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**ROBERT
FROST**



On his 100th Anniversary, a look at

ROBERT FROST

and the ecology of his poetry

As a poet and naturalist, Robert Frost has had few equals. His influence on the attitudes of millions continues to be an important element in environmental education. We are pleased to present the following articles, which point up some of the ecological insights of his poems and give a glimpse of the man himself. (All poems are quoted from THE POETRY OF ROBERT FROST, Edited by Edward Connery Latham. Copyright © 1969 by Holt, Rinehart and Winston, Inc. Reprinted by permission of the publishers.)

The goal of environmental education is to preserve a world of beauty; an ecosystem which functions for the benefit of all living creatures and for the whole man. To accomplish this will require a new outlook on life by the majority of people. Robert Frost had that ecosystem outlook. He was at one with the cosmos and the commonplace. His life proceeded down a road not taken by many in his day, nor by many today. For most of us, the life-style decision was made long ago — to change it will be expensive and perhaps traumatic. To those less firmly committed — who still have the choice before them — we must make clear the long-range implications of what may sometimes appear to be short-range decisions; for, as Frost points out in the following poem, it is doubtful that we shall ever come back to try the road not taken.

—J.A.G.

THE ROAD NOT TAKEN

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that, the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I —
I took the one less traveled by,
And that has made all the difference.

Robert Frost and the Edge of the Woods

MAXWELL C. WHEAT, JR.

This is the centennial year of the birth of Robert Frost who created nature poetry that is comfortable, disturbing and beautiful. He was born March 26, 1874 in San Francisco, California.

His poems abound in animals, plants and scenery that are as familiar as American apple pie. His work is a literary habitat for the wild animals and plants found in fields, meadows, brooks and woods on the traditional New England farm. Even people who do not like poetry often feel at home reading Frost's poems.

Readers meet the woodchuck, fireflies in the garden, chickadees in snow covered branches and whippoorwills that

*"Have come down from their native ledge
To the open country edge
To give us a piece of their bills."*¹

There are violets, lady's slippers, trillium, huckleberries, blueberries, fox grapes, wild apple trees, clearing rain and spring pools that endear nature to people. Almost every reader knows the trees Frost writes about like the maple, beech, elm, cedar, sycamore, and the birches that the poet likes to think some boy has been swinging.

*"When I see birches bend to left and right
Across the lines of straighter darker trees,
I like to think some boy's been swinging them."*²

Frost even makes the infinite universe part of the local scenery when he says of one starry constellation,

*"You know Orion always comes up sideways,
Throwing a leg up over our fence of mountains . . ."*³

What paradox is coiled like delicate watch springs within all this familiarity! The more humans try to make nature part of the every day scene, the more this effort reflects the human tension with nature's mystery. This mystery opens to the infinity of darkness and death—certainly natural enough, yet people experience deep unease thinking about it. The sensation can be compared to the tension one feels at the edge of a dark woods.

Conversely, the more people populate a landscape with familiar and enjoyable sights, the more comfortable they feel in nature. Frost seems to understand this as he populates his literary landscape with such commonplace sights as a "January thaw", "the first song-bird", "sprays of honeysuckle", "rain-fresh goldenrod", "meadow grass", and "green trees in the open".

It is useful in this era of ecological crisis to appreciate how far the human species can impose the familiarization process on nature—much farther than Frost. Behind the drive for progress may also lurk a subconscious urge to cover up the mystery. Thus, the industrial animal makes nature appear increasingly familiar with human-made works like an oil pipeline across the remoteness of Alaska or more simply with condominiums in place of bulldozed woods.

The dark woods is the stage and altar of nature's mystery. Frost senses this. He takes his readers to the edge of the dark woods in two of the most tense and lovely poems in American literature, "Stopping by Woods on a Snowy Evening" and "Come In."

The paradox surfaces at the wood's edge. At first the evening winter woods of the first poem appear as a familiar and comfortable, although chilly, scene. This has led many English teachers to include the work in poetry units. However, readers are often seized with the reality of the climactic line that this

is "the darkest evening of the year" and they interpret the familiar woods as a symbol of death and of the unknown.

Frost in his ambiguous playfulness on the reading stage fended off such interpretations from the audience. But control of interpretation moves away from the poet to the reader.

Frost's woods become the stage and altar of nature's mystery. A stage because of the speaker's (actually the reader's) confrontation with the unknown. It is Everyman's and Everywoman's confrontation, so the drama evolves into ritual enacted on the poem's stage-altar. The poem evokes mysticism with its picture of the secluded, cold, dark, quiet woods and through the musical loveliness of the lines like

*"The only other sound's the sweep
Of easy wind and downy flake.
The woods are lovely, dark and deep. . . ."*⁴

At the interface of the poetic woods the artist in Everyman and Everywoman senses the cosmic well of creativity in the mystery—creativity that is hurled up inside the artist from infernals and darknesses of paradox and enigma. The artist experiences intense ecstasy and terror.

This extreme tension can not be tolerated for long—not even by the artist. The soul is relieved to turn away from the mysterious, poetic woods to the commonplace society after hearing the familiar tingle of harness bells from the worldly, routinized little horse that

*" . . . must think it queer
To stop without a farmhouse near
Between the woods and frozen lake
The darkest evening of the year."*⁵

The same drama is enacted in the poem, "Come In." Here there is the same compulsion to enter the woods—to surrender to the wonder and terror of the mystery once and for all. Now the spell and pull of the woods and mystery is made even more compelling by the inviting song of the thrush (probably the tawney, cinnamon brown wood thrush which characteristically sings near the edge of trees). Liquid, flute-sounding "Thrush music," like the mythical siren, makes the woods and mystery even more enchanting, mystical, wondrous, terrifying and ecstatic.

*"As I came to the edge of the woods,
Thrush music—hark!
Now if it was dusk outside,
Inside it was dark.*

.

*Far in the pillared dark
Thrush music went—
Almost like a call to come in
To the dark and lament.*

*But no, I was out for stars:
I would not come in,
I meant not even if asked,
And I hadn't been."*⁶

Instead of the regularized little horse of the "Snowy Woods" poem tugging the speaker and reader back to the every day world, it is the regularity of the stars whose courses can be precisely predicted and counted on.

Yet, from herein bursts the ultimate paradox of this dramatic poem. In turning away from the woods and toward the stars, a person stands at the edge of the universe.

(Footnotes on page 3)

Robert Frost --- Poet-Ecologist

JOHN A. GUSTAFSON

As the American Nature Study Society meets in San Francisco this year, it is fitting to commemorate the anniversary of the birth of Robert Frost in that city one hundred years ago — on March 26, 1874. Perhaps more than any other American poet, Frost was truly a poet-ecologist. All poets, or at least good ones, have a universality and oneness in their philosophy which is akin to ecological thinking. Frost's intimate and knowledgeable relationship with the natural world, nurtured by years of living close to the land in rural New England, gave him a fund of understanding of natural phenomena from which he developed an ecological perspective.

During my undergraduate days at Dartmouth it was my privilege to know Mr. Frost, who held the appointment of Poet-in-Residence. In long and rambling discussions in Baker Library he would display those characteristics which make his poetry so appealing — wit and whimsy, playful sarcasm, and a kind of irreverent attitude toward mankind's favorite sacred cows. He seemed particularly to enjoy listening to the analysts dissect his poems for their hidden meaning — meanings which I think he never intended, but which he never would admit he might not have thought of. In his own reading of his poems he seemed to emphasize the "natural" meanings — perhaps it is part of his genius, and inherent in the things about which he wrote, that there is another dimension not at first noticed.

His poem "Stopping By Woods On a Snowy Evening" is one of the best-known by any American poet. It describes a lonely ride home in a gentle snow-storm; the beauty of the darkening woods as the snow filters through the branches; the bewilderment of the horse; and the drowsing off as the horse trudges home to the familiar barn. The rhythm of the third stanza is that of the horse shaking his harness bells ("He gives his harness bells a shake/ To ask if there is some mistake."). The repetition of the last line ("And miles to go before I sleep/ And miles to go before I sleep.") indicates the dozing traveler at the end of a hard day's work, under the spell of the calm serenity of the moment. How wonderful to be able to fall asleep at the rein! The horse would find his way home on his own.

Literary critics and scholarly analysts find in this simple and beautiful poem all manner of inner forebodings, death wishes, and hidden meanings. Perhaps Frost put them there deliberately, but I doubt it. But there's no doubt he kind of enjoyed the fuss!

A couple of years ago I was intrigued by the debate carried on in the pages of a literary journal over the meaning in Frost's poem "Spring Pools." The poem is about the vernal pools which fill up with melt-water in spring and then disappear as the leaves come out on the trees. Frost plays on the relationship between the woodland flowers which spring up as the snow melts and the leafy canopy overhead which shades them out. "Spring" pools are something special — not replenished by springs or brooks, hence very temporary. The trees overhead, coming into blossom before the leaves come out, drop their dainty flowers on the surface of these "flowery waters," while around the edge are blooming the woodland wildflowers, which carry out their photosynthetic duties early, before the woods are darkened by the summer foliage.

SPRING POOLS

*These pools that, though in forests, still reflect
The total sky almost without defect,
And like the flowers beside them, chill and shiver,*

*Will, like the flowers beside them soon be gone,
And yet not out by any brook or river,
But up by roots to bring dark foliage on.*

*The trees that have it in their pent-up buds
To darken nature and be summer woods —
Let them think twice before they use their powers
To blot out and drink up and sweep away
These flowery waters and these watery flowers
From snow that melted only yesterday.*

Professor David Toor, in his analysis, reads the poem this way:

"The attitude of the (poet) towards the trees and summer seems throughout the poem to be negative. He speaks of "dark foliage" and the ability of the buds to "darken nature." He contrasts the delicacy of the pools and flowers with the apparently overwhelming force — almost malevolent — of the trees that "blot out and drink up and sweep away."

"... The poem is about the cycles of nature and how each season must in its turn give way to the following one." Toor feels the trees are warned to "think twice" because the snow they drink up today is the "same snow . . . that only tomorrow will return and make the trees objects of pity, as the pools and flowers now are."¹

In a rejoinder to this analysis, C.R.B. Combellack takes issue with Toor's theory, pointing out that the spring flowers do not die, but merely become dormant, being perennials. He thinks the "watery flowers" are blue in color (like the water). They are not the objects of pity. To him, Frost intends, in his warning to the trees, to savor a moment of beauty, and asks them to join him in "brief regret." "The subject of the poem . . . is regret that beauty passes, that for example the beauty of the beginning of spring cannot co-exist with, but must give way for, the beauty of midsummer."²

I would say that Frost did not intend a hidden meaning in his warning to the trees. He is indulging in some wishful thinking — hoping that this lovely, vernal (and hence temporary) scene will linger a while longer if the trees can be convinced they should not cast their summer shade.

There are many instances in Frost's poems of what might be called ecological insights. He talks about the cycling of elements in nature in the poem *In Hardwood Groves*: "The same leaves over and over again!" He illuminates the blind force of instinct in *Departmental*: "It couldn't be called ungentle, / But how thoroughly departmental." He points up the irresistible forces of nature in *Mending Wall*, *Once By the Pacific*, and *Birches*.

Perhaps most significantly for us today, Frost is able to communicate a sense of awareness of nature, of sensitivity to natural processes and man's intimate relationship to them. This is beautifully expressed in the poem *The Tuft of Flowers*.

THE TUFT OF FLOWERS

*I went to turn the grass once after one
Who mowed it in the dew before the sun.*

*The dew was gone that made his blade so keen
Before I came to view the leveled scene.*

*I looked for him behind an isle of trees;
I listened for his whetstone on the breeze.*

But he had gone his way, the grass all mown,
And I must be, as he had been — alone,

"As all must be," I said within my heart,
"Whether they work together or apart."

But as I said it, swift there passed me by
On noiseless wing a bewildered butterfly,

Seeking with memories grown dim o'er night
Some resting flower of yesterday's delight.

And once I marked his flight go round and round,
As where some flower lay withering on the ground.

And then he flew as far as eye could see,
And then on tremulous wing came back to me.

I thought of questions that have no reply
And would have turned to toss the grass to dry,

But he turned first, and led my eye to look
At a tall tuft of flowers beside a brook,

A leaping tongue of bloom the scythe had spared
Beside a reedy brook the scythe had bared.

The mower in the dew had loved them thus,
By leaving them to flourish, not for us,

Nor yet to draw one thought of ours to him,
But from sheer morning gladness at the brim.

The butterfly and I had lit upon,
Nevertheless, a message from the dawn,

That made me hear the wakening birds around,
And hear his long scythe whispering to the ground,

And feel a spirit kindred to my own;
So that henceforth I worked no more alone;

But glad with him, I worked as with his aid,
And weary, sought at noon with him the shade;

And dreaming, as it were, held brotherly speech
With one whose thought I had not hoped to reach.

"Men work together," I told him from the heart,
Whether they work together or apart."

In the poetry of Frost, as in the works of others, there is a re-uniting of man with nature and man with man. Such works are truly "ecological." By making this literature an integral part of our environmental education programs, we not only help people to see the oneness of the physical world, but the essential unity of man's intellectual quest and of his academic disciplines is emphasized. In Frost's poems the sciences and the arts, the mind and the heart, are interrelated and brought into focus. The world, both within and without us, is truly 'all of one piece.'

