THE LAND REPORT

Number 12 Winter 1981

The Land Institute

Contents

On the Cover

The Marsh Hawk flying over a Kansas pasture in winter was drawn by Richard Courter, President of the Kansas Audubon Council. He designed The Land's logo in 1976 and currently serves on the Board of Directors of The Land Institute.

The Land Community

There is a Land Institute Community, even though its members do not all live together. Co-directors Dana and Wes Jackson live at The Land, but the students and research associates carpool or bicycle out from Salina each day. The members of the community include research associates Mari Peterson (county energy planning) and Marty Bender (soft agriculture); Pam Ellinghausen, secretary and former student; and Terry Evans, arts associate who spends one day a week at The Land. Students who joined the community in September were Dennis Ronsse (our appropriate technologist), Annie Ronsse, Tom Mulcrone, Paul Rasch, Ed Newman and Melissa Myers. All but Melissa returned for the spring semester, and were joined by four new students: Fred Vogler, Mary Grogard, Mark Bigelow and Cici Bigelow.

On a typical morning, everyone meets at 9:00 to plan the day's work and make announcements. This is also a time for environmental current events, and for sharing ideas, concerns and inspiration gained from individual reading. Group discussions over assigned readings then continue the rest of the morning. A few of the books to be read and discussed during the spring term will be Nature's Economy by Donald Worster, Ecology and the Politics of Scarcity by William

The Land Report
is published three times a year by
THE LAND INSTITUTE
RT. 3
SALINA, KANSAS 67401

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

Contributing to No. 12: Annie Ronsse, Paul Rasch, Mari Peterson, Wes Jackson, Marty Bender, Wendell Berry, Tom Mulcrone, Ed Newman, Dana Jackson and Joan Gussow.

SUBSCRIPTION RATE: $5.00

THE LAND INSTITUTE IS A NON-PROFIT EDUCATIONAL-RESEARCH ORGANIZATION DEVOTED TO A SEARCH FOR SUSTAINABLE ALTERNATIVES: AGRICULTURE, ENERGY, SHELTER, WASTE MANAGEMENT.

Ophuls, Small is Beautiful by E. F. Schumacher, Soft Energy Paths by Amory B. Lovins, and The Feeding Web by Joan Gussow.

One day a week everyone brings a dish for the potluck lunch in the Jackson house. On the other days, students and associates bring sack lunches or prepare soup in the kitchen of the classroom building.

Because of the nature of The Land's educational-research program, students are together longer each day than would normally be the case in regular college schedules. In order to keep up with all the general maintenance work in the classroom -library, shop-kitchen and greenhouse, everyone must cooperate and share the jobs. During the afternoons, the students usually do physical work around The Land. They may help Marty Bender transplant Eastern Gamagrass in the research plots or work with Dennis Ronsse to remove the aluminum frames from the patio doors, used as glazing on the active solar heating system, and replace them with wooden frames. Each student has the opportunity to choose an individual project, such as build a small barrel wood-burning stove for the former battery shed, or work with another person on a joint project as Paul Rasch and Tom Mulcrone did when they installed two active solar collectors with rock storage on the greenhouse.

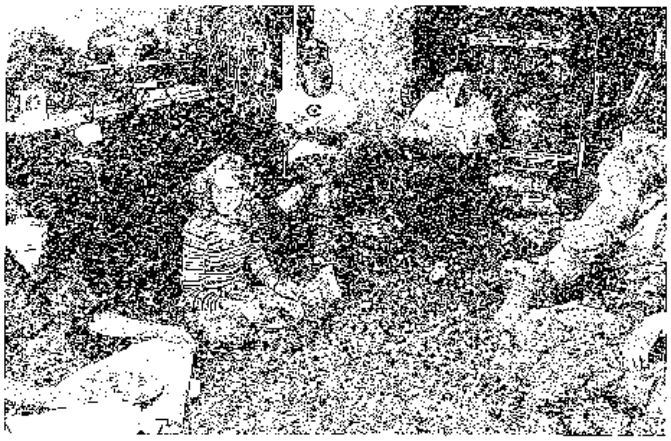
Sometimes conflicts occur between members of the community, but there is a general willingness to resolve them as soon as possible. The discussions can be intense and disagreements obvious, but this is considered to be a part of a vigorous search for sustainable alternatives. The satisfactions of a community in harmony are evident in the photographs on this page.

The Land Institute admits students of any race, color and national or ethnic origin. We recommend that applicants have completed at least one year of college. To apply for admission, write a letter describing past academic work, job experience, interests, and goals to Wes Jackson, The Land Institute, Rt. 3, Salina, Kansas 67401. Call (913) 823-8967 for appointments to visit The Land.

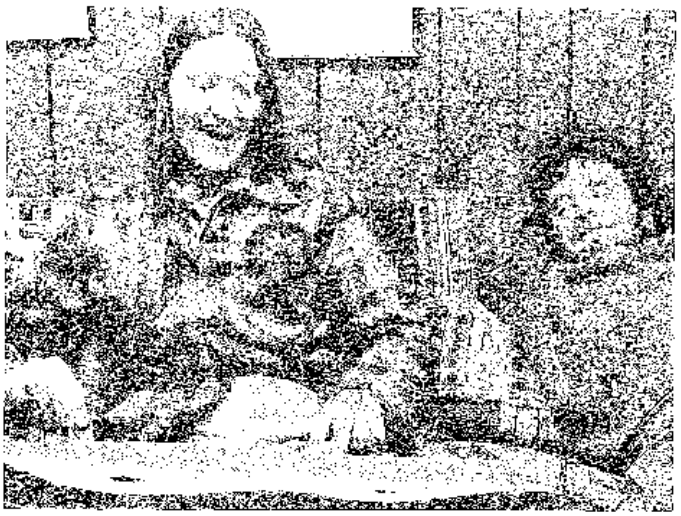
Nuclear Power and Nuclear Bombs

Amory and Hunter Lovins included Salina, Kansas in their fall lecture tour, so The Land Institute sponsored a public address by Amory in Salina and arranged to have the county energy planning conference at The Land during the time of their stay. This was the third visit for Amory, who is on the Honorary Board of Directors for The Land Institute, and the second for Hunter.

Continued on Page 4.



Ed, Mari, Paul, Melissa and Marty enjoy the conversation during lunch.



Annie and her dulcimer entertain Tom after lunch.

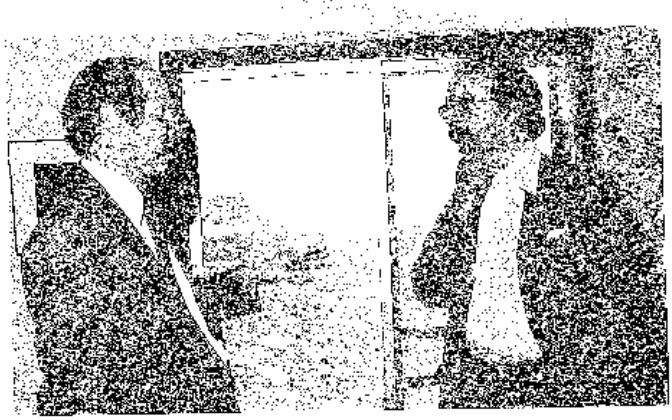
"How much wood could 8 woodchucks chuck if a red truck could truck wood?" The answer to this riddle, written on the blackboard, was two large piles of wood for the Jacksons' stove, a Christmas present from the community.

Continued from Page 3.

The speech which Amory Lovins gave at the Salina Community Theatre on Monday, October 17, was not his usual material. The "sermon " (as Amory calls it) is basically an optimistic description of how we can extract ourselves from the energy dilemma by developing conservation and diverse types of renewable energy resources, taking what he has called the "soft path." Instead of the basic sermon, Amory laid out the whole thesis of the article about nuclear proliferation and its relation to nuclear power plants, which first appeared in the summer 1980 issue of Foreign Affairs. He wrote this article with his wife and colleague, Hunter Lovins, and Leonard Ross, a former California Public Utilities Commissioner who now teaches at the Boalt School of Law. This was the first time Amory had given a complete address based on the paper, and it was a long speech, delivered more slowly than the standard sermon. He carefully presented his case that there is a direct link between nuclear power and nuclear bombs, and the audience concentrated on his words, following the reasoning and supporting information with effort but dedicated attention.

