable fragrance of fresh hay and honeysuckle. A bit early for the droning insect chorus and the long hot bullfrog nights, but summer nevertheless, and each moment should be remembered and stored away for reference on a cold winter night.

— CARLITA L. SNYGG, from "Nature Rambler"

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