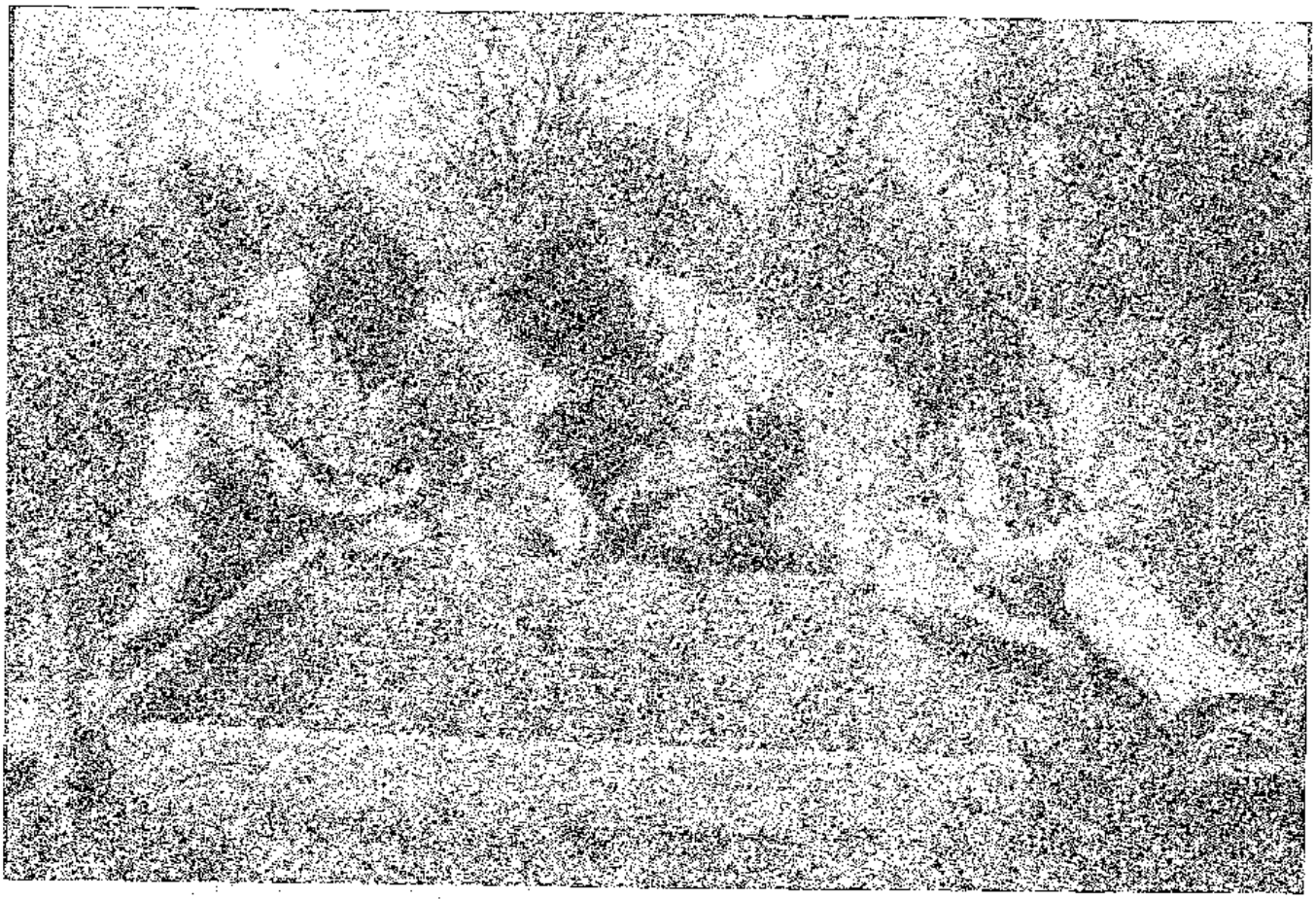
THE LAND REPORT

Number 5

Summer, 1978



Inside:

The Brontosaurus is Dead: Long Live the Sun!

Does the Prairie Practice Companion Planting?

The Future of Solar Utilization

On the Cover:

Joyce Fent (center), assists Jim Peterson and Maureen Hosey in the Companion Planting study. (See page 25). Cover photo by Terry Evans.

Editor's Note:

The editor finds each issue of THE LAND REPORT more challenging as our activities increase. The timing of this number has been affected by the usual production problems, plus the demands of our chosen lifestyle. Strawberries, peas and beets had to be harvested and preserved, and the rest of the large organic garden, which provides most of our vegetables year around, could not be ignored while we worked on THE LAND REPORT. This number has been "organically delayed," one might say. Perhaps to the reader accustomed to making schedules based on people's activities, rather than nature's, this may seem no proper excuse. However, trying to live more in harmony with the earth requires one to conform to nature's cycles. We just hope THE LAND REPORT can be mailed before the corn and beans are ready to harvest and preserve!

The Land Report

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

Contents

Last Free Issue

The Land has been sending THE LAND REPORT to a large mailing list free of charge. However, because the publication is now much longer and more expensive to produce, we cannot continue this practice. THIS IS THE LAST FREE ISSUE. If you wish to continue receiving THE LAND REPORT, and you are not already a subscriber or a Friend of The Land, please clip the subscription form on the back cover and send it along with your check. We urge you to do this right away so you will not miss the special fall issue.

At The Land . . .

Amory Lovins to Visit in October

Amory Lovins, a well-known proponent of energy technology based on renewable resources, will be a guest at The Land during his Mid-America tour this fall. He is scheduled to be in Salina on October 21 and 22. A conference on the international implications of the soft energy path is being planned, and details will be announced in September.

Amory Lovins resigned a Junior Research Fellowship at Merton College, Oxford, in 1971 to become the British Representative of Friends of the Earth. A consultant physicist since 1965, he now concentrates on energy and resource strategy. His current or recent clients include several U.N. agencies, the MIT Workshop on Alternative Energy Strategies, the Science Council of Canada, the U.S. Office of Technology Assessment, and Resources for the Future. He is active in international energy affairs and has testified before parliamentary and congressional committees.

The author of numerous technical papers, reviews and articles, and six books, Amory Lovins has become particularly well known in the past year for Soft Energy Paths: Toward a Durable Peace, published by Friends of the Earth in 1977. "Energy Strategy: the Road not Taken," Chapter 2 of his book, was first printed as a paper in the October, 1976 issue of Foreign Affairs. The reprint by Friends of the Earth was widely distributed and has become an environmental classic.

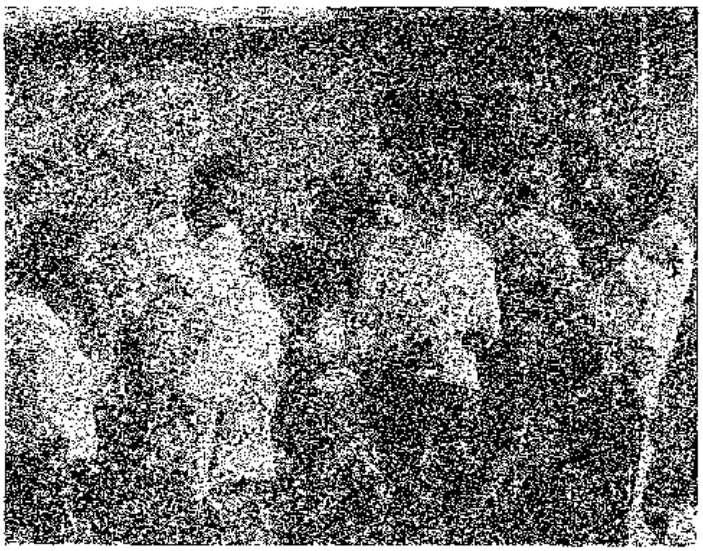
Members of the Board of Directors of The Land Institute discussed the paper at a March meeting and considered the challenge of making other people familiar with Lovins' concepts. On May 17, Gordon Maxwell and Sam Evans presented a thorough and absorbing review of Soft Energy Paths for other board members, students and a few friends. The consensus of the audience was that a concerted effort should be made to educate friends and acquaintances about soft energy before Lovins speaks in Salina. Step one of this effort follows on page 14 in a book review for readers by Karen Black, member of The Land Board of Directors.

Symposium on Soft Agricultural Paths

An invitation to attend a day of discussion at The Land began: "Because sunshine is dispersed rather evenly over the earth; because nature's three dimensional solar collectors called green plants, with an efficiency in the neighborhood of one to two percent, are also dispersed; because these collectors are so critical to the rest of life forms, including humans; because the substrate for growing these collectors in the U. S. is eroding at the rate of nine tons per acre per year; because some four to eight percent of our fossil fuel consumption (22% of the interruptable supply of natural gas) goes into our agricultural efforts; it seems we should start thinking very hard about how to 1) live on a renewable energy source, 2) cut erosion to the level of replacement, 3) reduce pesticide application to near zero."

Twenty-two invited participants came to the symposium at The Land on June 3 and thought hard about how to take these three steps toward a soft agricultural path. The "Prairie Think Tank" was given the task of identifying the elements of such a "balanced terrarium," and making suggestions as to how the elements might be integrated. Members of the group found it difficult to focus on the technology for work and shelter which would be part of the soft agricultural path. The need for changes in ethical systems, for a common philosophical approach to agriculture held by both producers and consumers formed the basis for much discussion.

Those who attended this first, all day discussion were Jim and Sue Lukens, organic farmers from Beloit, Kansas; Jim Gray, organic farmer from Geneseo; Rob Aiken, Small Farm Energy Project, Hartington, Nebraska; John Aiken, Lever Wrench, Glenvil, Nebraska; Steve Blake, Sunflower Power, Oskaloosa, Kansas; Bob McBroom, Holton, Kansas; John and Carol Craft, Hillsboro, Kansas; Dwight Platt, Bethel College, Newton, Kansas; Max Terman, Tabor College, Hillsboro, Kansas; Bill Ward, founder of WINDUSTRIES, Shawnee Mission, Kansas; Phil Haves from Great Britain, a summer associate at The Land; Jim Peterson, associate at The Land; Wes and Dana Jackson of The Land; and spring term students: Maureen Hosey, Jeff Brown and Mel Stampe.



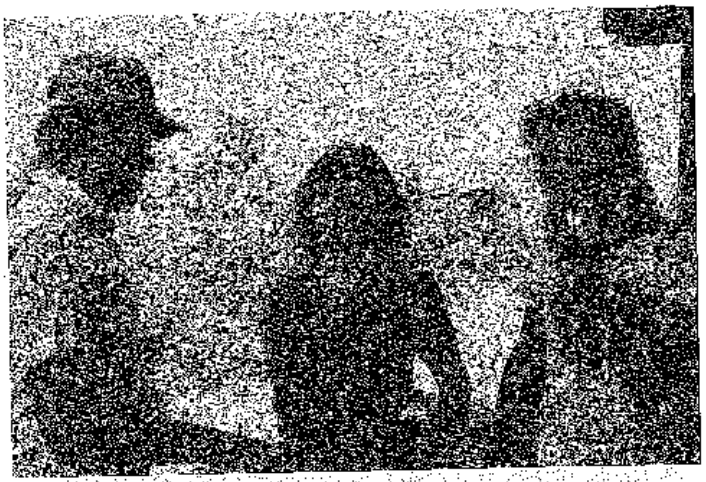
On Being a Student at The Land

More than once since I've been a student at The Land, I've been asked the questions: What does The Land Institute qualify you to do? What type of degree will it provide? Often I find my response a long-winded explanation which only adds to the confusion and leaves the questions still hanging, much to my chagrin. Of course, they are the wrong questions. If someone asked, "What are you learning at The Land that you couldn't learn in the university?", I could answer by comparing time spent as a student here to an equivalent amount of time spent at a conventional school of higher education.

While a student at a large university, it was difficult for me to realize I was an individual with something to offer and not just "another number." Because of the limited number of students at The Land, each person is seen in light of what she or he really is. Though strangers at first, we have evolved towards a thinking and loving community, struggling with ourselves and the problems of the day.

As opposed to just classroom learning with only rare opportunities to have outside experience, "learning by doing" is an integral part of the educational process here. To complete a project, a student may need to learn to weld, to use a cutting torch or carpenter's square, to measure BTU's, to roof a building, to plumb with plastic pipe, to operate a table saw, to mix concrete or to learn how to use a plant taxonomy book. Such things as sowing seed, shoveling dirt, raising chickens, or chasing Brownie, the Jacksons' cow, back to the pasture are not merely chores to be done, but rather valuable lessons in themselves.

Instead of having one professor for a course all semester as in the university, various people have been teachers as they have shared their experiences with us at The Land on a wide range of topics. Guest speakers do more than impart information; they share with the group, in a personalized manner, experiences and ideas that are of importance to them and which merit group consideration and discussion.



Wes, Maureen and Jim.

There are no grades given at The Land, yet success or failure is deeply experienced. If a project is undertaken and for individual reasons not pursued, then failure is evident to all. Having read the assignment is imperative in the small discussion group, or discussion is impossible. Sometimes discussions are intensely satisfying or stimulating; sometimes they must be postponed until everyone is ready. Again, success and failure are evident. At the end of the session, each person knows within himself or herself what has been learned and accomplished, in spite of having no grade assigned.

It is doubtful that the real value of this year will be fully realized right away. Nevertheless, I have gained a deeper appreciation for the earth and the determination needed to make the years ahead an endless education.