The U. S. has based its nuclear non-proliferation policy on the assumption that we can prevent an attractive source of plutonium for bombs from getting into the hands of terrorists and irresponsible governments by preventing the reprocessing of spent fuel from nuclear plants. This assumes that power plants themselves do not make plutonium that would be attractive to bomb makers. But Amory stressed that current knowledge of weapons physics reveals that any practical composition of plutonium, including "reactor grade" plutonium, can be made into bombs as powerful and predictable as those made from so-called "weapons grade" plutonium. This takes fancier bomb designs, harder to make but technically feasible. The U.S. government has suspected for some time that nuclear material has been stolen from a plant in Pennsylvania and one in Irwin, Tennessee. The International Atomic Energy Agency has found indications of thefts of nuclear material around the world but hasn't tried to do anything about it. The point Amory stressed was that nuclear power plants make nuclear proliferation inevitable, and the demise of nuclear power would make non-proliferation possible.

The proponents of nuclear power tell the public that the potential proliferation from the nuclear industry is a small price to pay because we need nuclear power to replace oil. Amory explained that nuclear power does not replace oil to a significant degree, as only about a tenth of the world's oil is used for making electricity, which is all nuclear fuel can do. Electricity is not a substitute for liquid fuel.



John Simpson and Amory Lovins.

The nuclear power industry is in real financial trouble today, and few utility companies want to invest in new, expensive nuclear plants. Rising costs and falling public acceptance, as well as a realization that demand for electricity is just not as high as previously predicted, all contribute to the slowdown in construction and licensing of nuclear power plants. Instead of propping up the industry with more government subsidies, Amory insists that the nuclear industry should take the verdict of the marketplace that nuclear power plants are uneconomical and not needed.

In contrast, the soft energy path shows great promise for providing all our end use energy needs at a much lower cost.

As long as we have nuclear power, we will have nuclear proliferation. But unless human nature changes or is disciplined better, we will still find ways to kill each other even without nuclear proliferation. "No matter how successful our non-proliferation is, we can only buy time before some other holocaust, unless we also come to grips with the central problem: power without purpose, tribalism, injustice and aggression." The soft energy path will foster a better social framework in which to address those problems, but it can't solve them."

This sobering reminder stayed on people's minds as they left the theatre.

Special reprints of the article, "Nuclear Power and Nuclear Bombs," can be ordered for 25¢ each plus 50¢ postage (minimum order, $1) from Friends of the Earth, 124 Spear Street, San Francisco, Ca. 94105. For a longer, more detailed discussion of the subject (footnotes "by the furlong," according to Hunter), read Amory and Hunter's new book, Energy and War: Breaking the Nuclear Link, which is available from the same address for $10 ($8 for members of Friends of the Earth).

Energizing Communities: Ideas and Resources for County Energy Planning

by Mari Peterson

This fall, community energy planners from Kansas and Missouri had the opportunity to discuss energy alternatives and community development with many persons knowledgeable in these areas. On October 28th, the Land hosted the conference, "Energizing Communities," funded by the Solar Energy Research Institute and the Kansas Energy Office.

Representatives of eight local energy projects in Kansas and Missouri came to the Land to hear speakers in the morning and to get acquainted and trade experiences in the afternoon. The purpose of the one-day conference was to support people trying to solve energy problems on a community level and make it possible for them to discuss common goals and concerns.

Dave Martin, solar director of the Kansas Energy Office spoke first of loans which will be obtainable through the Federal Solar Energy and Conservation Bank. He urged persons to apply for these loans through their local banks to show the federal government we are interested in solar and conservation. He also mentioned a series of solar hot water heating workshops that will be carried on throughout the state beginning this spring. Each workshop participant will assemble a solar hot water heating kit at the workshop for a minimal price.

The international energy scholar, Amory Lovins, encouraged the group to follow new energy developments in the publication, Soft Energy Notes that can be obtained through Friends of the Earth. Amory emphasized the need to work on energy efficiency before worrying about new energy supplies. He warned against "putting a solar system on a sieve."

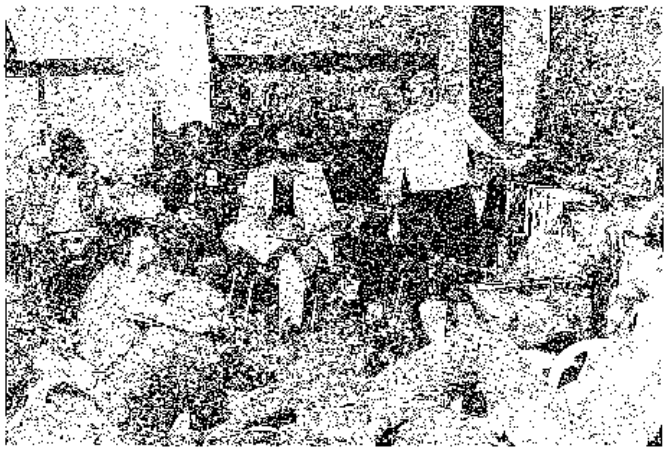
Rob Aiken of the Small Farm Energy Project in Hartington, Nebraska told about their experiences during the 3½ year project. He was concerned about the vulnerability of present agricultural practices, the dependence on outside sources of energy, complex machinery, and foreign exports. One of the biggest institutional problems farmers face is the tax structure which encourages land speculation and investment in machinery. Rob suggested demonstration projects are needed to accompany the abstract planning, and told of the $1100 savings in costs experienced by farmers trying innovative approaches to farming in their project.

Community development specialist, Jerry Wade, of the University of Missouri warned of "preempting the community of its own potential." The emphasis should be on the educational process rather than the planning, and on the development of community and local political control. He warned that the needs of the community must be learned and not assumed. "The central question is not technological but social. How can we get the community to regain control?" People must be aware of the role they have in decision-making processes.

Ed Dutton of the University of Kansas talked about collective self-regard versus individual self-fulfillment. To begin building collective self-regard, individuals must be met on a one-to-one basis, listening to their needs. As the organization develops, large tasks should be tackled in small pieces so there can be achievements and a sense of success. At this point, both individual self-fulfillment and collective self-regard can be experienced. At all times, more people should be encouraged to become involved, heightening a sense of community. Ed warned against stepping in as a "professional" with the community citizen as a "client".

Jim Benson, co-author of the County Energy Planning Guidebook, feels that we need to get conservation and solar elevated as national priorities. At present the utilities and oil companies have too much clout. The way to elevate these alternatives is through individual and community-level education which leads to action and political decision-making. "Democracy depends on education." Jim mentioned that currently 100 communities are using the County Energy Planning Guidebook. He encouraged people not to get too involved with data gathering, since approximate ideas of how energy is used could be sufficient for community energy development. A new publication from Jim's Institute for Ecological Policies in Fairfax, Virginia, called Energy and Power in Your Community was recommended as a way to get a quick overview of expected energy costs for the community in the year 2000. Jim stressed the urgency of local energy planning as a way of beating the top-down authoritarian approach.

In the afternoon, half the people met to discuss some of the institutional barriers to energy planning and community development. Four topic areas were covered. The group considering money incentives recommended that we encourage utilities



Jerry Wade leading afternoon session on institutional barriers to county energy planning.

to make no-interest or low-interest loans for conservation and renewables as is occurring in some places in the U.S. Those discussing political power dynamics felt that creating a separate power group that could demonstrate the positive impact of their views was most effective in educating and influencing established power. Under the broad heading of value considerations, individuals agreed that a necessary prerequisite to changed values is bringing back our connection to nature. Demonstrations of workable alternatives (coupled with sufficient, practical information) facilitates value reorientation and enables people to make their own decisions. The final group which met to discuss the role of government programs in energy and community development ironically turned out to be primarily Kansas Energy Office and Energy Extension Service people. They did not have enough others in the group to get the suggestions they would have liked. They urged citizens to make use of available services at their state agencies and give suggestions on how they could be of greater assistance.