1. David Toor, "Frost's Spring Pools," *The Explicator*, Vol. XXVIII, No. 3, 1969.

2. C. R. B. Combellack, "Frost's Spring Pools," *The Explicator*, Vol. XXX, No. 3, 1971.

Footnotes for

"ROBERT FROST AND THE EDGE OF THE WOODS"

(Continued from page 1)

1. "A Nature Note"
2. "Birches"
3. "The Star-splitter"
4. "Stopping by Woods on a Snowy Evening"
5. Ibid.
6. "Come In"

Robert Frost and Birds

MAXWELL C. WHEAT, JR.

Poet Robert Frost is famous for poems like those about a boy swinging on "Birches" and a little horse who "must think it queer" to have its master "Stopping by Woods on a Snowy Evening."

But the reader also hears the music of birds in his poetry. They sing or sound in his poems just when you would expect to hear them outdoors — in the spring, in the morning, and in the enchanting transition time of dusk. Sometimes they even break the silence of night as in the poem, "On a Bird Singing in Its Sleep." Here

*"A bird half awakened in the lunar moon
Sang halfway through its little inborn tune."*

Caws, clucks, twangs, twitterings and even the whirl of wings are heard through much of his work. For these, together with song, comprise bird music.



Photo by Bouchard

Robert Frost at Dartmouth College

It is music that arouses feelings. With it Frost can make the reader enjoy again the delicious anticipation that comes from hearing the first avian notes of spring and morning. He can bring on the sweep of poignancy that is felt from the last bird sounds of dusk and fall. It is music that outdoors or in his poetry inspires contemplation — even philosophy. Birds are "Our Singing Strength," Frost says in a poem of that title:

*"In spring more mortal singers than belong
To any one place cover us with song.
Thrush, bluebird, blackbird, sparrow, and robin throng;*

*Well, something for a snowstorm to have shown
The country's singing strength thus brought together,
That though repressed and moody with the weather*

*Was none the less there ready to be freed
And sing the wildflowers up from root and seed."*

The migrating birds in this poem had to press together in what bare spots they could find during a spring snowstorm. Late wintry weather sweeps into several of Frost's spring poems just as storm fortune often overtakes people when their lives seem headed for brighter days. Frost is drawn by these vernal snowstorms and uncertain days as in "Two Tramps in Mud Time" when

*"A bluebird comes tenderly up to alight
And turns to the wind to unruffle a plume
His song so pitched as not to excite
A single flower as yet to bloom.*

*It is snowing a flake; and he half knew
Winter was only playing possum.
Except in color he isn't blue,
But he wouldn't advise a thing to blossom."*

But there is exultance at the prospect of spring finally taking possession of the earth. He shouts in "To the Thawing Wind,"

*"Come with rain, O loud Southwester!
Bring the singer, bring the nester;"*

In "A Prayer for Spring," he pleads joyfully

*"Oh, give us pleasure in the flowers today;
And give us not to think so far away
As the uncertain harvest; keep us here
All simply in the springing of the year.*

....

*And make us happy in the darting bird
That suddenly above the bees is heard,
The meteor that thrusts in with needle bill,
And off a blossom in mid-air stands still."*

Frost is poignantly aware of the final audible signs of autumn. It is as though he is not sure another spring will come — an ancient, primitive fear of people dependent on the earth. In "The Last Word of the Bluebird," a poem written as though to a child, a little girl named Lesley (same as that of Frost's daughter) is sent word by her departing bluebird that

*"... perhaps in the spring
He would come back and sing*

During "A Late Walk" in fall,

*"... when I come to the garden ground,
The whirl of sober birds
Up from the tangle of withered weeds
Is sadder than any words."*

As if one fall was not enough, Frost is reminded of another in the vibrant call of "The Ovenbird" for which he names his poem. This warbler still tunelessly calls out in the middle of summer when the other warblers have quieted. But its music recalls that the spring flowers have fallen — an omen of the final fall when the leaves will go, too.

The ovenbird's call is like the melancholy that briefly comes across one's mind in the midst of a wonderful occasion as a reminder that it will eventually have to end. The bird's music is a touch of the finale before the finale.

*"There is a singer everyone has heard
Loud, a mid-summer and a mid-wood bird,
Who makes the solid tree trunks sound again.
He says that leaves are old and that for flowers
Mid-Summer is to spring as one to ten
He says the early petal-fall is past
When pear and cherry bloom went down in showers
On sunny days a moment overcast;
And comes that other fall we name the fall."*

Frost is acutely aware of so much absence of bird music in winter. Once in a while he hears birds calling such as the

chickadees after a storm in "Snow."

*"They will come budding boughs from tree to tree
Flirting their wings and saying Chickadee,
As if not knowing what you meant by the word storm."*

However, not even a faint "tsip" note is heard from the Slate-colored Junco in "The Wood-Pile."

*"A small bird flew before me. He was careful
To put a tree between us when he lighted,
And say no word to tell who he was
Who was so foolish as to think what he thought.
He thought that I was after him for a feather —
The white one in his tail;"*

The reader can sense the frozen hush that has come over the landscape and the soul when the poet longingly remembers a bird he heard and saw that previous summer in "Looking for a Sunset Bird in Winter."

*"The west was getting out of gold,
The breath of air had died of cold,
When shoeing home across the white,
I thought I saw a bird alight,*

*In summer when I passed the place
I had to stop and lift my face;
A bird with an angelic gift
Was singing in it sweet and swift.*

*No bird was singing in it now.
A single leaf was on a bough,
And that was all there was to see
In going twice around the tree."*

Seasons came naturally into Frost's poetry just as they did on his various Vermont and New Hampshire farms. Mostly these properties were residences for a man farming at poetry. But for a decade beginning at the turn of the century and starting with 200 Wyandotte eggs which he hatched, farms at Methuen and Derry, New Hampshire, were homes for a man farming at poultry. He learned that he had to deal with the seasons like winter when he had to bed down his chicken coops with protective leaves.

Morning and evening were also important to the chicken farmer as they came to be for the poet farmer. Certain chores were performed at these times like starting the fire and collecting the eggs in the morning. Certain feelings became linked to these times of day like the excitement of life getting started at dawn. In fact, an early riser is outdoors even before the beginning of the dawn bird chorus in "The Valley's Singing Day."

*"The sound of the closing outside door was all.
You made no sound in the grass with your footfall,
As far as you went from the door, which was not far;
But you had awakened under the morning star
The first songbird that awakened all the rest."*

Dusk intrigues Frost. Darkening fields and edges of woods, the rising full moon and bird music in the evening draw him. He feels enchantingly alone and pensive as in "Waiting."

*"What things for dream there are when specter-like,
Moving among tall haycocks lightly piled,
I enter alone upon the stubble field,
From which the laborers' voices late have died,
And in the antiphony of afterglow
And rising full moon, sit me down
Upon the full moon's side of the first haycock
And lose myself amid so many alike.*

*I dream upon the opposing lights of the hour,
Preventing shadow until the moon prevail;
I dream upon the nightawks peopling heaven,
Each circling each with vague unearthly cry,
Or plunging headlong with fierce twang afar;"*

Dusk is one of the times when nature seems most inviting. The evening scene can be so enchanting. But is it too enchanting for the civilized person who is used to regular, everyday scenes that are understandable? Is nature too real and beautiful to experience for more than a brief period? This compelling

Another Look at the Horizon

KINGSLEY L. GREENE

President, American Nature Study Society



"... one song more in a thrush's breast,"

question is invoked in the poem "Come In" by perhaps the most mystical of all evening music — thrush music.

*"As I came to the edge of the woods,
Thrush music — hark!
Now if it was dusk outside,
Inside it was dark.*

*Too dark in the woods for a bird
By sleight of wing
To better its perch for the night,
Though it still could sing.*

*The last of the light of the sun
That had died in the west
Still lived for one song more
In a thrush's breast.*

*Far in the pillared dark
Thrush music went —
Almost like a call to come in
To the dark and lament.*

*But no, I was out for stars:
I would not come in.
I meant not even if asked,
And I hadn't been."*

It is the paradox of Robert Frost that he chooses something like a star — something that does not have a song.

Please forgive me if I speak in a rather pessimistic vein today, but I am disturbed. I am genuinely disturbed by the lack of a true environmental ethic. I have been involved in education for the major portion of my life, and much of that involvement has been either directly or indirectly concerned with nature and the natural environment. I have been either a director or an officer of ANSS for many years, and I have rubbed elbows with some of the greatest environmental and nature educators and leaders of our time. I have seen ANSS programs come and go, and through it all I have always felt that nature education was a key ingredient in the long-range environmental picture. I believed that a knowledge of and an interest in some living thing would eventually and inevitably lead to a more direct concern for its survival and hence become a cornerstone for the building of a broader appreciation of natural systems. I don't know that this construct works in the majority of cases; but it is the premise upon which many of us operate, I know. I had misgivings, however, about the degree to which we were changing attitudes or actually altering human behavior. When I was directing the Title III — Outdoor Education Project in Southeastern Pennsylvania, I spent considerable time, as did the rest of the staff, trying to figure out ways of determining our impact on attitudes and behavior. Even with the help of several experts from educational institutions in the area we were never really able to get at this elusive factor.

As a college professor, teaching ecology to undergraduates, I find that environmental attitudes are already formed and difficult to change. During a recent speaking engagement with ninth-grade science students I found, to my dismay, that their foremost environmental concern, at that moment, was whether or not they would be able to get enough fuel to run their snowmobile this winter. Does this reflect the major concerns of their parents? You should hear the hue and cry and see the irate letters from "sportsmen" whenever a coyote is found in central New York. There is an immediate marshalling of forces to go out and get this menace before it kills all the game in the area. Where is the impact we are supposed to have made? By "we" I mean all of us here who are involved in any way in environmental education, and I include ANSS as a part of that group.

Now we face a great shortage of fossil fuels. Geologists, ecologists and economists have been predicting for many years that the explosion in energy demand was soon going to exceed the supply; and, in fact, the chart that I have been using in my ecology course for the past five years indicates that the earth's petroleum reserves would run out around the turn of the century. But, although some students took it seriously and were shocked by the facts, most simply laughed or shrugged it off as more "doomsday-talk." One of the programs offered at our unit of the State University of New York is in the field of automotive technology, and people in that area think that I am some kind of subversive, I guess, from things I have heard via campus gossip. But in spite of what was known about the energy shortage we now find that no provision whatever was made to deal with such a crisis. Our military-industrial complex has been so overpreoccupied with wars, Madison Avenue gee-gaws and sports events that we are caught

* Presidential Address, delivered at The Annual Luncheon, San Francisco, Feb. 28, 1974.

now without a viable, non-polluting alternative energy source to which we may turn.

I am perhaps more disturbed by another attitude that has always, but with greater impact now, pervaded our system. Last summer I watched a TV program called "Firing Line" in which William Buckley discussed some present environmental problems with Barry Commoner. I was amazed, although the full realization of what had happened did not occur to me until a day later, by the fact that the idea that "those who can afford it may buy a bigger share of the environment" is an acceptable, and viable, concept in our society and, moreover, in our world. Yes, Cadillacs use more fuel and pollute more; but the people driving them are paying heavily, in dollars, for this privilege. In other words, it is perfectly all right to destroy a bigger chunk of the environment as long as you can buy it with dollars. Incredibly, Dr. Commoner let this go unchallenged. Are we so programmed that this is truly an acceptable concept? The United States, of course, has always enjoyed a bigger share of the earth's resources because we could afford to pay for them. This is true of many other nations also. What exactly are the ethics involved here?

The same attitude frequently occurs in discussions over gasoline rationing systems . . . should that become necessary. There are some who say we ought to have a system providing a base quantity of gasoline and that anything over and above this base should be more heavily taxed. What this says, of course, is that those who can afford it may have a larger share of this rapidly dwindling resource. Shall we do the same for home heating fuels? An elderly couple recently died of exposure in our area because their energy supply had been shut off because they hadn't paid their fuel bill. I personally find the idea that the environment belongs to those who have more dollars to be abhorrent. As Paul Sarnoff so aptly put it in the *New York Times Encyclopedic Dictionary of the Environment*:

"The present laws in our free enterprise system permit unrestricted pollution. They also permit a total disregard for conservation of commonly used resources. Thus, as long as a resident in America can pay the bill, he can turn on all the faucets in his house and keep the water running until he decides to turn them off. The same is true of reproduction, if a person can find a willing and able partner. In other words, in America it is almost impossible to either stop pollution in its many nefarious forms, or to abate it significantly with present laws."

Perhaps I am out of line in expressing these thoughts to ANSS because this is traditionally an organization made up of educators and dedicated solely to educational concerns. It occurs to me, however, that it becomes more and more difficult to limit the scope of our influence as we have in the past. Our organization was founded in 1908. The present educational scene, even that of nature education, is certainly different from what it was, or from what could be envisioned, at that time. It is true that the organisms we talk about have not changed a great deal, but their habitats certainly have. How many of us conduct field studies these days where man-made environmental influences do not enter the picture? Perhaps I am only revealing my own shortcomings; but I find it impossible, and unthinkable, to exclude ecological, and therefore frequently man-influenced, factors. Furthermore, to pretend that I had no prejudices or biases concerning these factors would be absolutely ludicrous.