Maureen Hosey

Search for an Ecological Utopia

A unique situation existed at The Land this term because for the first time, students had been given the option of attending a second session. As in the one room schoolhouse, there were some students who had already considered the books that are usually read each session, and others who had not. It was felt that an interchange of ideas involving the whole group was necessary. Wes suggested that we center a discussion around a search for a Utopia as a means of value clarification for The Land as well as the students. The initial response of some was that this was too vague or too broad a topic. But in the course of debate, we realized that there were many loose strands in the experience at The Land. Tamped earth houses, solar collectors and wind generators as single entities do not create a future. It became apparant that the problems and questions we would have to deal with in developing a Utopian scheme would knit some of these strands into a more unified vision.

Once we had agreed that this was an appropriate topic, the next problem was to decide upon a procedural approach. One of the basic tenets of The Land is that a true vision of the future is impossible without a full awareness of the past. In accordance with this, we invited several friends of The Land who have a broad acquaintance with the various fibers of our past. In particular, we were interested in knowing about our religious, political and philosophical heritages as they related to our topic. The first of these visitors, Giulio Tambalo, former student of philosophy at the University of New Mexico, provided us with an introduction to the Utopian idea. He argued

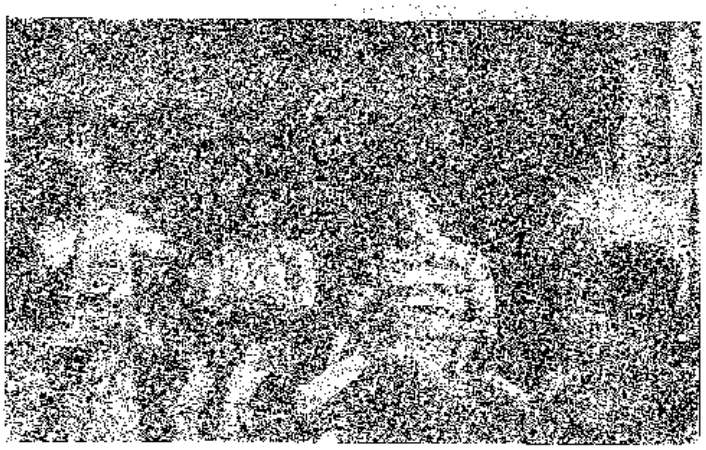
that Utopian thinking is well rooted in human nature and necessary for human development, and that it is valuable even if it never reaches fruition. Next, Rev. W. E. Cassell, Professor emeritus of Kansas Wesleyan's Religion Department, discussed the Judeo-Christian ethic and outlined the common bond that exists between the Jewish and Christian traditions.

Finally, Dr. Charles Giles, Professor of Political Science at Kansas Wesleyan, talked about the political structure that forms the basis for any human endeavor He contended that any ethical system is based on the technology or techniques of survival. He argued further that four modes of political organization follow from that proposition: 1) An otherworldly ethic with values geared toward the pilgrimage through this life to another; 2) a land-agrarian ethic based upon an agricultural technology which is conservative and interested in controlling an environment to insure future security; 3) a trade or exchange ethic in which the prevailing attitude is that everything is negotiable; 4) a competitive warrior ethic which evolves a system of hero worship and faith in individual prowess and is characterized by a will to dominance.

For the next several weeks we met about twice each week to discuss these ideas and attempt to formulate some principles on which an ecologically sound Utopia might be based. During the course of these discussions, a central idea emerged which guided our thinking through the rest of the discussions. The supposition was that from the point of view of the ecological systems, man is unnecessary as he now exists, and in fact is a burden. Each ecosystem, (forest, grassland, sea) is moving toward a state of permanence within which change is the ruling modality. Diversity of form seems to be a necessary condition in nature. Man has simplified these natural systems through monoculture of crops, elimination of pest species, and destruction of habitat, thus decreasing the gene pool so that there is rapid change with little permanence.

We found that the Utopian idea was becoming a strong undercurrent in all of our activities. The principle of serendipity began to operate, and apparently unrelated and diverse situations provided input to the discussion. For example, Lothar Schweder, a linguist-philosopher friend of The Land, spent a morning analyzing "The Idea of Order at Key West" by Wallace Stevens. This poem deals with the question of whether the world's existence depends upon man. It describes a woman walking along the beach singing:

She was the single artificer of the world
In which she sang. And when she sang, the sea,
Whatever self it had, became the self
That was her song, for she was the maker...
...there never was a world for her
Except the one she sang and, singing, made.



Mel, Tom and Wes find Jeff's point interesting.

Stevens concludes that through the naming of things, man creates an order of nature, and that without man nature does not exist. This idea led to one of the several confrontations over what ethical principles or myths would form the basis of the Utopia. Again and again man's value, over and against nature's, was a hotly contested issue. This was the bottom line in regard to the supposition of man's dispensibility in the natural order: What is our value vis-a-vis nature?

Once again at the Doane College conference we were reminded of the significance of the questions we were addressing. Dr. Alexander King, one of the founders of the Club of Rome, described in detail the many problems that now confront the world. He closed by suggesting that the best approach to the solution to those problems lay in engendering a sense of caring for one's children and grandchildren. This would manifest itself in our effort to establish a new world order. Carter Henderson, co-director of the Princeton Center for Alternative Futures, indicated that the trend toward more simple lifestyles would turn us away from thinking about scarcity of material goods and we would focus on the plenitude of intangible, vital experiences like romance, the arts, conversation, reading etc. These remarks provided an affirmative direction for the course of our Utopian thinking.

In the final week of the session, Fred Elliott, artist and sign painter, visited and talked to us about Dadaism, an avant-garde art movement of the 1920's and 1930's. One of the hallmarks of Dadaist thinking was that self importance must be deflated. Fred contended that this dictum should continue to operate in our lives. (Here again was a serendipitous connection to our previous discussions.) Man, through his feeling of self-importance, has separated himself from nature and thereby distorts his place within the natural systems.

There were many other visitors to The Land who contributed to our evolving concept of a Utopia. The Utopian discussion continues as many of the questions which emerged during the session still remain unresolved. One important mode of continued communication is the compilation of readings in a book which we have called the WEB, the Whole Earth Book. Among the articles "canonized" for inclusion in the WEB are a selection from Thomas Merton dealing with the value of the contemplative life, "Odyssey" by Aldo Leopold which compares the journeys of two atoms through the prairie ecosystem before and after the appearance of Europeans, and "The Great Kern County Mouse War" by Kennedy P. Maize which tells a story of the consequences of man's lack of appreciation for the complexity of the natural order.

David Brower has often referred to environmentalism as a religious movement. The WEB is a religious document which conveys our sense of the sacred importance of nature and our hopes for the future. The WEB will provide future students with a basis for continuing involvement with the ideas that have been discussed and will form a bond between each new group of students and those who have already participated, since each group of students will make contributions.

Mel Stampe and Jim Peterson

Visitors are Teachers

There were many days in February, March and early April when we were snowbound or mudbound in the classroom and could make no progress on our outside projects. This was an intense period of reading and discussion, and keeping the two wood-burning stoves going. When the spring warmth finally came, students began to spend more time working outside, and more visitors came to share ideas and experience with us.

While it was still fairly cold and muddy, E. Raymond Hall, Professor emeritus of Kansas University, former director of Dyche Museum, and author of the Mammals of North America, spent a morning with us around the stove. He told about the changes in animal populations as habitats were altered in Kansas, and he described his efforts to prevent a piece of prairie land from going under water because of a dam.

Five people came who talked specifically about solar or wind energy. Greg Gardner, and later Harold Leibowitz, midwest SUN DAY organizer, came to discuss solar energy prospects. Bob McBroom from Holton, Kansas and Steve Blake of Sunflower Power, Oskaloosa, Kansas, probably the two men in Kansas most knowledgeable about wind-generated electricity, sat in the classroom with John Craft, The Land's wind expert, and provided a pool of information and understanding about wind energy. Bill Ward of Windustries spent a morning later in the spring with students sharing his ideas about the potential of wind power.

Friends of The Land living in Colorado described some of the environmental problems faced in that state. Margo and John Burnham told about strip mining, and John, an engineer with experience in the design of equipment to extract oil from shale, gave a good description of the process. Rob and Cyndi Mohler have been learning about land use problems around Fort Collins, Colorado where they live, and they told about efforts in the area to change patterns of development.

H. O. and Thelma Wright discuss the problems of labor and the environment with each group of students. This term H. O. talked about the American Agriculture Movement as a labor movement and pointed out that the movement was a strike of capital (farmers withhold their land and equipment from production) as well as a strike of labor. A broad view of the potential of agriculture and the agricultural way of life was discussed when Charlie and Elsie Novak, David Novak and Lisa Paulson from Crete, Nebraska, spent a day talking about Charlie's "Balanced Farm Proposal."

Jan and Cornelia Flora from the Population Research Laboratory at Kansas State University talked to us about China. Their slides revealed the tremendous accomplishments of a labor-intensive society. Elvin Frantz of the Christian Overseas Relief Program (CROP), and about sixteen members of the Kansas Hunger Consortium, a group of pastors and lay people who work to alleviate hunger throughout the world, joined us that day. They brought sack lunches, and we ate our noon meal together in a pleasant atmosphere for getting acquainted.

Dodge Engelman, a medical doctor in Panama, talked to students about his experiences. Nancy Mil , member of The Land Institute Board of Directors, spent a day as a participant in all that was going on.

In our search for a holistic philosophy, the importance of the arts is not ignored. Students enjoyed a presentation on photography by Terry Evans, and a discussion about Dadaism by Fred Elliott. These friends of The Land shared ideas through frequent personal contacts with students during the entire semester.

Our last visitor of the spring session was Reverend Richard Taylor of Kansans for Life at Its Best, who works to prevent increased consumption of alcohol in Kansas.

Most of these visitors were scheduled in advance, but there were some who dropped in to see what was happening at The Land, and we took advantage of the opportunity to learn from them. We welcome Friends of The Land who wish to speak to students about their concerns. Special notice ahead of time is appreciated so we can clear our schedule and prepare for the topic of discussion. The general public is welcome to visit, but a prearranged appointment is necessary. Write or call The Land (913-823-8967) in advance.

Dr. & Mrs. E. Raymond Hall.

The Land Library

When students met in the Jackson house after the fire in October, 1976, The Land Institute had no books and periodicals, not even a dictionary. Harry Mason brought out two dictionaries and the Ehrlichs' Population, Resources and Environment two days after the fire, and a few days later Wendell Nickell loaned us the Whole Earth Catalogue, Foxfire and some other books. The new library was born.

It was exciting when the first gift box of books arrived in the mail. Friends in Kansas City organized a book drive which yielded many worthwhile contributions, and other individuals began to send books and back issues of magazines. Gradually the shelves in the house were filled, and we had to store boxes of books in Harry Mason's basement.

By April, 1977, the ground floor in the new building was roughly ready for our library. Jim Kohring (see LAND REPORT no. 2) and Giulio Tambalo began to file papers and arrange books on shelves. It was dusty, and too accessible to mice, but we felt that we resembled a school again with books out of boxes and on shelves.

In September, 1977, the books were moved into the classroom area of the building, although the room was far from finished. Students shook sawdust off magazines all fall, and were glad when windows and doors finally were trimmed, more shelves were built, carpet was laid and the room became a pleasant place to read and study. The room was ready by December 18, just before the cold winter really set in.

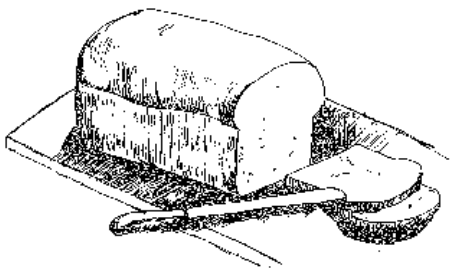
The biggest loss to Wes from the fire was his collection of biology, botany and genetics texts, accumulated during years in graduate school and as a college teacher. When Aaron Blair sent several boxes of botany and genetics textbooks, Wes was amazed by how many were duplicates of books which had burned. Of course, the autographed copy of Stevens' Kansas Wild Flowers or other books given to him by Dr. Worthy Horr, former professor of botany at Kansas University, could not be replaced. However, the biology section of the library has continued to grow through gifts from Lou Forster and Gary Hartshorn and others. Three boxes of books from Gary Hartshorn arrived in May, many of them duplicates of important books destroyed in the fire.

The Smoky Hills Audubon Society continues to keep its collection of books on wildlife in our library. Members have access to all our books and can use the classroom-library room in the evenings and on weekends.

Significant gifts of money from John and Diana Dahlquist, George and Marilyn Chlebak and Dodge Engelman have allowed The Land to purchase books and magazine subscriptions. Wendell Nickell contributed money to purchase several volumes of The Land Quarterly, a valuable collection of magazines from an organization no longer in existence, especially important in our search for alternatives in agriculture.

The Overseas Development Council has granted $100 to The Land for purchase of books on third world food and development issues. As a participant in the Transnational Dialogue to South Asia, Dana Jackson was eligible to apply for a grant from a seed money fund established to help participants continue the dialogue about third world development with their constituencies.

The Land Institute appreciates the gifts of books and money and hopes to continue to receive donations to improve the library. We welcome suggestions about significant books to buy, and will also welcome help as we establish a catalogue system and organize the library more efficiently.



Bread Retreat is New Experience

Bread is the most basic food in our culture. Unfortunately, many people eat bread all their lives and never taste bread, the real stuff, whole grain, hot out of the oven with butter melted on the top. Even more people never stop to contemplate the magic which happens when yeast is put into wet flour.