Meanwhile, persons engaged in community energy projects shared their experiences. The following counties and groups were represented: Harvey County (KS), Wabaunsee County (KS), Douglas County (KS), Metropolitan Energy Assembly Project (Kansas City), Callaway County (MO), Howell County (MO), and Boone County (MO). The person from Wichita was not present at this session. Most of these groups are in the early stages of their work. They are gathering data and spending much time and effort on involving more people and raising funds.

The opportunity to interact, to share ideas on raising funds, securing data, and increasing community participation was worthwhile and inspiring. The group decided to gather together again in the summer or fall of 1981 and invite any newly-involved communities to attend.

EPA Training Seminar Held at The Land

The Region 7 Office of the United States Environmental Protection Agency contacted The Land Institute last summer to discuss the possibility of our conducting a training seminar for twelve EPA employees. Although many EPA employees may attend special seminars updating technology or procedures relating to their particular jobs, there have been no opportunities for personnel from different divisions to come together to consider broad issues or objectives. The Land made a contract with the EPA to present general background material, to provide information and ideas which would inspire employees to work with dedication to protect the environment.

The theme for the seminar during the week of October 18 was "Sustainability: A New World View." Lecture-discussion topics included environmental economics, soft energy path economics, the book Entropy by Jeremy Rifkin, agriculture as an environmental problem, New Roots for Agriculture by Wes Jackson, sustainability on the prairie, appropriate technology and environmental ethics. Participants talked about the paradigm of sustainability and contrasted it to the productivity-growth-waste paradigm which is the basis of the American economy and society. Many of the tasks of the Environmental Protection Agency involve cleaning up the poisonous debris of our economy. Its tasks would be totally different if Americans depended upon life support systems based upon maintenance, recycling and renewal rather than rapid resource extraction, transformation and waste.

The ideas were not new to everyone, but spending time discussing a new world view and long-term goals and options was a new experience for them as EPA employees. The EPA has its share of idealistic people who become disillusioned about really doing an effective job protecting the environment within a federal bureaucracy. It employs some people who lack a sense of mission, who work within their areas of special expertise and just do their jobs. But the EPA also hires well-trained, highly-motivated persons who persevere with dedication and integrity to administer and enforce environmental protection laws. At The Land Institute, away from the city, the paper-

Dennis Ronsse of The Land and Jody Crane from the EPA at the potluck lunch table.

work, the telephone calls, everyone could think and speak about his or her areas of interest and concern and the philosophical basis for action.

As the discussions continued during the week, the Land people and seminar participants developed bonds of mutual respect and friendship. By Friday, the EPA employees were not physical scientists, sanitary engineers, public information specialists, or secretaries working for a large federal agency, but they were thoughtful, resourceful, considerate, members of our Land community.

The U. S. Environmental Protection Agency was set up to enforce laws protecting the air, water and land because very few cases of self-restraint from dumping wastes in the commons existed. Industry only stopped polluting when statutes and regulations forced them to stop. If the current administration dismantles environmental regulations and the watchdog agency enforcing them, it will be sacrificing the long-term ability of the land to support life for short-term profit. Nothing could be further from a paradigm of sustainability.

Kansas Environmental Action Workshop

Twenty-one persons representing about 15 different organizations attended the Kansas Political Action workshop for Environmentalists at The Land Institute on Saturday, January 17.

Robert Miller, Chairman of the House Energy and Natural Resources Committee spoke about many issues which will be discussed in his committee and told of the bills that he expects to be introduced which relate to the environment. He recommended that a coordinated environmentalist effort could best assist the passing of a bottle bill and a nature trails bill. The bottle bill, which would require deposits on all containers and the prohibition of pop tops, will have more co-sponsors this year and more supporters in the legislature. The nature trails bill, to be introduced by Ron Fox, would set up nature trails in Kansas associated with a national backpacker trail system and call for voluntary conservation easements on a three year basis.

In the afternoon discussion, participants decided to give priority to these two bills, plus the severance tax proposed by Governor Carlin. They developed a plan for a phone tree, and Annie Ronsse of The Land offered to design it. Elise Watkins, Vista Volunteer with the Kansas Rural Center and Brad May of the Kansas Audubon Council will track the bills in the legislature related to these three priority issues and inform the co-ordinator of the phone tree, Eulalia Lewis.

Each group desiring to cooperate in the phone tree was asked to do four things: (1) Give or send the name and phone number of a contact person to Annie Ronsse, The Land Institute, Rt. 3, Salina, KS 67401; (2) Raise some money from their general treasury or through individual contributions in their organization for the cost of phone bills. Any amount will be accepted. Send the phone expense money to Steve Burr, Nat'l Parks and Conservation Assn., Rt. 2, Salina, KS 67401. Steve will transfer all money to the coordinator; (3) All organizations should give the phone tree coordinator the names of paid and/or volunteer lobbyists who already work for them in the legislature so there can be good communication; (4) Explore ways to raise money to pay a fulltime environmental lobbyist for the future.

During the afternoon session, Diane Tegtmeier described her experiences and difficulties as a volunteer soft energy lobbyist in the Kansas legislature. She stressed the need for a fulltime environmental presence in the legislature to answer questions and give information. The group at the workshop agreed that their ultimate goal would be to pay a fulltime lobbyist to assist all of the organizations in more effective political action on behalf of the environment.

The group agreed to meet at The Land next November or December for a pre-session workshop to develop plans for the 1982 legislature. The Land Institute will organize the meeting again and inform participants.

Evenings with Alan Gussow and Wendell Berry

Bernd Foerster, Dean of the College of Architecture and Design at Kansas State University, and a member of the Board of Directors of The Land Institute, told us that Alan Gussow was interested in visiting The Land after his week of lectures at Kansas State November 17-21, and before flying to Denver to address a conference of landscape architects on November 23. We phoned Alan in Congers, New York, and were delighted when he accepted our invitation to spend the weekend at The Land.

Early in December, Wendell Berry phoned The Land and asked if he could spend some time interviewing Wes for an article in New Farm. We were eager for him to be our guest and could hardly believe our good fortune when arrangements were made for him to arrive on December 17 and stay until December 20.

Both Alan and Wendell agreed to make some type of public presentation while they were here. We tried to arrange a program format which would attract a good audience, but not one so large as to prevent a warm, conversational atmosphere. We

have long recognized that the most successful events at The Land occur when people sit in circle-type arrangements and see each other's faces. So we limited attendance to the first forty people who made reservations, the maximum number for good interaction among participants in our classroom.

The Land Institute is not a school of the humanities, but this fall semester the "Evening with Alan Gussow," and the "Evening with Wendell Berry" were two of the finest cultural events in the entire community.

Alan Gussow is a painter whose works have been widely shown. A former professor and department head at the Parsons School of Design, he is the author of A Sense of Place, the Artist and the American Land, an anthology of painting and commentary by American artists from 1585 to the present. He was the first Artist-in-Residence in the National Parks at Cape Cod National Park in 1968 and later directed the program which now includes artists at seven national parks. In describing his current painting, he says, "I've gotten more and more local. I tend to work right around our own grounds, our own house, the trees here, the garden."

Alan has been the Chairman of the Board of the Artists for Environment Foundation, and he is President of the Friends of the Earth Foundation. He is also a Friend of The Land. In 1964 Alan began his style of art-political activism ("Using the skill of the artist to inform people environmentally") when he testified at hearings of the New York State Legislature on the future of the Hudson River, and his testimony has become increasingly valuable to federal and state commissions. He is a consultant for the Department of Interior and has helped establish criteria for scenic beauty.

Those who attended the Saturday "Evening with Alan Gussow" were entranced with the color and patterns they saw on the slides of his work.

Wes Jackson and Wendell Berry.

Both artistically-trained eyes and untrained eyes appreciated the drama of the pattern made in the soil when the roto tiller goes through it, the pattern of a bee and a butterfly moving through the garden, the pattern of leaves falling. Alan talked about how he chooses segments of what he sees, particulars in his environment to paint.