Several ANSS members have indicated to me over the years that they felt we should speak out on some of the contemporary environmental issues that are appropriately interwoven with our educational mission. These indications plus my own thoughts and observations prompted me to prepare a question-

naire for our officers and directors, and subsequently our membership, dealing with a reevaluation of the role ANSS plays within the context of contemporary education and environmental issues. Many of you have seen the questionnaire and responded to it. The rest of the membership will have an opportunity to do so later on, as we plan to publish it in *NATURE STUDY*.^{*} I shall have a further report on this matter at a later date, therefore, and these findings will be reported in our journal also. At the present writing, returns indicate that our officers and directors are in favor of expanding our sphere of concern, i.e., do *not* limit ANSS to educational areas only and *do* get involved in contemporary environmental issues regardless of political overtones. Several suggested projects and meeting-topics were of great value also. Many of these ideas will, I am sure, provide fuel for future board meetings and, hopefully, some good things will emerge as a result.

If ANSS is ever to expand its horizons, it will take more than ideas and resolution. It will take commitment in the form of time and, equally necessary, money. If money were available many things could be improved and/or accomplished. First of all, the job of the Secretary has become next to impossible. Within the past few years the requests for information, from students particularly, have reached incredible numbers. As President, I received literally hundreds of letters asking for information on environmental problems. Most of these I sent on to our secretary for processing . . . knowing full well that she really didn't have the time or the resources to handle them properly. I know that our Treasurer and Editor get as many similar letters. These requests are sincere, legitimate and important. We are doing very poorly in this area. The person serving as our secretary should receive a stipend commensurate with the demands of the job, and we should be providing that person with many more materials, on a variety of environmental topics, which can be disseminated appropriately. We should also be conducting workshops to prepare these materials and, at least, paying expenses of those who participate. I also feel that the Treasurer and Editor should receive stipends to compensate for the enormous amount of time and personal expense involved. There should be a sum of money set aside for the President and First Vice President to use for expenses incurred in representing the organization and in setting up its annual meeting. Other monies might be used for a number of unfinished, but still worthwhile, projects waiting in limbo for lack of some spark to get them going again. It is obvious that it will take more than the efforts of a dedicated few to move ANSS to new heights.

Whether or not ANSS increases its sphere of influences, it is still imperative that we maintain our organization as a viable educational force. It is my opinion that we can do this only by providing some funds with which to carry on our present work adequately, prepare additional materials to take care of growing numbers of requests, set up expense funds for certain officers and designated representatives and use funds to finish and/or initiate organizational projects. These funds can come from only one source, and that is an increase in membership dues. Our present income barely keeps us in the black as we carry on the most minimal program of activities.

I do not know of a single organization that has not raised its dues in the past ten years. Operating expenses are at an all-time high and demands of society are putting greater pressures on organizations like ours to provide more information and services. As our costs increase we simply have to take up the slack by cutting back on what is already a marginal operation at best. It is obvious to me that this cannot continue indefinitely without a complete erosion of whatever viability we have left. I do not think that a five dollar increase in dues would cause any great hardship or precipitate any significant drop in

(Continued on page 20)

* See inside back cover.

Frost Among the Stars

PERCY M. PROCTOR

(Reprinted here by special permission of *The Christian Science Monitor* is an article of mine, "Frost Among The Stars," which that paper published on March 23, 1961. It describes the opportunity which a visit with Mr. Frost some years ago gave me to find the answer to a question which had long been troubling me.)

On September 11, 1897, Robert Frost wrote to Dean Briggs at Harvard College applying for admission to that institution, but expressing himself in this letter as "somewhat unprepared for examination" since five years had elapsed since his graduation from the Lawrence High School. "If proficiency in English were any consideration," he told Dean Briggs, "I make no doubt I could pass an examination in that . . . I might possibly pass in French also and in physics and astronomy."

Some years ago, a copy of that letter was sent to me by a man who had been in one of my star-gazing classes and who remembered how often I had read to the class various Frost poems which dealt with the stars. "Evidently," his accompanying note began, "Mr. Frost early in life must have had some formal instruction in astronomy or he would not have suggested that subject as one in which he might possibly pass a Harvard entrance examination. I never heard you mention any such background to account for his great interest in the stars and for the fund of knowledge about them which was revealed so often in the poems you read to us. You may know all about that background and when and where he studied astronomy, but perhaps I am furnishing you with a bit of new information about your favorite poet and fellow star-gazer."

It happened to be new information and it aroused my curiosity at once. When and where had Mr. Frost studied astronomy? For years I tried unsuccessfully to find the answer to that question. Although many of those who have written about him have commented on how interested he is in the stars and how much he knows about them, no one as far as I could discover had ever traced that interest back to where and how it began.

At one time, it seemed that I might find the answer in Professor Cook's book, *The Dimensions of Robert Frost*, for he seemed to be keenly aware of the poet's interest in the stars. "The star," Professor Cook comments, "is one of the chief symbolic images in Frost's poetry, and how important the stars are for him is only too apparent to anyone who has seen him readily identify Altair, Vega, and Antares, and many other stars as though

he habitually traveled by celestial navigation. . . . He has looked at the stars with a scientist's curiosity and a poet's wonder."

When he discusses Frost's poem *Come In*, Professor Cook makes another revealing comment. "Let the thrush call ever so alluringly in the dark woods at evening, he is otherwise occupied. He is and always has been out for stars."

In his talks with Frost, Professor Cook may very well have tried to probe back to find out what started the poet's interest in the stars. If he did, he never reveals in his book what he found out, and so I found him of no help in seeking the answer to my question.

Nor did I find Mark Van Doren helpful, although he too has written with deep appreciation of Frost's interest in the stars. "If he is greatly interested in the stars," Mr. Van Doren says in one of his interpretative comments, "and no poet is more so, the reason is that they are another world which he can see from this one, and accept or challenge as the mood of the moment dictates. They burn in their places as he burns in his, and it is just as well that neither fire can consume the other; yet each of them is a fire, and secretly longs to mingle with its far neighbor."

Not until April, 1959, did I finally find the answer to my question and it was Robert Frost himself who gave it to me.

I had gone to his office in the Library of Congress to see if there was any chance to meet him. A busy schedule kept him occupied all day, and it was not until 4:30 that I finally was granted permission to see him, sternly admonished that I was not to detain him longer than five minutes at the end of the busy and tiring day which he had put in.

I introduced myself by saying that I was not only an admirer of his poetry, but that I was a fellow stargazer who had long wondered how he had developed the interest in the stars and in astronomy which I found so often reflected in his poems. "I remember," I said, "that in your letter to Dean Briggs when you applied for admission to Harvard College, you listed astronomy as one of the subjects in which you might possibly pass an examination."

"I did?" said Mr. Frost, and when I assured him that he had, his face began to brighten and I could see that his interest has been aroused. Then he proceeded to tell me that in San Francisco before he was 12 years old he had had a four-inch telescope.

"Was that the telescope you wrote about in *The Star Splitter*?" I asked.

"No, that was another one," he replied, and went on to tell me that *The Star Splitter* told a true story and that he had actually known a man who burned his house down to get the insurance money to buy a telescope.

"I had to wait until he died to tell his story," Mr. Frost continued, "so that I wouldn't get him into any trouble by telling the truth."

When I asked him how he learned enough about the stars so that he thought he might pass an examination in astronomy, he said that as a boy about the same time that he had the telescope, he had read a book, *The Infinities Around Us*, written by a well-known English astronomer of that time, Richard A. Proctor. It was pretty old for him then, he admitted, but between the book and his observations with the telescope he had laid the foundation for an interest in the heavens which had continued all his life.

One final comment which he made about *The Star Splitter* was that this poem contained a reference to the title of the astronomy book of Richard Proctor's. With his marvelous memory, he quoted these lines:

"And spent the proceeds on a telescope
To satisfy a life-long curiosity
About our place among the infinities."

Mr. Frost's eyes were dancing now. I had opened up a subject that I think he would have been willing to talk about for hours. Mindful, however, of my promise to take only five minutes of his time and realizing that at least 10 had passed, I thanked him and said goodby.

In my copy of his *Complete Poems*, some 25 poems are marked as dealing in one way or another with the stars. They range from a discussion of whether the world will end in fire or ice to a description of how the sparks from the chimney of a sugar-house on a March evening float up to become entangled among bare

boughs and create constellations — “Leo, Orion, and the Pleiades.”

In one poem, you watch with him as Canis Major, “the great Overdog,” romps through the skies. In another, you search through stones in a farmer’s stoneboat for a star that has softly fallen from heaven at night and “has been picked up with stones to build a wall.”

Frustrated as I am occasionally when the street lights offer so much competition that I find myself defeated in trying to locate some obscure constellation, I remember how aptly he has said, “A town debars — Much notice of what’s going on in stars.” And I think I shall never watch Orion as it rises in the east on an evening in early winter without recalling these opening lines of *The Star Splitter*:

“You know how Orion always comes
up sideways
Throwing a leg up over our fence of
mountains.”

If you happen to share the interest which Mr. Frost and I have in the stars, you will know and recall many other of his star poems. Some which come readily to mind are *The Peaceful Shepherd*, *A Loose Mountain*, *Choose Something Like a Star*, *Fireflies in the Garden*, *Skeptic*, *On Making Certain Anything Has Happened*, and, of course, *The Literate Farmer and the Planet Venus*. To these should be added the whimsical *A-Wishing Well* which was published in April 1960, in the *Atlantic Monthly*.

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Michael Klein Wildlife Illustrator

This issue of *NATURE STUDY* displays, on the cover and elsewhere, some sketches by Michael D. Klein, 31, of Westport, Conn. Mr. Klein is an art instructor and wildlife illustrator, doing work for magazines, museum displays, book illustrations and emblems for nature organizations. He received the Artist of the Year Award in 1965, given by the Southern State Teachers College, and has received the Boston Graphic Arts award twice. He has earned many prizes from exhibits and galleries. He is now at work on a book about Thoreau’s nature writings.

Mr. Klein’s pen and brush capture the inner essence of his subjects in a way the camera — and even the eye — cannot do. We are pleased to introduce his work to our readers. If you are in the market for illustrations of natural subjects, contact him at Box 483, Westport, Conn. 06880.

Douglas E. Wade on Robert Frost

[Editor’s Note: *Dartmouth College*, starting in the late 1930’s through the 60’s, experimented with a unique extra-curricular program involving a wood-working shop (Virgil Poling), a printer (Ray Nash), an artist (Paul Sample), a naturalist (Dick Weaver, later Doug Wade), and a poet (Robert Frost). Later an arctic specialist (Vilhjalmur Stefansson) came to the campus. Doug Wade, *Naturalist-in-Residence* 1943-1950, presents some of his remembrances of Robert Frost. Doug is now Assistant Professor of Outdoor Teacher Education at the Lorado Taft Field Campus (Northern Illinois University), Oregon, Illinois. He was president of ANSS in 1968.]

During Robert Frost’s tenure as poet-in-residence at Dartmouth College, there was an understanding that faculty would stay away so he could give more attention to students. At this time, however, especially from 1945 on, there was generally a mass exodus of students away from Hanover on weekends. This left the poet pretty much to himself in his Baker Library office, especially Friday evenings.

Whenever Frost and I would meet casually on the campus, we always stopped to chat. Once I mentioned that the Ecological Society, in collaboration with the Outing Club, was having Stefansson at my office (which in part was a large meeting room) for a series of talks. Frost asked, “What’s he talking about? I heard him twenty years ago; I bet he’s saying the same things.” In a way this was probably true for, like many great persons, Stefansson realized the value of repetition, especially about the Arctic — the “Friendly Arctic.” So I defended the program, pointing out the audience was new and thought Stefansson was great and that there was currently great excitement surrounding the North. Then to clinch the argument, I pointed out that many poets repeated, through public readings and published volumes, their messages. These were gentle discussions and Frost would concede the value of repetition.

What really opened the door to a series of discussions between us occurred from another chance crossing on the campus. I had been examining Frost’s poems in light of ecological and wilderness feelings and connotations. On remarking this to Frost, he became quite interested; I had stumbled onto a new twist. He asked me to come by on a Friday evening to his office; he wanted to hear more. Frost always bantered about his office: “That a poet-in-residence should have an office; a poet should be everywhere!”

The details of our discussions are misty to me, but I do recall Frost did most of the talking and would range far afield from matters of ecology or wilderness. I often sensed he needed someone to listen, but he did ask questions about ecology and wilderness. After our first

ecology discussion, whenever we met on the campus, he would address me as the “Ecology Man,” and ask if I had picked out any more of his poems pertinent to the topic. Actually, although I never told him this, I suspect I was finding most of his poems had intimate threads tying together man and nature. I never called Frost a “nature” poet.

On some of our encounters, Frost would unburden himself (largely by using rhetorical questions) of matters involving his family or his manner of living. Once I asked him how he lived day-to-day. His response was, close as I can recall, “I set a goal for the day; I do this early in the day or the night before. To live, one has to get on top of each day. Even doing the dishes after each meal, sweeping up and making my bed. These are goals.”