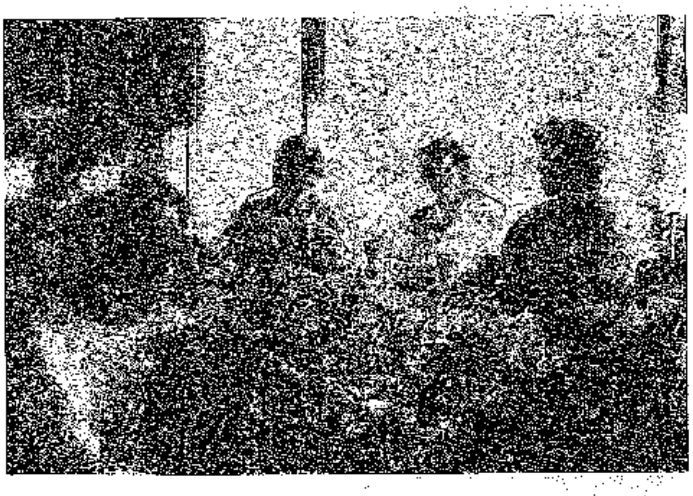
We set aside a day at The Land for a Bread Retreat, a day to bake real bread and taste it, a day to think about the significance of bread as it connects us to the Earth. Sister Rebecca Heidlage and Sister Mary Alice Guilfoil originated the concept of a bread retreat and developed the

ritual and the procedures which make the experience memorable. The two Benedictine sisters from Atchinson, Kansas, asked everyone to treat the day as a special day, and no one was supposed to work on projects or jobs which were part of the normal routine.

We began by examining the elements of bread, the ingredients, such as yeast, cracked wheat, wheat germ and bran and whole wheat flour, which were passed aroud to touch, taste and discuss. The sisters blessed each ingredient in a ceremony which heightened our awareness of the elements of bread. Then we baked bread, all ten of us working harmoniously together in a small kitchen. The sisters provided the recipes, but students had assembled the ingredients which were placed on a special table. By noon, everyone had two loaves of bread rising in pans, plus a small test loaf to taste. The breads were baked in two ovens, and as one batch was finished, another pair of loaf pans was put into the oven. While waiting on bread to rise and bake, we took walks, visited with each other, and read some of the books which the sisters provided, books about breads in many cultures around the world, and books about world food and hunger issues.

By the time the last loaf was baked, we had tasted cracked wheat bread, Tassajara whole wheat bread, water bagels, health bread, whole earth bread, Swedish rye, dark pumpernickel, sweet oatmeal raisin bread, English muffins and Jewish Challah.

The Bread Retreat concluded with a ceremonial soup supper, served with the large and beautiful Jewish Challah which Sister Mary Alice had made.



New Alliance

The Land Institute Board of Directors and the Board of Trustees for Kansas Wesleyan have approved the development of a cooperative program in environmental studies. Details will be worked out during the coming academic year.

Arbor Day Service Honors E. F. Schumacher

On Arbor Day, May 28, at 4:30 P.M., friends gathered outdoors at The Land for a service in celebration of the life of Dr. E. F. Schumacher, honorary member of the board of directors of The Land Institute before his death on September 4, 1977.

The program was brief, but moving. After Wes Jackson had welcomed the group, Ivy Marsh presented a biographical sketch of Dr. Schumacher. Sister Mary Agnes Drees of Marymount College then read Psalms 1 and 23 from a modern translation called Psalms Now, by Leslie F. Brandt, which described Dr. Schumacher and his faith. The following excerpt is from Psalms 1:

The man who chooses to live a significant life
    is not going to take his cues
        from the religiously indifferent.
Nor will he conform to the crowd
    nor mouth his prejudices
    nor dote on the failures of others.

His ultimate concern is the will of God.
He makes his daily decisions in respect to such.
He can be compared to a sturdy tree
    planted in rich and moist soil.
As the tree yields fruit,
    so his life manifests blessing for others.
His life is productive and effective.

Everyone reflected on these words as Nancy Clark played a flute solo by J. S. Bach. The sweet, clear notes floated over the alfalfa field, above the sound of the wind, communicating between people and Earth mutual gratitude and appreciation for the life of E. F. Schumacher. Steve Burr read part of a speech given by Dr. Schumacher during his U. S. tour in 1977, in which he spoke of the tree as a three dimensional solar collector, and urged more consideration of trees as food crops. Two Chinese chestnut trees were planted by students Mel Stampe, Tom Moore and Maureen Hosey just south of the alfalfa field driveway. They will be marked, so that through the years Dr. E. F. Schumacher will be remembered by those who notice the trees.

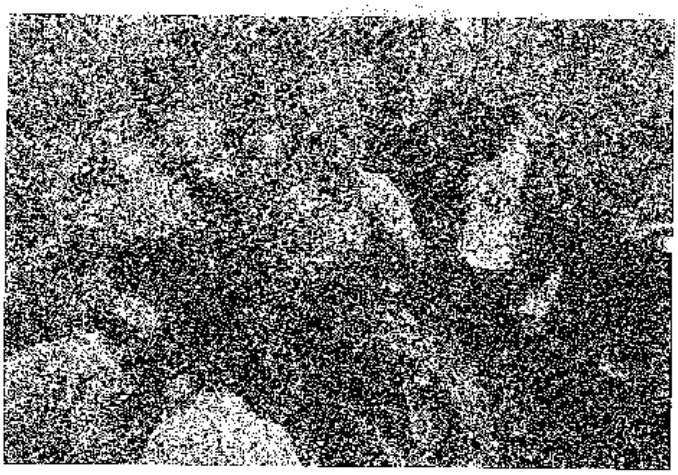
Mushroom Workshop is Popular

A group of enthusias' .c mushroom hunters, some novices and some highly experienced, attended the mushroom workshop at The Land on March 31 and April 1. People came from as far away as Lincoln, Nebraska and Kansas City, Mo. to learn about collecting, identifying and preparing mushrooms from Dr. Harold Keller of Wright State University, Dayton, Ohio.

Dr. Keller is a member of the Mycological Society of America, the North American Mycological Association, the Ohio Academy of Science and the Ohio Mushroom Society, and is the author of many papers published in professional journals. He teaches a popular course at Wright State Univ. called Biology of Lower Plants, a study of the morphology, taxonomy, ecology and economic importance of algae, fungi and bryophytes. Students experiment with bread, cheese and wine making, demonstrating the practical application of microorganisms in lower plant life in food production. Dr. Keller's experience in mycology and especially mushroom hunting was enthusiastically shared in the workshop which he conducted at The Land.

The workshop began on Friday evening with a slide presentation on poisonous and edible mushrooms. It continued on Saturday morning with instruction on keying out fungi, methods of collecting, and general safety principles. Dr. Keller distributed an instructional packet which he had put together for each participant. Following lunch, Dr. Keller led a foray into the Jackson woods. April 1 was too early for spring mushrooms, but participants found an amazing number of old specimens on trees and decaying limbs and kept the visiting mycologist busy answering questions. One fresh fungus was discovered, however, a small puffball on a stem. The National Fungus Collections at Beltsville, Maryland, has identified the stalked puffball as the rare Tulastoma lloydii Bres.

Although the absence of edible mushrooms in the woods on April 1 was disappointing, this did not cool the enthusiasm of those attending the workshop for mushroom hunting. Because of the instruction on identification they felt confident that when the earth became warmer later in the spring, they could successfully and safely find the edible mushrooms. The popular morel did not appear at The Land until April 17. The small gray variety was followed by the larger yellow morel during the first week of May. We would like to know what mushrooms the workshop participants found this spring and when they were found. We won't ask that the location be revealed, and we probably won't reveal the exact location of our morel area at The Land either!



Harold Keller describes a fungus find to Judy Clements, Russ Brehm, Donald McCrory, Mel, Wes and Steve Hetzke.

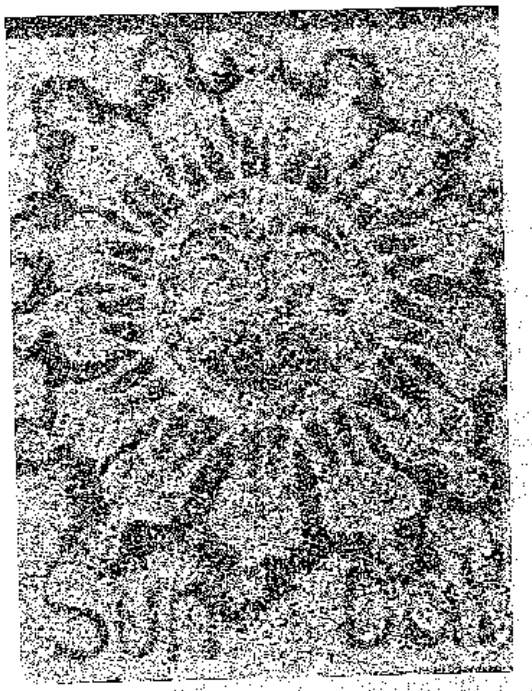
Home Gardening the Organic Way

Gardeners with various levels of experience attended the first organic gardening workshop at The Land on March 11. The workshop was scheduled just six days before potato planting, and a few days before starting tomatoes and peppers in flats. Most people were beginning to think about gardening, but as spring had not yet arrived no one had done anything except look through seed catalogues and perhaps order seed. Although March 11 was a rather cold, rainy day, participants felt summer warmth as they remembered the yellow-green lettuce of May, the red beets of June, the yellow squash and beans of July, and the red tomatoes of August. Second thoughts also reminded them of the bindweed of May, the squash bug of June, the cucumber beetle of July and the tomato hornworm of August.

Planning the garden, preparing the soil and planting the garden were topics discussed in the morning session. Dana Jackson, coordinator of the workshop, introduced the factors to consider in planning a garden. Maureen Hosey described the French intensive method of gardening in 5 X 20 feet beds which have been double dug. Michele Adams told of the advantages of cold frames for extending the growing season or getting an early start. The topic of soil preparation was presented by veteran organic gardener Ted Zerger. Ted spoke about the importance of obtaining organic materials for mulch or compost and possible sources of organic materials. A display table with garden books and magazines was available for consultation during the coffee break and lunchtime.

After lunch the problems of weeds and insects were discussed. Dr. Lawton Owen, entomologist from Kansas Wesleyan, projected diagrams of the life cycles of common garden pests such as the cabbage worm, cucumber beetle and squash bug on a screen and suggested stages in the life cycles when the insects were most vulnerable and their populations could be decreased. Nancy Sundgren and Jim Gray, members of the Kansas Organic Producers, explained how they coped with insect pests and what methods of control they had tried. Throughout the workshop, everyone shared his particular experience in gardening, and through this approach all were teachers and all were students.

This workshop will be repeated next spring at The Land, hopefully followed by a summer tour of participants' gardens. We would like gardeners to keep records of successes and failures this summer and help design the agenda for next spring's workshop by communicating with THE LAND REPORT about gardening experiences.



SUN DAY Rained out!

The unthinkable happened. It rained in Salina on SUN DAY. The day began with a cloud cover, but as it was not raining we stapled the colorful SUN DAY banner, created for us by Marcie Schwartz, on the outside north wall of the building and prepared to greet the nineteen junior high and senior high science classes scheduled to visit The Land for our SUN DAY program. While the fourth class was here it began to sprinkle, and by the time the fifth group arrived it was raining steadily. We decided to postpone SUN DAY for a week.

On May 10, a beautiful, bright, sunshiny day, we celebrated SUN DAY. Jim Peterson, Michele Adams, Maureen Hosey and Dana Jackson met each class as it arrived and guided students to the three instructional stations. Mel Stampe and Wes Jackson explained the principles behind the solar cooker, solar food dryer, and the solar heating system on the classroom building at the first station. Jeff Brown described the tamped earth structure and the sun-dried adobe brick experiment at the second station. The use of the sun's energy through wind electric systems was explained at the third station in the shop by Tom Moore. Tom showed students the battery bank and talked about the Jacobs wind generators. John Jankowski, an architecture student at Kansas State who did the first work on adobe at The Land, and John Craft who fixed the Jacobs wind generators, built the towers and installed the system, were both at The Land on May 3, but were unable to return on May 10.

Approximately four hundred students were guests on SUN DAY, including the classes of Dee Widler, Kevin Waite and John Bastin from South High School, Mrs. Ginny Usher and Ms. Mary Nielson from Roosevelt-Lincoln Junior High, John Kline from Southeast of Saline, Sister Mary Reiter of Sacred Heart High School and Janet Glazier of Brookville High School.

The national SUN DAY organization provided many free materials on solar energy, including bibliographies and pamphlets from the U. S. Dept. of Energy. The Land Institute set up displays to distribute these materials at the Salina Public Library, the Y. W. C. A. and the Prairieland Food Cooperative distribution site. The Sunrise Presbyterian Church made them available to its congregation and also borrowed the slide-tape program which The Land purchased for SUN DAY. All teachers visiting The Land were provided with materials for their classes. We still have many pamphlets and bibliographies to give away for the asking.

Jeff describes the Grow Hole to SUN DAY visitors.

Although there was not much activity in Salina, Kansas on SUN DAY (the only other activities were planned by a Marymount College environmental problems class), it has been estimated that between twenty and thirty million Americans in two thousand communities participated in solar activities sometime during the week of April 29-May 7. The major goal of SUN DAY was accomplished. National attention was focused on the reality that solar energy is practical now for supplying energy needs.

Two on-going organizations are being formed to fill some of the existing voids within the solar movement. Entitled The Solar Lobby and the Center for Renewable Resources, the organizations will lobby Congress and the administration, conduct policy research on solar technologies, and network with the SUN DAY coalitions across the country. Both groups will employ some members of the SUN DAY staff, including organizer Harold Leibovitz who visited The Land twice prior to SUN DAY.

The Alternatives Network

Prairieland food cooperative

The Prairieland Food Cooperative is in an important transition phase. Jan Peters, the able organizer and manager of the co-op, resigned at the end of May. A new manager, Sue Leikam, has been appointed, but she will be working fewer hours than Jan did under the new system. Recognizing the vulnerability of being so dependent upon one person, the cooperative has organized seven working committees or collectives, who are taking over some of the jobs formerly done by the manager and spreading responsibility among co-op members.

