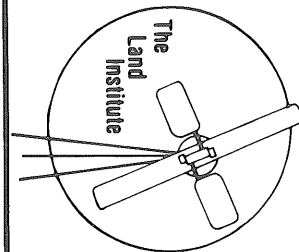


# THE LAND REPORT

Number 8

Fall 1979



Peace  
to Mankind,  
Goodwill to the  
Earth

To all the Flowers,  
Butterflies, Birds,  
and Whales —  
And Children,  
young and old,  
And especially  
to you —

A happy  
New  
Year  
1979

Isotype  
of  
*Zea*  
*diploperennis*,  
species  
novum.  
2cm.  
Cerro San Miguel,  
Sierra Manantlan,  
Jalisco, Mexico.  
2400m.

From the University of Wisconsin Herbarium  
John Doeblinger / Hugh Ellis / Rafael Guzman

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## At The Land . . .

### Our Energy Future: Soft Paths vs. Hard Paths

Power saw whines and welder buzzes were accompanied by the rhythm of rasping sandpaper blocks and pounding hammers as students constructed solar collectors and built wind generators during the June energy course at The Land. This afternoon activity was directed by Nelson Kilmer, Associate Dean of Hesston College and partner in a company manufacturing solar collectors, and John Craft, science teacher in Hillsboro High School. Towards the end of the course, the noise often continued into the evening as students worked to finish their projects, and John Craft, who designed the generators made from automobile parts, kept the welder flashing long after dark.

When the wind generators were finished, students bolted them on stands made from telephone poles for testing. Some adjustments were necessary, but by and large they whirled successfully and were ready to be installed in other locations. The electricity generated by the wind can operate a fan to blow air across the small solar collector and into a bucket of rocks for heat storage. Charles Couchman, a high school science teacher in Coldwater, Kansas, will probably have a tower constructed on the school grounds and use his collector-wind system to demonstrate solar principles to his students.



### The Land Report

is published three times a year by

The Land Institute  
Rt. 3  
Salina, Kansas 67401

Editor.....Dana Jackson  
Arts Associate.....Terry Evans  
Printed by Arrow Printing Co., Inc.

Contributing to this issue: Charles Washburn, Iralee Barnard, Harley Elliott, Wes Jackson, Dana Jackson, Lola Redford, Harriet Barlow, Pat Lewis Sackrey, Nancy Jack Todd, Francis Moore Lappe, Anne Ehrlich, Hazel Henderson.

SUBSCRIPTION RATE: \$3.00

The Land Institute is a non-profit educational-research organization devoted to a search for sustainable alternatives in agriculture, energy, shelter and waste.

BOARD OF DIRECTORS: Frank Anderson, Karen Black, Steve Burr, Sam Evans, Bernd Foerster, Dana Jackson, Wes Jackson, Gordon Maxwell, Nancy Miller, Wendell Nickell, John Simpson, John Schwartz.

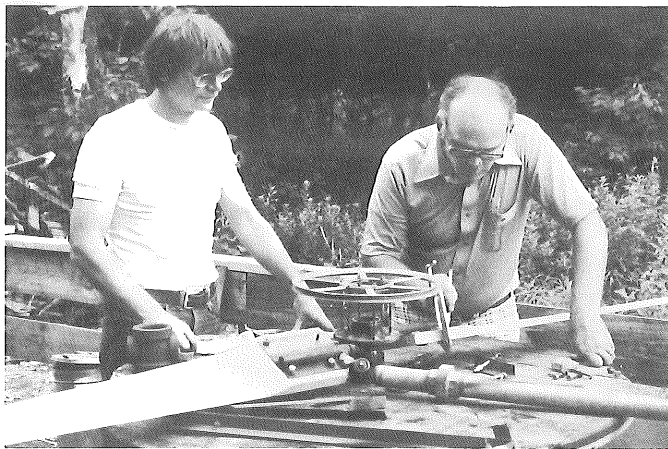
HONORARY: E. F. Schumacher (1911-1977)  
Amory B. Lovins

The morning activity during the energy course was equally as intense, but quieter. Dr. Charles Washburn covered a wide range of topics in the lecture discussions, from the history of the hard path to the energy flow in biosystems. He involved students in calculating space heating and cooling loads and designing solar homes. The class took field trips to see the small electric generating plant in Lindsborg, Kansas and the Wolf Creek Nuclear Generating Plant under construction near Burlington, Kansas. They also visited the oil refinery in McPherson, Kansas, and various solar installations in private homes in the area.

Dr. Washburn, whose Ph. D. is in metallurgy from the University of California, Berkeley, is a professor of Mechanical Engineering and former chairman of the department at California State University, Sacramento. He has worked for two federal agencies, the former Atomic Energy Commission and the Environmental Protection Agency, and the state of California as an energy consultant. In 1978 he conducted a study of attic fan effectiveness for the Sacramento Municipal Utility District.

As our first scholar in residence, "Chuck" shared his knowledge beyond the regular classroom sessions in informal discussions with students. He studied the potential role of alcohol in meeting the nation's portable fuel needs, and he talked to Kansans enthusiastic about on-farm ethanol production from grain. Some of his calculations and conclusions appear in the article "Energy from the Land" on page 24 of this Land Report.

Dr. Washburn's presence at The Land in June was made possible through the cooperation of two other institutions: Emporia State University and Kansas Wesleyan. The energy course was taught as an Emporia State Field Course, and students received four hours of graduate or undergraduate credit from that university. Dr. Washburn lived in the Pfieffer Hall guest apartment at Kansas Wesleyan and used the Wesleyan library. Some of the students stayed in a Kansas Wesleyan dormitory while taking the course. In the future The Land hopes to make similar arrangements with other institutions to have visiting scholars present special courses.



Dave Martin and Charlie Couchman work on a wind generator during summer course. On September 1, Dave began his new job as Solar Energy Coordinator for the Kansas Energy Office in Topeka.

## Cooperative Program Explored

The Land Institute and Emporia State University are in the process of developing cooperative programs for both undergraduate and graduate level students of both institutions. Although the cooperation will entail several departments, there will be special involvement with the newly-established Great Plains Center at Emporia State.

In the future, it is expected that summer courses will be offered through Emporia State at The Land, as was "Our Energy Future: Soft Paths vs. Hard Paths," taught in June, 1979. Land Institute students will be able to receive credit from Emporia State for some of their work during the regular semester program.

The Land will have access to the 2300 acre Cassidy Prairie in the Flint Hills managed by Emporia State for the Nature Conservancy, and the 1000 acre nature preserve near Emporia.

Dr. John Peterson, Dean of the College of Arts and Sciences; Dr. Harold Durst, Dean of the Graduate School; and Dr. Pat O'Brien, Professor of History and Director of the Great Plains Center, visited The Land on August 30 to discuss plans for the cooperative program with Emporia State.

## Fall Term Begins September 10

Six research associates and three students began the Fall-1979 semester at The Land on September 10. The research associates and the colleges they have graduated from are as follows: Martin Bender and Karl Parker, Wittenberg Univ. Springfield, Ohio; Mari Peterson, Pam Nelson Ellinghausen and Jay Ellinghausen, Augustana College, Sioux Falls, South Dakota; Kelly Kindscher, University of Kansas, Lawrence, Kansas. All are recipients of Noyes Foundation tuition grants, except Kelly Kindscher who will be working under

a D.O.E. Appropriate Technology grant for development of "The Agricultural Ecosystem Concept."

The three students are Ali Henderson of Gainesville, Florida; Mark Lieblich from Rutgers University, New Brunswick, New Jersey; and Joy Hasker from Marymount College in Salina.

The Land Institute admits students of any race, color and national or ethnic origin.

The winter LAND REPORT will describe student projects and research efforts undertaken during the fall semester.



## Terry Evans is Arts Associate

The search for sustainable alternatives in agriculture, energy, shelter and waste disposal is mostly carried out with plants, hardware and words; but more and more we see that images are important. Images can help us understand what values, lifestyles, technologies and personal and community relationships could be supported by renewable resources.

Sim Van der Ryn has said about solar villages, "We need images people can relate to. Then the images will create the reality."

At the PRAIRIE ROOTS/HUMAN ROOTS program in June, Dee Tolar, a member of the audience from Lawrence, Kansas, said that that she would like someone to translate the facts and figures of environmentalists such as Amory Lovins into alternative visions, into art that would help the average person understand what a soft path world could be like. She pointed out that we have the media of television, film, photography and various methods of reproducing art, and should use this technology to create compelling images.

Diane Schatz has created two line-drawn posters, "Urban Ecotopia" and "Suburban Ecotopia," which are first glimpses into how this soft energy path world might look. These appear on the covers of Rainbook and Stepping Stones, and can be purchased as posters from the publisher, RAIN: Journal of Appropriate Technology. Marcia Schwartz, a friend of The Land in Albuquerque, New Mexico, is creating brilliant sun designs for cards and posters. Robert Regier created an incomparable slide-tape show about the prairie. There are probably innumerable creations by artists which could contribute to our understanding of man's relationship to the earth and the concept of sustainability.

If we work with images at The Land, who is to help us make them, or choose them? We have asked Terry Evans to take on this responsibility as our Arts Associate. She has been working with The Land Institute since its beginning, although not in a formal capacity. Since receiving her degree in Fine Arts from the University of Kansas, Terry has become a professional photographer, and her photos have been featured in two books and various magazines. One appeared on the cover of the Aug./Sept. issue of RAIN. Terry has documented the history of The Land with pictures of students and visitors and projects. She captured the spirit of cooperation which prevailed on November 10, 1976, when friends help rebuild after the fire.

Terry began photographing the prairie in the spring of 1978 when she helped Jim Peterson and Maureen Hosey in their efforts to discover if the prairie practiced "companion planting." As her interest in the prairie ecosystem grew, she began to work regularly at the Fent Prairie and the Konza Prairie, producing black and white pictures which focus on plant associations rather than individual flowers or grasses. Examples of this work appeared in a special LAND REPORT insert in December, 1978. Under a grant from the Kansas Committee for the Humanities, Terry produced a photographic exhibit of the prairie as a part of the Prairie Project, which she co-directed with Jim Peterson. The exhibit included black and white prairie portraits, and also color aerial photographs of the landforms in the Konza Prairie.

As Art Associate at The Land, Terry Evans will create images, and she will help us find images which communicate our search for alternatives and the vision of a sustainable future.

## Kansas Wesleyan Offers Environmental Studies Major

A cooperative program in environmental studies has been established between The Land Institute and Kansas Wesleyan. The new interdisciplinary major in environmental studies at Wesleyan requires thirty hours from the Common Studies Program, thirty hours from suggested core courses, fifteen hours for attending The Land semester, and additional elective courses. Each student with her/his advisor will develop an individualized program of courses that relates to the student's educational plans. Students might concentrate in environmental assessment, urban planning, or alternative energy sources, to name three possibilities.

Kansas Wesleyan is a United Methodist liberal arts college located in Salina, Kansas about five miles from The Land. For more information about their environmental studies program, contact: B. L. Owen, Coordinator, Environmental Studies Program, Kansas Wesleyan, Salina, Kansas 67401.



## Fall Events Scheduled

### Wood Burning Workshop

This Saturday workshop is for those who are beginning to heat with wood or plan to sometime in the future. Topics to be covered: types and brands of wood stoves, cleaning the stovepipe, safety tips, the best wood for maximum BTU's, chain saws and crosscuts, how to split wood, stack wood, woodlot cultivation-- and more!

The INSTRUCTORS ARE Steve Burr, whose home is heated with a wood-burning furnace, and Jim Wesch, owner of Alternative Energy Sources, Inc. which manufactures wood burning furnaces and retails both furnaces and stoves.

9:00 A.M. until 2:30 P.M. Saturday, September 29.

BRING A SACK LUNCH.

To register, send \$5.00 to The Land by Sept. 25.

### Visitors' Day

Various individuals and groups have asked to visit The Land. On October 21, all interested persons are invited to attend an afternoon program from 1:30 PM until 5:00 PM. The tentative schedule is as follows:

- 1:30 Refreshments & Welcome in Building
- 2:15 Tour of The Land
- 3:00 Small Group Discussions
- 4:00 Informal Presentation by Carter Henderson, Co-Director of the Center for Alternative Futures, Gainesville, Florida. Questions and Answers.
- 5:00 Conclusion- Visitors' Day Program.

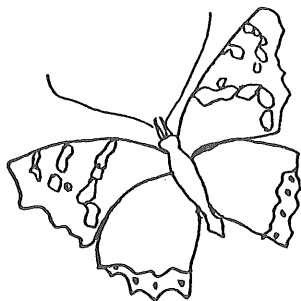
THERE IS NO REGISTRATION FEE. Pre-register by postcard & indicate number planning to attend.



On Saturday morning, June 2, 1979, Governor Carlin visited The Land for a discussion about energy. In this picture taken after the meeting are (from left to right) Dana Jackson, Sister Jeanne McKenna, John Simpson, Charles Washburn, Hunter Sheldon (and Sparky), Amory Lovins, Wes Jackson, Governor John Carlin, Sister Monica Schneider, and David Brower.