In all of our discussions, I never failed to sense the birth of poetry. His expressions, manner and tone, and pauses, and questions, were the rough forms of poems.

Frost had an amusing story about not wanting to go to heaven. I had always missed it, so once I pressed him on the story. Frost considered “curiosity and courage” to be two of the great attributes of human beings. Therefore, since he felt everything would be all hunky-dory in heaven and one would not need to have curiosity and courage, he did not feel he wanted to go to heaven.

Somehow Frost kept himself posted on the whole extra-curricular program, of which he was a part at Dartmouth, and dubbed those of us so involved as “loose-ends.” He once told me that he thought some of the best teaching and learning came when one was at loose-ends. This meant to him that whenever he grappled for a precise word to fit into a poem, his mind was at “loose-ends.” He had a goal and a problem interlocked, and he had to struggle. He said several of his poems (I never did learn which) were at loose-ends for a year or more.

It has been about twenty-three years since my last talk with Robert Frost, but still sticking with me are his two words: “Curiosity and Courage.”

TIPS for Environmental Education and Interpretation . . .

SOME POLLUTION PROBLEMS . . .

and how to find some answers

(Editor's note: The following "experiments" were developed as part of the Lee County (Fla.) Environmental Education Program by William F. Hammond and his staff. The Program is one funded under Title III, ESEA. They are given as examples of the many ways that students and teachers can work together to gain first-hand knowledge of what man is doing to his environment — and at the same time encourage the development of attitudes which will help correct the abuses which often accompany man's activities.)

I. Car Exhaust and Pollution

Problem: Which type of car gives off the most air pollution?

Materials: Parent's car, piece of cloth (white, 6 to 8 inches square), string, petroleum jelly

Method:

1. Take the piece of white cloth and smear a very light coating of petroleum jelly (or some other sticky substance) over the center section.
2. Place the cloth with the petroleum jelly over the exhaust pipe of your parent's car (CAUTION — TAIL PIPE MAY BE HOT) and tie it tightly with string. Do not use a rubber band; it may melt as the exhaust pipe heats up.
3. Have one of your parents start and run the car for 5 minutes. BE SURE TO DO THIS IN A WELL VENTILATED AREA OR OUTSIDE! After 5 minutes of the car running, stop the car and remove the cloth. DANGER — TAIL PIPE WILL BE HOT, REMOVE THE CLOTH WITH EXTREME CAUTION!
4. Place the cloth with the exhaust debris between two pieces of plastic wrap and bring to class.

Observations:

1. What is the year and make of the car you tested?
2. Compare all the samples brought into class. Which group of cars has the most exhaust debris? The least?
3. Which year of cars has the most exhaust debris? The least?

Discussion:

1. Which group of cars appears to pollute the air the most? Which group of cars pollute the air the least? How can you tell? Are you sure?
2. Compare exhaust debris of cars with anti-pollution devices and those without. Do cars with anti-pollution devices show a considerable decrease in the amount of exhaust debris?
3. Do you think anti-pollution devices should be placed on all cars? Why or why not?
4. Besides exhaust, are there any other things from an automobile which pollute the environment?

II. Garbage Disposal

Problem: How much garbage do you produce?

Materials: Four large paper or plastic bags, scales

Method:

1. Arrange to have your household garbage separated and collected as things are discarded.
2. Using four paper or plastic bags to collect the garbage, put all paper materials in Bag No. 1, all metal materials into Bag No. 2, all glass and ceramic items into Bag No. 3, and everything else into Bag No. 4. Keep a record of all the different things that go into Bag No. 4.

3. Start this experiment Monday night. Weigh each bag before it is put out for collection. End the experiment Thursday night.

Observations:

1. Complete the following charts

Chart 1

No. of people in household	No. of days collected	Pounds collected:				Total Weight
		paper	metal	glass & ceramics	other materials	

2. Calculate the amount of garbage discarded per person per day. Use the following formula for each of the four types of garbage:

$$\text{amount of garbage} = \frac{(\text{X pounds of garbage})}{(\text{Y people}) (\text{Z days})}$$

Examples:

$$\frac{16 \text{ pounds of paper}}{(2 \text{ people}) (4 \text{ days})} = \frac{16}{8} = 2 \text{ lbs. of paper/person/day}$$

Fill in the following information:

..... pounds of paper/person/day
..... pounds of metal/person/day
..... pounds of glass and ceramics/person/day
..... pounds of other materials/person/day
..... pounds of garbage/person/day

TOTAL

3. Friday in class we will calculate the average amount of garbage per person per day for all the families involved. You will be able to place this information in Chart 2.

Chart 2

Student Number	Weight of:				total weight
	paper	metal	glass & ceramics	other materials	
1					
2					
3					
4					
5					
Etc.					
Total					
Average					

4. In order to compare your findings with the results of more detailed scientific studies that have been conducted, you will have to calculate the *percentage* of each material.

For example, if there are 20 pounds of paper in a total of 40 pounds of garbage, the amount of paper comes out to be 50%.

$$\frac{(20 \text{ pounds of paper})}{(40 \text{ pounds of garbage})} (100) = 50\%$$

Calculate the percentage of each type of garbage and record the data in Chart 3. Use the information from class results.

Chart 3

Garbage	Average weight in pounds	Percent composition by weight
Paper		
Metal		
Glass		
Other		
Total		100%

Discussion:

1. What kinds of garbage were included in "other materials"?
2. Which type of garbage was thrown away most in your household? In the class total?
3. Compare the class findings of the percentage of each discarded material with that of the national average (will be given to you on Friday by the instructor).
4. There are approximately 209,000,000 people in the United States. On Friday, using the information from Chart 3, calculate the total amount of the 4 basic types of garbage thrown away every day in the U.S.
5. How accurate do you think your findings are in Question 4? What other aspects of garbage disposal must you take into consideration?

III. "Mini" Landfills

Problem: To observe how garbage decomposes in a landfill.

Materials: Glass jar, dirt, garbage items

Method:

1. Bury various pieces of garbage at different depths in the glass jar.
2. Place each of them against the inner surface of the container so that you can see what happens.
3. Leave an inch of air space over the firmly packed soil.
4. Keep the soil moist, but not puddled or water-logged.
5. Cover the container with a piece of aluminum foil folded down snugly around the outer sides.
6. Observe what happens every day for the next few days.

Observations:

1. Keep a record of how rapidly the different garbage items decompose in the "mini" landfill.

Discussion:

1. What was the growth that you observed on the various garbage items?
2. Which garbage items decomposed the fastest? The slowest? Rank them in order from fastest to slowest.
3. After some of the garbage materials are decomposed, you may notice empty spaces where they used to be. How can you account for those empty spaces?
4. Is there anything at all in these spaces?
5. Where did the materials that were in the spaces go?
6. What would happen if a city was built on a landfill?
7. What could a landfill be used for once it was filled with garbage, and covered over with soil?

ENERGY and Environmental Education

NANCY AYERS

The energy crisis can't do much to environmental education that hasn't already been done. Except for being "banned in Boston," EE has been cursed in about every way possible, including being misunderstood, underrated, ignored and generally passed over by ALL levels of government, the majority of educational institutions and a large percentage of scientists, planners and industrialists who should know better.

IF we had had adequate EE we wouldn't now have an energy crisis . . . or a paper shortage or solid waste disposal problems and all the others. Congress has repeatedly tried to support a federal program for broadscale EE only to be undercut by the bureaucratic machinations of the Administration, the Office of Management and Budget, the Department of Health, Education and Welfare and the Office of Education. (See reports of the Select Committee on Education of the House Committee on Education and Labor and the national Advisory Council on Environmental Education.)

Before the December adjournment, the House of Representatives passed an extension of the Environmental Education Act of 1970 with a three-year funding appropriation of \$45,000,000, but two different bills are still pending in the Senate. Both are faced with either a Presidential veto or the same HEW/OE inertia which annihilated the intent of the original Act.

Since two of the principle obstacles to EE are semantics (with as many definitions as there are people involved) and the lack of a sense of urgency, the energy situation is a particularly useful opportunity to analyze the relationship of a natural resource to social standards, supply and demand, international policy, free enterprise and the myriad of other aspects of life, liberty and the pursuit of happiness which we profess to hold so dear.

If we are to give serious commitment to these goals, we must have a national policy guaranteeing all citizens the opportunity to education that will enable them to understand, appreciate and pursue their responsibility, individually, to maintain the environmental quality of the universe . . . Arab, Israeli, Russian, Chinese, African . . . everybody. The point here is practical, relevant education for decision making and career preparation.

EE is not necessarily expensive or a new invention. It is a way of thinking, a process, a way of life. States can expedite EE by taking advantage of the many fine publications, materials and resources already available and adapting them for local needs. Every state should adopt a Master Plan for EE to insure an orderly, comprehensive program. (See Michigan's MASTER PLAN FOR ENVIRONMENTAL EDUCATION for an outstanding example. Available from the Office of the Governor, Lansing.)

States, regional agencies and municipalities can further augment EE by supporting or pressing for:

- a) Small grant programs to seed student and citizen courses, seminars, workshops and research in current environmental issues with local impact,
- b) Suitably located regional EE coordinators and environmental information centers, and
- c) establishment of local conservation commissions and regional environmental management councils based on both state and local aid.

Some states have made impressive strides towards these objectives. The option is before us now. Let's go!

Energy, Environment and Education

PAUL SWATEK

When you look at the energy situation these days, you talk in terms of the energy crisis. A couple of years ago the energy problem was seen primarily as a problem of environmental impact, of pollution. There is a very definite land-use impact, for instance, with strip mining; certainly there are air pollution impacts when we burn fossil fuel to generate electricity. There are problems of radiation associated with converting nuclear fuels to electric energy. In the transmission of energy you have land use impacts and the visual impacts of transmission lines. And then there are impacts associated with the end use of the energy; thermal pollution, for instance, is especially critical on confined inland waters.

More recently the energy crisis has been seen as a problem of sufficiency, of balancing supply and demand. This, I think, is the way industry has now chosen to picture the energy crisis. Indeed, there do seem to be, at the present time, some rather severe imbalances in supply and demand. Now there are two different approaches you can take to trying to redress this supply and demand imbalance. The energy industries have tended to advocate an increased supply; increased offshore drilling, for instance, more nuclear plants; generally trying to approach it by providing more. On the other hand, conservationists have tended to look at the other side of the equation to try to find ways to limit demand.

The tools that we can use to influence this supply and demand situation are both economic and regulatory. Many of us feel that economic measures are probably the most powerful that we have. Just letting the price of energy go up as it becomes more expensive to extract fuels from the earth and convert them from one energy form to another is going to dampen the demand. There are a wide variety of economic reforms that have been suggested to remove subsidies to the user of energy and measures such as the sulfur tax (which would impose a tax on each pound of sulfur emitted from industrial stacks) which would make

sure that the costs of producing power are reflected in the selling price of the power.

People sometimes argue that most uses of energy are "essential" and not much influenced by price. The economists point out, however, that it is important to distinguish between immediate effects and long-term effects. A person who cannot give up use of his large gas-gobbling automobile when fuel becomes more expensive will quite possibly think twice about the higher operating cost of a larger car when it comes time to trade the old car in for a new one. It may take some time, but higher energy prices will lessen demand.

When economic measures and the free market system fail, it may be necessary to resort to regulatory measures. This is especially true when controlling emissions of air and water pollutants. Tough standards, with penalties for violations that are enforced, are needed sometimes to cause industry to abate pollution.

Energy Decisions

It is interesting to look at who makes energy decisions. Of course, in a sense we all make energy decisions when we spend our money. When we buy a house, we make a very significant decision because we will spend a lot of energy heating and cooling it and getting from it to work and to school and to do shopping. When we decide how we are going to meet our transportation needs, we make some very significant decisions. And, of course, it eventually comes down to decisions like whether to buy the electric comb.

But the major decisions are made at a higher level, by corporate boards and utility managements. Of course, there is government regulation of utilities. So you can segment the decision-making process and look at different levels and get a better sense of how the future is being shaped.

I think it's also very important to look at the interrelationships. I have already mentioned a few with land use. There are some very significant relationships, of course, with transportation because transportation accounts for about one-fourth of the energy that is used in this country. There are energy interrelationships between land use and transportation. For instance, one of the significant factors in determining your energy requirements for transportation is the pattern of where you live and where you go to work and where you shop. Because we have relied

on the automobile and the highway we have tended to separate where we work from where we live and where we go to school and do our shopping and go to church. That has some very, very real implications for the whole energy picture. It means that to try to change that aspect of the problem you're going to have to make some very fundamental changes that relate to lifestyle and the ways we make very basic land-use decisions.

It has also become very clear in the last six months or so that the energy matters relate very much to the economic health of this country. We're now importing enormous quantities of fuel and that has a very significant impact on the balance of payments situation, for instance.

Social Impact

There are a number of us, too, who are concerned with the social impacts of energy policy decisions. The poor person pays a much larger percentage of his total income for energy than does the wealthy person. So if, as I mentioned before, we allow the price of energy to go up and use that as a primary method to curb demand, we have to realize that such a policy will have a significant social impact unless measures are used to combat this effect. So there is another interrelationship that is very important.