Each member belongs to a collective for a six month period, then changes to another collective. There are seven collectives: 1) Newsletter and mailing, 2) Packaging, 3) Food Ordering, 4) Distribution Day Coordination, 5) Bookkeeping, 6) Trucking and Clean Up, and 7) Calling. A specific list of jobs has been assigned to each group. A new administrative council, replacing the old steering committee, is composed of a representative from each collective.

The co-op takes orders and distributes food once a month at the Sunset Presbyterian Church in Salina. A good location is still being sought to establish a storage, collection and meeting place. Several refrigeration units from the old University Market are being stored at The Land until the co-op can use them in its own building.

Kansas Organic Producers

The Kansas Organic Producers are growing in importance to Kansas agriculture. This organization is composed of family farmers and organic gardeners who are dedicated to producing food in harmony with nature. They communicate with each other through meetings, committees, workshops, and their excellent bimonthly newsletter edited by Sue Lukens of Beloit, Kansas, sharing knowledge and experience in organic growing methods. Although they are not vigorously trying to convert all chemical farmers, their activities as an organization and their comparable farming success as individuals have caused growers using conventional procedures to observe them more carefully and ask questions about organic farming techniques.

Some K.O.P. activities are open to the public, such as the annual meeting which was held in Salina last February. William Lockeretz, principal investigator in the Washington University study comparing organic farms to conventional farms, was the major speaker at this meeting. Two workshops were also sponsored during the winter, one on consumer food cooperatives and one on biological pest control. A workshop on crop rotation is planned for the future.

The Land Institute is a supporting member of the Kansas Organic Producers. Their board of directors, education committee, and a group working on a proposal for VISTA volunteers have all met in our classroom building. The Land Institute values its association with the K. O. P. and looks forward to continued cooperation for our mutual benefit.

Workshops and Conferences of Interest

July 26-28. Hilton Plaza Inn, 45th & Main, Kansas City, Mo. 4th ANNUAL ACRES USA CONFERENCE. Focus is on eco-agriculture.

August 12, Grand Island, Nebraska. BIOLOGICAL AGRICULTURE WORKSHOP. The main topic will be "Organic Matter and Humus and its Relationship to Water Management, Compost and Nitrogen Management." There will be other topics as well as a tour of a local composting facility. For further information, contact the Center for Rural Affairs, P.O. Box 405, Walthill, Nebraska 68067.

August 12-17, Ohio State Univ. SIXTH NORTH AMERICAN PRAIRIE CONFERENCE. Prairie devotees will present papers on topics relating to prairie research, conservation and restoration. Wes Jackson will present a paper, "Soil Loss and the Search for a Permanent Agriculture."

August 28-31, Denver Colorado. SOLAR DIVERSIFICATION. The 1978 ANNUAL MEETING OF AMERICAN SECTOR OF THE INTERNATIONAL SOLAR ENERGY SOCIETY. For information about registration and program, write to The Colorado Energy Research Institute, 2221 East Street, Golden, Colorado 80401.

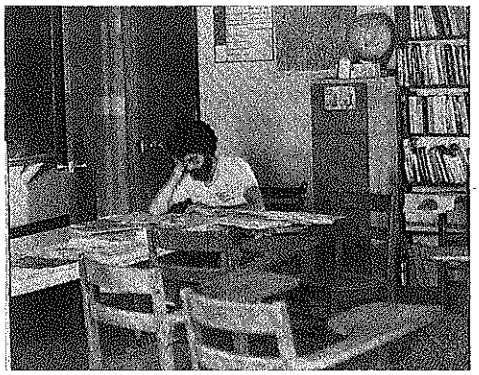
Alternatives in Energy

The Future of Solar Utilization

By Mel Stampe

Colorado and New Mexico are two states that are in the forefront of what is often referred to as the coming Solar Age, and it is for that reason that I recently spent ten days traveling from Albuquerque, New Mexico to Fort Collins, Colorado. Along the way I visited facilities doing research in solar energy, talked to people involved in the educational and promotional aspects of solar energy, and visited some solar heated buildings. This was all part of my effort to depart from The Land with some idea of the direction that the growth of solar energy utilization seems to be taking in the United States. The trip was extremely informative, and it stirred up many questions about the most appropriate direction and the one that is most likely to succeed in having a significant impact on the country. But assuming that it is inevitable that solar energy will play some role in solving the energy crisis, I see three distinct methods that might be employed to utilize solar. Although none seems to be exclusive of the others, it does seem likely that one of the three will dominate. Which of the three ends up occupying this position will be largely determined by the values that guide people in making choices. But I will say more about this after outlining the three methods using examples from the trip.

The first method can be characterized by terms like "grass-roots," "low," or "soft" technology and "do-it-yourself." One of the best examples of this which I encountered was Zomeworks, a company in Albuquerque started by Steve Baer that has developed several beautifully-simple solar products. The one that is probably best known is called "Drumwall." This is a passive solar heating system, that is, one without pumps or fans to move the heat around. It uses water-filled fifty-five gallon drums placed behind a south-facing glass wall to collect, store and distribute the sun's energy. Another of their products is "Skylid," an insulating, shuttering system for skylights that opens automatically whenever there is sunlight available and closes at other times to prevent heat loss through the skylight. The automatic control does not need an outside power source since the sun itself provides the needed energy to open and close the shutters. "Beadwall" is another of their products which



can be used in a passive system. It consists of two panes of glass separated by a space of about three inches into which insulating styrofoam beads are blown whenever there is no sunlight available. Besides selling these and other products, Zomeworks also makes available detailed plans of most of the systems for those who want to save money by doing the construction themselves, and all of their products have been designed simply enough to allow for this possibillity.

Another example of this method is work being done by F. Zangrando of the Physics and Astronomy Department at the University of New Mexico in Albuquerque. She is experimenting with what is known as a solar pond. When sunlight penetrates a shallow pond and strikes the bottom, the water there is warmed. Then, because warm water is less dense than cold, it rises to the surface and the heat is dissipated to the atmosphere. The solar pond acts as a solar collector and storage by preventing this convection, so that the heat is trapped at the bottom of the pond. The trick is to make the warm water heavier than the cool water on top by adding salt to the bottom few feet. The pond collects the solar energy all year long so that in effect the summer heat can be kept for winter use. By the end of the summer, the bottom layer of water can be as warm as 93 degrees C (200 F). The pond, which is about fifty feet in diameter and just over eight feet deep, is expected to satisfy the heating requirements of a 2000 square feet Albuquerque house with the water temperature dropping to about 30 degrees C (86 F) by the end of the heating season. Cost estimates place this system at about five dollars per square foot, excluding the cost of the land. Now a pond on this scale is almost as large in surface area as the home it would heat, but if it were expanded to service a small group of houses, this ratio would decrease because of the fact that the volume of the pond increasses much faster than the surface area as its size is increased. Thus this is potentially a very economically competitive system.

Some adobe houses around Santa Fe, which were designed by architect David Wright, are further examples of this first method of development. They are all passive, direct gain systems, that is they allow the sun to enter directly into the building by means of large areas of south-facing windows and allow the massive adobe walls to soak up the energy during the day and reradiate it at night. They make use of design features that are easily incorporated, make the best possible use of the energy striking the building, do not add significantly to the cost of construction and are aesthetically pleasing as well.

Assisting the growth of this method to utilize solar are those groups like the New Mexico Solar Energy Association in Santa Fe, who are not involved in the research or the marketing of hardware, but in the education of people about the techniques and advantages of going solar in a low technology approach. The New Mexico Solar Energy Association is a non-profit group that publishes a very informative monthly newsletter, offers solar workshops throughout the state teaching construction techniques and offers free engineering consultation to individuals building their own systems.

The second possible method of solar utilization in the United States involves a carefully engineered approach that gears the system to providing the needs of the individual building. The system is generally an active system that circulates air or water to move heat from the collector to the storage or from storage to the room. This is the approach that seems to be most visible at the present time and fits the image that most people have when they think about solar energy. It is exemplified by the commercially-built, standardized solar system that the user can buy "off the shelf" just like any conventional heating system. Within this type of solar development is a wide range of approaches, scale and sophistication.

I encountered several examples of this approach, the first being a fairly sophisticated system designed by a Santa Fe engineering firm for the new Indian Hospital Service Facility at the Institute for American Indian Arts. This automated system uses 557 three feet by six feet collector panels on the roof and 40,000 gallons of water for storage to provide sixty five percent of the heating and hot water load. The federal government is also involved in research along this path at Los Alamos Scientific Lab at Los Alamos and nearby White Rock, New Mexico. They are doing comparative studies of about forty different kinds of flat plate collectors, and have designed two relatively simple systems for use in mobile homes. The goal of this last project is to arrive at a solar home that is easily affordable by a large number of people who could not otherwise take advantage of the benefits of solar heating. They seem to be succeeding. Their estimates for a mass-produced, double-wide, three bedroom, solar heated mobile home place the cost at $25,000 to $30,000, very inexpensive as far as housing costs are concerned.

Los Alamos Labs have also designed the most complex system I saw that belongs to this second method of solar utilization. It heats and cools their Scientific Library and Study Center. The building is very modern in appearance and shows how well solar heating can be integrated into a building. The system is designed to provide 94% of the heating and 70% of the cooling load. The system even captures the waste heat from the lights and a good part of the heat that would normally be exhausted by the ventilating system.

Colorado State University in Fort Collins has a very active research program centered around four houses that are identical except for the heating systems, which include two kinds of flat plate collectors, an evacuated tube system designed by Owens-Illinois, and a hydroponic greenhouse to provide food as well as heat. These systems are being closely monitored so that a detailed analysis and comparison can be done. Every ten minutes, temperature and heat flow information is recorded on magnetic tape within each house, collector and storage system. This is then periodically compiled and summarized by the University's computer, along with weather data collected at the site

The third method that solar development might follow is the antithesis of the first. It involves, for the most part, the centralized conversion of sunlight to electricity, but includes other schemes like tapping the power of the tide and ocean temperature gradients, and placing satellites in orbit to collect sunlight and transmit the energy to earth via microwaves. This is the path being pursued by places like Sandia Labs in Albuquerque and many of the large corporations investing in solar research. Sandia is primarily a weapons research facility that has been doing energy research since they came under the control of the Atomic Energy Commission in the early sixties, and subsequently under the Energy, Research and Development Administration and the Department of Energy as each of these organizations replaced the previous. The attitudes

(Continued on pg. 14)

The Brontosaurus is Dead: Long Live the Sun!

(Soft Energy Paths: Toward a Durable Peace, Amory Lovins, FOE/Ballinger, $6.95)

Reviewed by Karen Black

A memory of early fascinations with a kaleidoscope recurred in my reading of this profoundly important book. Lovins is not only a technical energy expert of the first rank. He is a visionary. Like a kaleidoscope, Soft Energy Paths reveals a plenitude of visions in a small space--variously gentle, beautiful and sometimes, to use Lovins' favorite adjective, elegant.

His vision of energy strategy is so wise and his arguments structured with such fundamental common sense, one wonders who could assail or reject them. For ultimately, he convinces, energy policy and life on this small planet are so entwined that the choice of one will determine the quality and continuation of the other. Without a radical course change from the "hard path" of super technology, nuclear power and centralized supply, to the "soft path" of renewable, diverse and diffuse resources, mankind is foreclosing survival options. Lovins refers not only to the survival of the human experiment itself, but to political and social structure, ethics, and freedom or the hope of freedom.

The soft and the hard paths are Lovins' definitions of the energy supply/use options available. The hard path is essentially the course along which the U. S. and the rest of the industrialized world is now hurtling. The hard path is profligate in consumption, and presents grave environmental risks. It eternally mismatches energy transmission and supply with ultimate energy uses. (For example, preparing breakfast toast with electricity transmitted from a vast, distant generating plant is thermodynamic inefficiency that senselessly wastes energy. Approximately two-thirds of the fuel used to generate electricity is lost between supply point and end use.)

The hard path demands rapid extraction of fossil fuels and expansion of nuclear power. It presumes gargantuan power grids (which Lovins shows are quite fragile and vulnerable); supply and transmission systems remote from users; intensive amounts of capital and eventual dictatorship by technocracy. Consumers cannot participate in the policies or decisions on which, nevertheless, they are totally dependent. Lovins illustrates: "In an electrical (centralized, hard path) world, your lifeline comes not from an understandable neighborhood technology run by people you know who are at your own social level, but rather from an alien, remote, and perhaps humiliatingly uncontrollable technology run by a faraway bureaucratized, technical elite who probably never heard of you. Decisions about who shall have how much energy at what price also become centralized--a politically dangerous trend because it divides those who use energy from those who supply and regulate it. Those who do not like the decisions can simply be disconnected."

The soft path is an eminently sensible policy based on a concept of "elegant frugality." The soft path incorporates renewable and/or inexhaustible resources (sun, wind, water, biomass), appropriate technology, diversity and efficiency to construct "a whole greater than the sum of its parts." Lovins uses a textural description deliberately, to demonstrate that the soft path is flexible, resilient, sustainable and benign. Five principles characterize the elements of the soft path:

"1. They rely on renewable energy flows that are always there whether we use them or not, such as sun and wind and vegetation: on energy income, not on depletable energy capital.

"2. They are diverse, so that,as a national treasury runs on many small tax contributions, so national energy supply is an aggregate of very many individually modest contributions, each designed for maximum effectiveness in particular circumstances.

"3. They are flexible and relatively low technology--which does not mean unsophisticated, but rather, easy to understand and use without esoteric skills, accessible rather than arcane.

"4. They are matched in scale and in geographic distribution to end-use needs, taking advantage of the free distribution of most natural energy flows.