Wendell Berry is a poet, novelist and essayist. Among all of his published work, which includes three novels, nine volumes of poetry, and three books of essays, he is perhaps most widely known for The Unsettling of America: Culture and Agriculture, published in 1977. We did not know how widely known until we began to receive responses to the flyer announcing the "Evening with Wendell Berry" on December 18. To tell Friends of The Land calling in for reservations that they could not come because there was not room for them was very distasteful, so the circle was sacrificed, and we borrowed folding chairs to accommodate 60 people sitting in rows. We still had to tell some who called that there would be sitting-on-the-floor room only.

Wendell Berry has been described by one reviewer as "a man that left his native hills and valleys (of Kentucky) for a time, but returned in the conviction that in the surroundings to which a man is closest, which he loves and understands best, he makes his greatest contribution to his fellowman." Wendell farms his own acreage in the country where he grew up, using draft animals instead of a tractor. He no longer teaches at the University of Kentucky, but devotes his time to the farm and to being a contributing editor of New Farm.

Wendell was told to "talk about whatever was on his mind," and the audience soon learned that Wendell wasn't thinking simple or trivial thoughts. He described the struggle for humans to find the right balance in the expression of what is wild and what is domestic in them and their activities. Scientific agriculture is an effort to domesticate fertility, yet the soil itself must be wild and teeming with life to be fertile.

The ex-English professor traced the human attitude towards oneself and nature as revealed in English Literature, dwelling most upon Alexander Pope's Essay on Man. Pope understood man to be a part of the "great chain of being," part of the structure of nature. "Consult the genius of the place in all," Pope said, and Wendell Berry cited this as advice to all humans in their efforts to treat nature with the proper respect.

Wendell delighted the audience when he read some poems from his latest book, A Part (North Point Press, Berkeley, CA, 1980). "Horses," the last poem he read, movingly explained why he farms with horses and how he loves them.

The evenings with Alan Gussow and Wendell Berry will long be remembered.

Does Kansas Have Integrated Pest Management?

October 25, 1980

Dana and Wes Jackson
The Land Institute
Route 3
Salina, KS 67401

Dear Dana and Wes:

I just read Dana's article MAN IS JUST A LITTLE BIGGER PEST in the Fall, 1980 issue of the Land Report. I find it excellent. A few statements, although basically correct, could turn certain people from support to opposition of your and my goals.

I refer specifically to the references to county agricultural agents in the bottom part of p. 23 and the top of p. 24. A county agent reading this could justifiably feel falsely accused, because it implies that he is untrained and/or against integrated pest management. I expect my concern is sharpened by talking to Norman Schlesener a week ago. He stopped in to talk. He is County Agricultural Agent in south-central Kansas; Kingman County, I believe. I told him how I was pleased to read about the trend toward IPM which results in much reduced use of chemical pesticides than formerly. I asked him about his experience with consultants in the state. He was strong in his statements that county agents are trained and fostering IPM as much as the consultants.

Norman may be atypical. Obviously some county agents are not the same as Norm, and not as strong for environmental improvement. However, my point is that if Norm should read this he would feel he is unjustly maligned. He is trying to do a good job, and he needs support, not unjust accusations, to encourage him to continue.

Of course you wish not to weaken your story so it does not do as good a job of stimulating people to act to do the things you seek. However, I believe you can keep such enthusiasm and still not alienate those who are working in the right direction. One way would be to say that "many county ag. agents (fortunately not all) ..."

The same thing applies to schools of agriculture. You are correct that they have fostered attitudes that need changing. However, faculty in ag are not monolithic. You may, for example, know Orville Bidwell, professor of Agronomy (soil scientist) here at KSU, who is one of your supporters. He was the only KSU faculty member that attended one of your meetings in Salina a year or two ago. He is likely to understand and not be turned against you by blanket statements about Ag faculty, but there are others who are less dedicated but on the way to better attitudes that might be turned back by a feeling of unjust accusation.

I hope that I have not stressed this so strongly you feel accused. Remember my first paragraph. I write this in the hope of being helpful.

Sincerely,

Lloyd C. Hulbert
Division of Biology
Ackert Hall, KSU
Manhattan, KS 66506

Dear Lloyd:

Thank you for responding to the article about aerial spraying for pest management in Kansas which appeared in our last Land Report. In regard to your concern that we might offend potential supporters, my editorial philosophy is that if Land Report articles are true and not deliberately inflammatory, we cannot be concerned about negative reactions from readers. We are concerned, however, if we have "falsely accused" anyone. After receiving your letter, I did some checking to learn more about integrated pest management in Kansas. My article did overstate the case. There is an extension integrated pest management coordinator making an effort to teach county agents that the "period of blithe reliance on chemicals has past." The IPM program being developed at Kansas State stresses the importance of expert ecological assessment in the field and the use of computer models to determine the right treatment. This is an agricultural technology more practical and affordable by large production units than small farms, therefore more applicable in certain counties. Some county agents actively promote IPM; others don't.

One of the difficulties in discussing IPM is that there are two substantively different philosophies of IPM understood by those using the term. Environmentalists, greatly concerned about the harmful effects of chemical pesticides in the environment, consider IPM to be an alternative to pest control

strategies of the last three decades. The use of chemicals is not ruled out, but is considered a last resort treatment. In Kansas, by and large, the pest management experts, the farmers, and probably the county extension agents, consider IPM to be prudent use of chemicals. They rely on scouting the fields to count the number of insects per plant and make accurate measurements of damage, knowledge of the life cycles of insects and their predators and data about the weather before choosing the proper chemical and the proper timing of application. This approach leads to a much safer, more economical application of chemical pesticides, but it also insures the continued use of pesticides.

I interviewed Dr. Donald Mock, Extension Integrated Pest Management Coordinator at Kansas State University, and he told me about the IPM program in Kansas. The USDA inititated pilot programs in IPM in 1971, and the Kansas State University Cooperative Extension Service began pilot pest management programs in grain sorghum in 1973. By 1975, this three-county program had expanded into eight counties and addressed weed, disease and insect problems in both grain sorghum and corn. This involved field scouting and computer programs to develop recommendations for numbers and timing of spraying. Several private, agricultural consulting companies now do this work in southwestern Kansas. Perhaps these are the consultants Norman Schlesener referred to.

The "1980 Annual Report and Evaluation of Integrated Pest Management in Kansas," written by Dr. Mock, stated that in 1980 the IPM program reached directly into "more than thirty counties." A chart in the same report says 25 counties for 1980 and thirty for 1981. (Looking at it another way, there are still two-thirds of the counties in Kansas which do not have IPM programs.) The IPM program involved insects, weeds, plant diseases, and nematodes in corn, grain sorghum, alfalfa, soybeans and turf. State specialists in the Departments of Agronomy, Plant Pathology, Entomology, Horticulture, and Agricultural Engineering provided IPM educational programs and demonstrations at various sites throughout the state. The county extension agents were trained at such meetings, according to Dr. Mock.

The interview and written information given to me by Dr. Mock does indicate a trend toward IPM in Kansas and an attempt to train county agents in the prudent use of chemicals. Until basic research and field testing produce effective strategies for pest control other than pesticide spraying, this is the "state of the art" in IPM. This is especially true of the state agricultural programs developed for "industrial agriculture," large, capital-intensive production units, often specializing in one or two irrigated crops. Unlike the farmer on a small, diversified farm, who has other crops to fall back on, the agribusinessman raising corn on large acreage faces the chance of enormous loss if pests in his field are not checked in time. Careful monitoring and data collection in his fields are necessary.

Back in the days when the agricultural college worked primarily with "agrarian" agriculture (see Farm Policy: Thirteen Essays by Harold Breimyer, Iowa State Univ. Press, Ames, 1977, for the origin of the terms "industrial" agriculture and "agrarian" agriculture.), the county agents could advise those on the small, diversified farms about crop rotation, careful timing of planting, plowing and selective burning, use of trap crops, selection of planting sites, and seed selection, all of which contributed to pest management.