# A Prairie Festival

## "The Wholeness of Life and Things"

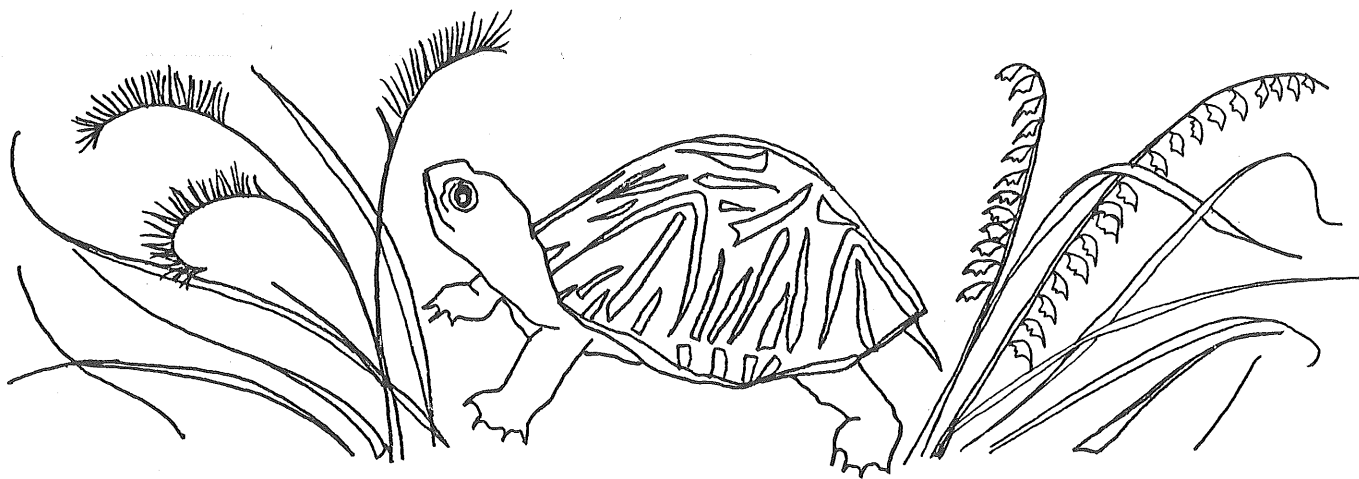
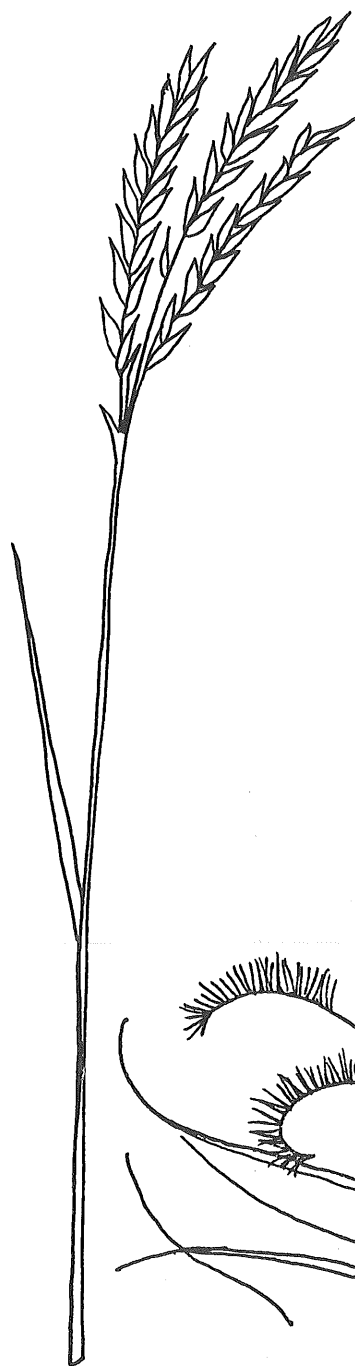
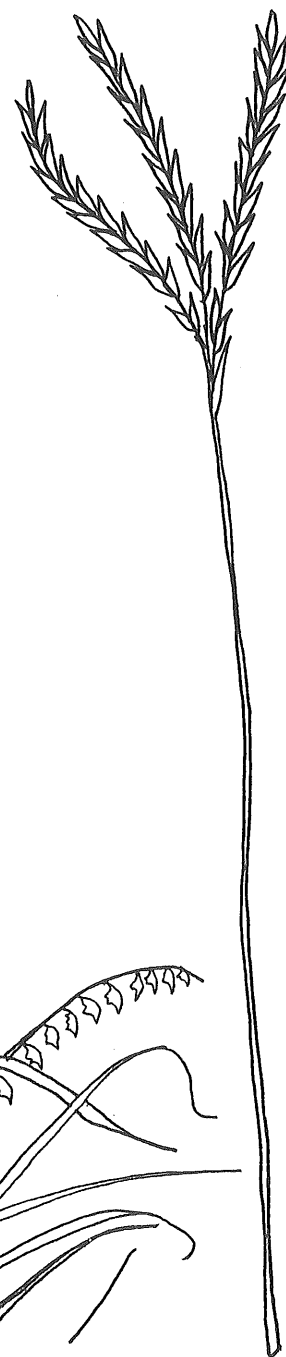


We were excited when the grant from the Kansas Committee for the Humanities for the Prairie Project was approved and project directors Terry Evans and Jim Peterson began to make final plans. The unique format of the program and the interesting and inspiring people who had agreed to participate suggested the possibility of an exceptional event, one that would transcend the level of a series of academic lectures and panel discussions about the prairie.

Since David Brower, the President of Friends of the Earth, was to be a major speaker for the Prairie Program on Saturday evening, and Amory Lovins from the London office of FOE was planning to visit The Land on June 1-3, we decided to bring together as many members of the Kansas Friends of the Earth as possible to meet these two leaders of the national organization, and to meet Friends of The Land at a second gathering on Sunday. The success of our two day event far exceeded our expectations.

Someone asked, on the evaluation sheet which participants filled out to comply with the requirements of the Kansas Committee for the Humanities, "Who was in charge of your weather committee?" Lady Luck herself must have been chairperson, as the lovely, mild June days enhanced the prairie environment and stimulated the senses of participants.

The schedule of events began at six Saturday morning when Terry Evans took David Brower for a flight over the Konza Prairie to take photographs. Amory Lovins, his fiancée Hunter Sheldon, and Charles Washburn, visiting professor from California State University, Sacramento, teaching the summer energy course, joined them after the flight for a walk through Nick and Joyce Fent's prairie north of Salina. Then they returned to The Land for a discussion about energy problems with Governor John Carlin, his aide Sister Jeanne McKenna, and friend Sister Monica Schnieder.

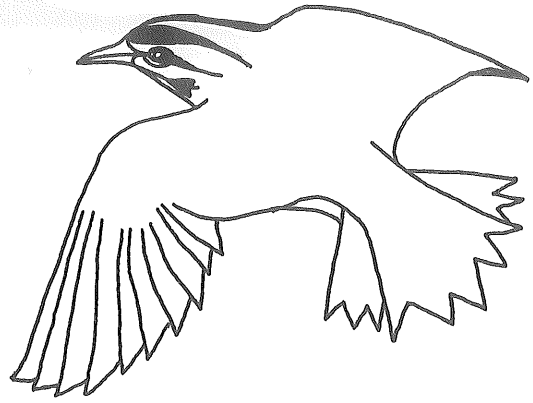


The annual meeting of the Board of Directors for The Land Institute started at 1:30 that afternoon. It concluded in time for everyone to leave for the Evans Ranch to hear the prairie poets, Harley Elliott and Stephen Hind, read their poems at 4:30 P.M. This first part of the Prairie Program was followed by George Chlebak's introduction of the special exhibit of prairie photographs by Terry Evans. Members of the audience found themselves going back to look at the exhibit again during the supper hour, as they mulled over his remarks.

It had been rather hot in the late afternoon sun, although quite comfortable under the surrounding shade trees. But cooler shadows began to stretch across our gathering place as the picnic supper concluded, and members of the audience returned for the second part of the program. Keith Sebelius, 1st District Congressman, Richard Keller, Associate Professor of English at Emporia State University, and David Wishart, Associate Professor of Geography from the University of Nebraska, spoke about man's cultural roots on the prairie against the background sounds of birds and insects and children. Dr. Keller talked about the sense of place evoked in the works of prairie writers; Dr. Wishart described the effect which the geography and climate of the Plains has had upon the psyche of the prairie's settlers and their descendants.

It was pleasantly cool as Nick Fent and Wes Jackson discussed the natural elements which make the prairie unique. The rewards of an intimate experience with nature were evident when Nick, Saline County's foremost naturalist, described the box turtles (Curly, Tape, Jane and Burny) who return each spring to feed at the dog food bowls on his back porch. Wes Jackson reminded the audience of the special riches which prairie soil has provided in the development of agriculture. Because these riches are being eroded, he suggested that we work toward replacing the annual crops, which require plowing and baring the soil to rain and wind for a large part of the year, with perennial crops.

David Brower's comments began as Red Admiral butterflies came out in the cool evening to



examine Terry Evans' photographs and alight on the audience. Children's shouts floated above his words as he spoke about the prairie sky and the mid-westerner's attachment to his prairie land. Brower urged his listeners to recognize the limits of the "only planet we will ever be on" for the sake of our children and grandchildren.

Then there was time for members of the audience to make comments or ask questions and for the speakers to respond. Following this, people wandered to cars and back to find their jackets, silent for the most part, still under the spell of David Brower's last response to questioners. A very brave, very loud meadowlark began to sing in the middle of the darkening amphitheatre. It turned out to be the recorded opening notes of a slide-tape presentation prepared by Robert Regier, Chairman of the Art Department at Bethel College. His vivid photography, accompanied by insect and bird sounds, and music, was an exquisite offertory prayer to the prairie.

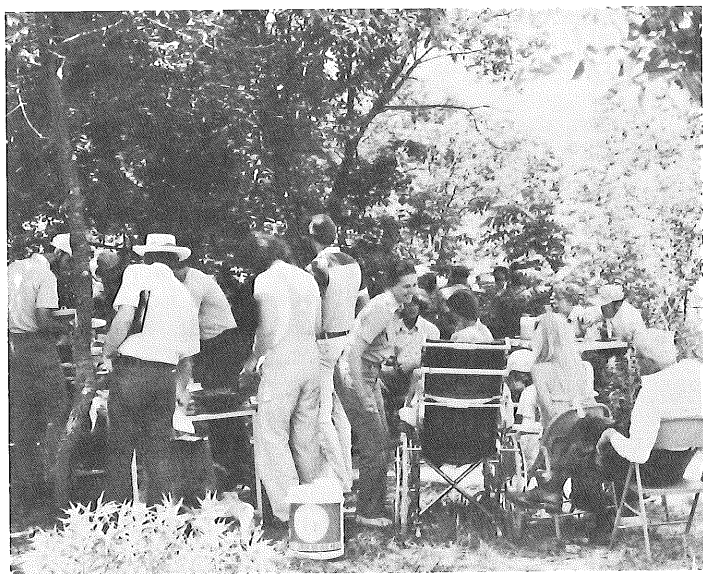
The program concluded and the audience dispersed. At The Land, tents were set up in the Jackson orchard with the help of car headlights. In spite of the sustained howling of Scott Jackson's fenced Springer Spaniel, who was disturbed by the guest canines, people slept.

Very early the next morning, animated discussions were already developing around coffee



campfires, and a few joggers were out on the road. A guitar could be heard from the woods near The Land Institute building.

Other people began arriving and exploring The Land about mid-morning. Wes conducted a tour of the Eastern Gama grass plots and polyculture plots, explaining the objectives of the experiments. After the tour, the group began to move towards the picnic area near the river to prepare lunch. Wes released the brake on the newly-installed 110-volt Wincharger to demonstrate to them how it worked. It continued to whirl excitedly when he tried to reapply the brake and turn it off, so Marty Bender and Ron Mueller climbed the fifty foot tower to stop the wind machine. Lunch was delayed as the group stood on the hill watching Marty and Ron wrestling the dragonfly against the sky.



The potluck picnic was accompanied by much milling around for introductions, conversation and picture taking. Friends of The Land from South Dakota, Nebraska, Missouri and Colorado met Kansas Friends of the Earth and Friends of The Land. Former students were reunited. People of



all levels of affluence and influence were there; but they shared a common philosophy about the value of the prairie and the need for sustainable alternatives in agriculture, energy, shelter and waste disposal.

After clearing the tables and placing as many chairs as possible in the shade, an informal afternoon program began. Hunter Sheldon, an attorney with Tree People, an organization dedicated to reforesting the Los Angeles basin with smog-resistant trees, stood in a clearing and described her work. She told how the program was begun through the persistence of one high school boy, and emphasized how the efforts of one or two people can have great impact upon the environment.

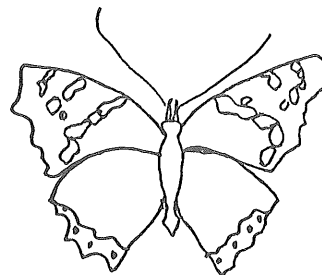
Amory Lovins, the "new age" energy optimist, delivered a version of his classic Soft Energy Paths sermon to an audience now so large that it spilled out into the unshaded areas, even into the ravine where poison ivy grew. This presentation was originally scheduled for June 4, the opening day of the summer energy course at The Land, but it was given Sunday so Amory could be in Lewiston, Maine Monday morning to receive an honorary degree from Bates College. Amory described a recently-released study from the Harvard Business School which concluded that conservation and soft energy development was a wiser investment for the country than hard path development.







Then David Brower, the Archdruid himself, the environmentalist known as the defender of trees, rivers, mountains and prairies, an environmentalist sometimes accused of caring more for wilderness than people, spoke. David described a meeting in which thirteen representatives of environmental organizations were given seventeen minutes to discuss issues with President Carter. In their desire to efficiently use that seventeen minutes to discuss their concerns, each person was allotted one to two minutes. Speaking rapidly, several of them had bombarded the President with their complaints of the administration and their fears that laws to protect the environment were being weakened, until finally, he stopped them. When the members of the delegation sensed his extreme weariness, and the effect of their procedure upon this human being who happened to be President, they relented. A woman in the group explained to Carter that they were just trying to use their brief time to its fullest and had not intended to attack him. Then, in a different mood and at a different pace, the meeting continued for over an hour longer. David Brower concluded this story, and his speech, affirming that humans' love for each other is an important aspect of environmental activism.

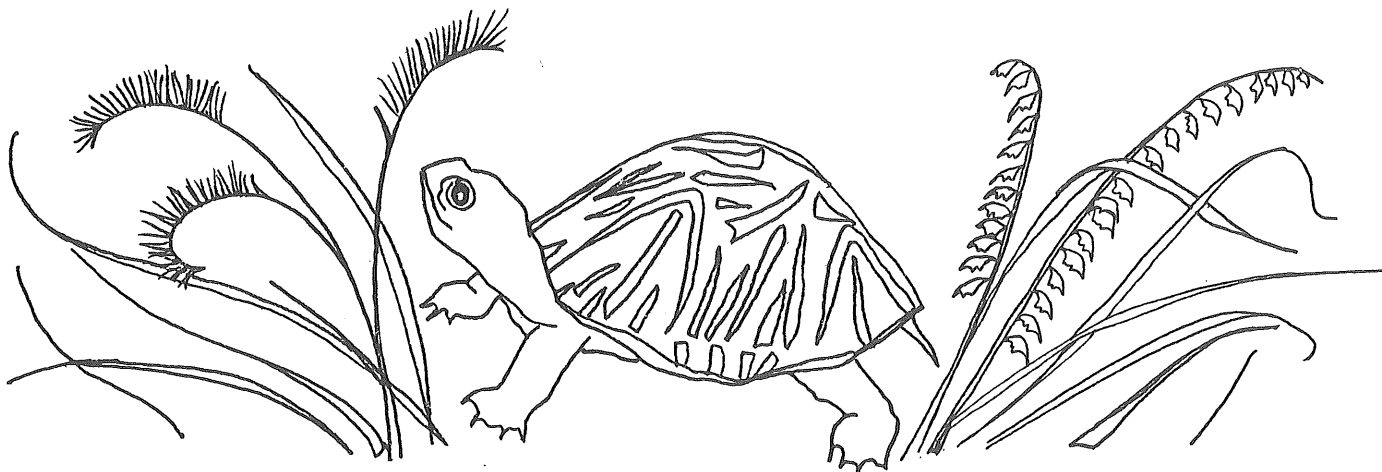


Again, as on the night before, a quiet audience prepared to leave, the weekend program concluded. Many lingered until later in the afternoon, however, to get to know their new acquaintances better, to share knowledge, ideas, concerns and experiences. Although the Sunday program had not been co-sponsored by the Kansas Committee for the Humanities, the spirit of Humanism and the spirit of reverence for other natural organisms, were joined in harmony.