"5. They are matched in energy quality to end-use needs."

The soft path has positive social and political advantages as attractive as the technical and economic sense embodied in these principles. The soft path encourages pluralism and citizen participation in energy policy-making. It allows tinkerers and basement inventors to

flourish and prosper. It is labor intensive, and responsive to the needs of those who build or use its myriad, diverse systems. It is socially, politically and technically vigorous in its diversity.

The hard path exacts social costs in unemployment (Lovins calculates that each new power plant results in a net loss of 4000 jobs). Because decision-making for the hard path is centralized, political alienation results. Institutional inertia is a hazard (demonstrated by inability to halt nuclear power development until the rather obvious requirement for safe waste storage is adequately met). The hard path technology is extremely vulnerable. A decade of blackouts and brownouts clearly shows how easily the hard path can produce regional paralysis from small technical failures. No one has come to terms with the spectre of terrorists using this vulnerability to cause incalculable economic and social harm.

The U. S. has traveled the hard path as the result of grave errors in calculating energy needs. The policy makers have used the wrong formulas. Where ethics and human values should have been the criteria, decisions instead are based on artificial growth projections and narcotic fixation on economic expansion.

The energy problem is not, at the root, an economic problem but a critical social question. "The energy problem should be not how to expand supplies to meet the postulated extrapolative needs of a dynamic economy, but rather how to accomplish social goals elegantly with a minimum of energy and effort, meanwhile taking care to preserve a social fabric that not only tolerates but encourages diverse values and lifestyles."

To those who have regarded the energy problem chiefly in physical terms, e.g. capital costs, dwindling supplies and fear of shortages, Lovins' approach is revolutionary. By training he is a physicist, but he analyzes energy issues in part as humanist and philosopher. By illuminating the social, political and ethical consequences of the soft and hard paths, he reaches the reader at a visceral level.

The uninitiated may react in bewilderment to the technical aspects of energy issues. But anyone can grasp the dangers inherent in the hard path (gigantism, erosion of freedom, rising discontent and nuclear anxiety) and the attractions of the soft path (resurgence of community, gentle stewardship of the planet and the death of the nuclear age). This approach makes Lovins' book compelling, and surely frightens the technocrats. He teaches that policy-making is not the exclusive preserve of "experts." By cutting through the technical issues to expose the ethical heart of the matter, Lovins makes experts of us all. This he states eloquently, and it bears repeating.

"Ordinary people are qualified and responsible to make energy choices through the democratic political process, and on the social and ethical issues central to such choices, the opinion of any technical expert is entitled to no special weight; for although humanity and human institutions are not perfectable, legitimacy and the nearest we can get to wisdom both flow, as Jefferson believed, from the people; whereas pragmatic Hamiltonian concepts of central governance by a cynical elite are unworthy of the people, increase the likelihood and consequences of major errors, and are ultimately tyrannical."

And again, "The basic issues in energy strategy, far from being too complex and technical for ordinary people to understand, are on the contrary too simple and political for experts to understand.

It does not, for example, take an expert to grasp the awesome potential for nuclear accidents; the dangers of nuclear proliferation; or the absurdity of taking a nuclear path without safe storage for the garbage. It does not take an expert to understand this was a gentler planet before the nuclear genie was unbottled. It takes no expertise to yearn for a world again unthreatened by balances of nuclear terror. It is simple to understand that the immense capital costs of the hard path rob public and private resources sorely pressed to meet other needs.

In the awakening of these perceptions among ordinary people, Lovins sees hope. The persistent opposition to nuclear plants has, he believes, effectively killed nuclear power development in America, though he adds a caveat. Nuclear power is "dead in the sense of a brontosaurus that has had its spinal cord cut, but is so big and has so many ganglia near the tail that it can keep thrashing around for years not knowing it's dead yet." He finds a rapid proliferation of all types of soft energy technology, despite the efforts of the federal government and the energy industry to discourage them. He warns that this nation must not only take the soft path at home, but refuse to export nuclear technology to other countries. Otherwise, the hope for a durable peace, now fragile at best, will vanish.

There is urgency in Lovins' persuasive invitation to move toward the road not yet taken--the soft energy path. If nuclear proliferation

is not stopped now, it will be too late because we will all be in our caskets. Furthermore, the soft and hard paths are mutually exclusive. Hard technologies exhaust energy and financial capital which should be spent now for technical fixes and transitional technologies.

The soft path entails changing social and political values, and social change requires time. The soft path is communal and public, and Americans historically value individual primacy. The shift cannot be made overnight.

The soft path means adjustment in the job sector (such as reemploying the hard technologists); changes in land use and probable upheaval in personal lifestyles. No matter how desirable, change is not easy. We already are a nation of hard energy junkies. Continuing on the hard path will make withdrawal the more difficult, if not impossible, foreclosing our option to make a choice.

There is immense technical information in Soft Energy Paths to buttress Lovins' philosophical arguments. He presents it, on the whole, in digestible fashion and furnishes a helpful glossary for laymen.

His publisher, Friends of the Earth, excerpted one chapter in the FOE magazine, Not Man Apart, admonishing subscribers that it was "required reading." The statement is worth heeding. This book is a seminal work in the energy debate. Lovins defines the issues and choices clearly. We are at the fork in the road. We can, Lovins says, take plutonium or sunbeams, sowing the seeds of our own destruction along the hard path, or choosing "to live lightly, live with light and so choose life itself."

K.G. & E. Official Deceives Nuclear Regulatory Commission

By Bill Ward
Attorney for MACEA

The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies prepare an environmental impact statement on any proposed "major Federal action significantly affecting the quality of the human environment." The issuance by the Nuclear Regulatory Commission (NRC) of a construction permit to allow the building of a nuclear power plant is such a major action. Environmental statements must assess environmental impacts "to the fullest extent possible," and must include evaluation of the "alternatives to the proposed action." Assessment of alternatives has been described as the "'linchpin' of environmental analysis" by both the courts and the NRC.

I will not attempt even an outline of the efforts of the Mid-America Coalition for Energy Alternatives (MACEA) to oppose the construction of the Wolf Creek nuke on the bases of deficiencies in the environmental statement and the inability of the Kansas Gas and Electric and Kansas City Power and Light companies even to afford the plant. The effort, however, began in 1974 when both MACEA and the State of Kansas, by its Attorney General, intervened in the NRC's licensure process. Relying on the efforts of volunteer witnesses, MACEA and Kansas presented what was acknowledged by veteran observers of such proceedings to be the strongest case ever made that a plant was not needed to serve the load---not needed until long after alternative sources of energy would be obviously cheaper than a nuke. Our arguments fell on what always seemed to be the deaf ears of NRC licensing and appeal boards, and the construction permit was granted in May, 1977.

Shortly thereafter, however, MACEA learned of an alternative to Wolf Creek that had not been considered in the environmental statement, both because of the agency's discriminating blindness and because of substantial misrepresentation by a utility witness during the hearings over a year earlier. The alternative consists in the conversion of KGE's currently gas-fired units to coal, a measure witness Harley R. Macklin, KGE's Superintendent of Production, Fossil Plants, had called an "economic impossibility." Ironically, it was Mr. Macklin who wrote, in April, 1977, in response to an inquiry by a MACEA member, that since 1948 all of KGE's gas-fired units (providing the majority of KGE's baseload generating capacity) were designed for conversion to coal, that this capability had provided a lever to permit the utility to secure favorable gas contracts through the years, that the utility was investigating the practicality of converting the 380 megawatt Gordon Evans No. 2 unit to coal after Wolf Creek was built, and that "preliminary studies" indicated a cost of $500 per kilowatt to do so.

Since the beginning, the utility had insisted that, because of the declining availability of natural gas for boiler fuel, the gas-fired units serving the base load (the fairly constant system demand, as contrasted with short term daily and seasonal "peak" loads) would, when Wolf Creek was completed, be shifted to peaking service. An alternative to that approach, clearly, would be to convert the gas plants to coal and purchase as necessary additional, cheaper, peaking units. The alternative would satisfy KGE's inflated demand estimates every bit as well as the Wolf Creek nuke-- and with economic and environmental advantages. (KCPL doesn't need its share of the plant, as evidenced by its recent attempts to peddle portions of Wolf Creek and another of its large plants to utilities in Nebraska and Missouri.)

The licensing board denied MACEA's motion to reopen the record on the basis of the Macklin letter. However, we succeeded ultimately in getting the Department of Energy's coal conversion

branch, on the basis of the contrast between the utility's representations to them and the Macklin letter, to schedule an on-site investigation of the plant for December, 1977. The investigation was to determine whether, under the authority of the Energy Supply and Environmental Coordination Act, the utility should be ordered to convert the Gordon Evans unit to coal to save gas and oil (which the utiltiy is substituting in increasing quantities for gas).

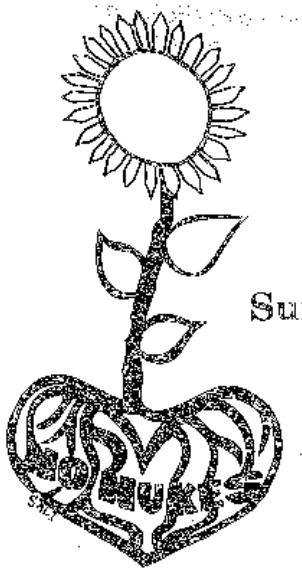
Told that MACEA would "be advised immediately of the findings," the DOE's subsequent delay and reluctance to do so prompted a Freedom of Information Act request for all information developed by the investigation. After a substantial -- and unlawful -- delay, during which DOE indicated its intention to withhold all such materials, the agency abruptly released what it claimed to be its entire file. Notwithstanding the absence of certain anticipated memoranda, the material confirmed that, on the basis of the utility's own figures, the coal conversion alternative, with a generous allowance for the cost of additional peaking units, is a real bargain compared to Wolf Creek.

While DOE was debating the release of its file, the NRC appeals board handed down its final decision, rejecting again MACEA's request to reopen the record, without the slightest effort to discover what its companion agency had determined about the matter. MACEA petitioned the U. S. Court of Appeals for the District of Columbia Circuit for review of the decision.

On April 24, 1978, after receipt and analysis of the DOE material, MACEA asked the Court to stay the final decision, suspending the construction permit for the plant. If granted, construction would stop until the Court's review was completed. However, on June 5, the Court ordered our petition for stay held in abeyance until June 17, by which time the NRC will have considered the matter again.

The coal conversion alternative involves land which has already been committed to power generation. Transmission lines are already in place. Water demands are fixed. Environmentally and economically, the conversion of base load units originally designed for conversion and the securing of appropriate peaking capacity is the sort of alternative one should consider if one should consider any sort of alternative. As we advised the Court:

> "It is incredible to MACEA that the NRC has shown such utter disinterest in an alternative which, with obviously less environmental damage, would keep base load units doing what they were originally intended to do. We are distressed and angered that the agency would ignore substantive misrepresentation under oath by the KGE official probably most knowledgeable with respect to the viability of the alternative."



Sunflower Alliance Holds Rally

Senator John Simpson described a common feeling among those attending the anti-nuclear rally at the John Redmond Resevoir near Burlington, Kansas, on Sunday, June 25. "As I arrived here today, I had a sick feeling in the pit of my stomach when I saw the construction of the nuclear plant across the road."

In spite of the obvious fact that it isn't needed for Kansas (KCPL is trying to peddle some of its portion of the plant to utilities in Missouri and Nebraska), is too expensive and uneconomical, construction of the Wolf Creek nuke is underway and clearly visible from highway 75 leading into Burlington.

About 500 people, including six Land Institute people (Dana Jackson, Phil Haves, Sue Leikam, Carol Maguire, Maureen Hosey and Tom Moore), expressed their opposition to this Kansas folly and their support for the non-violent occupation occurring the same weekend at Seabrook, New Hampshire and Satsop, Washington, by attending the Sunflower Alliance demonstration. The crowd listened to music and speeches, then made a march to the lake and carried back containers of water, symbolizing the water to be taken from the reservoir to cool the plant, water granted through a state contract which gives greater priority to the nuclear plant than to the towns downstream that depend wholly on the Neosho River for their water supply.

Speakers at the rally urged participants to keep working together to halt the Wolf Creek Plant. Anyone who wishes to share the commitment to prevent Wolf Creek from operating can contact The Land for contacts in the nearest anti-nuke group. BETTER ACTIVE TODAY THAN RADIOACTIVE TOMORROW!

"Getting out of the nuclear business also implies shifting simultaneously to a sound nonnuclear energy policy...and developing ways to recycle the nuclear industry. That does not mean bailing out the corporations involved: they have taken a business risk in full knowledge of the economic consequences of failure..." (From Soft Energy Paths)

(Continued from pg. 13)
associated with the weapons research seems to have been carried over into the energy field. Indeed, I was told by a Sandia physicist, who at one time worked on photovoltaic cells, that there is much crossover of personnel between the two programs and much use made in the energy research of knowledge gained in the weapons program. Thus the solar research is all geared toward highly technical, sophisticated, concentrating collector systems that produce high temperatures which are used to create steam to run an electric generator. The scale of the projects runs from a system to provide the heating and electrical needs of a small office building to a two hundred feet tall, concrete tower surrounded by 222, one hundred square feet computer-controlled mirrors that focus the sun's rays onto a spot at the top of the tower, generating temperatures in the 1000° C. range. Materials are being tested to determine their properties when exposed to this kind of energy source, one goal being to find a material suitable for use in building boilers to generate steam to run the electric generators of a large capacity power plant.