But even before the agricultural extension agents began advising farmers, many of these practices were commonly known and followed. As Ray F. Smith wrote in "History and Complexity of Integrated Pest Management, " a paper in the book Pest Control Strategies, edited by Edward H. Smith and David Pimentel (Academic Press, 1978), farmers developed cultural and physical control practices for protection of their crops by trial and error, and some were later proven to be scientifically valid.

But wasn't there a lot more damage from insect pests then, before the age of chemicals? No, according to David Pimentel in "Socioeconomic Aspects of Pests and Pest Control," a paper in the book mentioned above. "Crop losses from insect pests increased nearly two-fold (7% to about 13%) from the 1940's to the present. This increase occurred in spite of a ten-fold increase in insecticide use." Of course, greater crop yields due to higher-yielding crop varieties and more fertilizer lessened the impact of crop losses from insect pests. The fact remains that crop losses from insect pests doubled (almost) during a period of intensive pesticide use.

During the chemical-drenching days of the 50's and 60's, even the small farmer became hooked on the use of pesticides and ignored the old methods. The relative cheapness of the chemicals, the quick results and lack of restrictions on their use were impelling reasons for lots of spraying. The agricultural schools promoted chemical pest control through "preventive" spraying programs. Now, ag schools like Kansas State are telling the farmer to hold back on spraying until specific field conditions exist. He is confused, especially as the farm magazines and farm radio and TV advertisements still tell him that their products are

Prudent Use

Last Resort

the answer to all his pest problems. Kansas people still see plenty of aerial spraying, and most aren't aware that agriculturists are employing a new method called Integrated Pest Management. Some farmers may not understand the distinction either, and, judging from the regular columns written by county extension agents in local newspapers, some of them haven't caught on yet.

Nevertheless, the experts at the agricultural college and in extension are guiding the farmer into IPM, not because of a great concern for the impact of pesticides in the environment, but, like the rest of the agricultural establishment, they are reacting to the pressures of the marketplace. First of all, farmers need to cut production costs, and the rise in the price of oil has caused a rise in the price of agricultural chemicals as well as the fuel to apply them. Second, the chemical companies themselves were beginning to experience negative feedback from the "preventive" chemical drenching programs of the 50's and 60's. During this era, the companies were expected to keep introducing new products as new strains of insects evolved which were resistant to old pesticides. In an article called "Defending Irrigated Crops against Super Bugs," (Irrigation Age, May/June 1980), M. J. Nelson pointed out that ten years ago most chemical companies spent ten to fifteen million dollars over five years to invent a new treatment and develop it for the market. Today the same process takes from 47 to 55 million over five years, and in a few years it may be too expensive to develop any new products at all. Therefore, it is to the advantage of the chemical companies to have customers prudently apply pesticides. One application a year instead of three will slow down the rate of development of pesticide-resistant insect populations. As M. J. Nelson put it, "In order to postpone the day when no effective chemicals remain, entomologists have devised a program called integrated pest management (IPM)..."

The chemical companies do not intend to promote IPM to the extent of putting themselves out of business. IPM is not a step towards organic farming. The petro-chemical industry cannot be expected to be enthusiastic about paying for research on biological controls. The leadership to move on from "prudent use of chemicals" to a "last resort" IPM program will come from people who see the reduction of pesticides use as a social goal. A clamor for real change in pest management methods will not come from the agricultural universities, but from environmentalists. The move toward IPM was partly because of environmentalists and the impact of the Environmental Protection Agency. Restrictions on the introduction of new pesticides, licensing procedures and training requirements for applicators and farmers have been heavily criticized by the agricultural establishment for raising costs and preventing quick action. Many people now taking credit for IPM leadership were simply pushed into it by the marketplace and EPA regulations.

Environmentalists and farmers are becoming better friends every day as the problems of soil loss, water and energy interface more obviously. Husbandmen and stewards of the land have much in common with Friends of the Earth, and there should be a logical partnership between agriculture and ecology. However, the professionals in the agricultural college are still, with a few exceptions, not on the same team with The Land Institute, Kansans for Safe Pest Control, the Sierra Club, or Friends of the Earth. You are right, Lloyd, that the "faculty in agriculture are not monolithic." We recognize that we have Friends of The Land at Kansas State, such as you and Orville Bidwell, and other Friends at the University of Nebraska, University of Missouri, Iowa State University, North Carolina State University, Cornell University and the University of California at Davis; but they do not characterize their colleagues. Most faculty members would support IPM as an economical method of pest management, but not get involved in working towards reduced use of pesticides as a social goal.

I have had direct experience with people in the agricultural establishment who express disapproval of those who have been leaders for change. The late Robert van den Bosch, a well-known and outspoken research entomologist at the University of California at Berkeley, author of The Pesticide Conspiracy, was referred to as "extreme." David Pimentel, who has published widely on the problems of agricultural chemicals, was accused of making invalid conclusions based on untrustworthy data. Bosch's and Pimentel's out-front criticism of agricultural methods has, of course, made many people uncomfortable. Remember the reaction of agricultural entomologists and the chemical industry to Rachel Carson's Silent Spring?

Wes and I have been critical of the agricultural universities because they generally are not providing leadership toward a more ecological agriculture in the United States, although there are some fine individuals within them who are. We appreciate your friendship and help to The Land Institute and greatly admire the important work you are doing at the Konza Prairie.

Sincerely,

Dana Jackson

American Food: S/OIL and Water

by Wes Jackson and Marty Bender

Fossil fuel calorie in for edible calorie out, the American food system is the world's most inefficient. Compared to the developing countries, which typically expend a fifth of a calorie or less for every food calorie harvested,[1] U.S. agriculture spends two calories of fossil fuel energy for each calorie of food in the field. And the energy consumption doesn't stop there: from ground to mouth we use 9.8 times the energy value of the food we eat.[2]

The food system in America is more energy costly than in the less developed countries because it runs mostly on oil, rather than on soil. The diet of the average American embodies, each year, the energy equivalent of 13.3 barrels of petroleum - 70 percent as much as the average American car consumes.[3] But because people still outnumber cars in the U.S., farming uses more petroleum than any other industry.[4]

These fossil fuel inputs make land and labor highly productive, but before we congratulate ourselves for producing enough food last year to export $34.3 billion worth, we should tally up all the costs: not just the energy dollars sent abroad, but the nitrogen, the phosphorus, and the potassium shipped overseas in that food, and eroded out of the land.

TABLE 1. ENERGY CONSUMPTION WITHIN THE U.S. FOOD SYSTEM[9]

Sector	% of U.S. Total Energy Use	% of U.S. Food System
On Farm		
Direct Energy	1.0	6
Input Due to Chemicals and Transportation	1.9	12
Food Processing	4.8	30
Distribution System	1.8	10
Commercial Food Service	4.3	26
Home Food Preparation	16.5	101

In the long run, soil and water are more important than oil. But because the American food system is increasingly dependent upon fossil energy, we ignore the declining quality and quantity of our soil and water resources. During the last 200 years, at least a third of our cropland topsoil has been lost.[5] Studies within the last decade[6,7] indicate that we are losing from 25 to 50 percent more soil per acre now than we were over 40 years ago, when Hugh Hammond Bennet - founding chief of the Soil Conservation Service - was lamenting the loss of American soils.[8]

Since that time, water has also become a serious resource problem. A full two-thirds of the ground water is pumped to irrigate our crops.[9] About one-fourth of this withdrawal is overdraft. Our agricultural system seems to have a penchant for "double mining": we now mine fossil fuel in order to mine water; long ago we became accustomed to mining soil nutrients during harvest while promoting the downward rush of remaining soil to the sea. Conserving these natural resources is at least as vital to our interests as conserving the massive fossil energy inputs that American agriculture requires.

Not counting food exports, the food system consumes 16.5 percent of the country's entire energy budget.

ON-FARM: FERTILIZER, IRRIGATION, PESTICIDES FIELD OPERATIONS

Energy used on the U.S. farm is only 18 percent of the total used to get food on the table. Of this initial energy expenditure, nearly half is for fertilizers, pesticides, and irrigation.