We were reminded of the Friends of the Earth publication, Not Man Apart, and the line from a Robinson Jeffers' poem to which it refers:

"...the greatest beauty is organic wholeness, the wholeness of life and things, the divine beauty of the universe. Love that, not man apart from that."

Dana Jackson and Laura Jackson





# Commenting on the Prairie

June 2, 1979

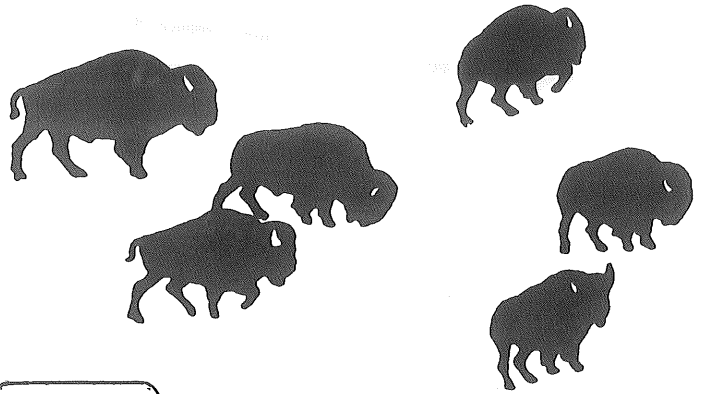
Question from the Audience: There are counts of between forty and a hundred million bison, huge-hoofed, high concentrated protein, on this Great Plains area. And yet our cattle production--the numbers that we have (and I'm not sure of the numbers) is something like twelve million. ...It seems to me that there is a big loss of efficiency. Here we have to bring in fossil fuels to grow corn to feed twelve million cattle when the original prairie fed eighty million cattle, not to mention the pronghorn or elk. Does anyone have any insight into this?

**NICK FENT:** "I think in the first place, bison experts are not absolutely sure of the size of the herd-- there are a lot of conflicting claims of the number of bison. Another important thing: the bison ranged as a subspecies of wood bison in the eastern part of the country; they ranged into the mountains; they ranged north, and they ranged south. No one is exactly sure of the herd's migration. But one of the great differences--the great effects on the prairie--was their lack of confined grazing. The large herbivores are very selective in what they eat; they make choices. Cattlemen and stockmen often call some of the grasses, some of the herbs, the ice cream of the prairie. Confining large herbivores to a small space has undoubtedly reduced the diversity--the number of legumes, the number of protein producers--has undoubtedly diminished it. This is why a pasture that has not been subjected to confined grazing is a unique property.

...I approach this with a lot of optimism. We are still a young-enough country that in little triangles in the roads, little ungrazed areas along the railroad tracks, the edges of pastures, we still have most of the species that have largely vanished. We can still bring back tracts like these. We can still do plant experimentation to bring back the productivity of the prairies...I think it is essential."

**NICK FENT.** "You can tell a lot about people's relationship with the prairie by just how they mow their lawn. My lawn is always lumpy. I have to mow around the prairie orchids, around the tiny bluets that haven't yet completed their seeding, and some of our favorite mallows."

**WES JACKSON** "...I see the prairie as a standard against which we judge our agricultural practices. The prairie has to be our teacher. We have had a pretty poor schoolmaster until now. The annual monocultures have, in effect, taught us expediency, taught us to maximize production. The prairie can teach us sustainable agricultural practices. Man rewards enterprise, and the prairie rewards patience."



**NICK FENT**

..."Usually, people view the prairie from one or two typical approaches: the distant view, or the very minute, close-up view. And a nice way to live with the prairie is to be able to appreciate the vast expanses and the individual plants and animals... The close view is the more exciting. When you consider differences that you'll find in the micro-topography, in the geology--these are not only changes over space, but also changes in time, time within the same prairie. Climatic changes make a big difference in one individual prairie--drouths, seasonal variations. You can see daily variations--flowers that open in the morning, not at noon, others that open in the evening, and there are hourly changes on the prairie... The nice thing about identifying with the prairie individually and the prairie in the distant view is a feeling of being part of what's happening...You can stand on the prairie and see the fog run down the valley, and you can see the fog retreating. You're not sitting, being overwhelmed by what happens to you. You can see storms as they're coming, and what happens, happens with you. You are a participant, rather than a victim. It makes a oneness with the prairie that you can see."

**DAVID BROWER** "...One of my favorite Thoreau quotes is something like this: 'Remember thy creator in the days of thy youth. Rise up early in the morning and seek adventure. Let the noontime find thee by other lakes, the nighttime find thee everywhere at home.' He was trying to stir us, the youth in each of us, the ability of each of us...to move around, most of us on feet that will carry us a long way. Get to know the country here, the way Nick does. That is a luxury you can't afford not to enjoy. And then once you've got to know it a little bit better and admire it the way he does--and the way I do just watching him admire it and know it-- then go get this Tallgrass Prairie National Park for us, because I don't know where else we are going to get it if Kansas doesn't get it for us. This is a unique part of the world. The country does rest here. It doesn't stand on its head to get attention, but it has a beauty that you aren't going to find anywhere else."

# A Gift to Your Children

Iralee Barnard

After returning home from a trip to the Great Smoky Mountains National Park, I found the latest copy of THE LAND REPORT in our mail. Dr. Charles Grimwood's article on preserving the prairie especially caught my eye. I could not help but think of the proposed Prairie Park as I rejoiced in the splendor of the Great Smokies.

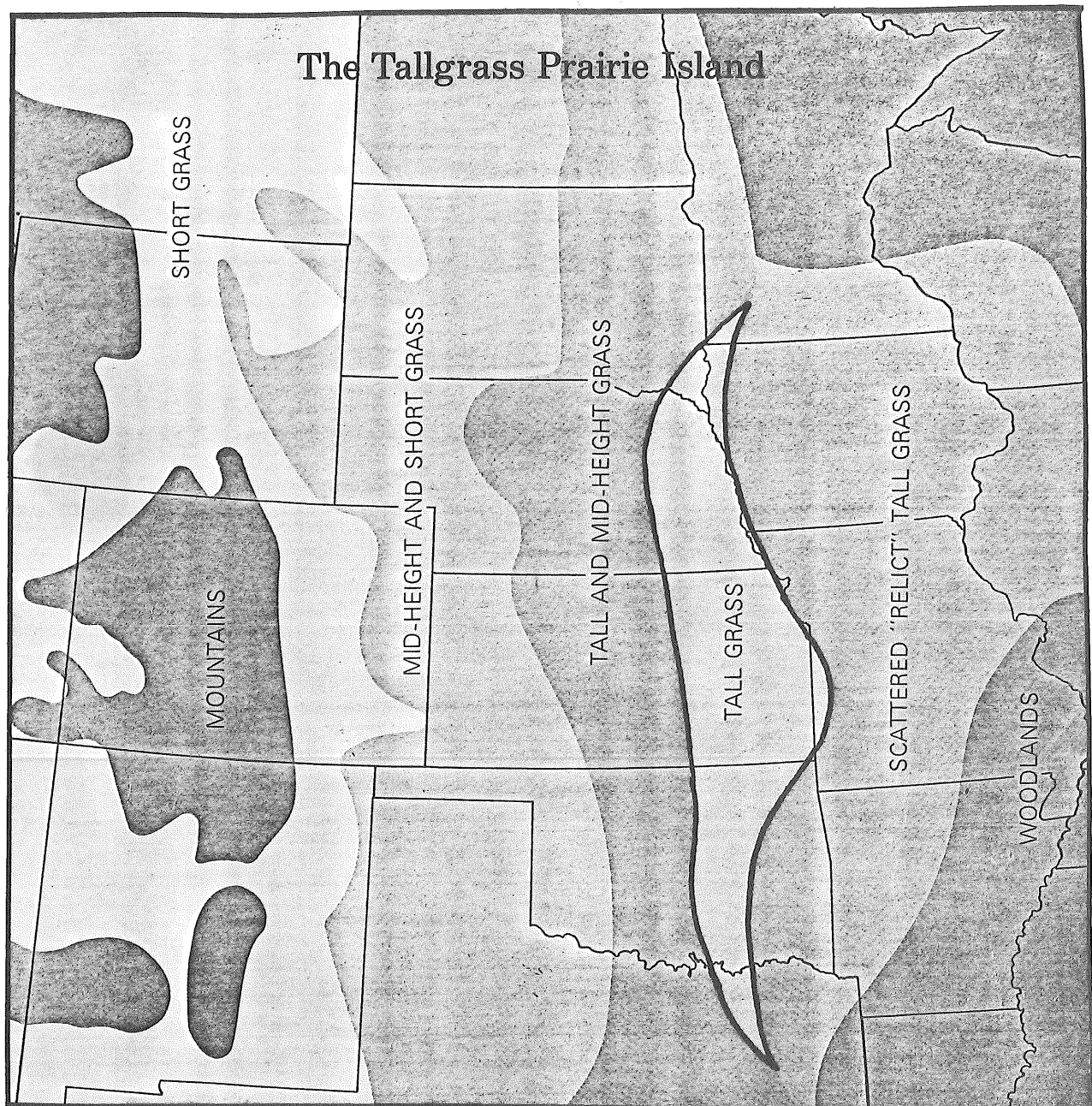
I was for a long time a border-line enthusiast for the Prairie Park until I was confronted by one anti-Park friend. In our discussion, I was forced to defend the Park proposal and through that experience realized, in spite of opposition, how very important such a park is.

I have been fortunate to have visited the majority of National Parks west of the Rockies,

also some Preserves, Monuments and Wilderness Areas: Crater Lake, Olympic, Saguaro, Yosemite, Mesa Verde, Yellowstone, Bob Marshall, Mt. Ranier--to name a few. I am not familiar with the history of the establishment of most of these parks, but the history of the Great Smoky Mountains is something every visitor, who more than drives through, can soon discover.

The Great Smokies easily earns its title of International Biosphere Reserve. It's a naturalist's delight. Because of range in elevation, less than 1,000 feet to 6,642 feet, varied climatic zones exist. About half the native trees in this part of the Appalachians are of northern origin. Within the 780 square miles of

(continued on pg. 28)



# Alternatives in Agriculture

## First Steps on a Long Journey

By Wes Jackson

Readers of past LAND REPORTS and visitors will recall the basic contention which underlies all our current agricultural work at The Land: agricultural land washes away because high-yielding crops are annuals in monoculture (one crop fields). Annual crops require annual soil disturbance, thus making the soil vulnerable to nature's forces of wind, water and gravity. Furthermore, a monoculture forces individual plants to compete for the same nutrients at the same soil level and thereby partly accounts for the massive doses of fertilizer needed. Since such stands invite epidemics of insects and pathogens, pesticides are readily applied. We believe that perennial polyculture can reduce soil loss and lessen the energy expense and poisoning effects of fertilizer and pesticide application.

With this as our baseline consideration, we have two areas of investigation now underway at The Land: to inventory and grow numerous perennials with an eye to their potential for seed production, and to examine the potential of perennial polycultures.

### Eastern Gamagrass (Tripsacum dactyloides) Crosses

Nearly all of the almost 400 Eastern Gamagrass collections planted last fall from across the species range flowered this summer. The chromosome number for about seventy of these

individuals is known. As is not uncommon in plants, three different "levels" of chromosome numbers exist. We have several collections with 36 chromosomes, several with 72 (2 X 36) and several with 54 (half of 36 plus half of 72). Our 36 chromosome plants are two ploid or diploid, that is they have two sets of chromosomes, as humans and most all other animals. The 72 chromosome plants are "four ploid" or tetraploid with four sets. (When plants and animals produce eggs and sperm cells, the chromosome number of such cells is ordinarily just half what is found in each body cell of the donating organism. Therefore, a diploid, 36 chromosome plant will donate 18 chromosomes, and if it crosses with a 72 chromosome plant which has donated 36 chromosomes to the next generation, we get a 54 chromosome plant. For reasons I won't discuss here, this triploid plant is highly sterile.

We need some baseline information before we begin an active improvement program. We want to know the degree of fertility between plants of the same chromosome number within a locality and between localities. We have made scores of such crosses. Furthermore,

### On the Cover

ENTER "CHAPULE"

Eastern Gamagrass, Tripsacum dactyloides, has been successfully crossed with corn by researchers several times. The progeny are highly "tripsacoid," however, and of low yield. Subsequent backcrosses to corn re-introduced the annual condition. In January of this year, I read a report in the January 12, 1979 issue of Science, which at the time I thought should have been highlighted as the feature for the cover. An old botanical acquaintance, Professor Hugh Iltis of the University of Wisconsin at Madison, his student John Doebley, Batia Pazy of Hebrew University in Israel and Rafael Guzman of the University of Guadalajara, Mexico, published their description of a species of teosinte, new to science, from a small mountainous region near Guadalajara, Mexico. The locals referred to it as "chapule." To have status in the scientific literature, it needed a Latin binominal, so they called it Zea diploperennis. As is often the case with Latin names, the species name is descriptive. The "diplo" refers to the fact that it is diploid, and what's more amazing, it has the same chromosome number as its near relative, an annual corn. Therefore, perennis, referring to its perennial condition, was attached. The "discoverers" observed field hybrids between it and Zea mays, our corn.



Eastern Gamagrass inflorescence (seed "head")

sometimes within the same localities are different "ploidy" levels. We crossed these plants to study the viability of their offspring compared to the offspring of plants from different "ploidy" levels of different localities. Such basic information is invaluable when we spot a character in the future which we might regard as desirable.

We have already observed that some of our plants display characters which should contribute to higher production and have involved these in various crosses and combinations.

A continuing frustration this season resulted when high winds blew off bags, both from plants which had been pollinated, as well as spikes which had been bagged in preparation for crossing. The seventy miles-per-hour wind which damaged much of Salina on July 4 ripped off well over 100 bags alone. Marty Bender and Karl Zimmerer, who had done essentially all this work, were beginning to wonder about the promises of alternative agriculture! In spite of the wind damage, 120 crosses "survive."