"A poorer person spends a larger share of his income on heating and lighting and cooking and washing and on gasoline to get to work and the supermarkets. He is, in effect, trapped because he uses energy for things he cannot do without. If, for example, the price of heating oil doubles, what can the average working man and his family do about it? In theory he could add storm windows and more insulation but if he is poor he probably doesn't have the money or the credit. He can turn the heat down, but he really can't 'buy something else.' Similarly, what if the price of gasoline doubles? Many working men and women live a long way from their places of employment and there is no public transit available. The only adjustment they can make to at least partially relieve the long term pressure on their budget is to buy a smaller car. But poor people don't have the ready cash or credit to buy new cars or old ones until they wear out."

VITAL ISSUES

In studying this broad picture and applying what you learn to your local situ-

Transcript of a Presentation on the Energy Problem given at a Conservation Foundation Workshop on Environmental Education.

Paul Swatek is presently Environmental Affairs Coordinator at the Massachusetts Audubon Society. He also serves as a Member of the Board of Directors and Treasurer of the Sierra Club. In 1970 Mr. Swatek wrote "The User's Guide to the Protection of the Environment," published by Friends of the Earth.

ation, I would suggest the following seven areas of investigation:

(1) First, try to get a good handle on where energy comes from; I mean energy used in your region. Of course, it comes most immediately from the utilities, but what do they burn to generate the power that they deliver to you? Where does the gas that comes through the pipelines into some of our homes come from; how is it transported; eventually where does it come from; in what forms does it come; in what quantities? And then, of course, who provides it?

(2) Then, it is worthwhile to look at how energy is used. We don't have heavy industry in this area [New England] so we don't have, for instance, a steel industry or an aluminum industry to consume enormous quantities of energy. We have in New England a particular mix of business and industry. How much does it use? For example, how much energy does the paper industry or the computer industry need? How much is used for electric home heating, how much is consumed in other household uses and in transportation? I think in both of these cases it is desirable to try to be as quantitative as possible, in other words, to try to track down where the energy is coming from and where it is going in terms of gallons of oil, cubic feet of gas, and kilowatt hours of electricity.

I have been working recently on a paper for a conference on energy conservation in the industrial sector. Use of energy in the commercial sector and residential sector have been worked out fairly well in terms of national averages and we know where energy is being used. But in the industrial sector, it is not known very well at all. There is a feeling that somewhere in the industrial sector there are very large potential savings for energy, but we really need to find out exactly where energy is going and how it is being used before we can figure out how to try to curb our use of it.

(3) It would be interesting to look at the local impacts of energy use. Where are power plants located; what do they emit? What are the impacts on air and water; what thermal pollution problems do we have; radioactivity; what visual impacts? Looking toward the future, what call are we going to make on the coastline, for instance, for more power plants?

(4) It would be interesting to try to trace locally some of the interrelationships that I have mentioned with transportation, land use, and with economics. We are in the process right now in Boston of looking very actively at our transportation system, and it's an opportune time to trace that line and try to find out what would be the impacts in terms of energy of an increase in mass transporta-

tion, of trying to change the home-work travel patterns.

(5) It would be interesting to take a look at how energy is taxed in this area; what the utilities pay. What sort of breaks do utilities give their larger customers in terms of lower rates?

(6) Who makes local energy decisions? What role does government play? We are in the process in Massachusetts right now of designing a power plant siting procedure; there is legislation now before the state legislature. And public utility commissions are making rate decisions. It would be interesting to try to follow these. What role is business playing, what sort of advertising policies do local utilities follow?

(7) And lastly, how would changes in present energy policies affect the region? To what extent can the region contribute to the solution of some of our energy problems? Here, of course, you want to look at the change in import policy that's recently come about and what impact it is going to have in terms of the development of supertanker ports; what is going to happen in terms of offshore oil and gas development and exploration? What would happen if we revised our utility rate structures? Massachusetts is right now revising its building code. This presents a major opportunity to influence future energy use by tightening up insulation standards.

Then, of course, there is the whole question of research. It would be interesting to try to get some sense of what is going on out there in business in terms of energy research. I think you'll find that there's a lot of very interesting work going on.

Further Reading (from *Vital Issues*)

Energy; A Crisis In Power, John Holdren and Philip Herrera, Sierra Club, San Francisco, 1971. (Probably the best general book on energy for the general reader.)

The Limits to Growth, Donella H. Meadows et al., Universe Books, New York, 1972. (The most provocative book ever written on resources and economic growth. Much debated, often maligned and never ignored.)

Brownout and Slowdown: A Citizen's Manual wind and water.)

For the Twin Crises of Energy and Transportation, Walker & Co., New York, 1972. (A fair overview of our present energy difficulties.)

Energy and Power, Scientific American, W. H. Freeman and Co., San Francisco, 1971. (A wide-ranging collection of essays, some of which are rather arcane, but its terrific illustrative material makes it well worth looking at.)

Energy In The United States: Sources, Users and Policy Issues, Hans Landsberg and Sam Schurr, Random House, New York, 1968. (A nontechnical book with some solid background material, but very dry.)

Night Comes To The Cumberlands, H. M.

Caudill, Little, Brown & Co., Boston, 1963. (The masterwork on the coal industry, very readable.)

The Last Whole Earth Catalog, Portola Institute, Random House, New York, 1971. (Contains some excellent source material on unconventional energy sources: solar, wind and water.)

The Atomic Establishment, H. Peter Metzger, Simon & Shuster, New York, 1972. (A hard-hitting, accurate report on the nuclear power business by one of its most responsible critics, written for laymen.)

Also:

Citizen Action Guide to Energy Conservation, Citizen's Advisory Committee on Environmental Quality, Government Printing Office, Washington, D. C.

Dimensions of Change, Don Fabun, Glencoe Press, Beverly Hills, California, 1971. (Especially Chapter 3, *Energy: Transactions in Time*. A thought-provoking look at energy problems, possible technological answers and the obsolescence of social and economic institutions.)

REFERENCE

1. **The Energy Crisis: What Makes It So Complex and Complicated?** S. David Freeman, *Vital Issues*, Center for Information on America, Washington, Connecticut, November 1973. (This edition of *Vital Issues*, a monthly publication of the Center for Information on America, is an excellent overview of our introduction to the major issues involved in the current energy situation.)

Teacher's Guide To Environmental Education

A teacher's guide to environmental education programs and materials has been released by the National Center for Education Communication, an arm of the U.S. Department of Health, Education and Welfare.

The 100-page booklet evaluates a variety of resources for teaching environmental education — books, films, curriculum guides and programs — and indicates who the resources are designed for, how much they cost, and where they can be obtained.

The book also offers case studies of environmental education programs from throughout the country and presents recent research findings on the best teaching methods for various grade levels.

It is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 for \$1. When writing for the publication refer to stock number 1780-01093.

Another helpful source of environmental education information was recently released by the National Park Service. It lists potential federal, local and private sources of assistance and informational materials.

The publication, as well as additional information and assistance, may be obtained by contacting the Division of State and Private Assistance, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240.

AEE Sponsors Earth Week 1974

All ANSS members are urged to get to work immediately in their states and communities to implement these plans for Earth Week 1974. The suggestions given above are but few of the many that can be adapted to meet local needs. You are urged to send in your ideas so that they may be disseminated through the "Instant Exchange" publication of the Alliance. Send your ideas directly to Alice Cummings, National Education Association, 1201 Sixteenth Street, N.W., Washington, D. C. 20036.

When Alice Cummings and Walter Jeske, representatives of organizations belonging to the Alliance for Environmental Education, discovered that Earth Week 1974 was in need of a sponsor, they proposed to Senator Gaylord Nelson that the Alliance be designated the sponsoring organization. Consistent with the objectives and purposes of the Alliance, the sponsorship of Earth Week 1974 provides a rallying point for all twenty-six of the member organizations, enabling them to pool their resources and encourage their members to use the Earth Week format for a major environmental education effort.

Alliance president Ken Dowling polled the Executive Committee of the Alliance, and received enthusiastic support. Alice Cummings, who represents the National Educational Association on the Alliance Board, agreed to serve as national chairman. Plans have been made, and the following action taken:

The *message* overriding all activities of the week agreed upon by the committee is as follows:

"Earth Week 1974 is a time to recognize that the educational process is the most dynamic tool for change. Each generation has the opportunity and the challenge to focus on the environment as it is received. Earth Week 1974 provides our generation with an opportunity and challenge to educate and enlist every American in a cooperative effort to change the future and its quality of life."

The *theme* prevailing throughout is education and commitment of every American. He will be urged to take time to think about and understand what he is doing in terms of the consequences of his acts on the future of the Earth and its inhabitants.

Suggestions include:

Reversal of energy crisis

Devote an issue of the school newspaper to helpful hints to parents on the theme — "Don't mis-use your appliances and your car; use them only in emergencies and try this:

- battery operated lights and appliances
- walking and bike riding
- candles
- kerosene lamps
- muscle — beat your cakes by hand; use a wire whip or rotary beater

- let the sun in to warm your house
- give the dryer a rest; hang the laundry outdoors
- grow your own vegetables
- use linen napkins
- open a window instead of turning on the air conditioner
- cover windows and doors with plastic to retain inside heat
- push a manually operated lawnmower
- use a broom and a Bissell carpet sweeper
- shampoo your hair a little earlier and let it dry naturally
- serve a cold meal at least once a day

Solicit from individuals testimonials on conservation steps of their own initiation. Award originality, creativity and individuality. Encourage each individual to be a leader and not a follower.

Lifestyles and Individual Alternatives

Every classroom devote the entire week to teaching that the future of the Earth depends upon developing ethical standards and behavioral patterns that will preserve and improve essential environmental resources, using members of Alliance organizations as guest teachers.

Have the school children keep a family diary of all activities. Have them analyzed by local teams of Alliance members to predict future shortages by density of wasteful habits.

Elementary level students study their individual family and community water resources and usage. Translate essentiality of adequate water supply in terms of effect on their lives should supply be inadequate.

- thirst
- bathing
- toilets
- fire fighting

Each school system establish teams of students and community resource individuals (Alliance members and others) to assess the quality of community life. Each team assigned one of the following areas to assess:

- litter
- parks
- recreation areas
- use of chemicals
- garbage disposal
- sewage

- solid waste disposal
- neglected and unsightly areas
- housing problems

Publicize findings of teams in local newspapers.

Earth Stewardship

Geography, earth science or civics classes study their community's watershed areas in terms of:

- geographic features
- volume relative to needs of individuals, agriculture, industry, commerce.

Make the school a collection point for "junk" mail received by each home, e.g. political campaign literature, advertisements, solicitation letters, anything addressed to occupant or resident. Categorize it by source and contact the sender pointing out the consequences of such waste. Recycle the paper collected.

Maximizing Human Resources

Run a series of articles in the local newspaper prepared by member organizations on product ingredients and scientific factors of commodities to educate consumers.

Hold a community town-hall to climax the week and plan next steps for every week and future Earth Weeks. Use the occasion to honor the most creative, hardest working, most committed (other adjectives to be determined) Earth Week Citizens. Suggest that the local Chamber of Commerce contribute the awards and that the selection panel have a 75% student representation.

Suggestions as to support activities in which your organization can engage include:

- Participation of your chief official in a press conference.
- An article in your newsletter.
- Offering the services of members as guest teachers in their local school systems.
- Working cooperatively with school systems on teams to assess the quality of community life.
- Preparation of scientific articles for newspapers.
- Taking the first step to insure that your chief local government official proclaims Earth Week.
- Urging other organizations to which you belong to join in the Earth Week observance.

Good Reading

BEN HALL

Animals of the African Year: The Ecology of East Africa by Jane Burton. Ill. with color photographs by the author, plus maps and diagrams. Holt, Rinehart and Winston, New York. 1972. 173 pp. \$10.95.

As the subtitle indicates, this book deals with East Africa: Kenya, Tanzania and adjacent states. It describes the total living population of the region. It is concerned with the complex interrelationships between the plants, the animals, and their physical environment. It presents a fine picture, from the viewpoint of natural history, of a part of the world that, despite the inroads of tourists and other exploiters, is still an extremely beautiful and interesting one.

In a sense this is a picture book, copiously illustrated with one to three color photographs on each page. The photos relate directly to the text. They lack figure numbers and parenthetical references to them in the text; but this does not impose any great difficulty, since the illustrations are closely related to the accompanying text, and one need only study the pictures and their captions as he proceeds to read the text. In general the photographs are very good, although some, because of confusing detail or too great reduction in size, make it difficult for the reader to find the detail the caption refers to.

The text, quite as important as the pictures, is especially well written, in a simple, direct style from which the beauty of the things described emerges vividly.

Two of the phenomena this book deals with especially interested me. One of these is the Plate Theory, according to which the surface of the earth is composed of many "plates" that are moving in various directions. Pressure of one plate against another at their borders has forced up the major mountain ranges. The mountains of East Africa are not, however, caused by this pressure, but by volcanic activity. Thus the famous Mt. Kilimanjaro, for example, is a gigantic extinct volcano. The present pattern of the earth's continents has resulted, over millions of years, from Continental Drift, caused by the separation of today's continents from a single huge land mass or supercontinent.