TABLE 2. 1976 U.S. ON-FARM ENERGY USE[10]

Component	10^6 bbl. Petroleum At the Wellhead	% of Total
Fertilizer	153	30
Field Operations	98	20
Transportation	81	16
Irrigation	67	13
Livestock	40	8
Crop Drying	29	5
Pesticides	26	5
Miscellaneous	15	3
TOTAL	509	100

For comparison, the daily U.S. energy budget in 1979 was 39.3×10^6 barrels of petroleum-equivalent, at the wellhead.

Almost three-fourths of on-farm energy, and 88 percent of crop output is spent to provide meat. Per capita consumption is among the world's highest. To produce the 250 pounds of meat the average citizen consumes each year, we have to maintain a livestock population that weighs four times as much as the human population it feeds."

Diverting much of our human-edible grain to livestock represents a major diseconomy of energy and protein in the food chain. Livestock convert food with an energy efficiency of only 5 to 15 percent. Overall, for every 5 pounds of vegetable and fish protein fed to livestock (in addition to the large forage intake), we obtain one pound of animal protein.[12]

U.S. annual fertilizer consumption amounts to 50 million tons: 10 million tons of nitrogen and

5 million tons each of phosphorus and potassium. The production of chemical fertilizers is America's fourth largest basic manufacturing industry. (Petroleum is first, steel second, and cement third.)

The agricultural system's total energy consumption for fertilizer "from the ground to the ground" is about 120 million barrels of petroleum equivalent at the wellhead. Of this total, 88 percent was for production, one percent was for transport of raw materials, and 11 percent was for transportation, storage, handling, and application. The major energy-consuming phases of the fertilizer system are ammonia production

TABLE 3.
ENERGY COST OF ANIMAL PROTEIN PRODUCTION IN THE U.S.[13]

Animal Product	Feed Energy Input / Protein Energy Output	Fossil Energy Input / Protein Energy Output
Milk	30	35.9
Eggs	20	13.1
Broilers	19	22.1
Catfish	25	34.6
Pork	65	35.4
Beef (feedlot)	122	77.7
Beef (rangeland)	164	10.1
Lamb (rangeland)	188	16.2

(71 percent of the total), product distribution (11 percent), and production of wet-process acid (8 percent for production of phosphate fertilizer). Of the energy used to produce the fertilizers, nitrogen, phosphate, and potash account for 85 percent, 11 percent, and two percent respectively.[15]

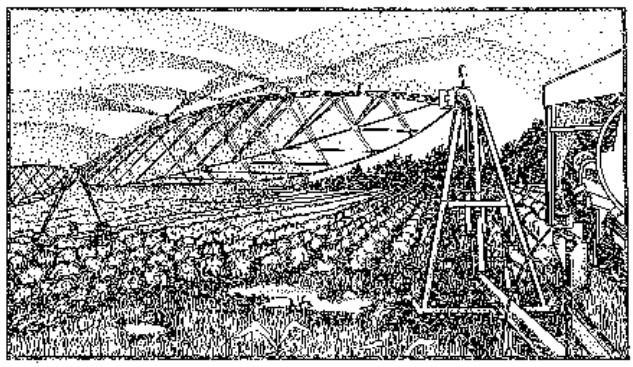
TABLE 4.
U.S. ON-FARM ENERGY AND CROP INPUT TO THE AMERICAN DIET.[14]

% of Diet	% Energy Input	% Crop Input
Meat--40%	73	88
Plant--60%	27	12

Corn, wheat (winter and spring), and hay (other than alfalfa) consume 45 percent, 17 per cent, and ten percent, respectively, of the invested energy in fertilizer for agriculture.[16]

Irrigation accounted for one-third of U.S. water use in 1974[17] and required 58.4 x 10^6 bbl. of petroleum-equivalent at the wellhead - or 13 percent of U.S. agricultural energy use.[18] Ground water used on 75 percent of all pump-irrigated acreage accounted for 90 percent of irrigation energy use. Sixty-three percent of groundwater irrigation withdrawal was in regions of critical groundwater depletion.[19]

Although irrigation accounts for 13 percent of agricultural energy use nationally, that figure jumps to 25 percent[10] for a state such as Nebraska which depends heavily on irrigated crops. A center pivot sprinkler in Nebraska uses ten times the fossil fuel used for all other on-farm requirements to produce a field of corn.

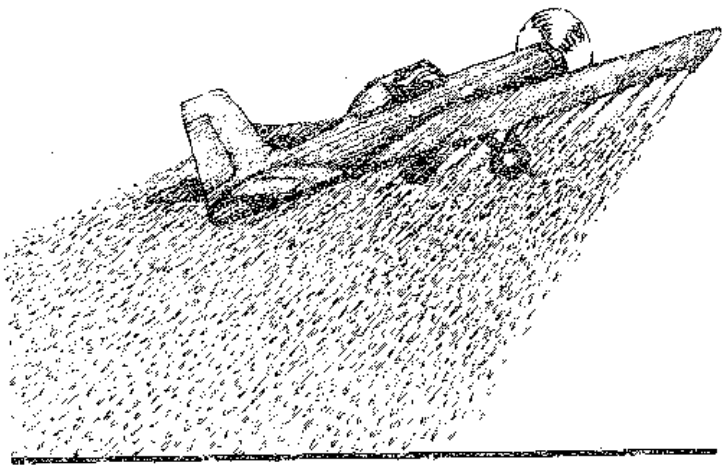


The 17 western states are the most heavily dependent on irrigation. Eighty-three percent of all pump-irrigated land is in the 17 western states; they consume 93 percent of all irrigation energy. The Northern and Southern Great Plains, as defined by the USDA, consume 71.4 percent of all natural gas used for irrigation and 58 percent of all energy at the pump.[20] In the Southern Great Plains alone, the land area irrigated by natural gas totals one-fourth of all pump-irrigated land area.[20] Irrigated agricultural production in the Northern and Southern Great Plains depends mainly on the Ogallala aquifer. Groundwater mining here occurs at the rate of 14 million acre feet annually.[5] By comparison, the annual discharge of the Colorado River at Lees Ferry, Arizona is 12 million acre feet a year. If water were diverted from the Missouri at Kansas City during the pumping season to try to supply the irrigation demand above the Ogallala, it would be a dry bed at that point.

TABLE 5. IRRIGATION FROM PUMPED WATER IN THE U.S., 1974[20]

	Ground Water	Pumped Surface	Both	Total
Area irrigated				
1000 acres	25,997	7,356	1,729	35,082
%	74	21	5	100
Quantity of Water				
1000 acre ft.	51,530	14,101	3,266	68,899
%	75	21	4	100
Energy for On-Farm Pumping[21] 10^6 bbl. petroleum equivalent at the wellhead	52.4	6.0	---	58.4
%	90	10	---	100

U.S. farmland received 641 million pounds of active pesticide ingredients in 1974. Half were herbicides, nearly 30 percent insecticides and 15 percent fungicides.[22] Nearly as much - about 500 million pounds - was used in 1970 by government, industry, homeowners and in mosquito control programs.[23] Cotton, corn, and soybeans are the big users: in 1974 they accounted for 37 percent, 30 percent and 15 percent, respectively, for the energy used to manufacture these pesticides and provide the carrier solution. Corn acreage consumed 33 percent of all herbicides and cotton land received 42 percent of all insecticides by weight in 1974.[22] In 1976, it was estimated that 90 per-



cent of the corn crop and 80 percent of the soybean acreage received pesticides. In 1971, 47 percent of the wheat acreage was treated and overall 52 percent of all cropland received pesticide chemicals.[24]

The amount of energy required for this part of our chemotherapy treatment of the countryside is really minuscule, around a twentieth of one percent of the 1980 oil consumption. Nevertheless these huge quantities of poisons could very well have a serious long term negative impact on the energy value of healthy soil, forcing technology to do what a balanced and healthy microbial flora once did.