Next year at this time, when these seeds have been planted and given their chance to germinate, we should have some useful information for increasing seed production in this perennial.

This research is financed in part by the Rodale Organic Gardening & Farming Research Center, Kutztown, Pennsylvania.

## *Zea diploperennis,*

I immediately wrote Dr. Iltis for seeds. Within two weeks after the report in Science, professional friends from all over the country had sent me xerox copies of the Science paper. A month or so later, friends began to send clippings about the discovery from the New York Times and from a Chicago paper. June came and I had about given up on receiving seeds, realizing that the number of requests to Iltis for seed must have been staggering. Apparently publicity was more common than seeds.

One June day, 88 seeds, collected from three localities, arrived along with a nice note from Professor Iltis. We planted 44 of them. I sent 10 to a fellow geneticist and corn breeder in Africa, and 4 to a friend in North Carolina. 36 plants are now growing in the experimental garden at The Land. One had germinated but was albino and died after the nutrition in the seed was exhausted. The rest did not germinate. We want to cross some of these individuals with our Eastern gama grass next year and retain the perennial condition in subsequent backcrosses. If we can come up with the money, we hope to go to Mexico in January to collect seeds from the highest elevation, around 10,000 feet, in order to increase our chances of picking up nature-selected, cold-resistant genes to enter into our crosses.



### Perennial Polyculture Experiments

We currently have two perennial polyculture experiments underway. The one described in the last LAND REPORT includes five grasses and one legume. Each is growing in a monoculture consisting of 30 individuals each (plus a border row to cut out edge effect). Every species is represented by 30 individuals, each randomly distributed in a polyculture (plus the border row again). We want to compare the collective yield of the monoculture with the yield in the polyculture.

A second experiment involves four species of grasses. They are planted in rows; therefore, all experience the edge effect we hoped to avoid above. Within the row, the four species are randomly distributed as in a polyculture. Each is also represented in monoculture. Again, our purpose is to compare seed yield.

### The Nursery

Each of 37 species now grow in five meter-long rows for us to evaluate. These are candidates which may be integrated into some of our experiments with polyculture. Most will not pass the test, but we want to be rather confident that we don't miss something.

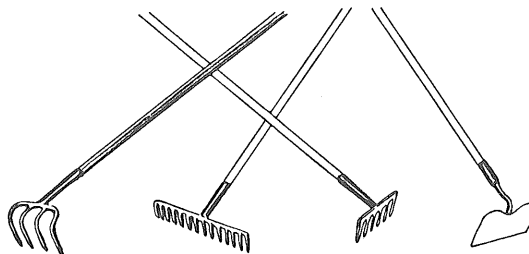
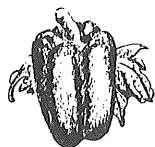
An additional nine species growing in the nursery plots will likely be integrated into our polycultures. Some will be propagated by transplanting; others will be introduced by seed. We hope to add several species to the nursery soon.

It is satisfying work. But by choosing the earth as our text and the prairie as the particular chapter for study on the development of an ecological agriculture, we are constantly reminded that enterprise is less likely to be rewarded than patience.



# Tending the Garden: the Summer of '79

By Dana Jackson



The people at the Findhorn gardens in Scotland give credit for their successful crops to the spirits, the devas of the plants, which advise them in their gardening practices. People from all walks of life talk to their plants, and many insist that the plants respond with vigorous, healthy growth. There is an organic gardening teacher in California who believes that plants grown with compost have the ability to take in certain minerals from the soil and turn them into the specific nutrients they need. If one is gardening "God's Way," transmutation of elements is possible. To me this is all voodoo!

"Tending the garden" is an old expression. Although I don't believe in the explanation for successful gardens in the three examples above, I do know that those people "tend" their gardens and am convinced that this is the main requirement for success. At our organic gardening workshop last spring, Ted Zerger and Marilyn Jones and other experienced gardeners frequently referred to the importance of walking through the garden every day and carefully observing the plants. They spoke about the work involved in obtaining and spreading mulch, composting, hand-picking bugs, thinning and pruning, and watering. One beginning gardener became disillusioned and left the workshop at noon. She was under the impression that organic gardeners practice some kind of magic, some special mysterious techniques which "keep away insects." After listening to the morning session and talking to Ted Zerger (Ted tells people who complain about squash bugs to not plant squash!), it was clear to her that even organic gardening required work ("tending the garden") and did not promise a guaranteed annual harvest.

MOTHER EARTH NEWS and ORGANIC GARDENING MAGAZINE sometimes make organic gardening sound too easy. Of course, some practices are easier than others, and small gardens require less attention than large ones. But I find our garden work to be time-consuming, hot, dirty and itchy. However, I also find the work to be a Zen type experience; and sometimes, if I can ignore the backache as I am pulling weeds or picking beans, I can even "quit the internal dialogue" and "stop the earth," as Don Juan tried to teach Carlos Castaneda to do. There is great reward and satisfaction in eating the produce too. Each summer we raise and preserve almost enough vege-

tables for our family for the whole year, and we share in-season vegetables with students and friends. Many of the preserved vegetables go into the soup lunches which are prepared once a week for everyone at The Land during the fall and spring terms.

During the six summers we have worked our garden plot, the clay soil has been improved tremendously through the addition of organic material. Each spring we clean out the barn, barnyard and chicken house and spread the manure and old hay on the garden. Some years we truck loads of cow manure from the Hammond Dairy to add to the soil. But our principal material for sheet composting has been the horse manure and straw (mostly straw) cleaned out of the Simpson barn. In the summer of 1978 we also hauled in loads of additional barn cleanings from people who board horses just one-half mile east of us. It was used to thickly mulch the entire garden during the season, then disked in to compost in the fall. But that summer we received more than we had bargained for in our horse manure/straw--bindweed. By the end of July it had spread unmercifully all over the garden. It came up from under ten inches of mulch; it made its way through the three feet high piles of straw and horse manure along the terrace.

Getting rid of bindweed is nearly impossible. The general recommendations are to spray with a potent herbicide diligently or to cover the whole area with black plastic and leave it on for years. As bad as our problem was, we decided the solutions were worse. We chose to cope with the bindweed by hoeing, roto-tilling and disk-ing it out as much as possible. This meant we could not mulch everything. We did mulch the long-season things: tomatoes, peppers, eggplants, cucumbers and melons. The corn, beans, peas, lettuce etc. were roto-tilled regularly. The bindweed keeps coming back, and we chop it down again. It is annoying, but hasn't interfered with our yield that we can tell.

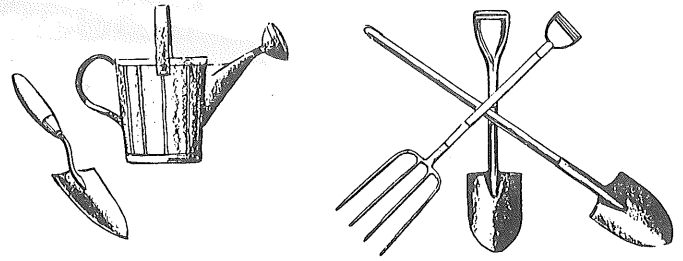
One of the main reasons for mulching is to preserve soil moisture, especially during the hot July days when the temperature is 105 and the wind is blowing. But June and July were amazingly cool in 1979, and the abundant rain made it unnecessary to water the garden much. August was hot and dry, and the vegetables still producing were mulched heavily.



One effect of all the early summer moisture was not so beneficial. The bottom leaves of the tomato plants began to turn yellow, and several plants died from this fungal wilt. I trimmed infected leaves off some of the plants, added more mulch, and tried to harvest and preserve every ripe tomato in case we did lose all the plants. They were still looking ragged, but producing, on the first of September.

Every year we talk about staking the 35-50 tomato plants, but mostly they have been allowed to spread on top of straw, making back-breaking work out of harvesting. This summer we attached one inch galvanized pipe (given to The Land by Jim Fredrickson) to the tops of fence posts, and we tied three to five branches of each plant to the overhead pipe with baling twine. As the branches climbed the twine, we trimmed off extra side growth, and the effect was a thin hedge five feet tall. This arrangement would be vulnerable to hot, dry winds occurring in a summer with more normal weather. Even in the moist summer, tomatoes were sometimes blistered by the sun when they had no foliage protection. But it is delightful to pick tomatoes waist high or higher!

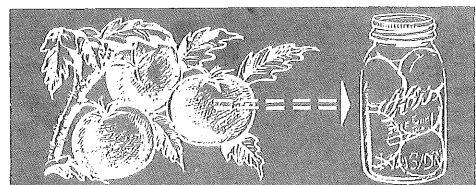
Our familiar insect pests showed up on schedule: aphids, potato bugs, flea beetles, cabbage worms, Harlequin bugs, squash bugs, cucumber beetles, and the main villains--Grasshoppers. We hand-picked many potato bugs and controlled cabbage worm with bacterium *thuringiensis*, but mostly ignored the rest. Two



factors kept the insects from causing us much distress: our garden was planted early, and the rain and good soil fertility caused early vigorous growth. The insects began attacking strong, mature plants after we had been enjoying their harvest. We were getting tired of squash and cucumbers anyway by the time the insects overcame them.

Grasshoppers were an enormous problem in 1978. They stripped the beans and rhubarb and ate the onion tops to the ground. Entomologists warned that they would be destructive in 1979 also. Since the main damage had occurred in July, we decided to plant a very large early spring garden and sow our summer-harvest vegetables earlier than usual to be ahead of the grasshoppers. This worked very well. Also, there seemed to be fewer grasshoppers than predicted, perhaps because of all the rain. They did move out of the bluestem grass into the kitchen herb garden, in spite of the screens I leaned around it. They devastated the basil, marjoram, parsley, oregano and mint and even ate the strong sage and tarragon. Our main garden was nibbled in July, but not devoured. The potato patch, which became a mess of sunflowers and velvet leaf before we dug the potatoes, harbored many of these pests, and they moved into the okra, beans, tomatoes and raspberries with a vengeance in August. We had already harvested and canned many beans, so it wasn't so hard to share them with the grasshoppers, but we were more selfish with the raspberries. We found it necessary to pick all the orange tomatoes as the grasshoppers gorged themselves on the red ripe ones.

The success of the garden should not be measured in mid to late summer by how neat it looks. People who expect all the plants to look like rows of pampered house plants should grow only house plants. The success of the garden at The Land is measured by how full the deep freeze and the pantry are. The 325 sealed jars on the pantry shelves and over 200 bags of food in the freezer are evidence that "tending the garden" paid off well in 1979. The jars and freezer bags contain not only fruits, vegetables and jams, but reminders of summer and our participation in the cycles of nature.



Corey Evans, Richie Courter, Amy Baker, Dana Jackson and David Evans in the garden.

# A Beacon of Hope



*"In a darkened world beset by the fear of nuclear holocaust, degradation of our soil and air and imbalance of population growth that threatens to strangle our human settlements, the Year of the Child stands like a beacon of hope. We must see that its light guides us and gives us direction for preparing a liveable, sustainable, beautiful world for our children—those who have been born, those who have been conceived but not yet born, and those children of the future not yet conceived."* (written by Margaret Meade, July, 1978)

One woman's work helped start the environmental movement. Silent Spring by Rachel Carson was published in 1962, and it raised issues never before considered by most people, or the government. It aroused the public's interest in pesticides and, subsequently, in the effect of all contaminants in the environment. Rachel Carson helped to make the word "ecology" one the public could understand, and one the government had to learn to use.

Other women have made important contributions to the environmental movement of the 60's and 70's. Some have been distinguished in specific professions or academic fields; many have been anonymous, self-educated homemakers whose volunteer efforts in grassroots organizations made passage of environmental protection legislation possible. Why have so many women organized recycling centers, lobbied for control of air and water pollution, and marched in anti-nuclear demonstrations? On the other hand, considering the biological and cultural-historical nature of women, why haven't more become ardent environmental activists?

The image of woman as a housekeeper and mother can easily be expanded to the image of woman as an earthkeeper, the nurturer and protector of life. The biological capacity to

breast-feed human infants gave women the initial responsibility for nurturing, and cultural patterns then locked her into the primary responsibility for feeding, clothing and caring for the growing children. Even though this stereotype is changing as more women have business and professional careers and men participate in the child-rearing process, at this stage of our cultural evolution, women still think of themselves as nurturers more than men do. This special sense of responsibility for children causes them to care intensely about their children's future.

It is unfortunate that this capacity to care has been misdirected into a passion for continuing the development of all fertilized human eggs, at whatever the cost to the mother or society. The poor have been denied access to abortion in our country by this passion, and sometimes the right to life has become the right of children to be born unwanted and neglected, deprived and abused. The abortion issue has divided women and absorbed energies which could have been used to develop opportunities for women and improve the living conditions of living children. It has also obscured the problem of overpopulation, which is extremely serious, even in the United States.

Although the growth rate has slowed around the world, the actual number of people continues to increase dangerously. We affluent Americans, with the greatest per capita consumption of resources in the world and the greatest producers of waste, are the greatest threat to the earth. We must bring the world population problem into focus again, as it was in the early seventies, and concentrate on solutions which will benefit all humankind.

The International Year of the Child is an appropriate time to renew our commitment to protect and improve the environment. It is a time for women, the traditional nurturers, to seriously assess the contribution they are making to their children's future. Along with physical necessities, love and affection, and cultural-educational opportunities, women should try to give their children a healthy planet to inherit. The effort may be on a personal level through

simplification of lifestyle and a lower consumption of resources. Or it may mean choosing a particular area of environmental concern, becoming as well informed as possible about it, and then using the knowledge in writing to legislators and representatives, in writing letters to editors, and in presenting written or oral testimony at hearings on environmental issues. Some women who accept responsibility as citizen activists may eventually develop full-time careers working in the public interest.

Fortunately, we have models. There are many women working to "prepare a liveable, sustainable, beautiful world for our children," as Margaret Meade declared we must do. The following statements are written by such women. They are all mothers, and all work full time in public interest careers, although several of them began as homemakers volunteering their time. Each woman responded positively to my request to send THE LAND REPORT her expression of commitment, the particular point of view which motivates her to work to maintain and improve the life support system our children will inherit by challenging the social structures which threaten it. We appreciate the contributions of these prominent women to THE LAND REPORT, and we thank them for their efforts on behalf of the children of the world.