Each of the three methods of solar utilization outlined in this paper has unique implications for what the future might be like in areas besides energy, because each has associated with it qualities whose appeal varies according to the values of the person or group choosing between them. Thus, those same values that will help decide which of the three comes to play a predominant role will also help to shape other policies and courses of action that collectively form our culture. Some people have argued that values will have much less to do with the method chosen than will economic forces. In the past this may have been largely true. However, today's economy has become so much influenced, manipulated and directed by government intervention through devices like tax incentives and price controls, that the choice can and must be a conscious one based on our values.

In order to understand what values will lead to the adoption of each method of solar development, it is necessary to look at some of the qualities of each path. The first offers techniques that are easily understood, easily incorporated into current building techniques, easily maintained, and by and large, easy on the pocketbook. It gives the users of its techniques a good deal of control over their energy source and provides a greater awareness of just exactly how large a demand they place on the natural systems of the planet. The second offers techniques which make use of existing knowledge and are relatively easy to understand. The devices require a greater degree of maintenance by somewhat specialized technicians (in the sense that plumbers are specialized), and are more expensive than those employed in the first method of solar development. The third offers techniques that, while easily understood in concept, require highly trained people to build, operate andmaintain. If the current centralized power plants are any example, then this third path offers the possibility of failure on a large scale, resulting in blackouts of large areas and shutdown or curtailment due to strikes by those operating the system. It gives the users little and only indirect control over their energy source and isolates them from any sense of how large their demands are. This last quality is perhaps the most dangerous because it leads to continually escalating demands which, as anyone familiar with the concept of exponential growth knows, cannot be continued forever, no matter how large the room for growth appears to be at the moment.

The various qualities associated with the three methods of solar utilization will interest people according to the value systems they have. If either of the first two methods is to be adopted, people must develop a willingness to decrease expectations and standards regarding what constitutes a good life. They must understand the reality and urgency of the energy crisis and be able to extend the time frame used to make decisions so that the consequences for the next couple of generations at least are considered. These values in combination with an emphasis on frugality and simplicity, and on work as a means of fulfillment, not just a source of income, are needed if the first method is to dominate. A dependence on technology and gadgetry to solve all problems, a belief that only through ever continuing growth in consumption is a better life possible, and an attempt to ignore anything more than the immediate consequences of decisions will make the third method the only viable one.

Right now, the second direction of solar utilization seems to be the most likely, since many people are gaining an awareness of the seriousness of the energy problem, but still want to maintain as much of their current lifestyle as possible. This fits the image that the majority of people have of what solar technology is like. The power generation schemes could play a small but useful role supplying the electricity for those energy uses that require it. Amory Lovins, in Soft Energy Paths, Toward a Durable Peace, estimates that this is a mere eight percent of current end use needs. Of course, if photovoltaic cells drop in price as much as some people are predicting, they preclude the need for any of these centralized power stations. The first method will probably play a rather small role as well, unless there is a drastic reorientation in the values of a large number of people.

Whichever method is used, solar has the potential, when combined with conservation and efficient use of energy, to supply a large part of our energy needs. Dennis Hayes, initiator of SUN DAY, estimated in a Worldwatch Institute "Solar Energy Timetable" that all forms of solar,

including wind and biomass fuels, could provide five-sixths of world needs by 2025. Even the U. S. Government is slowly beginning to wake up to the potential of solar. Their early projections gave solar only a small part in the national energy picture, but a recent report by the Council on Environmental Quality of the Executive Office of the President estimated that it could provide 25% of the country's needs by 2000 and significantly more than 50% by 2020. However large a role solar plays, the method of development will determine the particular kind of society we will be living in.

Water Pumping Windmill is Raised

Windpower once had a common and vital role in the lives of rural Kansans. Rural Kansas was thirsty, so as the settlers crossed the plains, they had to sink wells to find water, and if it were there, they would construct windmills to pump it out. These windmills pumped water for domestic use, livestock, irrigation, and even refrigeration. Ways were also found to use the wind to run feed grinders, butter churns, corn huskers and other farm machinery.

Since a manufactured windmill might cost eighty dollars, a prohibitive price in the late 1800's, many people designed and built their own windmills. These mills had one main feature in common, they were cheap. Using scrap wood and other locally found materials, they could build something to harness the wind for about five dollars.

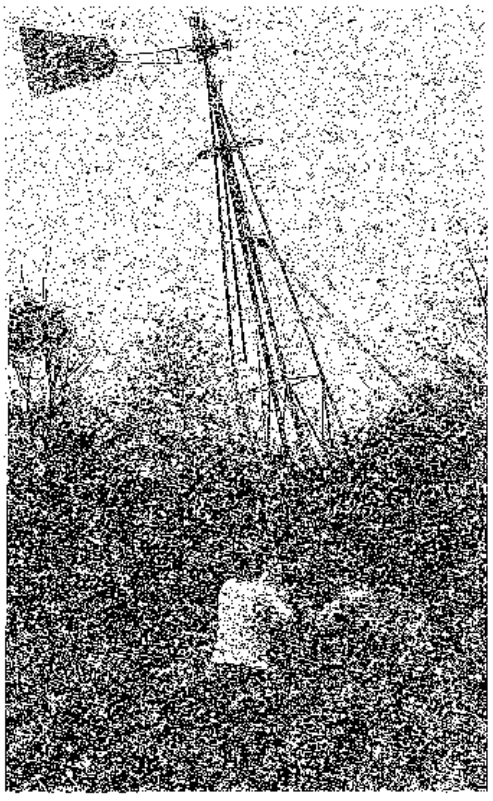
Even though the more efficient and dependable manufactured windmills eventually replaced the home-built variety, the use of wind as a common energy source was doomed. In 1935, Congress established the Rural Electrification Association (R.E.A.). As the electrical web slowly spread to support the farm economy, the art of wind use was cast off in favor of the more convenient electricity.

The "energy crisis" of 1973 slapped many people awake to the need for wind as a source of unexhaustible, clean, self-sufficient and cheap energy. It has been roughly estimated that there are at least 240,000 windmills still scattered across America that can be refurbished and put into top running condition. Vernon Wood of Los Cruces, New Mexico, recently restored a windmill which pumps all the water he needs for three hundred pecan trees and forty fruit trees.

My "hands on" project at The Land this spring has been the revival of a 1914 Aermotor, which blew down in strong winds many years ago. First I checked the windmill head to make sure that it would still run. The head, which is where the blades are attached, converts the rotary motion of the blades to rhythmic up-down motion of the rod joining the head to the pump. Except for a couple quarts of oil which were needed, the head seemed to be in fine condition. Next, I proceeded to straighten the mangled angle iron which once comprised a twenty-four feet tower. In the process I learned to use an arc welder for repairing breaks, and a cutting torch for heating the angle so the metal would not be weakened when I straightened the bends.

The tower is standing again, covered over a well and ready to catch some wind, our often-ignored and occasionally-cursed resource.

Tom Moore



Michele and Jeff help raise the windmill.

Alternatives in Shelter

Continued Work on Tamped Earth Walls

Upon my arrival at The Land in February, 1978, I chose the Indian House and the completion of its tamped-earth walls for my individual project. The Indian House was begun by Nancy Vogelsberg and Sue Leikam during The Land's first semester, and Dave Kearns started the tamped earth walls in the fall of 1977. Certain problems in the construction had become evident by the time I inherited the project making changes and corrections necessary.

The framework of the building consisted of Osage Orange posts and beams, a layer of wooden pallets, and a layer of polypropylene plastic. The plastic had burst where there were gaps and slots in the pallets, so the first thing I did was cover the openings with various pieces of scrap lumber. Though use of such scrap material is not considered traditional in either nineteenth century American Indian or twentieth century American suburban architecture, converting refuse into a resource has become a tradition at The Land.

The outside surface of the walls was determined by the placement of steel concrete forms, and the method of holding the forms in place needed to be changed. Four by four inch wooden beams each four feet long were imbedded in the ground and propped against the forms to prevent them from moving outward. They were not strong enough to resist the horizontal expansion of the tamped earth between the framework and the forms. I did three things to correct this problem. Short pieces of wood were inserted between the forms and the framework to hold them at the proper distance. Second, thick gauge wire was doubled and then twisted and attached to the framework and the forms. Third, I covered the base of each form with one and a half feet of loose earth.

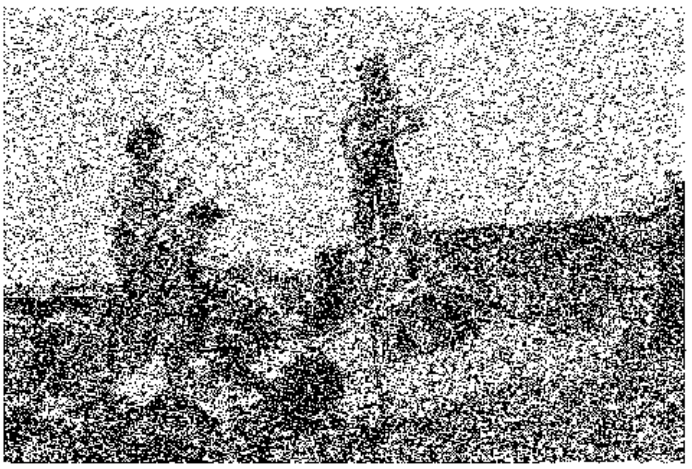
In observing the consistency of the first tamped earth walls that were built, I found that the mixture was not high enough in lime content, and in certain places the mixture was not homogenous. This resulted in crumbling of the walls when the first forms were pulled off. We increased the soil-lime ratio to approximately nine to one and mixed it more thoroughly. Our mixing technique was to roto-till a five by ten feet area one foot deep. After the tilling, we poured in fifty pound bags of lime and tilled again until the mixture resembled the test batches mixed in the desired ratio. The walls made from this process seem to withstand rainfall better than the older wall sections.

We tamped the walls with a rented, gasoline-powered pneumatic compressor operating two pneumatic tamper units. The Omaha tribe of American Indians, who lived in lodges very similar to our experimental building, threw up loose soil around the framework, instead of tamping in a lime-earth mixture. We are interested in using tamped earth because it is more durable. Tamped earth has a greater density than loose earth, and the presence of lime in the walls make them less permeable to water, more weather resistant. Although the loose earth walls would be less labor intensive and less energy intensive, they would be less permanent.

This project involved all of the students on days when we rented the tampers. Using the roto-tiller and pneumatic compressor did not eliminate the need for hand labor as we still had to shovel the soil-lime mixture into the space between the forms and the framework. We felt justified in using the pneumatic tampers rather than arm muscle only because of the time it saved. We also employed a man with a bulldozer to move subsoil near the walls of the building. Had we dug away topsoil and moved the clay subsoil all by hand, the project would have been delayed and students would have been spending most of their time on the Indian House and neglecting other projects. We have adopted the position that these two machines, the pneumatic compressor and the bulldozer were used appropriately for our alternative structure.

When the walls are completed, an overhanging roof would serve to protect them from precipitation. Alternatives to this would be to stucco the walls, or to cover them with inclined earth planted in grass. We would build up a bank of soil sloping at a forty-five degree angle from the top of the tamped earth wall down to ground level. Possible roof covering could be thatch, sod, or canvas.

Jeff Brown



Amanda, Jeff and Maureen at work on Indian House.

For the Children

Dana Jackson

How does one respond to the immensity of world problems, such as over-population and food, the arms race and nuclear proliferation, the inequitable consumption of dwindling resources, including energy? Most of us are inclined to shrug our shoulders, and decide that it is just too much to think about and impossible to do anything to change the situation.

During my trip last fall to South Asia, sponsored by the Overseas Development Council, and while at the follow-up workshop at the Wingspread Conference Center in February, I was amazed by the number of people who not only can think about these large, complex issues, but who do so every day.

Those of us who took part in the Transnational Dialogue to India and Sri Lanka met at Wingspread, near Racine, Wisconsin, for a "debriefing" session. After sharing impressions, questions, and reflections about the experience, we began to discuss in more depth some of the dilemmas of development in South Asia. As if this subject were not difficult enough, we were joined by participants in the Transnational Dialogues to Latin America and East Africa, and then we considered the crucial issues of food and development in all three areas of the world.

We talked for nearly three days about the problems of development in the third world, and considered ways to educate the American public about the needs and aspirations of developing countries. We drafted a statement summarizing our deliberations and recommending to the U.S. Government broad policy guidelines in regard to developing countries in the areas of food production, employment, health/nutrition, education, population, women, human rights, research, trade, aid, investment and capital flows, energy, private iniatives and public education for Americans. The first nine recommendations focus primarily on the components of a "basic needs" strategy which would help improve the quality of life of the world's poorest billion. The next four are major elements of a new relationship between industrialized and developing nations, commonly called "a new international economic order."

During April, The Land students and I read and discussed the third Club of Rome study called RIO (Reshaping the International Order), coordinated by Jan Tinbergen. The first section of the book establishes the need for RIO by describing the main problem areas, most of them corresponding to the areas of policy recommendation made by the group at Wingspread. The second section covers "the architecture of the new international order, initiating and steering the process of planned change," and the third section lists proposals for action. We were astounded at the magnitude of the task of reshaping the international order. The book was convincing until we tried to imagine nations actually following the proposals and sharing the "smaller pies." The Utopia discussions (see page 4) had been underway for several weeks before we read RIO, and the concept of a world government which would make RIO possible, fell into the category of Utopia.

But what are the alternatives if we do not take RIO seriously? The third Club of Rome study emphasizes that growing political instability, because of the inequities among nations, could have disastrous effects upon the security and economies of industrialized nations.