Second to fertilizer, which requires 153 million barrels of wellhead petroleum, field operations require about 98 million barrels.[25]

FOOD PROCESSING & DISTRIBUTION

The major consumption of energy in the U.S. food system occurs in the processing and distribution of food, which account respectively for 30 percent and 10 percent of the energy used in the total food system.[10]

S.C. Unger reported the most energy intensive food-related industries, as a whole, derived about 48 percent of their energy from natural gas, 28 percent from electricity, nine percent from coal, seven percent from residual fuel oils, and eight percent from other fuels.

TABLE 6.
ENERGY CONSUMED IN FOOD PROCESSING & DISTRIBUTION IN 1970.[26]

Component	10^6 bbl. Petroleum, wellhead	% of Total
Food processing	276	36.7
Food processing machinery	5	0.7
Paper packaging	34	4.5
Glass containers	42	5.6
Steel cans & aluminum	109	14.5
Transport (fuel)	221	29.3
Trucks & trailers (manufacture)	66	8.8
TOTAL	753	100.0

SOFT AGRICULTURE VS. FOOD CONSUMERISM

The American food system needs to be re-organized, quite literally from the ground up. Changing farm technique is not the most productive way to increase energy efficiency, since this captures a relatively small share of the total energy expenditure. Priorities should be given to revamping the largest areas of end-use: the food processing industry, the ultimate consumers who prepare food in the home, and the system of marketing and distribution.

The food processors, in consuming 30 percent of the total energy invested in food, go through countless expensive motions of taking substances out, then putting them back in again - along with other additives. It is time we recognized this wasteful effort for what it is: packaging and consumerism, which is itself the heart of the ecological problem. This is one reason the food co-op movement, so small and presently so powerless, is also so radical and so necessary. If the energy conservation values which motivate people to take on the food processing industry can carry over into the kitchen, it might be possible to chip away at the 26 percent energy consumption that occurs in the household sector. These same values would inspire food preferences and purchases that render some of the long distance transport of food unnecessary.

TABLE 7. ENERGY USED IN 1973 BY VARIOUS ENERGY-INTENSIVE FOOD-RELATED INDUSTRIES[27]

Sector	Energy Used 10^6 bbl. petroleum, wellhead
Meat packing	22.4
Prepared animal feeds	19.5
Wet corn milling	18.9
Fluid milk	17.7
Beet sugar processing	16.8
Bread & related products	15.5
Frozen fruits & vegetables	14.1
Cane sugar refining	10.0
Sausage & other processed meat	5.7
Animal & marine fats & oils	5.6
Manufactured ice	1.0

Soft Agriculture saves more than energy. It could also help to conserve our shrinking endowment of soil and water resources, without which agriculture itself is impossible. Our present form of plow agriculture presents our number one ecological problem (aside from the threat of nuclear disaster) - a planetary disease which has reached epidemic proportions. It will not be cured until we resolve to meet our food needs without losing and poisoning our soil.

This article first appeared in SOFT ENERGY NOTES: Vol. 3, No. 6 (Dec./Jan. 1981) U. S. subscription rates $25 ($15 FOE). Order from Friends of the Earth Foundation, 124 Spear St., San Francisco, CA. 94105.

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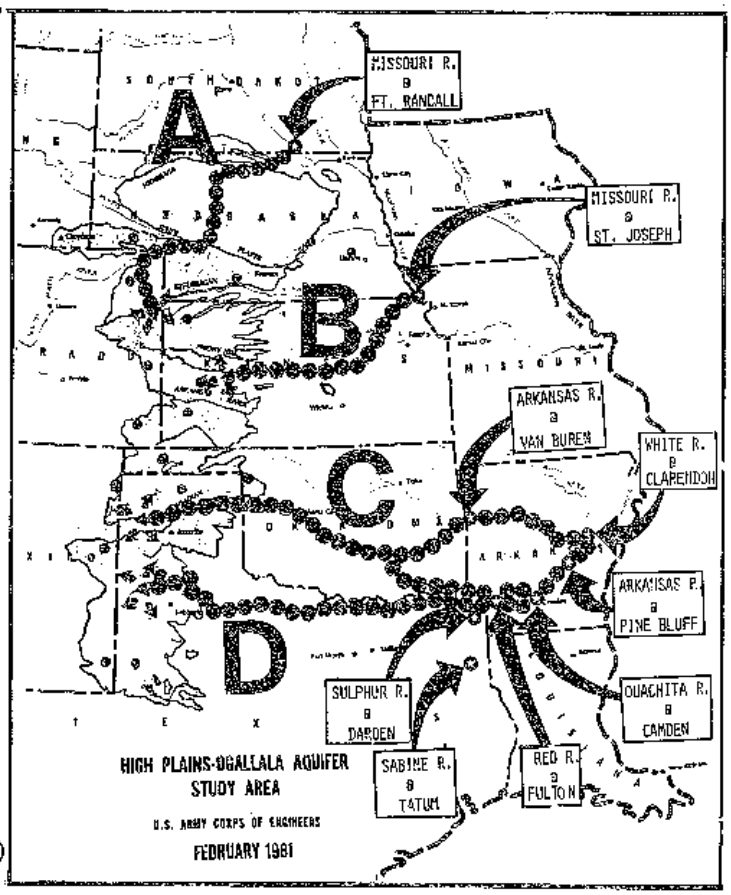
The Great Plains in Transition

In the summer 1980 Land Report, Wes Jackson wrote an open letter to the six governors on the High Plains Council, expressing amazement that they would pay the Army Corps of Engineers $775,000 to study the feasibility of transporting water from out-of-state rivers to recharge the Ogallala aquifer. He estimated it would cost $216 to lift one acre foot out of the Missouri River at St. Joseph and move it to Dodge City, Ks.

The Corps has presented the results of the study, shown on the map. They estimate an annual pumping and maintenance cost of $272 per acre foot to lift a total of 6 million acre feet in a ditch 180 feet wide and 30 feet deep across Kansas to Dodge City. The total first cost for this project would be $16.1 billion. (For comparison, the Wolf Creek Nuclear Plant is expected to cost $2 billion.)

The map also shows a transfer route from the White River (C). To move 6.8 million acre feet per year would require a total first cost of $20.7

(Continued on pg. 34)



Horses

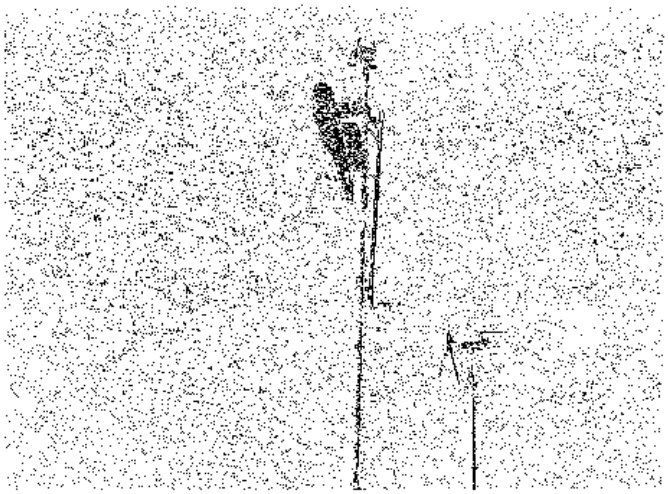
by Wendell Berry

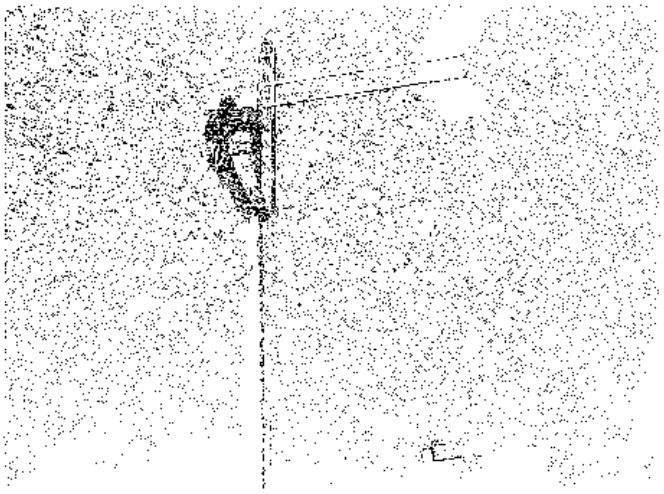
When I was a boy here,
traveling the fields for pleasure,
the farms were worked with teams.
As late as then a teamster
was thought an accomplished man,
his art an essential discipline.
A boy learned it by delight
as he learned to use
his body, following the example
of men. The reins of a team
were put into my hands
when I thought the work was play.
And in the corrective gaze
of men now dead I learned
to flesh my will in power
great enough to kill me
should I let it turn.
I learned the other tongue
by which men spoke to beasts
--all its terms and tones.
And by the time I learned,
new ways had changed the time.