*Dana Jackson*

## Women for the Earth

Lola Redford, a woman deeply moved by Rachel Carson's Silent Spring, became an environmental activist in 1970 when she helped create Consumer Action Now in New York City. This group of women educated themselves and then other concerned consumers about environmental issues and volunteered their time to work for change. CAN's Council on Environmental Alternatives is now a professional organization with a fulltime paid staff. CAN organized the 1978 SUN DAY activities for the entire city of New York and is currently in the process of developing a national energy education program for women emphasizing conservation and renewable resources, under a grant from three federal agencies: HEW, DOE, and EPA.

Besides being the salaried president of CAN, Lola is a consultant to the congressional Office of Technology Assessment, and is on the Board of Directors for the Center for Renewable Resources. She has met with President Carter as a solar energy expert, and was the subject of a cover-feature story, "Lola Redford Wants to Help You Harness the Sun" in the July issue of Ms. Magazine.

Lola Redford is also one of the special Commissioners for the INTERNATIONAL YEAR OF THE CHILD.

She wrote the following statement especially for THE LAND REPORT.

The International Year of the Child comes at a time of fundamental re-evaluation of the goals of society in general and of the world's energy future in particular. It was because of my work as an environmentalist and consumer advocate that I was asked to serve as a Commissioner.

The connection between the goals of the IYC and energy related issues may not at first be obvious. Indeed, I sat a bit timidly at the first Commission meeting as, in turn, each Commissioner told a bit about his or her work as a child advocate. The projects I heard about were in such areas as child abuse, juvenile justice, teenage pregnancies, and I wondered, briefly, if there had been some mistake in asking me to serve as a Commissioner.

But I-- and the other women who started Consumer Action Now ten years ago-- had become



International Year  
of the Child 1979

environmentalists precisely because of our concern for the health of our children growing up in New York City. Our initial efforts included researching and writing several newsletters. In 1972 we first covered the complexity of the energy problem in an issue called "The Kingdom and the Power." As we learned more about energy issues, we came to understand that energy was a major factor in inflation, unemployment and a whole host of environmental problems.

Our work led us to understand that, as a nation and as a world, we are at the end of an era-- an era of cheap, seemingly inexhaustible energy supplies. Our work since then has been toward planning the transition to a reliance on safe, clean and renewable energy sources and to energy conservation.

As a mother, an environmentalist and an IYC Commissioner, I believe there is no single issue that will have a greater impact on our children, the children of all nations and the children of the future, than the decisions we make now about how we meet the energy needs of the world. These decisions have profound and long-lasting consequences not only on the environment and its ability to sustain life in a healthful and meaningful fashion, but in the social and economic areas as well.

The wrong decisions now-- over-reliance on fossil fuels, growing dependence on nuclear technology-- could yield a world in which our children are not only deprived of a safe and healthy environment, but are condemned to live in a world beset with strife and international conflict over who will use the limited energy resources. Political and economic instability will surely result if we don't act now to conserve our precious resources and turn to safe, clean and renewable energy sources to meet our needs.

The Declaration of the Rights of the Child spells out very clearly the basic humanitarian rights for all children throughout the world. The environment-- the world in which children experience these rights-- underpins every one of these rights. Not to recognize this, and worse, not to take action to preserve and protect that environment, is to condemn our children to a world in which their rights may cease to have meaning.

Lola Redford

Anne Ehrlich is a Senior Research Associate in the Biology Department at Stanford University. She is co-author with Paul Ehrlich and John Holdren of Population, Resources and Environment, a widely-adopted college textbook. The third edition in 1977, called ECOSCIENCE: Population, Resources and Environment, is a 1000 page paperback text which covers a tremendous range of topics in human ecology. Anne Ehrlich is on the Executive Committee of the Board of Directors for Friends of the Earth.

What kind of a world will our children and grandchildren inherit? No other generation has faced such a crucial question. In times past the physical world has changed rather little from one generation to another. But our generation has the power to rape and plunder what remains of Earth's resources, physical and biological, renewable and nonrenewable. Our children's generation unavoidably will be much larger than ours, and their children's, even larger. Their needs for food, clothing, shelter, and other amenities will be correspondingly greater than ours-- but their resource base, at best, will be no greater. In terms of some resources-- fossil fuels, easily extracted metals, etc.-- it will have shrunk. Whether such basic renewable resources as cultivable land, forests and grazing areas will have been protected and preserved depends on decisions made today. What kind of system will provide energy for the human population for many generations hence will be determined within the next decade or two. And even how many children are born in this and future years will have a significant bearing on their future well-being. It is up to those of us who can see these things to persuade our leaders to take the long view in making decisions-- to consider that our children deserve to inherit a share of the Earth's wealth, at least as much as we did. And we must teach our children as well that it will be their task to preserve, replenish, and restore that bounty for those who come after. This generation must embark on the path toward a Sustainable Society; failure to do so will surely mortgage our descendants' chances for decent, happy lives.

Anne H. Ehrlich



Amy Baker and Corey Evans

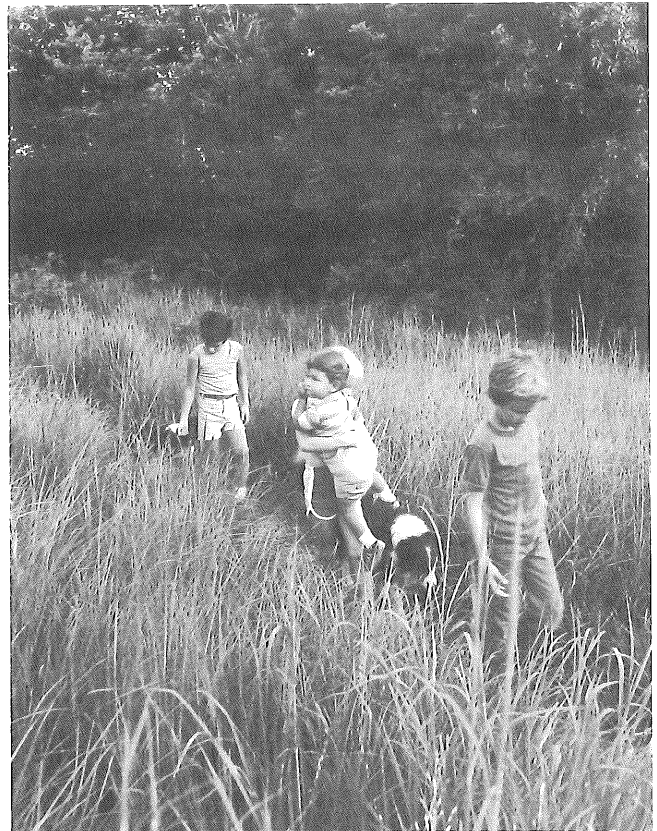


Hazel Henderson is a futurist, and author of Creating Alternative Futures: The End of Economics. She has been an environmental activist since 1964 when she joined with other citizens and mothers of small children in New York City to form an organization called "Citizens for Clean Air." Since then she has helped organize various public interest groups and has undertaken a thorough process of self-education in ecology, economics, and all the complex, interdependent components of our socio-political system. In 1973 she was appointed to the Advisory Council of the U. S. Congress Office of Technology Assessment. She is in great demand as a speaker and is currently editing her second collection of published articles into a new book.

As a parent, I believe in my daughter's future. I hold it self-evident that my generation must preserve as many options as we can for her generation and all those to follow. I hope that we will learn that we do not inherit the world from our parents-- we borrow it from our children. Thus, my values are all affected by these principles of inter-generational justice, as well as for greater equity in access to resources for all people alive today.

This three-dimensional view of justice and equity is not contradictory, but complimentary. For if access to resources, power and wealth are broadly shared within and between nations today, this in itself reduces the dangers of concentrated power and wealth which leads to over-exploitation of resources, human oppression and the depletion and destruction of future options. Only social systems that learn to use today's resources frugally and fairly can create perpetually renewable resource-based systems of production managed for long-term sustainability. The Year of the Child and the Land Institute are both expressions of this knowledge. My optimism and hope stem from the understanding that living in harmony with each other and nature is not merely a moral imperative-- it is now the only pragmatic course of action. Today, only the idealists are realistic! I rejoice that we humans already know how to achieve this harmony; we only need to remember. It is our oldest vision: the Elysian Fields, the Kingdom of God, the Great Mother, the goddess Gaia of all Nature, the Great Oneness-- however we have described it to each other. All our prophets, seers, visionaries and religions have taught its principles: cooperation, sharing, honesty and empathy with all beings and Nature-- the Golden Rule, or simply doing as you would be done by. We are also learning fast in mass-consumerist societies that over-emphasis on material things diverts us from achieving fuller human maturity.

Hazel Henderson



Richie Courter, Amy Baker, Jed Burr, David Evans

Harriet Barlow is the Administrative Director of the Institute for Local Self Reliance, a Washington D. C.-based research and technical assistance organization. She serves on the board of directors of eleven change-oriented organizations in the fields of energy, agriculture and community development. She was one of the main organizers of the successful anti-nuclear rally in Washington D. C. last May which involved between 70,000 and 100,000 people. Harriet is now working with Barry Commoner in the formation of a new political party called the Citizens' Party.

"Commitment" is a word which implies conscious choice. My work, like that of many women, seems to stem more from intuitions of possibility and responsibility rather than from an intellectual process. I know that nuclear power is dangerous, so I organize to oppose it, informing my arguments to further my chances of success. Similarly, when I look people in the eye and ask them about their visions of society, I know that there is a craving for justice still alive in most of us. That we have been sold a bill of goods by the minions of an economic system which exploits land and people is the tragedy of our time. But my gut tells me that it is not an inevitable tragedy. And as long as I can still smell, touch, feel, hear and see evidence of



courage, kindness, and endurance for right, I believe in the chance of pulling the wick on the timebomb before it explodes. I look to my sisters for strength; those who hear the message that the purpose of life is to nurture for the continuum. My children say that they too are ready to struggle, if they have to. I guess I don't think we have that much time left, that we will win or lose it for them. Which means, for me, trusting to that intuition, honing a tight political analysis, building an organization that includes all the interests that speak to the protection of the life process, and proceeding until we prevail.

Harriet Barlow

**Pat Lewis Sackrey** is the Co-Director of the Center for Rural Communities sponsored by the Extension Service, University of Massachusetts, Amherst. She is director of the six state New England Small Farm Project to build an informal and effective small farmer constituency in New England. Pat is particularly concerned with the role and potential of women in rural areas as producers of appropriate technology hardware, and leaders in local community development. Pat has given us permission to select and print excerpts from two speeches which she gave recently.

The issue of power is fundamental. About two and a half years ago, after I had been working in the women's movement for a long time, and working for the Office for Children in Massachusetts, I found out that in New England we import about 80 to 85% of what we eat.

That got a few of us started in a work group called Women in Agriculture, Food Policy and Land Use Reform, which grew out of our Massachusetts Governor's Commission on the Status of Women. It gave us a small link to some people who were making decisions at an other-than local level. By the time we started the group, however, we had pretty well decided that we wanted to work locally as much as we could.

Since then I've thought a lot about the connections between economic development and the delivery of human services as basic as housing, health care, and heat for our homes-- how we run our machines, how we get to work. I have thought that we must start figuring out how to provide for our own economic development, our jobs, our own human services, in ways that are accountable to our own communities. We've got to talk about integration with what's there, building on the natural resource base. That doesn't have to be limited to the trees, and the water, the land and the minerals-- it can be the people too.

It takes other people--it takes being interdependent-- but, you hope, as Wendell Berry pointed out at a recent conference at Prince Edward Island, that it is interdependency among



Nathan Washburn on wind generator test stand.

independent people, not among dependent people, which we can achieve.

I see things going on at a lot of different levels that are hopeful. Through projects like Women in Agriculture, we are pursuing direct marketing and processing of foods at the local level, and even finding ways to educate a new group of people to become farmers on our land as we try to save it. Cooperative Extension at the state and regional level has recently hired small farm extension staff people; it's beginning to help small, part-time family farmers. Finally, I see a growing awareness at every level for the need for what Wendell Berry calls "the kindly use" of our natural resources-- our land, our forests, and certainly, each other.

Appropriate technology has everything to do with power, I think, individual and community, national and international. Power has a lot to do with who knows what and who can do what to whom. Technologies which are appropriate to people and are at a size which we can understand and affect are the kinds of technologies that help us-- individuals, small groups and local communities-- grow powerful.

I've heard lots of people talk about power and about their sense of having none. "Well, what are you going to do? It's all going in the wrong direction, but what are you going to do?" There are a lot of things to do! We want power-- the power to live fully, to express ourselves, to assert ourselves, to be able to change things in our own lives and in the spheres where we have influence. There are people to help us learn how to do that, to support us. Meanwhile, it is inappropriate to be passive, to be a victim these days, inappropriate and inexcusable.

We need to work politically. Carter Henderson listed the appropriate technology areas that multi-national and other large corporations are getting into deeply. There's no other way to control them except politically. Political work feels nasty and dirty to us for a whole lot of reasons, but if what we mean by power has to do with politics, then we really do need to deal with those people who have power.

It's very important to have a common understanding of our problems, and a common understanding of our assets. It's very important to know where we want to go, how we want the world to be for ourselves, our kids and our grandkids.

It may sound trite I guess, but Emma Goldman once said, "You know you might not get as high as you aim, but you ain't going to get any higher." And that's true with the way groups of people move, the way societies go forward. The way we end up has a lot to do with one another, and being one another's leader.

Pat Lewis Sackrey



International Year  
of the Child 1979

Frances Moore Lappé is the author of the best-seller, Diet for a Small Planet, which has changed the eating habits of many Americans. She is associated with the Institute for Food and Development Policy in San Francisco, California, a non-profit, research, documentation and education center focusing on food and agriculture. Francis Moore Lappé has co-authored with Joseph Collins a book called Food First: Beyond the Myth of Scarcity, which during its six hardcover printings became an international reference point in virtually any discussion about the issue of hunger. She has given THE LAND REPORT permission to print this excerpt from the last chapter of the revised paperback edition of Food First which will be released in September by Ballantine Books.

We believe that anyone who is privileged enough to become aware must make a choice. We either choose to be observers of history, thereby lending our weight to the forces now in control, or we choose to be participants, actively building a new culture based on human values. Seen this way, do we really have a choice?

Human society is, after all, only a product of the collective struggle of all people. If we say that we have no power to change things, who does?

If we answer that the power is in the hands of an elite who alone are making the decisions, we will be doing exactly what the established forces of power want of us. We will have folded our arms in defeat, saying that we prefer to build shells to protect ourselves from reality to keep out the bad news.