Dr. Alexander King, one of the founders of the Club of Rome and a contributor to RIO, was the major speaker at a conference at Doane College and the University of Nebraska, which we attended immediately after finishing the discussions about RIO. In his speech, "The Ethical Response to Scarcity," Dr. King reviewed the scope of the "world problematique," but focused on population and food. He reminded us that forty percent of the world's underfed are children, and that in the third world, one half of all children are undernourished. Dr. King stressed our humanitarian obligation to respond to the challenge of RIO and stated that the one chance that we could cooperate to solve our world problems would be because of "ego projection," because we loved our children and grandchildren. We would respond ethically to scarcity, because we care about the future of our children.

Wanting to believe, and believing, are two different things. I remembered the Worldwatch paper by Bruce Stokes entitled "Local Responses to Global Problems: a Key to Meeting Basic Human Needs," which refers to a World Bank study in 1977. It estimates that the price tag for solving humanity's most pressing problems is an average annual cost between 1980 and 2000 of at least 47.1 billion dollars, for developing countries only. The World Bank analysts concluded that third world nations will not have this capital, and the "political will does not exist

(Continued on pg. 27)

Alternatives in Agriculture

Adobe House Becomes Grow Hole

At The Land, we try to use materials that are on hand in constructing our projects. The importance of "making do" with what we have is stressed again and again, and this session a nine feet deep hole was something I had to "make do" with.

The hole was the unfinished product of a project begun at The Land by the second session students. The original plan was to build an adobe brick building on the site. The students began by digging a five and a half feet deep hole, ten feet wide and twelve feet long. The walls of the hole were covered with pasture rock and a cement foundation was poured on top of the walls at ground level. The students next began experimenting with various types of adobe mixtures to form brick walls. Some bricks were made with clay and straw, and others were a clay and cement mixture. The adobe walls were only two and a half feet tall with an opening for a door on the west side when the second session ended. And, this is where I picked up on the project.

In the fall of 1977, after visiting a friend of The Land, Mrs. Marilyn Jones in Peabody, Kansas, Wes and I thought of using the adobe-rock structure for a "grow hole," a pit greenhouse. Marilyn had a "grow hole that she used to harden off plants and store cool weather plants, shrubs and perennials that came from her larger greenhouse.

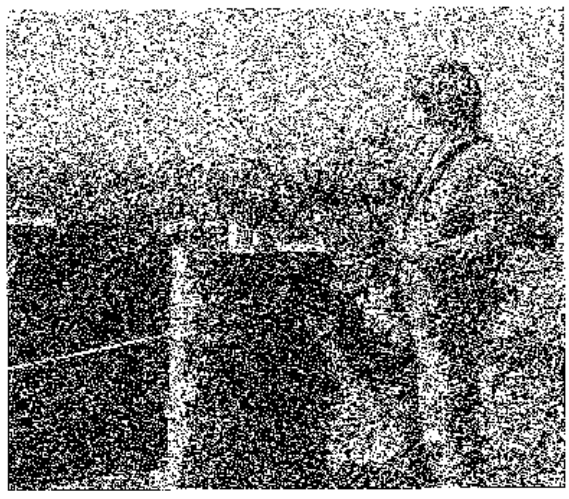
Marilyn's grow hole was a simple rectangular dug-out with old window panes set at an angle on the south side to catch the sun's rays and warm the air inside. The door was on the east side with steps leading down into the hole. She suggested using old scrap boards for shelving, but not plywood or old doors which would warp too easily in the high humidity. Marilyn said that not much would germinate within the grow hole because of the fluctuation of temperatures. When temperatures reached a cold 20° F. during the winter, she had to use a heat lamp inside to keep things from freezing. There was no problem with ventilation during the warmer months; she simply left the door open.

In February, Wes and I took the ideas and suggestions from Marilyn and began to modify them to create our own grow-hole out of the adobe building. Since the north adobe wall was built higher than the south, our angle for the top was predetermined. Wes and I built a wooden frame over the hole which extended one foot over the edge of the building to protect the adobe wall from exposure to rain and snow. Four glass patio doors were placed in the center of the frame to make the glass roof for the pit greenhouse. I then painted the frame and covered the remaining roof space with black composition shingles. One ton of coarse gravel and six recycled wooden pallets were put on the floor of the hole to cover the mud hole which had developed when the building had no roof.

In addition to the rock and adobe wall which collects and stores heat, we decided to use twelve fifty-five gallon drums painted black and filled with water as a solar heat sink. I decided that tomato paste drums would be better for the plants than recycled oil drums. The barrels had previously been filled with tomato paste used at the pizza factory, and they were hard to clean. After washing them out with a hose, I knew that quite a bit of tomato paste remained in them, but I hoped that fifty-five gallons of water would dilute the red goo until it was of no consequence. The four inch holes in the tops of the drums were left uncorked to allow aerobic decomposition of the tomato paste, and the odor inside the grow hole on hot afternoons was often unbearable. Eventually one will become accustomed to the smell, or it will disappear. On top of the barrels we placed metal shelving to hold the plants and drilled holes in the shelving for drainage.

Two final steps were left in the construction of the grow hole. Jim Peterson and I built a door frame and a 2' by 3' door in the space left between adobe bricks on the west wall. Then I filled the cracks and spaces with straw for better insulation.

After the major task of building the grow hole was completed in the first week of March, we waited for warm, sunny days to begin heating the water in the barrels. By the end of the month, the days were warm enough to set the plants inside the grow hole. I put in four various house plants, and in spite of what Marilyn had said about germinating seeds inside her grow hole I planted a flat with cabbage, broccoli, eggplant, pepper, tomato, marigold and thyme seeds. I also placed three cabbage



and three broccoli plants which had already been started in the grow hole.

During the first week of April, I set up four thermometers: one on the south wall outside, one on the west wall inside, one in a barrel on the west side, and one in a barrel on the east side. I began recording temperatures at 12:30 P.M. each day. The temperatures fluctuated between cloudy and sunny days, but the temperature inside the grow hole always remained approximately fifteen degrees higher than the temperature outside the grow hole.

When four weeks of patient watering and waiting went by and nothing came up in the flat of seeds, I realized that Marilyn was right. The other plants survived fairly well. On a sunny day the air temperature in the sun often reached 106° F., and too much heat was a problem. In spite of the high temperatures inside the hole, the temperatures inside the barrels were not rising as rapidly as I had expected they would. The first reading in the barrels was 60° F., and in eight weeks it rose only 20°. Cloudy days often lowered the temperatures to the 50° range. I finally sought the advice of our in-house solar expert, Mel Stampe, and he explained the reasons why the temperatures in the barrels did not rise faster. Although it would be possible for the temperatures to rise 12° per day, conditions were not optimum in the grow hole. The barrels were often in indirect sunlight, not direct sunlight. The rock and adobe walls absorbed some of the heat rather than the barrels. Heat was lost through the spaces between patio doors, through opening the door for ventilation, and through evaporation of water.

Now I am beginning to see what modifications could improve the grow hole. Leaving the door open has not provided sufficient ventilation on hot, sunny days, and a more efficient system needs to be worked out. The four glass doors on the top could be put on tracks to pull open and closed for good ventilation, or a few adobe bricks from the south and north ends could be removed to provide good cross ventilation. In this case, the doors on the top would need to be sealed tightly to prevent any excess heat loss during the winter.

There has not been a chance for any humidity to be built up inside the grow hole. Marilyn Jones said that there is always enough humidity in her grow hole as long as there are plenty of plants. I've been reluctant to add more plants because of the ventilation problem and because condensation on the walls causes the adobe to dissolve. The adobe walls should be stuccoed to prevent their disintegration.

The barrels and plants along the south wall never get direct sunlight. Perhaps, if the barrels along the north wall were stacked two high, more heat would be stored in the barrels and less lost to the outside through the adobe walls. Or, a reflector made of scrap tin or sheet metal could be attached to the north wall to reflect light back toward the south wall.

For the coldest of cold nights, a heat lamp could be connected to the wire running from the wind generator located in the experimental village.

Perhaps the most efficient use of the grow hole is during the fall and early winter after the summer's heat has been stored in the walls and the barrels. Hopefully this will be tested at The Land also.

Three articles that I came across in Organic Gardening and Farming (Sept., 1975; Nov., 1976; Feb., 1977) about sunpits, with designs similar to our grow hole, stated that the sunpits were used for growing lettuce and other vegetables, for getting a head-start on spring flowers, and for protecting tender prospective transplants.

It seems that a grow hole can be as elaborate or as simple as one cares to make it. It can be free standing or attached to your basement. It can be completely underground, or built into the side of a hill. However it is constructed, it can provide an inexpensive greenhouse atmosphere.

Michele Adams

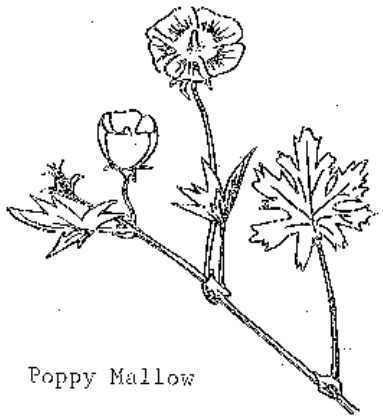
Experimental Plots Started

Seed from thirty-five different varieties of perennial forbs and grasses have been planted in our new experimental garden at The Land. Our purpose is to establish a strong stand of various species as candidates for use in breeding alternative seed crops.

The seeds were made available from the U.S.D.A. Plant Materials Center near Manhattan, Kansas, through through the cooperation of the local Soil Conservation Service. They were then planted by hand in rows sixty feet long, in roughly roto-tilled strips of mowed alfalfa. Fine top soil was lightly sprinkled over them after sowing. Most species have germinated.

The following varieties have been planted: 'Lutana' Cicer Milkvetch, Wild Soybean, Arrowleaf Clover, Lespedeza stuvei, Lespedeza daurica, Lespedeza japonica, Roundhead Lespedeza, Prostrate Lespedeza, Wagner Flatpea, Perennial Peavine, Birdsfoot trefoil, Illinois Bundleflower, Purple Prairie Clover, Bush Sunflower, Maximillian Sunflower, Sunflower Heliopsis, Small Soapweed, El Reno Side Oats Gramma, Blackwell Switchgrass, Little Bluestem, Big Bluestem, Blue Gramma, Eastern Gramma Grass, Indian Ricegrass, Western Wheatgrass, Buffalo Grass, Sand Bluestem, Texas Dropseed, Bend Sand Lovegrass, Prairie Sand Reed, Prairie Cord Grass, El Reno Side Oats Gramma.

We expect Eastern Gamma Grass, Tripsacum dactyloides, to be especially promising because the stamens and pistils are contained in separate flowers but localized on the same spike. We know this close relative of maize is highly nutritious and prized by cattle.



Poppy Mallow

Much research needs to be done on these plants. We want to learn about their productive potential, their nutritional value, and the gluten content of their seeds. We expect to devote more time to genetics and plant breeding at The Land with the goal of producing nourishing food without the liability of soil loss.

Maureen Hosey

Indian Uses for Prairie Plants

Many of the plants we are studying on the Fent prairie have been quite useful to humans over the years, and were main staples of the Indian tribes who roamed the plains. It is only since the coming of the white man and the development of agriculture that these tasty edibles have been put to the wayside by humans and left for cattle to enjoy.

Ground Plum Milkvetch, which the Dakota Indians called "pe ta wote," meaning food for the buffalo, is one of the target plants in the companion planting study on the Fent prairie. It contains succulent seed pods with a tender red skin that resembles Tokay grapes. These pods can be eaten raw or cooked, and they taste somewhat like green peas.

Poppy Mallow is another plant included in the prairie study. This low-lying, vinelike plant contains a taproot which the Indians boiled and made into a brew to be drunk for intestinal pains. For those suffering from head and bronchial colds, the dried root was burned and the smoke inhaled to help clear out congestion.

One of the few woody plants of the prairie is Lead Plant Amorpha. This plant, which is actually a shrub, provided the Indians with leaves suitable for tea or tobacco, according to Kansas Wild Flowers by Stevens. For people afflicted with neuralgia ("an acute pain that follows the course of a nerve"), small pieces of the stem were laid on the body and burned there as a "counter irritant."

A plant which many folks ignore and cattle shun is wavy leaf thistle. This thistle, which has a rose-purple flower, is the most widely distributed thistle in Kansas. It has long, sharp prickles on the leaves, stems, and cup that holds its flowers. Although it is generally left alone, it has been said that humans have found the roots and stems quite palatable. Mrs. Louise Johnson, a friend of The Land who is quite knowledgeable about wild flowers, says she has always known this thistle as "Grandpa's Shaving Brush" because the flower heads resemble just that.

One plant which is not only found on the prairie, but in pastures and woods as well, is wood sorrel. The small delicate, tart leaves are tasty in any wild salad and were even used by the pioneers as a replacement of rhubarb or gooseberries. However, one should not be too attracted to this plant as the leaves contain oxalic acid which is poisonous if taken in large doses.

These are just a few of the hundreds of prairie plants to be used and enjoyed by those willing to learn them.

Maureen Hosey

The Feasibility of Perennial Crops

We have begun to promote and work on the development of seed-producing herbaceous perennials as substitutes on our uplands for the high-yield annuals such as wheat and corn. As I stated in the last LAND REPORT, it would appear that it is the cultivation of annuals which makes the soil vulnerable to wind and water at the rate of nine tons per acre per year nationwide. The critical question becomes: Is the development of seed-producing herbaceous perennials, as substitutes for the annuals, technologically feasible in the near future?

We do not know the answer yet, but essentially no new breakthroughs are necessary for us to begin a very large program involving hundreds of crosses and selection experiments now. Most of the science and technology for this work occurred during the first half of our century when Darwin's ideas of evolution through natural selection were fused with Gregor Mendel's principles of heredity. Techniques were developed to count chromosomes and follow them through the various stages of replication and division. Chromosomes were irradiated, broken and fused, and their gene sequences mapped. Sterility barriers between species came to be understood, and artificial hybrids, including some resulting from intergeneric crosses, were successfully made. We came to understand how species arose through chromosome numbers being doubled or reduced, and investigators learned to artificially induce these changes.