Another interesting phenomenon is the duet singing of birds. Contrary to the situation in temperate regions, in some species the female sings like her mate. The pair practice their duet, developing songs that distinguish them from other

pairs of the same species. This serves the pair as a means of keeping in touch with each other during the breeding times.

Animals of the Arctic: The Ecology of the Far North by Bernard Stonehouse. Ill. with photographs, charts, maps and diagrams. Holt, Rinehart and Winston, New York. 1971. 172 pp. \$10.95

Animals of the Antarctic: The Ecology of the Far South by Bernard Stonehouse. Ill. with photographs, maps and diagrams. Holt, Rinehart and Winston, New York. 1972. 171 pp. \$10.95

These two books, together with that reviewed above, make up an excellent series on world ecology, although the publishers supply no title for the series. These two books by Stonehouse are similar in format to the *African* volume. Most of the illustrations are color photographs, not done by Stonehouse himself. In both the *Arctic* and *Antarctic* volumes Stonehouse uses colored drawings of birds and mammals, in addition to the photographs. Each of the three volumes ends with a Bibliography, a Glossary and an Index. In my opinion, the glossaries could well have been more extensive. In the *Arctic* volume, for instance, the glossary is limited to only 19 terms; there are many others that might well have been included.

I was especially well impressed by the last section of the *Arctic* book. In dealing with Exploitation, Stonehouse becomes quite eloquent. The two following quotations will identify the viewpoint of the author and the basis of his pessimism and indignation. "Nowhere in the world," he writes, "do we see more clearly that, buying the benefits of civilization, man mortgages his future to pay for them." And, "Our successors will marvel that civilized man destroyed, with single-minded determination and under international supervision, the creatures which unlocked for him the capacious food cupboards of polar seas."

I read these three books with an enjoyment that had nothing to do with my sense of duty as a reviewer. They led me to look at travel brochures and dream about the possibility of my seeing more of these unspoiled places of the earth, before the impact of tourism and technological exploitation will have destroyed the reasons for going to them.

The World of the Gray Squirrel by Frederick S. Barkalow, Jr. and Monica

Shorten. Ill. with photographs. J. P. Lippincott Company, Philadelphia and New York. 1973. 160 pp. \$5.95

The World of the Wood Duck by F. Eugene Hester and Jack Dermid. Ill. with photographs. J. P. Lippincott Company, Philadelphia and New York. 1973. 160 pp. \$5.95

We have received the above two volumes of this publisher's 31 *Living World Books*. The series is ably edited by John Terres, who is a Contributing Editor to *Audubon* magazine. The books are well written by a well qualified group of writers. They are an important addition to the literature of American natural history, and constitute a sort of encyclopedia of animal behavior and biology. Books like these, each dealing with a single species, or a few closely related ones, are needed.

Both the books under consideration are generously illustrated with good black and white photographs; in addition there are distribution maps of gray squirrel subspecies in the United States and Britain, and line drawings showing how to build nesting boxes for the wood duck.

The authors meticulously document the sources of their information, acknowledging in the text from whom the various facts and ideas have been derived. This is supplemented by an ample bibliography in each book. The two books are alike in format and arrangement of their contents. Both have introductory general chapters— "Meet the Gray Squirrel [or Wood Duck]." The four succeeding chapters deal respectively with the animals' behavior during the year's four seasons. Each of the books has a chapter on "The Wood Duck [or the Gray Squirrel] and Man."

I am impressed by how much is known about the life history and ways of the gray squirrel. Information in this book that is especially interesting includes: the senses of squirrels, especially the roles of rods and cones in the sense of sight; the reproductive cycle and the nurture of the young; the parasites of squirrels, such as warble flies and nematode worms; the migration of squirrels; the molting of the hair and hair colors (curiously, although parts of the animal are gray or brown, there are no brown or gray hairs); the ways in which the species copes with the population problem, maintaining an optimum population in spite of hunters and other predators.

A similar list of "high spots" could be made for the wood duck book. It is not difficult to become interested in a bird of such distinguished beauty, and one of the very few ducks that perch in trees and nest in tree cavities. It is to be hoped that the chapter on nest boxes will inspire some readers to help the wood

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duck hold its own in an increasingly hostile world.

The discussion of the unhappy results of introducing gray squirrels into other parts of the world furnishes a good example of the detrimental complications that result from such tampering with animal distribution.

We look forward to seeing others of the 31 volumes of these *Living World Books*.

* * *

Jungle Laboratory by Nancy K. Robinson. Ill. by Bill Tinker. Hastings House, New York. 1973. 83 pp. \$4.95. Ages 7-11.

This book is subtitled *The Story of Ray Carpenter and the Howling Monkeys*. It describes how Carpenter turned away from laboratories and zoos to study a species of Howling Monkey in its natural habitat. He found suitable places for this on Barro Colorado Island (on the Panama Canal) and Cayo Santiago (off the coast of Puerto Rico).

The book describes the difficulties Carpenter experienced in setting up his field work. He had to solve the problem of how to count the animals. A mass attack by ticks threatened to halt his work until he figured out how to outwit them by taking advantage of their negative geotropism. He had to defend himself also against the impolite manners of the monkeys themselves, whose way of saying "I don't like you" was to bombard the observer with their urine and feces. A chapter on "Questions, Answers, and Guesses" lists some of the questions Carpenter had to formulate as a basis for his observations. This can show the young reader that the questions a scientist asks are as important as the answers, since the question in large part determines what the answer will be.

The chapter on "Howling" is especially interesting. It shows how the howling habit serves the purpose of the animals' survival. For one thing, it functions as a means of settling disputes within the species in such a way that nobody gets hurt. (Would that mankind might learn from the good example of the monkeys!)

This book can serve well to introduce young readers to the fascinating world of animal behavior. I would take exception, however, to the statement on the jacket that describes ethology as "the study of animals in their natural homes." It is not true that ethology is limited to field observations; it depends also on experiments and observations in both laboratory and field. And further, it is not true that ethology began in 1931: "In 1931, however, this was a new idea. Animals were studied in a laboratory, not in the jungle." One could compile an extensive bibliography of ethological studies, dated earlier than 1931. It would in-

clude a significant part of the publications of von Frisch, to cite one example, who is certainly one of the leaders of present-day ethology. The name, *Ethology*, is, however, newer than the science itself.

The "Afterword: More About Primate Behavior" tells of the value of work like Carpenter's in helping us understand human behavior. It also describes studies by other students of monkey behavior.

The illustrations (drawings in black and white) and the Bibliography and Index are adequate. The Bibliography lists unpublished notes of Carpenter's, and films, as well as published books and articles.

* * *

Seasons by Hal Borland. Ill. with photographs in color by Les Line. J. B. Lippincott Company, Philadelphia and New York. 1973. 127 pp. \$14.95

This book might be called a quartet of somewhat rhapsodical prose poems, describing the beauty of the changing seasons in this part of the world. It is made up of four chapters, one dealing with each of the four seasons. Each chapter is followed by a Portfolio of full-page color photographs. The prose and the illustrations complement each other, thus giving a unity to the book. The captions of the photographs are written in the same style as the four chapters.

The illustrations are fine, by and large, but a few are spoiled by too much out-of-focus detail in the background, as in the picture of the goldfinch or that of the dock plant, both in the Autumn portfolio.

Hal Borland is no doubt well known to our readers through his nature essays on the editorial page of *New York Times*. So is Les Line, as Editor of *Audubon* magazine. One would expect an attractive book to result from the joint effort of these two men, and so it does.

Seasons would make a good bedside book, and a pleasant one to browse in when obliged to stay indoors. It would make an excellent gift to give to someone who is sensitive to the things the book deals with.

* * *

Ode to a Wildflower by Rudolph Lindenfeld. Ill. with drawings by Lucille Geary. Published by the author, Staten Island, N. Y. 1972. 12 pp. packet. \$2.50. (Also available in booklet form.)

This packet of twelve sonnets about some of the flora found on Staten Island are individually printed on colored paper and illustrated with sketches of each species, suitable for framing or display. Mr. Lindenfeld, a linguist born in Vienna, now serves as a naturalist at High Rock Park nature center—one of the few natural areas left within the confines of New York City. The poems demon-

strate his botanical knowledge of the plants—their structure and relationships—and a sensitivity to their subtle beauty, whether they be spring woodland wildflowers or trees like the tulip poplar and wild crabapple. His use of the ode form requires the convolution of sentence structure and a certain rhyming pattern which makes it difficult to create the feeling of freedom and love of life which he senses in these wild creatures. Persons not familiar with technical terms such as "follicle", "achene", "portulacaceous", and "umbel", as well as such non-technical but unfamiliar words as "niveous" and "argentous" (argenteous?) will want to expand their vocabulary a bit to fully enjoy these poems. All of us, hemmed in by winter's harsh realities or by urban encroachment, can find in these gentle poems a touch of warming spring. One of my favorites is reprinted elsewhere in this issue.

J.A.G.

Other Books Received

The Long-Lost Coelacanth and Other Living Fossils, by Alike. Ill. by author. Thomas Y. Crowell Company, New York. 1973. 32 pp. \$3.75.

Comets and Meteors by Isaac Asimov. Ill. by Raul Mina Mora. Follett Publishing Company, Chicago. 1973. 32 pp. \$1.25.

The Sun by Isaac Asimov. Ill. by Alex Ebel. Follett Publishing Company, Chicago. 1973. 31 pp. \$1.25.

The Long and Short of Measurement by Vicki Cobb. Ill. by Carol Nicklaus. Parents' Magazine Press, New York. 1973. 64 pp. \$3.78.

Silver Wolf by Paige Dixon. Ill. by Ann Brewster. Atheneum, New York. 1973. 108 pp. \$4.50.

Dead as the Dodo by Lynne Edwards. Ill. by Brian Edwards. Parents' Magazine Press, New York. 1973. 30 pp. \$4.50.

Skunk Baby by Berniece Freschet. Ill. by Kazue Mizumura. Thomas Y. Crowell Company, New York. 1973. 42 pp. \$3.95.

Pronghorn on the Powder River by Berniece Freschet. Ill. by Robert Quackenbush. Thomas Y. Crowell Company, New York. 1973. 44 pp. \$3.95.

John Muir by Charles P. Graves. Ill. by Robert Levering. Thomas Y. Crowell Company, New York. 1973. 34 pp. \$3.75.

Splish Splash! by Ethel Kessler. Ill. by Leonard Kessler. Parents' Magazine Press, New York. 1973. 30 pp. \$3.95.

Water for Today and Tomorrow by R. J. Lefkowitz. Ill. by Lawrence di Fiori. Parents' Magazine Press, New York. 1973. 64 pp. \$3.78.

Continued on page 20

NEWS and NOTES for Environmental Education . . .

Flamingo From Canada

Dr. Paul Fluck, Director of the Rand Memorial Nature Center in the Bahamas, received a cold Flamingo that had somehow gotten to New Brunswick, Canada, in late October and stayed around for two weeks before being captured and shipped back to milder climes. The bird evidently came with a hurricane that lashed the Atlantic Coast during the last week of October.

Dr. Fluck reports that the Nature Center is going very well with visitors from 48 countries over the past five years. Many of them go home with enthusiastic ideas for their own programs. The Rand Nature Center is unique in that it caters to the native population and also to visiting tourists who come to the Bahamas. As the accompanying photograph shows, the setting is one of pinewoods and coral paths, but there is sufficient water available to provide a touch of tropical rain forest and the wildlife to go with it.



Dr. Paul Fluck with a crowd of visitors to the Rand Memorial Nature Centre, Freeport, Grand Bahama.

Antioch Gets Eco-Center

A new nature center for one of the oldest environmental education programs in the country was dedicated on July 30, 1973 at Antioch College. The Vernet Memorial Eco-Center includes space for displays, conferences and seminars, as well as a library and auditorium. The offices of the Glen Helen Preserve will be located there. The \$300,000 building, with furnishings and a sophisticated audio system, as well as annual maintenance support, was a gift of the Vernet Foundation as memorial to the late Sergius Vernet. The building is designed to fit unobtrusively into the natural surroundings of Glen Helen, a 1,000 acre natural preserve in Yellow Springs, Ohio. Dr. Kenneth Hunt, long-time director of Glen Helen, inaugurated the use of the building with the annual Glen Helen Association lecture on September 7, 1973. Dr. Hunt, who resigned from the Glen last year, is now a professor of environmental studies at Stockton State College in Pomona, New Jersey.

"The Curious Naturalist" Goes National

"The Curious Naturalist," a publication of the Massachusetts Audubon Society for a number of years, will now be distributed through the co-sponsorship of the National Audubon Society as part of a new nationwide educational service. "Audubon Environmental Service" is a new environmental science program geared for upper elementary and junior high school classes. Subscribers will get ten issues of "The Curious Naturalist" magazine, one subscription to Audubon magazine, and various natural science bulletins and charts published by National Audubon. This classroom package is available for \$59.80 per year and can be purchased from the Audubon Environmental Center, Walker and Company, 720 Fifth Avenue, New York, New York 10019.