Based on our own experience we have come to believe that people prefer a protective shell only because they are overwhelmed with negative information that they cannot integrate. They cannot integrate facts into useful action because they are made to feel guilty about and fearful of the hungry. Too often, the problem of hunger gets turned into a contest between them and us-- all of us in the rich world versus all of them in the poor. In fact, the majority of the American people are not pitted against the hungry people; those are not the battle lines of the hunger struggle. The struggle is against a system profiting on hunger in the Philippines or Brazil just as it is in the United States. The real forces creating hunger span almost all nations in the world. Once the lines of struggle are clear we can no longer be manipulated by profferers of guilt and fear.

But some would say that our choices, if we do indeed have them, are limited-- that since human nature is basically self-centered, all we can do is build on that trait. But in our experience, debates on 'human nature' have been unproductive-- for who can prove anything? There is no need to prove that human beings are basically good. Rather, history has shown human potential for cooperation as well as our potential for cruelty and cut-throat competitiveness. With this view, the most pressing question becomes: What kind of structures of human organization can we help create that will elicit our best, not our worst qualities?

Nor are we saying that people extinguish their self-interest for the sake of the larger community. Rather, we are learning that there need not be the often-assumed contradiction between self-interest and community interest. We then ask: What kind of structures allow an individual's natural self-interest to contribute to the community's progress?

Many people here and in other countries are asking these questions, and, moreover, are actively working to build such social structures. There is no more important work today than explaining this to people in countries like our

own. Before they would work for change they have to believe that change is possible, that a culture fixated on individual profit-seeking alone is not "natural." The tragedy is that we have had to reach the point where so many people are hungry and malnourished, including millions here at home, before we could begin to see that our system-- a system built on the vulnerabilities of the human personality instead of its strengths-- can never create a humane society.

Finally, we must not allow our appropriate sense of urgency to lead to frustration and despair. It took centuries to create the structures that cause the world-wide deprivation we now witness. It will take time to construct a human world. That does not belittle our task; that makes it all the more important. Our personal time frames have changed. We must come to understand today's struggle in light of the entire scope of human history. We must not limit our vision by what we see around us today. What we see today may tell us little about what our children and their children are capable of creating.

Frances Moore Lappe



**Nancy Jack Todd** is the co-founder and co-director of the New Alchemy Institute in Woods Hole Massachusetts. She is the editor of their major publication, the Journal of New Alchemy. Nancy is a dancer as well as a writer. She is a Lindisfarne Fellow. Nancy has given us permission to reprint the introduction which she wrote for the 1979 Calendar of the New Alchemists, dedicated to the INTERNATIONAL YEAR OF THE CHILD.



Nancy Todd and her daughter Susannah.

There is an old Chinese story that maintains that human nature is, in essence, basically good. This cautiously optimistic prognosis has its origin in the conclusion that most people, if they were to hear the cries of a child who had fallen down a well, would try to rescue it-- indicating that, on the whole, we tend to be well-intentioned. The same hope, or faith perhaps, was echoed in our time by Anne Frank, who wrote in her diary, even after the terror of her confinement, "I still believe that, at heart, people are really good." More recently, Dr. Helen Caldicott, who has been instrumental in the fight against nuclear power, was asked why she continued to struggle in the face of such overwhelming odds and she replied, "Because I believe in the goodness in people."

From the evidence of the state of the world about us, it is hard to believe that we are much better than a mixed and contradictory bag of impulses. Yet there is one element of human nature that seems to cut across all cultural differences, and that is our love for our children and our concern for their future. This love, perhaps more than any other quality, bonds all humanity, making us truly a human family.

The world that they, our children, will inherit does not, at present, reflect our love. At least thirty percent of them are still malnourished, and even more lack adequate medical care and housing. Over all children, the fortunate as well as the deprived, in a global situation of increasing economic and political instability, hover the shadows of nuclear war and ecological catastrophe. The minimal hope for survival is a meager and bitter legacy at best.

They deserve better. We owe it to them. To the rights of the child, as declared by the United Nations, Saul Mendlovitz of the Institute for World Order has suggested there be added:

1. The right to food.
2. A global tax scheme to be used for the development of appropriate technology to meet basic needs.
3. To begin an annual ten percent reduction in all arms budgets and to initiate within three years an actual disarming process which by 1985 would be down to the level of police appropriate for order and authority in an agreed-upon set of police units.

It will take more than concern, more than theoretical, but rather applied love to restore this world to one that is fit to leave to our children. And such applied love must consist, in part, of the vision to create the structure for a sustainable future and the fierce and stubborn faith that it can be done. With this kind of unifying vision, we can begin to fulfill our responsibility to the children of the world, now, and in a hundred years. And in two hundred. And a thousand.

Nancy Jack Todd

# Children

by *Harley Elliott*

The problem is more and more  
in the eyes how to understand  
the beautiful issue  
of children moving on the earth

as the old masters did  
when they painted children  
and virgins their faces  
are all newly fleshed the eyes  
barely settled in

as if coming into this new dimension  
each cell of their bodies  
turned its opposite side.

The problem is more and more  
in the mind how to see  
the mystery of children  
as they move into their spaces

with the old wisdom now gone  
that a child grew  
in the eye of each rose  
there is nothing  
left to know.

The problem is more and more  
what is not understood:  
the astral loveliness singing in their blood

the light at the soft  
blurred edges of the moon  
collecting in luminous circles  
around the eyes of infants.



(reprinted from All Beautiful & Foolish Souls,  
The Crossing Press.)

## Our Children's Inheritance

(The following remarks were made by David Brower during the PRAIRIE ROOTS/HUMAN ROOTS program at the Evans Ranch, June 2, 1979.)

"I was at the Brookings Institution not too long ago for a meeting held by EPA...It was attended by a good many people from the government, corporate heads, and also a few token environmentalists--I was one of those...A member of the President's Council of Economic Advisors told his audience: "Our children are inheriting more than we did." Well, that kind of shook me; I didn't know whether I'd heard it right. But that's what he said. I had a ten minute chance to speak that evening, so I said that I didn't know how it was with him, but I knew how it was with me. I was born in Berkeley, California,

July 1, 1912. My children were all born in Berkeley except for Ken--he was a cheap war-time baby born in San Francisco, and then we shipped him immediately to Berkeley. I know what I inherited; I know what they inherit; I know what my grandchildren will inherit, if I have any. I inherited a much larger bay than we have in San Francisco now. You could look through the air much better then. On both sides of the Bay there were truck gardens; there was good food that you could afford to put on the table. The Berkeley Hills were a part of my wilderness; there were no roads in them. Through some of those hills was the Sacramento-San Joaquin Valley. When I was born in California there were six thousand miles of salmon stream in that valley. My children

(continued on page 26)

# Alternatives in Energy

## Energy from the Land

*by Charles Washburn*

The traditional building materials--wood, thatch, bamboo, even sod--as well as the traditional materials for clothing--cotton, flax, leather, wool, fur--have come directly from the land, as has all of our food except fish and seafood. It's easy to forget how recently we depended on the products of the land--wood, grass and grain--to power our land transportation. The horse population peaked in 1915, and although the steam railroads date from 1830, it wasn't until 1875 that coal became more important than wood as a locomotive fuel. Only as the industrial revolution gained momentum, first expanding the ancient quarrying and metals industries as their products were made available to most people, did man move away from an economy based almost entirely on the products of the land to an economy heavily based on materials extracted from the earth. Soon the increased demand for energy--originally to power the expanded extractive industries, but then to power a mechanized transportation system and then to power centralized industries processing the products of the land--outstripped the capacity of the land to provide the fuels. Often the processes were synergistic--the railroads' demands for fuel accelerated clearing the land which accelerated settlement and agricultural production which increased the need for railroads which assured their further extension. Just as wood fuel supplies were failing, coal and then oil deposits were found in quantities far larger than seemed likely ever to be needed.

Now we look back to the land to see if it can once again power our society on a sustained basis. The earth's surface has, of course, always been a solar collector, and, except for the small proportion of energy being recovered from uranium, all of our current fuel consumption is solar energy that was stored by that collector. In the future we will make far better use of the earth's surface as a solar collector. A small fraction of the land will operate as a fairly efficient collector of low temperature heat energy useful for space, water, and industrial heating and cooling when it is covered by devices simple in concept and often simple in construction which can gather from 30% to 100% of the sunlight falling on them. Recognizing that we'll want to improve the efficiency of our use of such energy, perhaps only 0.1% of the area of the U.S. will be covered by such devices. (0.2% is already covered by buildings and 0.5% by pavement.) One day early in the next century, a somewhat larger area

will be covered by devices of greater technical sophistication than the heat collectors, directly converting solar energy to electrical energy at an efficiency of from 5 to 10%. If electrical energy consumption is held constant at current levels (efficiency improvements will allow us to get much more useful work from the same amount of electricity), about 0.25% of our land area will be covered by electricity-producing collectors operating at an efficiency of 5%.

Unfortunately, we can't so easily imagine meeting our transportation energy demand with "fuels from the land." We can imagine meeting high levels of heat and electrical energy use by covering our buildings and some land, not needed for crop production, with solar collectors. But if we're going to even consider producing portable liquid and gaseous fuels from the land, we must carefully look at the scale of our transportation energy demand, the potential of the land to "grow fuel," other needs for productive land, and the impact of "growing fuel" on the land. All vegetation-covered land is, of course, already acting as a solar collector, converting light energy from the sun into chemical energy, using processes much more complicated than the man-made collectors. The sun's energy also drives the water, air and mineral circulation systems of the oceans, atmosphere, and living systems.

A small part of the sun's energy is stored as chemical energy in the products of photosynthesis. An acre of ground in Northern Illinois receives about 20,000 million Btu in a year. The corn grains from a 150 bushel crop grown on the land store 56 million Btu's, only 0.3% of the yearly input from the sun. If the stover is included, the storage is 0.5% of the yearly input. As either cultivated crops or natural ecosystems go, that Illinois cornfield is an extremely efficient solar collector--only a few tropical crops such as sugar can do better, and then only by a factor of two or three.

Your body's yearly energy needs (and your protein needs in quantity, but not in quality) could be met by the harvest of only 1/20 acre of corn crop. But if your car is powered by the alcohol made from corn, it will need the production of 4 acres to sustain it.

The current interest in "switching back" to solar fuels overlooks the fact that while our bodies consume the same amount of energy as those of our great grandparents in 1860, there are now seven times as many of us, and our machines have over 2,000 times the horsepower capacity of their machines. Fully 95% of the horsepower of our machines is the power of engines for transportation.

What will powering our transportation system with "grown fuels" mean to the land? First of all, it's plainly impossible to contemplate



powering our current transportation system, or even one remotely resembling it, from the land. Our transportation system directly consumes twenty million billion Btu's of fuel energy each year. If every acre of the coterminous U. S. land area--including cities, deserts, and mountains--were devoted to fuel production and could produce it at a rate equal to that of a ninety bushel per acre corn field, the total alcohol yield would just about equal our transportation fuel use.

So the question of meeting all our current transportation energy "needs" from the land can be clearly answered. But what if we're willing to mentally change both our transportation system and our approach to gaining liquid fuels from the land? What kind of transportation system could be fueled from the land which is not needed for food production and that could be safely "cropped" (i.e., energy cropped with good assurance that the land use is sustainable--that the land is as suitable for any other use after an indefinite number of years of cropping as it was before the cropping began)? At this time only some rough outlines of the potential supplies are possible. We can consider the easy conversion of our already collected urban wastes into liquid and gaseous fuels. The conversion of our agricultural and forestry wastes is a much more difficult problem, since all solar collectors, including vegetative cover, gather the energy from a very diffuse or spread-out source. The energy content per pound of dry biomass is only about 1/3 that of a pound of petroleum or natural gas, so the "energy cost" to transport biomass fuels to a processing plant quickly mounts up.



Chuck Washburn and John Craft

Furthermore, while it will be easier to convert wood than coal into liquid fuels, it is still much more difficult to gain the fuels we want from biomass (where about 40% of the energy will be lost in processing) than from crude oil (about 15% of the energy lost in processing) or natural gas (about 3% of the energy lost in processing).

We can't seriously consider the possibility of "energy plantations" in the deserts--the energy inputs for irrigated desert energy farming will be larger than the recoverable energy production from the crop. In addition, we must be sure that growing an "energy crop" in an area with favorable soil and climate, and hence with a favorable net energy balance, doesn't force us to grow more food and fiber crops under irrigation in Kansas or California, requiring an input of two or more Btu's for each Btu returned.

If the urban, agricultural and forestry wastes which are readily collectable are used together with the agricultural products from "surplus" land to produce transportation fuels, the net energy available will be from 1/20 to 1/10 that now consumed by our transportation system.

Even if the current rush to gasohol and alcohol fuels ceases before the end of the year, we're sure to hear more about biomass-derived fuels in the years ahead. The country may jump into a crash program to make liquid and gaseous fuels from coal, but even if successful, our coal can provide only a short diversion between our unsustainable, petroleum-based society and some future society based on sustainable energy sources. We often hear that our recoverable coal resources could last a century or two at the current rates of consumption. But if we manufacture liquid and gaseous fuels from coal, we face an entirely new level of demand for coal. Coal production would have to rise by nearly a factor of five since gas and petroleum are nearly five times as important as coal in our current energy economy. In addition, the high energy inputs for coal production and transportation, coupled with the losses in conversion to gaseous or liquid fuels, dictate a demand at least eight times larger than the current coal demand, if coal is also to provide our gaseous and liquid fuels. So a comfortable two century supply (a problem for my three-greats grandchild) is suddenly shrunk to a short forty year supply (a problem for my child). This time could be further shortened if concerns about rising atmospheric CO<sub>2</sub>, acid rain from coal burning, land destruction, or diversion of scarce western water supplies to synthetic fuels production become more important political issues in the U. S., i.e., if people choose the land over the car. The American experience with nuclear power has at least pretty well defined the unresolvable uncertainties associated with its use; there is little reason to believe that the uncertainties associated with synthetic fuel from coal or shale will be fewer.

When the coal boom has ended, people will once again be asking how much liquid fuel can

come from the land. I can't but wonder to what extent the productivity of the American soil will have been further eroded by that time. The study of America's energy problems has repeatedly shown us that our energy consumption level is incompatible with sustainable production of fossil fuels; analysis of the bio-fuels potential shows that our consumption level is incompatible with sustainable production from the land.

## Sinfuels and the Environment

"Policy consists in serving God in such a manner as not to offend the Devil."

Thomas Fuller

The program for energy independence in the United States as outlined by President Carter in July presents a tremendous threat to the environment. The national environmental organizations are mobilizing for the upcoming battles to prevent health and safety regulations achieved in the 70's from being amended and side-stepped, and wilderness and wildlife protection from being ignored in our rush to achieve "strength through exhaustion."