This reservoir of practical knowledge could enable us to begin the second agricultural revolution.

Wes Jackson

Does the Prairie Practice Companion Planting?

Jim Peterson

Companion planting is now a standard practice in many so-called organic gardens. The Encyclopedia of Organic Gardening compares domestic companion planting to an imitation of the plant array which exists in nature. For the most part, the methods of the companion planters are based upon anecdotal information. Few scientific studies of this phenomenon have been done.[1]

Companion planting may be considered more of an art than a science. After all, this was the case for domestication or selection of plant varieties until this century when scientific models were developed. Alphonse de Candolle was the first to focus attention on this process in 1823 with his L'origine des Plantes Cultives.[2] N. I. Vavilov (1926) elucidated further the origin of domestic plants and the practices which made this possible. He referred to domestication as an art and expressed the hope that his work would transform it into a science.[3]

Folklore has been one of the primary guiding forces in maintaining procedures such as domestication and companion planting. Folklore, anecdotal communication, is a system of classification which focuses on appearance rather than underlying form.[4] There is seldom a philosophic overview which knits these processes into a relationship with other events in nature and asks questions concerning consequences. Neither is there any standardization of results which can be proved or disproved by testing in other environments.

Even so, the backlog of knowledge available through folklore should not be ignored. Edgar Anderson in Plants, Man and Life pointed out the value of the folk consciousness in gardening practices in Mexico. At first Anderson believed he was observing random, uncultivated assortments of plants behind houses. Upon closer inspection he found that there was order in these gardens, but on quite a different level than in our own. Years later in Guatemala, he investigated another garden like those in Mexico and described it in this manner:

> Though at first sight there seemed little order, as soon as we started mapping the garden, we realized that it was planted in fairly definite crosswise rows. There were fruit trees, native and European in great variety: annonas, cherimoyas, avacados, peaches, quinces, plums, a fig, and a few coffeebushes. There were giant cacti grown for their fruit. There was a large plant of rosemary, a plant of rue, some poinsettias, and a fine semi-climbing tea rose. There was a whole row of the native domesticated hawthorn, whose fruits like yellow, doll-size apples, make a delicious conserve. There were two varieties of corn, one well past bearing and now serving as a trellis for climbing string beans which were just coming into season, the other, a much taller sort, which was tasseling out. There were specimens of a little banana with smooth wide leaves which are the local substitute for wrapping paper, and are also used instead of cornhusks in cooking the native variant of hot tamales. Over it all clambered the luxuriant vines of the various cucurbits. Chayote, when finally mature, has a large nutritious root weighing several pounds. At one point there was a depression the size of a small bathtub where a chayote root had recently been excavated; this served as a dump heap and compost for the waste from the house. At one end of the garden was a small beehive made from boxes and tin cans. In terms of our American and European equivalents, the garden was a vegetable garden, an orchard, a medicinal garden, a dump heap, a compost heap, and a beeyard. There was no problem of erosion though it was at the top of a steep slope; the soil surface was practically covered and apparently would be during most of the year. Humidity would be kept up during the dry season, and plants of the same sort were so isolated from one another by intervening vegetation that pests and diseases could not readily spread from plant to plant. The fertility was being conserved; in addition to the waste from the house, mature plants were being buried in between the rows when their usefulness was over.[5]

The dump heap garden, as Anderson named it, was a miniaturization or imitation of nature. Other studies of dooryard gardens in Puerto Rico and Brush, Texas, further illustrate the widespread nature of this phenomenon in folk cultures.[6,7] A description of a vernacular garden in Puerto Rico seems similar to Anderson's description of the dump-heap garden.

> The vernacular garden comprises a house with ornamental plants arranged in beds, which may or may not be surrounded by a fence, and has herbaceous food plants somewhat segregated by crop. Plants in pots are numerous. Mowed weeds may provide a lawn of sorts, and substantial living fences are characteristic of these gardens. Large floras, with a rich diversity of species, are indicative of a high degree of interest in plants. Moreover, the plant cover may substantially exceed the land area of the garden because of the layering of trees, shrubs, and herbs. Bare ground is common in back of the house and of varying importance on the sides. There are middens, shallow drains, and privies. A laundry shed, or at least a hydrant and a mounted washboard, are found somewhere in the garden. Many kinds of animals are present and are penned or tethered.[8]

In both studies, a high tolerance for volunteer plants was found in the traditional gardens. Also, in the Puerto Rican garden study, the largest amount of plant diversity existed in the more traditional (vernacular) gardens.

This study of the folk consciousness is interesting in what it tells about man and his relationship to nature, but it tells us little about companion planting in a scientific context. We have chosen to pay attention to the teachings of the prairie, with the hope that we can gain some additional insights for companion planting in our gardens.

The particular prairie that we have chosen for this study is an eighty acre patch belonging to Nick and Joyce Fent. This is an untilled patch of virgin ground (hereafter referred to as the Fent Prairie) located in the northern part of Saline County. This land has never experienced forced grazing. The latest, most intense period of grazing was probably when the buffalo were still around over 100 years ago. The prairie is cut for hay each year, usually in August. As a result, plants appear on the Fent prairie that do not appear in adjacent native pasture.[10] This provides a natural laboratory resembling, to some degree, conditions which existed when Europeans first entered this area.

WORK IN PROGRESS

We want to know if the prairie practices companion planting. In early April we began to investigate this question in the Fent prairie by cataloging the ensemble of plants surrounding individuals of two species which were selected as "target" plants; Astragalus crassicarpus (ground plum milk vetch) and Callirhoe Papaver (Cass.) (poppy mallow).[11] These plants of the pea and mallow families respectively, might be regarded as wild analogs of the widely used domestic peas and beans (legumes) and okra (mallow).

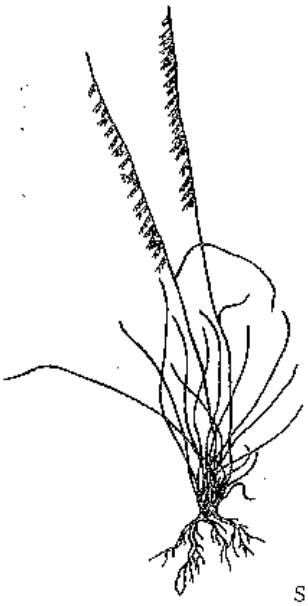
The study sites were located in the northeast quadrant of the Fent prairie on a cline sloping to the east.[12] Individual plants in this area were selected on the basis of healthy appearance and distance from one another in the sample area.

One meter square quadrates were placed over the area with our target plant at the center. The quadrates were constructed out of wooden two by fours and fishing twine, the twine serving to divide the quad into 100 decameter squares. All species in each decameter square were counted and mapped on a quadrate sheet which replicates the site. Each site was marked with two wooden stakes placed at the southwest and northwest corners. This makes it possible to return to the site for further counts. Before each count was done, a photograph was taken.[13] Perhaps in future years these photographs will give some indication as to plant community changes on the site.

So far, in our extensive sampling using the quad method, no paired relationships have emerged, but our work continues. We have recently changed our sampling method in order to cover more plants in a short period of time.[14] If it develops that we discover no natural associations that go beyond slope, soil conditions, etc., this part of the investigation will end.

Since the prairie is a biotic system which has reached a condition known by oldline ecologists as climax, it has passed through a succession which involves a move from predominantly annual plants(comparable to the domestic garden) toward a mostly perennial ensemble.[15] This process took place over millions of years.[16] In view of this, our selective look at possible companion plant relationships may not be penetrating the more complex situation in the prairie. In accordance with this, further studies involving a look at lower and intermediate levels of succession might better answer our questions concerning the effectiveness of companion planting. For example, a look at species relationships in recently disturbed areas such as abandoned barnlots or fields might be more appropriate.

Big Blue Stem



Side Oats Grama

References and Notes

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6. Wilhelm, Jr., Gene, "Dooryard Gardens and Gardening in the Black Community of Brushy, Texas." The Geographical Review, 65, 73-93, 1975.

7. Kimber, Clarissa T., "Spatial Patterning in the Dooryard Gardens of Puerto Rico," The Geographical Review, 63, 6-27.

8. Op. Cit. Kimber, Clarissa T., p. 10.

9. Clarissa Kimber reports that more species were found in the vernacular gardens, the total range for the study being from 8 to 119 species identified.

10. Nick and Joyce Fent have observed this prairie for many years and have noted the differences between this meadow and the neighboring pasture. Last year, Mr. Fent compiled a list of those plants that were present on his prairie but absent on the adjacent field. These include:

Nodding Lady's-tresses
Slender Lady's-tresses
Broomrape
Plume Dalea
Illinois Tick Clover
Virginia Tephrosia
Round-headed Lespedeza
Black Sampson
Stiff Sunflower
Cobaea Penstemon
Lovegrass
Fringeleaf Rubellia
Stiffleaf Vetch

11. Stevens, W. C., Kansas Wild Flowers. University of Kansas Press, Lawrence, 1961.

12. We thank Nick and Joyce Fent who allowed us to enter their prairie and helped us identify several species.

13. We thank Terry Evans who photographed each quadrate over the course of the spring months.

14. Dr. Phillip Raves, a recent associate of The Land, has suggested modifications in our data collecting technique. He suggested and built a device which helps to increase the speed and reliability of sampling. This is a meter by ten centimeter rectangle containing six decameter square boxes. The base of the sampling rectangle is positioned next to the plants and pointed in a direction selected at random. Contrary to what was done with the larger quadrates, only the forbs are identified and counted. Random sampling without regard to a target plant is also done.

FOR THE CHILDREN (Continued from pg. 21)

to solve problems through a large transfer of resources. Any strategy based on the assumption that the rich will more than double their foreign aid is doomed to failure." The U. S. is now 12th on the list of 17 industrial nations giving aid, giving about .23% of our GNP each year, and with the fallout from California's proposition 13, the U.S. Congress is again talking about decreasing this amount.

Stokes says in his paper that the key to meeting basic needs will not come through highly centralized national and international efforts, but through people doing more to help themselves. Local responses through cooperative self-help is the best way.

Does this let us off the hook? If our efforts to consider the complex problems of meeting basic needs and "removing manifest injustices endemic in the present system of relationships between nations and peoples" are discouraging, maybe we can let people take care of themselves locally and assume no responsibility.

Stokes doesn't imply that rich nations can turn their backs. He is asking for a different strategy in development. "Programs and policies should respond to the expressed need of communities, rather than imposed notions of what communities and individuals should want. Stokes gives many examples of people who produce their own food and provide their own shelters, people who lack capital but have the reserve of labor and ingenuity to get things done. "Centralized, paternalistic attempts to help the disadvantaged no longer have a place. With appropriate help, individuals can work out their own best solutions."

This approach is compatible with our emphasis and goals at The Land Institute. We are interested in regional semi-self-sufficiency and stress the need for people within communities to cooperatively use resources readily available to them. Our experiments in shelter and energy are based on this concept. Many of our ideas which relate to an alternative future for rural America are now being tried in the third world.

Can this "appropriate help," which Bruce Stokes refers to, be given without the "world solidarity movement" described by Alexander King and Aurelio Peccei in the Foreward to the 4th Club of Rome study, Goals for Mankind? "The possibility for mankind to emerge safe and even stronger from its current multiple predicaments does exist, but the possibility that mankind will do so is frighteningly slim. The situation can be turned around and human prospects made bright only by a supreme concerted effort by all peoples and nations, before it is too late."

The complexity of problems is only superseded by the complexity of solutions. While "local responses to global problems" will best provide for basic needs, the injustices and inequities among countries can only be eliminated through reshaping the international order. Utopian? Yes. But as a search for an ecological Utopia is justifiable, so is the search for a new international order.

I still believe, as we said at Wingspread, "There is a pressing need to inform the broader American public about the world food situation and the development needs and aspirations of developing countries." Thinking about these problems is not easy, not encouraging, but essential if we are to make the long range decisions necessary to preserve an inhabitable Earth for our children.

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Special Programs

I. TECHNOLOGY ASSESSMENT DISCUSSIONS. During the course of two evenings, John Black, Salina attorney, will review The Zapping of America: Microwaves, their Deadly Risk and the Cover-Up by Paul Brodeur (Norton Publishing Co.); The Toilet Papers by Sim Van der Ryn, and Pedal Power in Work, Leisure and Transportation by James C. McCullagh (Rodale Press). Will Americans buy "appropriate" technology, or will they only accept the "Cee-Whiz" technology? Think about this on September 26 and 29 at 7:30 P.M. at The Land. To register, send $5.00 to The Land by September 20.

II. Soft Energy Paths: Towards a Durable Peace. Arrangements are not yet complete for Saturday, October 21, but a conference is being planned which focuses on the international implications of the soft energy path. Amory Lovins will be in Salina, and will be the featured speaker. Details will be available in September.

III. SOLAR HEATING WITH A WOOD BURNING STOVE, a Saturday workshop for those who heat with wood or plan to sometime in the future. Topics to be covered include types and brands of wood stoves, building your own stove, installing a stove, cleaning the stovepipe, safety tips, the best wood for maximum BTU's, chain saws and crosscuts, how to split wood, stacking wood, woodlot cultivation, and more! November 18, 9:00 A.M. to 3:00 P.M. Bring a sack lunch. To register, send $5.00 to The Land by November 18.

The Fall Term for 1978 will begin Monday, September 11. The Land admits students of any race, color and national or ethnic origin. College credit is available through Marymount College in Salina. To apply for the fall, 1978, or spring, 1979, term, write to The Land Institute, Rt. 3, Salina, Kansas 67401.

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