Individual subscriptions to "The Curious Naturalist" can still be purchased for \$3.00 per year from the Massachusetts Audubon Society, South Great Road, Lincoln, Massachusetts 01773.

Consulting Services In Environmental Education

The Foresta Institute for Ocean and Mountain Studies draws on the professional expertise of qualified scientists, through the use of a systematic interdisciplinary approach in all aspects of environmental education curriculum development and provides consulting services in the development of environmental education programs. With a distinguished board of advisors, headed by Dr. Richard Miller, Foresta has worked in a broad spectrum of projects both in this country and in Latin America. It has devoted a significant percentage of its resources toward saving threatened wildlife. It has established a crisis center and informational service with regard to endangered species. Believing that the Environmental Education Act of 1970 emphasizes a multidisciplinary approach focusing on urban and rural environmental problems, Foresta is ready to provide its experience and consulting capabilities in the development of environmental education programs.

Persons interested in exploring the use of Foresta's capabilities should write the Foresta Institute, 6205 Franktown Road, Carson City, Nevada 89701.

Nature "Aids" Still Available

Many ANSS members remember the little pocket sized loose-leaf notebook "Aids to Knowing Natural Science" which were published by the Slingerland-Comstock Company in Ithaca, New York. In addition to individual sheets on birds and mammals, there were many small keys to winter and summer trees, evergreens, twigs, aquatic insects, galls, a moss key by A. J. Grout, a bird nest key by Arthur Allen, and helps to stars and constellations. Many of the illustrations were done by Louis Agassiz Fierste, and the texts by E. Laurence Palmer.

These "Aids" are still available from the owner of Slingerland-Comstock, Mrs. Lempi Parsons, 100 Port Watson St., Cortland, N. Y. 13045. Mrs. Parsons runs the business as a small home-based enterprise, finding it of great interest to help many people in their environmental education work. She can provide an order blank which lists all the materials available and the prices.

AIN Conference

The Association of Interpretive Naturalists and the Western Interpreters Association are jointly sponsoring an Inter-

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national Interpretive Conference and Workshop at Asilomar Conference Grounds in Pacific Grove, California. The Conference, scheduled for April 2-6, 1974, has as its theme "Interpretation - Many Things - To Many People."

AIN Workshops have long been of interest to persons teaching and interpreting in the environmental education area. This conference will be of special interest to naturalists, historians, outdoor education, nature center staffs, and children museum staffs. To receive programs and reservation forms, write Christian Nelson, Chief Interpretive Department, East Bay Regional Park District, 11500 Skyline Blvd., Oakland, California 94619.

ANSS In Section Q

ANSS President Kingsley Greene has announced that on November 28, 1973, the Society was approved as a member of Section Q (education) of the American Association for the Advancement of Science. Dr. John A. Gustafson will serve as representative of the Society on the Section Q Committee.

In the new AAAS structure, the Council of the organization has been cut down from over 500 members to less than 100. Various affiliated organizations have been grouped together to form constituencies which will elect council representation. Each of the affiliates has an opportunity to align itself with one of the sections of AAAS. For many years, ANSS has been a part of Section Q and will now have a direct voice in revitalizing the section activities.

Sykes' Back To Greenwich

Martha Sykes writes that she has been transferred back to the Greenwich Audubon Center, to direct that operation and the Audubon Ecology Workshop held there each summer. With the help of a Ford Foundation Grant, the National Audubon Society centers have cooperated with the Educational Development Center of Newton, Massachusetts and the Bank Street College of Education in New York to develop new ideas in environmental education. Open classrooms, British primary schools, and informal schools are all part of the new educational outlook. A direct outgrowth of the grant has been the development of a Teacher Resource Center. Courses for teachers and youth group leaders are now being offered through the Resource Center. It is hoped that all of this activity will help to introduce ecological and environmental studies into the school curricula, implemented through workshops and curricula materials.

Martha took a bit of time off from this busy schedule of workshop and administration to spend three weeks in Great

Britain this past September, birding along the coasts and out to sea.

"Walk For The Blind"

Marshal T. Case, Executive Director of the Connecticut Audubon Society, reports on the development of a "Walk for the Blind" at the Roy and Margot Larsen Wildlife Sanctuary in Fairfield, Connecticut. This walk, especially constructed for the blind, is a pine bark path several hundred yards long. It is enclosed on both sides by a smooth cedar rail fence, with benches placed at various points along the trail identified for the visitors by markers which are on the hand rail opposite these resting and listening places.

Believed to be the first trail of its kind in a natural woodland, it was constructed in 1967 under the joint sponsorship of the Connecticut Audubon Society and the Bridgeport Garden Club. Although originally designed for the blind, it is now open to all handicapped persons. Many children and adults from nearby rehabilitation centers and hospitals utilize the facilities at this Sanctuary.

The Fairfield Lions Club now maintains this unique trail, continuing in a new way the long reputation which the Lions Clubs have had in helping persons with visual difficulties. Last year over thirty thousand people visited this trail, many of them using a self-guiding booklet keyed to the numbered stations along the trail and written in Braille.

ANSS members should cooperate with the Lions Clubs in their own communities to establish similar trails throughout the country. For further information, write to Marshal T. Case, Executive Director, Larsen Audubon Sanctuary, 2325 Burr Street, Fairfield, Connecticut 06430.

B.I.M. Wilderness

When the Wilderness Act was passed in 1964, the 450 million acres of public land under the jurisdiction of the Bureau of Land Management of the Department of the Interior were not included. That oversight can now be corrected if the Congress amends a bill now before it which would authorize review of all this land with the objective of identifying wilderness areas and providing for their protection, as has been done for many areas in the National Forests and National Parks. The standard wilderness inventory procedures of the Wilderness Act should be a part of this Act. ANSS members are urged to ask their congressional representatives to work toward this end.

The Ashland Conference

The Massachusetts Audubon Society and the New England Camping Associa-

tion, with help from the Fund for the Advancement of Camping, jointly sponsored an environmental education conference last Fall which was exciting in several respects. Not only did it include in-depth workshops on many topics vital to environmental education, but it brought together the two most important organizational components in E.E. today - schools and camps.

Several years ago, under the leadership of former president John Brainerd, ANSS worked toward upgrading the quality of nature activities at organized camps. The increasing development of environmental education is resulting in formal school programs assuming many aspects of the resident camp, so that it is more evident that the facilities, and to some extent the format, of organized camping holds promise for school E.E. programs.

Here are some of the topics of this conference, held in Ashland, Massachusetts: How to initiate and administer a school-camp E.E. program; sources of staff and of federal funding for year-round E.E. programs; preparation of children and parents for the residential experience; Innovative new teaching techniques for the out-of-doors; Reading-the-landscape hikes; Modifying camp facilities for year-round use and E.E.; Seasonal opportunities for New England outdoor education; Learning from living together; Alternative school; Involving the community in your E.E. program; The day camp E.E. center; development of a year round program; English, math, history art, and the environment; Outdoor education for the special.

If you want to hold a conference of this type in your region - and every region of the country should have one - write for information to Charles E. Roth, Director of Education, Massachusetts Audubon Society, Lincoln, Mass. 01773, or the N. E. Camping Association, 29 Commonwealth Ave., Boston, Mass. 02116.

Energy Bibliography Available

The Massachusetts Audubon Society has published a bibliography to aid teachers in dealing with the current energy crisis as part of their environmental education programs. One of a series of "Aids to Environmental Education," it lists books, pamphlets, magazine articles, films and other media materials, along with addresses, costs, and reference information. You may obtain a copy of this useful bibliography by writing to Massachusetts Audubon Society, Hatheway Environmental Education Institute, Lincoln, Mass. 01773, enclosing 60 cents (50 cents each if you buy 50 or more).

Cap'n Bill Vinal Issues Another "Vineholler"

Cap'n Bill Vinal, the father of nature recreation in this country, has issued another of his annual summaries of the activities of the many persons who have studied in one way or another under his guidance. Cap'n Bill's 92 years haven't dulled his wit, as indicated by the following quotes from this year's issue:

"WHAT IS VINEHOLLER? It is a friendly greeting by campers, friends, students. It is a gospel of the environment, not so much biological knowledge as *quality*. It is outdoor leadership capsulized. It is a report of family-village scope rather than astronauts bouncing messages from the stars. It is a WE-JOURNAL (Not I, or wee). It is COMMUNICATION by letter or voice. It is innovative in being *nature recreation*."

"PLANT 5 ROWS OF PEAS: Purity, perseverance, promptness, peace, preparation.

3 rows of Squash: Squash gossip, Squash indifference, Squash criticism.

Finally some Turnips: Turn up each day with a smile; turn up some original ideas in your work; turn up in 1974 VINEHOLLER with COMMUNICATION."

We wish Cap'n Bill continued vigor of mind and spirit as his influence continues to expand through the hundreds of persons who have come to love him and to appreciate and understand his philosophy and life style. He would like to receive "communications" from you. His new address is Dr. William G. Vinal, 67 Bridge Street, Norwell, MA 02061.

University of Michigan Offers Independent Study Courses On "The Environment And The Citizen"

To meet the needs of a growing number of people interested in learning how to help solve environmental problems, The University of Michigan's Extension Service and the Department of Environmental Education of the School of Natural Resources have recently announced two new independent study courses on "The Environment and the Citizen."

The two courses will be offered for the first time in September, 1973 with a maximum enrollment of 1,000. They are open to college or high school students, extension or adult education students, non-students, educators, environmentalists, senior citizens — in short to all who are interested in this timely subject.

Instructor and developer of the courses is Dr. William B. Stapp, professor of environmental education and chairman of the department in the School of Natural

Resources, and former ANSS president.

Developed and tested by Dr. Stapp over a five-year period, each course consists of a printed text and a series of activities designed to help participants apply the text to local and regional situations. Community surveys and interviews as well as more traditional review questions and papers are among activities included.

Though the courses each carry two hours of college-level credit, they may be elected without credit. In either case, fees, which are subject to change, are \$64.00 for each course of seven units, plus an additional \$12.50 for the text and learning kit. The fee for anything less than seven units will be \$15.00 a unit.

The first course consists of three required "core" units and four elective ones. The core units are: Man and the Environment; Population and Urbanization; and Ecology. Upon completing the "core" units, participants may choose any four of eleven elective units, which are: Government, Policy and the Environment; Economics and the Environment; Urban and Regional Planning; Soil Resources; Tree Resources; Water Resources; Fishery Resources; Wildlife Resources; Air Resources; Outdoor Recreation; and The Role of the Citizen.

The second course is offered for participants who want to study the remaining seven electives.

Since these are independent study courses, the student is not bound by classroom schedules and may proceed at his own pace through the entire course. The courses are so designed, however, that organizations may participate as a group and meet regularly to discuss course materials and to share learning experiences.

Those who complete the courses without academic credit will receive a certificate acknowledging their involvement.

The course materials were developed under a grant from the Ford Foundation, in cooperation with the Michigan Department of Natural Resources and the Department of Independent Study of The University of Michigan.

For more information or enrollment forms, write: Department of Independent Study, U. of M. Extension Service, 412 Maynard Street, Ann Arbor, Michigan 48104.

"Is Dick Fischer Still Alive?"

Dick Fischer, professor of Environmental Education at Cornell University, is still busy with students and writing, so much so in fact that his promise to send a short note about himself to let ANSS members know that he is indeed still alive, has as yet not arrived. We

know he is still going strong because of all the student memberships which come from his classes. We hope that other professors around the country will urge their students to join the Society and team up in the great environmental education work which must be done.

Miss Beulah Frey And The Fox Chapel Story

Long before it was an organized program, environmental education was happening in the Fox Chapel School District of Western Pennsylvania. Miss Beulah Frey, a biology teacher who extended her time and efforts beyond the classroom, has worked for several years with Fox Chapel Garden Club in a labor of love and dedication. Few other areas of the educational program in that community burns so much midnight oil and yet have energy left to guide youngsters on rigorous nature hikes or classes of high school students on nature interpretive trips through the Carnegie Museum's nature exhibits.

The environmental program of the Fox Chapel Area School District is largely the story of Miss Frey and the host of teachers and interested residents who saw the crisis on the horizon and began to do something about it.

The outdoor and environmental education program of this school district is extensive. It is a galaxy of small things happening daily. It is an effective program. In its almost evangelical spirit, it is causing children to see the world differently and to assume personal responsibilities for what they see.

The Fox Chapel story is truly a story of community integration and outreach. Persons interested in seeing how diverse and effective environmental education efforts can be should write for the informative booklet, "Information Series No. 3," subtitled Outdoor and Environmental Education in the Fox Chapel Area School District. Copies may be obtained by writing to Fox Chapel Area School District, Fox Chapel, Pennsylvania 17828.

Job Corps Camp Converted To EE

Another job corps camp, this time in Minnesota, has been converted to environmental education. Originally built in 1965, it was used for three years as a job corps training center. In 1971, with funds provided by Title III, the facility was leased to the Cook County school system and was opened as a live-in learning center. It is located within the Superior National Forest, about 85 miles northeast of Duluth, Minnesota.