The key element in the new energy plan is a massive development of synfuels, oil from oil shale and the liquification of coal. Environmentalists object on the following grounds:

(1) Every barrel of oil shale fuel produced will require two to five barrels of water; every barrel of oil from coal, four to thirteen barrels of water. Combined with the dangerous leaching of toxic substances, this could seriously damage agricultural lands in the West where most of the nation's coal and oil shale is found.

(2) 120% of the original volume remains after oil shale production. The extraordinary amounts of waste rock contain large quantities of alkaline salts and other toxic elements.

(3) To produce 2.5 million barrels of synfuel from coal a day by 1990 as Carter proposes would require 270 million tons of coal a year, one-third above the current production rate, with resultant increases in air pollution and damage from strip mining.

(4) In a recent report to the White House Council on Environmental Quality, scientists warned that a major synthetic fuels program could add significantly to the harmful "greenhouse effect" of carbon dioxide artificially warming the atmosphere.

The CEQ study was not the only one ignored in the decision for a crash program in synfuels development. In a study for the Department of Energy, the Rand Corporation warned that costs for synfuels would be 2.5 to three times the current estimates and would rob investment capital from other areas which could better help our

economy. The Harvard Business School recently completed a six year project with the publication of a book called Energy Future. They recommended that the government spend more on conservation and solar energy and only one-fourth of what the White House proposes on synfuel.

To achieve goals in synfuel production will require what Carter labeled "trade-offs": lifting state and local air and water quality standards in certain instances and waiving provisions of the federal Clean Air Act and National Environmental Policy Act.

Such national sacrifices are unnecessary. Major investments in the alternatives (conservation and solar, and mass transit) could lessen our dependence on foreign oil without degradation of the environment. The national environmental groups will be working harder than ever for alternatives to the "strength through exhaustion" approach to energy independence. Grassroots help will be essential. Those who wish to help should become active members of several national environmental groups, such as the following:

|                         |                          |
|-------------------------|--------------------------|
| Friends of the Earth    | Solar Lobby              |
| 124 Spear St.           | 1028 Connecticut Ave. NW |
| San Francisco, CA 94105 | Washington, D.C. 20036   |

|                         |                          |
|-------------------------|--------------------------|
| Sierra Club             | Environmental Action     |
| 530 Bush St.            | 1346 Connecticut Ave. NW |
| San Francisco, CA 94108 | Washington, D.C. 20036   |

Natural Resources Defense Fund  
122 E. 42nd St.  
New York, N.Y. 10017

The National Audubon Society  
950 Third Ave.  
New York, N.Y. 10022

The 4th NATIONAL PASSIVE SOLAR CONFERENCE  
will be Oct. 3-4-5 at the Roe Bartle Convention  
Center in K.C., Mo. Write P.O. Box 1643, Jerr-  
erson City, MO. 65102 for information.

(Remarks by David Brower Contd.)

inherit three hundred. There were redwoods; there was wilderness that is gone...

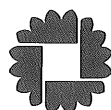
I also inherited a freedom from fear of what you were to do with nuclear waste, a freedom from fear of nuclear exchange; in sum, I inherited the American dream. My children don't. They don't to such an extent that they don't feel entitled to bring children into the world. I've been watching these children play today...I would like to see some that would be my own children's children this age. I think I would like to encourage them to have one or two; I would like to see the line go on. I think it's rather important for the world to have children in it. It's rather that people have children and feel a responsibility to those children, and not do things to the earth which is going to steal from those children."

# The Alternatives Network

RAIN

NEW  
CRITERIA

THE MIDWEST  
JOURNAL OF  
APPROPRIATE  
TECHNOLOGY



KANSAS  
SOLAR  
ENERGY  
SOCIETY



TRANET

Tilt

New Alchemy

## The Ozark Institute

The Ozark Institute is a private, non-profit, publicly-funded corporation that provides information, technical assistance, and self-help training to individuals and community-based organizations in the Ozark bioregion. Among the projects they have been involved in recently are a community cannery in Berryville, Arkansas, a seed bank project in Lee County, Arkansas, solar greenhouse demonstration programs throughout the region, and a community-based radio station in Eureka Springs, Arkansas. The Ozark Institute publishes Ozarka, a quarterly journal, and occasional special publications, such as the June 1979 Solar Greenhouse Guide.

The Ozark Institute is primarily involved in Energy and Agriculture, but has provided assistance in other areas deemed worthy.

For further information, contact Ed Jeffords, the executive director of the Ozark Institute, Box 549, Eureka Springs, Arkansas 72632.

## Small Farm Energy Project

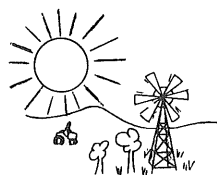
Since we received their first newsletter in August, 1977, The Land has been very interested in the work of the Small Farm Energy Project in Hartington, Nebraska, a research and demonstration project sponsored by the Center for Rural Affairs and funded by the Community Services Administration. They now have 48 demonstration farms in Cedar County, Nebraska. Cooperating farmers have installed solar collectors on hog houses, garages and grain bins. Vertical solar collectors and solar greenhouses have been attached to old farm homes for inexpensive supplementary heat systems. They have experimented with compost turning and loader-spreader equipment, wind-electric systems, and have investigated the feasibility of on-farm ethanol production. Energy savings and effects on income have been monitored.

The project has a newsletter, edited by Dennis Demmel, which is designed to disseminate information on renewable alternative energy sources for farms, such as organic farming, waste recycling, composting, minimum tillage, energy conservation, wind and solar energy, alcohol and methane. Each issue is more substantive and interesting than the last. The May issue

contained two Special Project inserts, one on the Fish family solar greenhouse and one on alcohol production. (Reprints can be purchased)

The second Small Farm Energy Seminar was held on August 17 and 18, 1979. During this two day event, alternatives to the high costs of energy and fertilizers were discussed, new energy devices were on display, and tours of cooperating farms in the Hartington area were conducted. The public was invited to all sessions and tours.

Cooperating farmers cannot always take time to show visitors around. Potential visitors should make reservations by phone at least two weeks in advance.



Small Farms Energy Project  
Center for Rural Affairs  
P.O. Box 736  
Hartington, NE 68739

Phone: (402) 254-6893

## Sunflower Power Company

The Sunflower Power Company was established in 1972 with the single goal of developing wind energy resources. Since that time, the company has worked primarily in research and development. It helped pioneer the development of residential wind-electric systems which interconnect with utility networks for parallel generation. It developed an expertise in site selection for wind systems through its private efforts and through work with the American Wind Energy Association and the U. S. Department of Energy.

While many of the past activities have been research-oriented, Sunflower Power has also offered complete wind systems, design and installation services since 1975. Since installing the first utility interconnect wind electric system in Kansas in 1976, Sunflower Power has provided the equipment on all ten interconnected wind electric systems in the state. The Company emphasizes wind systems, such as the Enertech 1500, which interconnect for parallel generation with a home's existing 115/230 volt AC utility company service, as these systems are the most cost/effective available today.

The wind system is interconnected with the home by simply plugging it into a conventional wall socket. Thus, when the wind blows,

wind electric automatically supplements and decreases the amount of utility company electricity used. And if the wind system produces more electricity than the home can use, the excess is fed back into the utility. The blending of wind and utility company electricity is fully automatic. For example, a light, or any electrical device, can be running on 60% wind electricity and 40% utility company electricity at the same time, and these percentages will change from instant to instant as the wind speed varies. Sunflower Power offers to talk to the utility company for their customers and work to meet necessary standards of safety and power quality.

Steve Blake, the president of Sunflower Power, received an M.A. in geography, specializing in site selection for wind systems, from the Department of Geography and Meteorology at the University of Kansas in 1974. Through a non-profit Appropriate Technology Group, he has worked as a consultant on wind energy development in third world countries for the World Bank, the Brace Institute and the U.S. Agency for International Development. Steve has often advised Land Institute people working on wind energy systems. He spent an afternoon at The Land in June, showing slides and talking about wind electric systems to students in the energy course.

Sunflower Power Company  
Rt. 1, Box 93A  
Oskaloosa, Ks. 66066

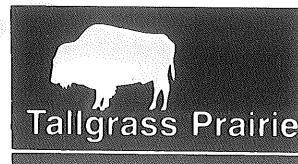
## Anti-Nuclear Groups in Action

Anti-nuclear groups have become more numerous and more credible since the Three Mile Island accident. The August 3 issue of Science reported that the cost to repair this nuclear plant will be twice or three times what had been anticipated--not \$140 million, but \$240 to \$320 million. This does not include the costs of replacing the reactor core, which has been estimated at \$60 to \$85 million. Thus the total working estimate is around \$400 million. Each month the plant remains closed, the utility loses \$14 million over and above the losses as a direct result of the accident. These debts will be amortized and probably charged to the ratepayers.

## Salinans for Alternatives to Nuclear Energy

Alternatives to nuclear power plants with their economic booby-traps and unacceptable public health hazards are available. S.A.N.E. is an organization working to educate the public on the hazards of nuclear energy and the benefits of renewable energy systems.

The September meeting of S.A.N.E. is at the Sunrise Presbyterian Church at 7:00 P.M. on September 20. A film, "Sentenced to Success" will be shown. The public is invited.



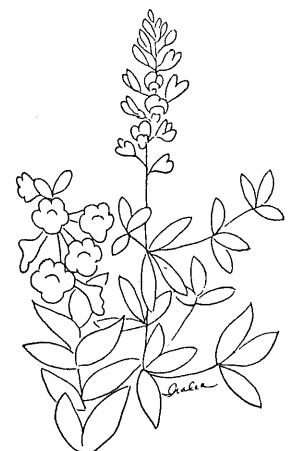
(continued from pg. 11)

park boundary, you may experience the Tennessee woods to the forests of central Canada. During our four day visit we hiked 35 miles of trails through the park. I tried to identify as many plants as possible, but the numbers are staggering. Approximately 1,300 species of flowering plants, of which 131 are native trees, 50 ferns, 330 mosses and liverworts, 230 lichens and 1,800 fungi. We stumbled upon interesting insects, snails and salamanders, as well as many larger animals. Brilliant butterflies were everywhere.

As beautiful as it is, the forest of the Great Smokies is now a young one. Only remnants of the primeval forest exist. Before the park was established in 1934, approximately 65% was logged, while other portions were cleared for grazing or crop land. Since the creation of the park, the woodlands are redeeming these acres, although a hundred years will not suffice to repair the damage done to the ecology of the region in the past century. Establishment of this park came after a ten year struggle to transfer ownership from 6,000 private individuals and lumber companies to that of the people of the nation.

Think for a minute about a national park you've visited. Then think of the person from the East Coast, or deep South, or far West, who would come into a Prairie Park to see, feel, hear and experience the uniqueness of the prairie for the first time. Perhaps we here in Kansas too often take the prairie for granted. The native prairie of the Flint Hills of Kansas and Oklahoma is the last remaining "island" of its kind, like the Great Smokies, a wondrous and beautiful ecosystem like no other. But let's not wait a century too late. Let's be certain that the prairie will be preserved in such a way to share its beauty with others and with future generations so they may love it as we do.

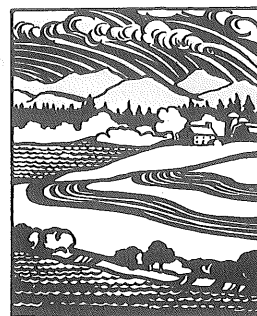
What a wonderful gift to our children!





After the fire which destroyed The Land Institute building in October, 1976, friends appeared who donated time and physical work to help us rebuild. Others sent money and books. We began to refer to all the people who made contributions as Friends of The Land. Later that year, Carl Dowd, a farmer friend from south of Tescott, Kansas, told us about a defunct organization called Friends of the Land, and he gave us a pile of their magazines. Later we obtained more issues of the journal through the Nemeha Book Sellers. We knew nothing about the organization when we established our program, and we were amazed to learn how much we held in common with it.

The Friends of the Land was a citizens' society established in 1939 "for the conservation of soil, rain and man." It was dedicated to a "rational evangelism" for soil conservation and the support of a newly-formed government agency, the Soil Conservation Service. In a review of the work and aims of the Friends of the Land, the editor Russell Lord wrote in their journal, The Land, "It was not our purpose to conduct lobbies, either in Washington or at the state capitols, but rather to attack by meetings, tours, institutes, publications, press dispatches, articles, books, movies, radio and all educational media a prevailing public ignorance and inertia."



## FRIENDS OF THE LAND

The green-covered quarterly journal was both educational and inspirational. Contributors ranged from ecologist Paul B. Sears and Cornell University botanist Liberty Hyde Bailey to well-known authors such as E. B. White, Jesse Stuart, Stuart Chase and Norman Cousins, editor of the Saturday Review. Louis Bromfield and Aldo Leopold frequently wrote articles for The Land. The journal was sprinkled with woodcuts and sketches of farm life, landscapes, and animals by Kate Lord. The first issue of The Land appeared in 1941, and the last in 1954.

## Marked While Reading



One irregular feature in the quarterly journal contained excerpts from books and articles which readers had clipped and sent to the editor. The following excerpts are selections which I "marked while reading" in our collection of The Land. The illustrations by Kate Lord have also been taken from the journals.

Dana Jackson

One day in the spring of 1883, as a Scandinavian farmer, John Christiansen, plowed his fields in Montana's neighbor state of North Dakota, he looked up to find that he was being watched--not by a stockman..., but by an old and solemn Sioux Indian.

Silently the old Indian watched as the dark soil curled up and the prairie grass was turned under. Christiansen stopped, leaned against the plow handle, pushed his black Stetson back on his head, rolled a cigarette. He watched amusedly as the old Indian knelt, thrust his fingers into the plow furrow, measured its depth, fingered the sod and the buried grass.

Then the old Indian straightened up, looked at the farmer.

"Wrong side up," he said, and went away.

from "Prophet of the Grass" by Joseph Kinsey Howard. Vol. III, No. 3, page 271.



I have always had a great affection for grass. It seems to stand for quietness and strength. I believe that the quietness and strength of grass should be, must be, permanently a part of our agriculture, if this nation is to have the strength it will need for the future. A countryside shorn and stripped of thick, green grass, it seems to me, is weakened just as Sampson was. An agriculture without grass loses a primary source of strength.

It is only recognizing the truth to say that in the past we have been lured by the Delilah of profits to destroy grass covering recklessly. We plowed up millions of acres of grassland; we overgrazed millions of other acres. We thought too much and we still think too much, in terms of plows and cultivators. My guess is that even today not one farmer in ten uses good pasture methods. Grass we have. Pastures we have. But our grass is usually on land that we figure is no good for anything else; and after we put in grass, we neglect it.

from "Country Matters" by Henry A. Wallace. Vol. IV, No. 4, Page 391.