Within walking distance are lakes Gegoka and Flathorn, both used exten-

sively for study. The Little Isabella River, one of Minnesota's finest trout streams, flows through the camp. Many miles of interpretive nature trails begin at the Center.

The site contains four dormitories, a large gymnasium, an education building and a dining hall complex. Each dorm accommodates about 100 persons. The education building contains classrooms, photography darkroom, library, craft-room, weather station, trading post and a film viewing room. Other classroom and science areas are provided as is an outdoor recreation area. There are camping facilities, swimming beach, and canoe launching facilities on the lakes.

While at the Environmental Learning Center, students are involved in activities that are designed to develop an understanding of the principle that nature is functional in its design, and that living things and non-living matter are interdependent. The program hopes to foster an appreciation for nature and a desire to protect it, and to increase the observational skill of the participants. What they learn at the Center will support their classroom knowledge with practical application to the environment. The Center provides a large selection of curriculum materials for use by participants. Art, scientific exploration, mathematics, social studies and language arts are all conducted out-of-doors. Equipment available ranges from canoes and rowboats to skis, buses, snowshoes, telescopes, parabolic receivers and other things necessary to conduct the program. School groups and other organizations using the center must provide their own teachers and chaperones. A program host is assigned to work exclusively with each participating group.

The majority of participants at the environmental learning center come from Minnesota's elementary schools. However, church groups, scout groups, civic groups, handicapped persons, and secondary and university students also use the facility. The Center sponsors a variety of seminars, many for college credit, conducted by outstanding consultants in their fields.

Those interested in further information should write to John Pichotta, Project Director, Northeastern Minnesota Environmental Learning Center, Isabella, Minnesota 55607.

Highvista A New Nature Center

By means of a "bargain sale" to The Nature Conservancy, Miss Elizabeth Darrah of Canastota, N. Y., has contributed 137 acres of upland woods and fields overlooking Skaneateles Lake, the most beautiful of the Finger Lakes in

Central New York, for the establishment of a new concept in nature education. Highvista, Inc., a new organization set up to run the nature center at the Highvista site, has as its purpose "to provide means of educating its members and the public in the study of nature and particularly the interdependence of all living things through continuing programs involving field trips, meetings, lectures, and the opportunity for individual observation and research." The guiding philosophy of the nature center is that natural methods will be employed for the management of the area, including a demonstration garden and small fruit orchard.

Several members of ANSS in the Central New York area are members of the Board of Directors, including Miss Darrah, Dr. Eugene Waldbauer, Dr. Harlan Metcalf, and Dr. John Gustafson. Paul Kelsey, a frequent contributor to *NATURE STUDY*, is also on the Board.

Smithsonian Institution - Peace Corps Environmental Program

During the past two years that this program has existed, approximately 350 volunteers have been assigned to environmental projects overseas. The number of requests from developing countries for volunteers skilled in the biological and environmental sciences is constantly increasing. Assignments cover a very broad spectrum of scientific and technical fields, such as forestry, fisheries, wildlife management, national park planning and management, ecological research, marine biology, watershed management, environmental monitoring, preservation of endangered species, air and water pollution research, water resource development, conservation education and environmental health. In their assignments, individual volunteers may work directly in a host government program or may be attached to a scientific or conservation organization assisting the host country. Most of the assignments provide opportunities for field work. The Smithsonian Institution serves as a participating organization to assign applicants who are trained in environmental and related sciences. Many of the assignments provide opportunity for volunteers to carry out research that can be used to complete requirements for advanced degrees. Length of tour is from 24 to 27 months including a language training period. Living allowances cover modest in-country living costs and vary with the country of assignment. In addition, \$75 per month is held in the United States and is available to him at the conclusion of his service. Many assignments can accept couples. Both the husband and wife will be volunteers and will receive the appropriate living allowances. Families will

usually not be accepted in cases where more than three children or more than two school-aged children will accompany the volunteer overseas. Service is confined to citizens of the United States. Arrangements for academic credit should be undertaken between the applicant and his university.

The standard Peace Corps application should be used, sent to the Office of Ecology, Smithsonian Institution, Washington, D.C. 20560. Additional information may be obtained from Mr. Robert K. Poole at the above address.

Joe Shomon Retires

Joe Shomon retired in June, 1973, from the directorship of the Nature Center Planning Division of the National Audubon Society, a post he has held since 1961. During that twelve-year period the Division prepared over 180 plans for nature centers and related facilities, all the way from Alaska to the Bahamas and from eastern Canada to California. This program has resulted in the saving of some 300,000 acres of urban land, now being used as "land for learning." These facilities represent a capital investment of more than \$65,000,000. Each year forty to fifty million people visit these centers. New centers are being opened at the rate of sixty-five or more per year.

Joe worked closely with Byron L. Ashbaugh and Bob Holmes in these planning projects.

Joe foresees 2,000 nature centers throughout the world by the year 2000. He sees a great need for more prototype centers in regions where there are very few. They are needed in the deep South, in the prairie and Rocky Mountain states, and in the Pacific Northwest. Upon his retirement, Joe had this to say about the future: "Nature centers must become bigger and better. By bigger I mean larger in area and by better I mean better planned and better programmed. We need to guard against all kinds of encroachment upon these islands of green, against noise, air, water and land pollution, and against too much compromising. We should not readily accept left-over bits and scraps of land for nature centers; we need the most diversified land available. After all, they are supposed to be islands of green saved for urban America for our generation and all future generations which will follow us."

Richard J. Manly has been named the Division's new director as of July 1, 1973.

Look into almost any field of practical endeavor and we find accurate data going back only a century or two. Civilization has just begun. — Arthur E. Morgan

Michigan — And Stapp — Lead The Way

The School of Natural Resources of the University of Michigan has developed a unique program in environmental education and outdoor recreation. Embracing both the natural and social sciences, the graduate program in the School of Natural Resources cooperates closely with the standard academic departments of Botany, Geology, Zoology, etc., to provide graduate degrees in environmental education with three major emphases: Environmental Instruction, Environmental Communication, and Environmental Advocacy.

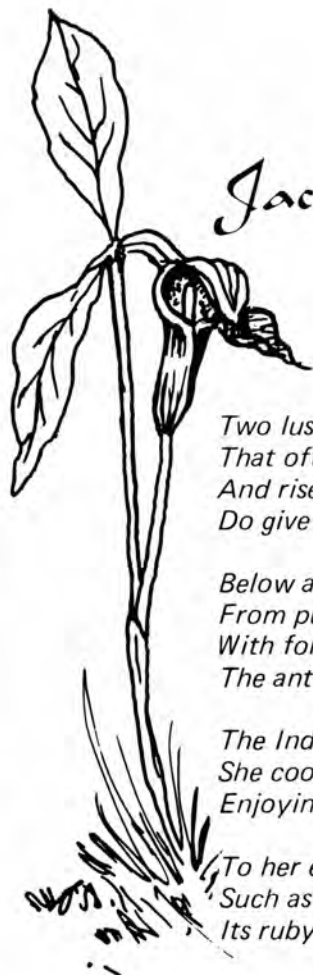
Under Professor Bill Stapp, former president of ANSS, the instruction option puts the greatest stress on developing, implementing and evaluating environmental curricula for primary and secondary schools and for other educational related organizations. It is designed for students who want to improve the environment by helping young people clarify their environmental values and obtain new environmental knowledge and skills.

The communication option, directed by Professor Pete Sandman, stresses mass audiences, and the use of communications media for environmental persuasion and planned attitude change. It is designed for students who want to improve the environment by convincing others to interact with the environment in new ways.

The advocacy option, under Professors Bunyan Bryant and Jim Crowfoot, emphasizes the relationship between environmental quality and social justice, and how to change political institutions through interest group activism. It is designed for students who want to improve the environment by organizing interest groups to fight for their environmental needs.

These three options follow many common threads, and interact in many ways. There is no question that those engaged in formal instruction in environmental education need the skills of persuasion and organization which those in other types of activities possess. Likewise, advocacy and environmental activism are relatively short-run approaches unless tied in with a carefully drawn educational program.

Persons interested in a detailed description of these programs should write to Professor William B. Stapp, Program Chairman, Environmental Education/Outdoor Recreation, School of Natural Resources, The University of Michigan, Ann Arbor, Michigan 48104.



Jack-In-The-Pulpit

(*Arisaema triphyllum*)

*Two lush-green leafstalks, blades rent into three
That often last until the dawn of fall
And rise to heights of up to two feet tall,
Do give the little preacher privacy*

*Below a verdant, brown-striped canopy
From pulpit's platform people to enthral
With forest's tales and incidents recall:
The ant's visit, the busy bumblebee . . .*

*The Indian squaw knew naught of white man's waste:
She cooked the corm before her wigwam's place
Enjoying every bit of turnip's taste;*

*To her each living blade or bloom would talk
Such as this acrid arum's flowerstalk,
Its ruby berries autumn yet to grace.*

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President's Address

Continued from page 6

our membership. Our brochure "... Invites all persons who are concerned about environmental problems to become active members — NOW." If we are to live up to this invitation, which is actually an implied statement of purpose, then it appears to me that a hard look be taken at our activities. I feel we need to expand our horizons and speak out on any and all environmental issues we feel appropriate and that we should prepare educational materials dealing with these issues. We must strengthen our present operations by using funds as I have already suggested and we will need to generate this additional money through a dues increase.

If we can begin to move in these directions, I think we will find greater interest in our organization and a concomitant increase in membership. We will be in a position to increase our leadership potential in the area of environmental education and, therefore, exert a greater influence within the sphere of environmental conservation. I do not feel that this would be a radical departure from our chartered mission for if we stand by and watch as our habitats are deci-

mated and our ecosystems simplified to the point of dangerous instability, then all of the lofty purpose involved in the exciting study of nature will be meaningless.

I feel that a brighter future lies ahead for ANSS, but finding and paving the way to that future will take considerable thought and action. We could begin in 1974.

Good Reading

Continued from page 15

The Zoo Conspiracy by Betty Levin. Ill. by Marian Parry. Hastings House, New York. 1973. 123 pp. \$5.95.

Twist, Wiggle, and Squirm: A Book About Earthworms by Laurence Pringle. Ill. by Peter Parnall. Thomas Y. Crowell Company, New York. 1973. 35 pp. \$3.75.

What is Sound? by John M. Scott. Ill. by Lawrence DiFiori. Parents' Magazine Press, New York. 1973. 64 pp. \$3.78.

The Chemicals We Eat and Drink by Alvin and Virginia Silverstein. Ill. by Eva Cellini and with photographs. Follett, Chicago. 1973. 112 pp. \$4.95.

The Mysterious Eel by John F. Waters. Ill. by Peter Zallinger. Hastings House, New York. 1973. 64 pp. \$4.95.

NATURE STUDY

MEMO . . . from President Greene

In view of the rapidly changing environmental situation in the U. S. and the world today I thought it would be good, or at least healthy, for ANSS to reevaluate the role it now plays and/or will play in the future.

We all know that the "energy crisis," regardless of its origins, will place new and excessive burdens on our already overtaxed ecosystems. In our panic-induced race to extract and utilize all of the fossil fuels from the earth it is clear that many important environmental safeguards and concerns will be overlooked or forgotten. The demands of our present life-style have been straining the fibers of natural systems for some time. Are we now at the breaking point? Environmentalists have won a few "skirmishes," fought a few "holding actions" and influenced some legislation. We must realize, however, that these are all temporary victories to be tested by the onslaught to come. The important question is — have we changed attitudes?

The ANSS constitution states: "The purposes of the society shall be to promote nature and conservation education and avocation — by conducting meetings and field excursions; by producing and distributing publications; by contributing to appropriate publications of other agencies; by cooperating with organizations having allied interests; by encouraging members to contribute consultant services and to assist in the training of teachers and counselors in nature leadership; AND BY ENGAGING IN SUCH OTHER ACTIVITIES AS SHALL HAVE BEEN AUTHORIZED BY THE COUNCIL."

I have capitalized that portion which provides us with such directional latitude as we desire. Please consider the matter carefully, respond to the following questionnaire, and return to me as soon as possible.

QUESTIONNAIRE

Directions for ANSS

1. Do you think ANSS is fulfilling its mission?
2. Do you feel its purposes and activities should be changed or expanded?
3. Should ANSS get involved in current or future environmental controversy?
4. Should such involvement be limited to educational areas only?
5. Should ANSS take firm positions on environmental issues in spite of political overtones?
6. Should such positions be reported in NATURE STUDY?
7. What should ANSS be doing that it is not presently?
8. List any specific projects that ANSS might explore.
9. What things would you like to see included in our annual meetings?
(Indicate any changes you feel appropriate)
10. Comments:

AMERICAN NATURE STUDY SOCIETY
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11 Stone Hedge
New Paltz, New York 12561

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The American Nature Study Society

Invites you to join us in promoting Environmental Education

Send in this membership form to J. A. Gustafson, R. D. 1, Homer, N. Y. 13077.

- | | | |
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| ☐ | FAMILY MEMBERSHIP | \$ 8.00 |
| ☐ | CONTRIBUTING MEMBER | \$10.00 up |
| ☐ | STUDENT MEMBER | \$ 3.00 |
| ☐ | LIFE MEMBER | \$100.00 |

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