It is often said that a weed is a plant out of place, but this is not so. Nothing is more in place than a weed! Wherever they are, they make themselves at home. They are good colonizers; they make the most of their opportunities; they are always on time, and they have other commendable qualities. They are great schoolmasters; they have kept man going from the time he first began to till the earth, or until he gave up, and then they came and took possession and kept the ground in condition until another man came.

The earth would be bare and bald indeed without them. Man tills only a small part of the land he has cleared. He leaves much of it furrowed, scarred and hard featured. The weeds of one kind or another take up the task of recovering it. The gullying stops. Mold forms. All the biological processes of soil building go forward. The waste places around man's slovenly habitations are covered. We speak of ragweed and plaintain as ugly plants, but this is only because of their association with man's unkempt by-places and wastes. I would rather see a good pigweed than a poor rose bush.

Travellers never see the weeds, and we who farm or make gardens must kill them, yet they are messengers sent around the world, the fore-guard of comradeship, the perfect adaptation to all the conditions and needs of life. Everywhere that I have been I have looked for the most common of them, so little noted that they are uncommon. The great views, the resplendent objects do not make a man at home in the world and content, not until the trivial and the common have a meaning to him.

from "Marvels at our Feet" by Liberty Hyde Bailey. Vol. IV, No. 2, Page 145.

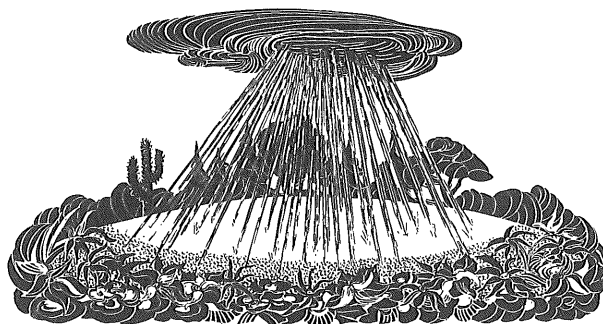
We hooked the tractor to the end of the long tongue on the side delivery rake and turned the well-dried swaths of soybeans into large, loose windrows. On that afternoon, the four boys and I loaded them on the trailer and drew the feed over to the barn.

I remained at the field and let the youngsters unload the beans into the mow themselves. As I passed a soft heap of hay I obeyed an impulse--scooped out a hollow and stretched out full length. The bed was soft and strangely fragrant. I lifted my head to look out over the stubbly distance--the chocolate soil was so close that I felt the strength of it--and in my deeper consciousness a voice seemed to speak...

"I am this soil you live upon. I am old, yet I am very young. I am rain and sunshine, the crumbling rocks of ages past.

"The dust of centuries is mine, shifting and sifting over all the earth; death and decay--yes, and resurrection--are part of me. I gather the rarest lilies, when their bloom is shed, into my bosom and make them bright and new again for another season. I gather all the waste and scum--the wrecks of men--purify and send them forth a new creation. The secrets of ages past are safe with me. Keen undaunted men of courage, godly, holy men have felt my challenge and have come to me for healing of humanity."

from "COMMONPLACES: Some Pages from a Farmer's Diary" by Calvin A. Byers. Vol. IV, No. 3, Page 308.



The city may depend upon the flow of the river for its power and economy. The flow of the river depends upon the landscape to release the water in a stabilized flow. The type and amount of vegetation becomes a vital factor. A gashed and eroded landscape with its frequent floods will soon cause "Factory Closed" signs in the cities. The resources of power, stream flow, grass, forests, and soils are locked together in our industrial economy. The chain of events in our society is trapped raindrops, crops, money, business, happiness and optimal progress.

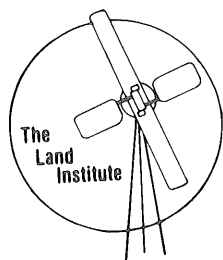
from "Man and Rain" by Ollie E. Fink, Vol. XI, No. 4, Page 376.

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Climate, hardly less than soil, shapes the individual, the regional, and the national mood and bent...

Our soil troubles have come, really, not so much from our daring to try new forms and ways of culture as from a stubborn adherence to methods that we inherited from you. By clinging to practices that worked all right here in the old country we were led for more than a century to develop a misfit agriculture that was ruining our land. Here in England the rains fall softly to bless and caress your island. Our rains and winds in America slash and bite. When we bare land for crops and expose it to the beat of the weather, as we have done inordinately under the harsh compulsions of cash crop economies, the rain dashes off with grit in its teeth and tears down our soil like a billion furious buzz saws.

from a paper by Russell Lord read before the Royal Geographical Society, London; April 30, 1945, Vol. IV, No. 3, Page 315.



Neither our logo above, nor the map on the right, totally describe The Land. The wind machine against the sun represents the goal of developing renewable energy sources. The terraces, shelterbelt planting, prairie plant nursery and unmowed prairie represent values associated with a sustainable agriculture. Visions of a sustainable agriculture and a sustainable society are needed to stimulate our imaginations in the search for alternatives.

We invite readers to help us present these visions by sharing sketches, designs, photos, and articles which contribute toward an understanding of what a sustainable society could be like. Submit your dreams to THE LAND REPORT. We will publish those images which, in our judgment, can help in the search for sustainable alternatives in agriculture, energy, shelter and waste disposal.

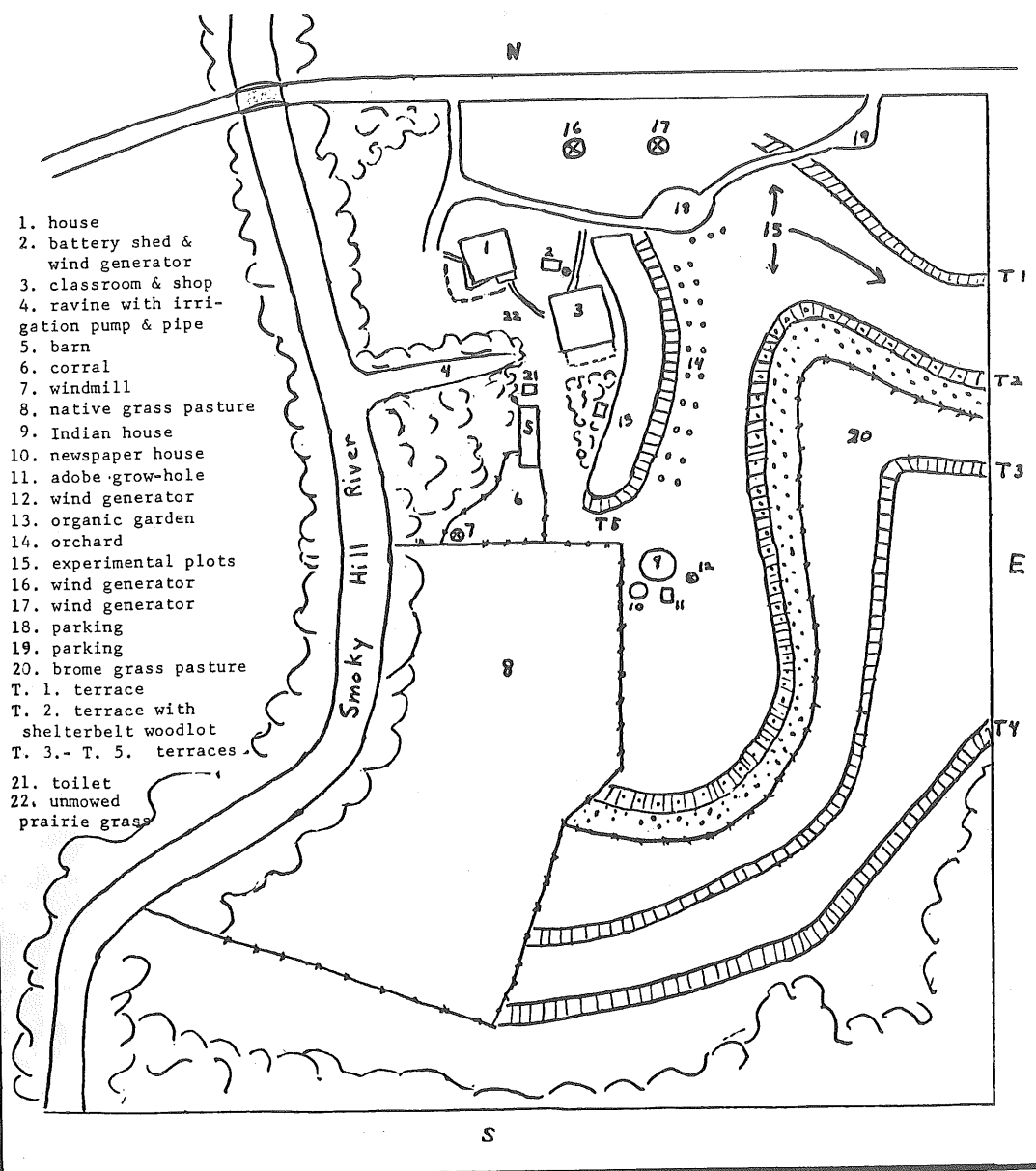
Dana Jackson  
Editor

## Friends of The Land

The Friends of The Land have been extremely important to The Land Institute. Many helped collect materials to build the first building; many donated time and labor after that building burned to help start reconstructing the classroom/library/shop. Friends donated books and money to help develop another library. The Land needs these friends, and new friends too.

The Land Institute is a private, educational-research organization, financed by student tuitions and private gifts. Contributors receive THE LAND REPORT, any special publications, and notices of interesting events at The Land. The Land Institute is a non-profit organization, and all gifts are tax deductible.

# THE LAND



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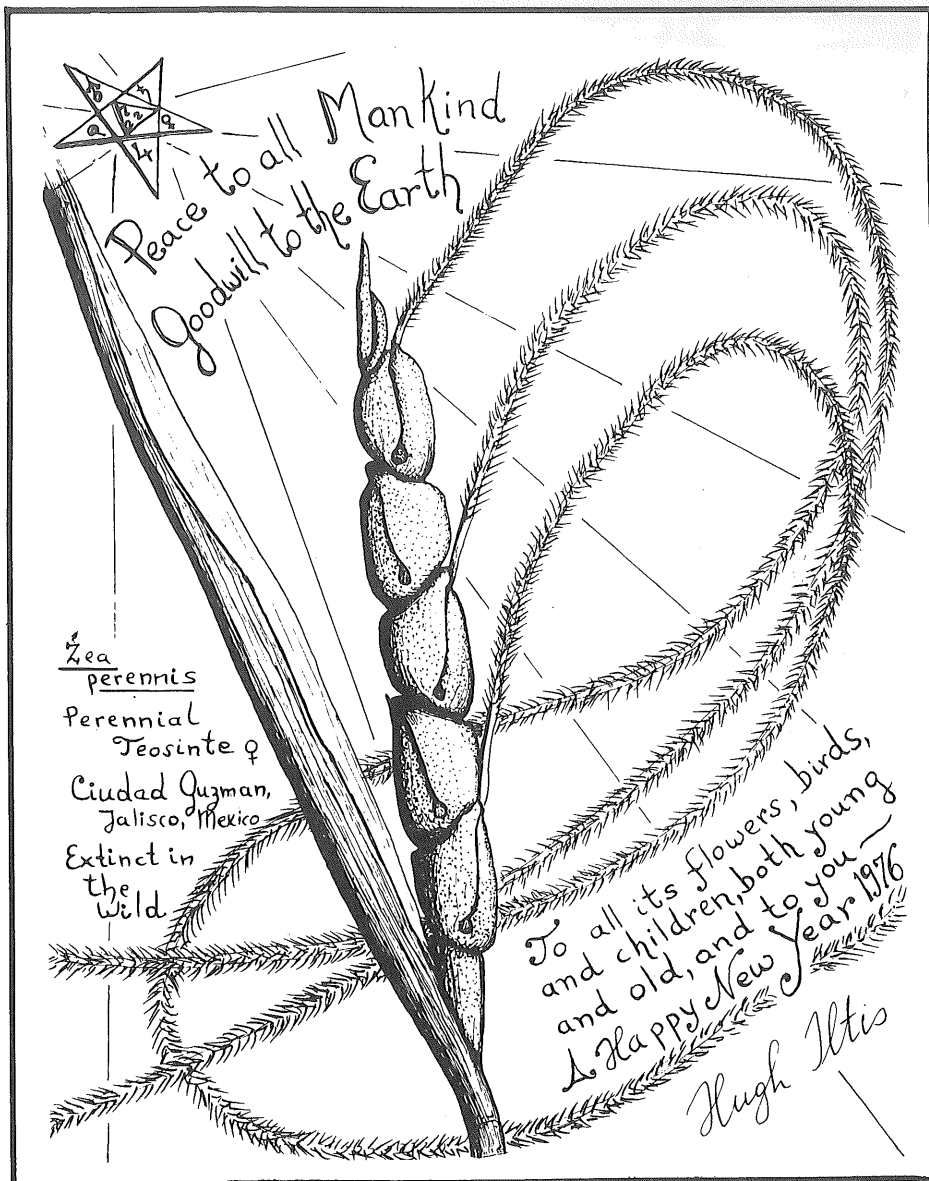
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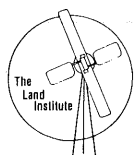


## Chapule Greets 1979

Dr. Hugh Iltis of the Univ. of Wisconsin sent the greeting card on the left to friends in 1976. In September, 1978, a student at the Univ. of Guadalajara in Mexico, who had seen the card, found the supposedly-extinct teosinte plant growing near a tiny village in the state of Jalisco. Rafael Guzman informed Hugh Iltis of his discovery. When Iltis and another student joined Guzman, they soon found another variety of teosinte called "Chapule" by local residents. The discovery was extremely significant because the plant is a perennial, and it has the same number of chromosomes as corn. Dr. Iltis observed hybrids between corn and "Chapule" growing in the wild.

In 1979 Dr. Hugh Iltis sent the greeting card which appears on our front cover, announcing the discovery of the perennial relative of corn. Wes Jackson describes the importance of this find to The Land's search for alternatives in agriculture on page 12 of this issue of THE LAND REPORT.

The picture of Chapule on a New Year's greeting card was particularly relevant in 1979, the INTERNATIONAL YEAR OF THE CHILD. The potential for developing perennialism in corn could be one of the greatest gifts ever given to the children of the world. Dr. Iltis is quick to point out, however, that no efforts to improve production or the dependability of food crops can offset the increasing demands for food by the world's exploding human population. Population control must accompany research and development of food crops.



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