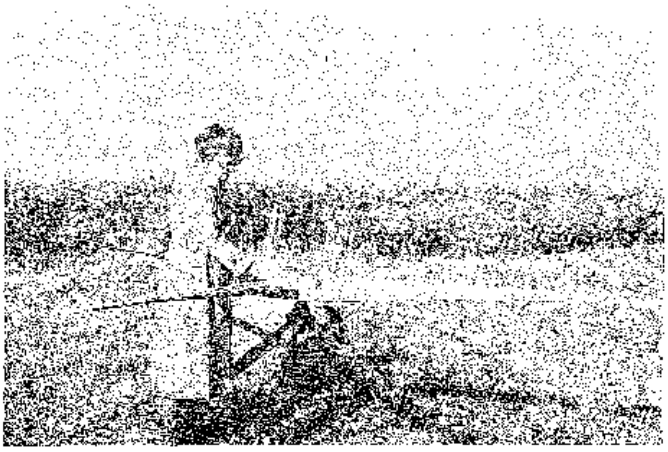
The tractors came. The horses
stood in the fields, keepsakes,
grew old, and died. Or were sold
as dogmeat. Our minds received
the revolution of engines, our will
stretched toward the numb endurance
of metal. And that old speech
by which we magnified
our flesh in other flesh
fell dead in our mouths.
The songs of the world died
in our ears as we went within
the uproar of the long syllable
of the motors. Our intent entered
the world as combustion.
Like our travels, our workdays
burned upon the world,
lifting its inwards up
in fire. Veiled in that power
our minds gave up the endless
cycle of growth and decay
and took the unreturning way,
the breathless distance of iron.

But that work, empowered by burning
the world's body, showed us
finally the world's limits
and our own. We had then
the life of a candle, no longer
the ever-returning song
among the grassblades and the leaves.

Did I never forget?
Or did I, after years,
remember? To hear that song
again, though brokenly
in the distances of memory,
is coming home. I came to
a farm, some of it unreachable
by machines, as some of the world
will always be. And so
I came to a team, a pair
of mares -- sorrels, with white
tails and manes, beautiful! --
to keep my sloping fields.
Going behind them, the reins
tight over their backs as they stepped
their long strides, revived
again on my tongue the cries
of dead men in the living
fields. Now every move
answers what is still.
This work of love rhymes
living and dead. A dance
is what this plodding is.
A song, whatever is said.







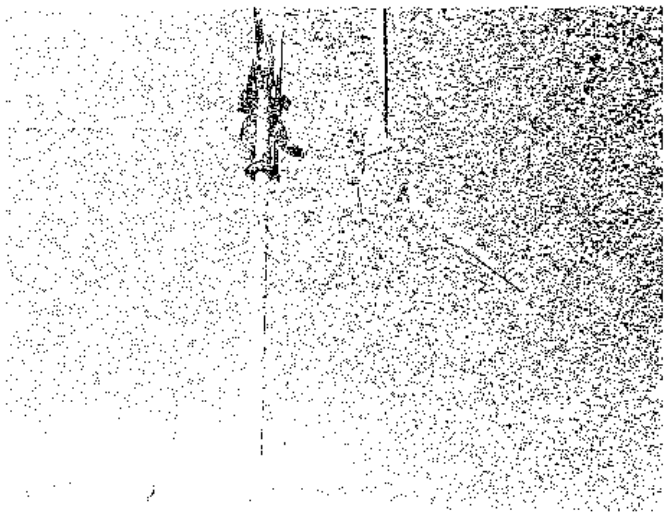
Mrs. Ruth Worman of the Kansas Power and Light Company inspects the Windcraft rotor.

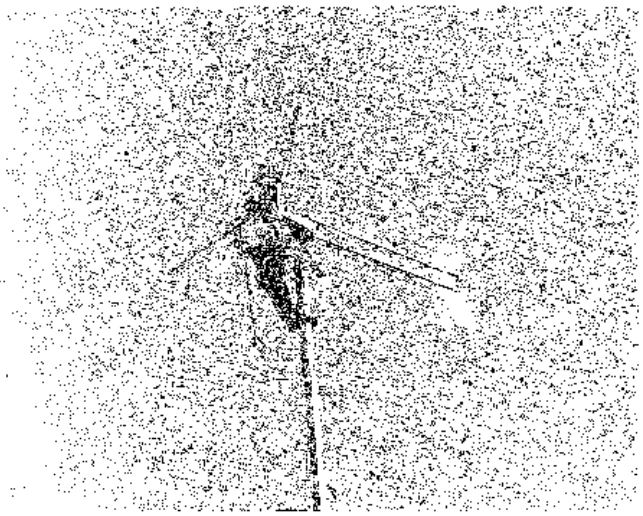
The Windcraft is Installed

The 2500 watt Windcraft was installed by its designer, John Craft, on a crisp, clear December day. A gift from Mai Steel Services made the purchase of the new wind machine possible.

The Windcraft is tied in with the Kansas Power and Light service line. If more electricity is generated than The Land is using, KP&L buys the excess. When the wind is not blowing, The Land purchases electricity from the utility.

During February the Windcraft did not generate much electricity. Land people made mistakes in handling it and some parts did not operate properly. Leo Bircher of Kanapolis, Kansas, who services it, experimented with adjustments in the control box. The fledgling wind machine industry, like the auto industry in the early days, has the problem of getting all working parts to perform dependably. Improvements can and will be made.

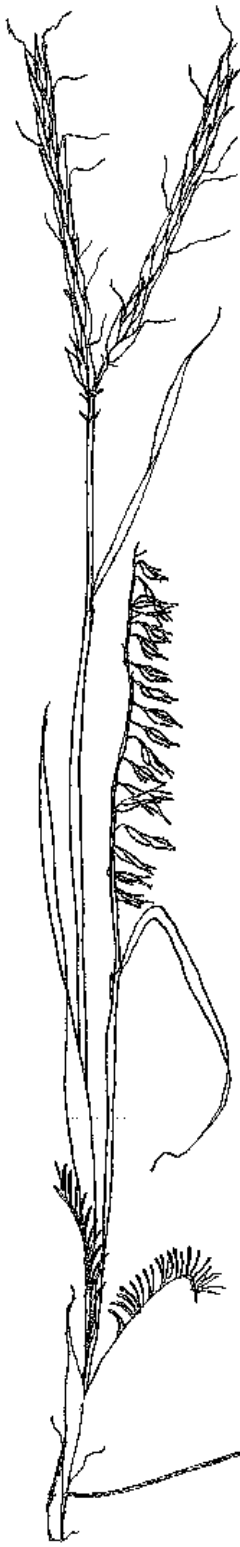




A Sense of Place

Being "A Part"

By Dana Jackson



Sometimes ideas and events relate in a way that is unplanned and create rich insights. The visits of Alan Gussow and Wendell Berry and our experiences with their work combined this way.

In the introduction to Alan's book, A Sense of Place: the Artist and the American Land, is this sentence: "A place is a piece of the whole environment that has been claimed by feelings." Alan's paintings portray portions of his environment and express his feelings about them.

Wendell Berry began talking about chauvinism for a place and teased the audience at The Land by saying, "I'd rather be an orphan in Kentucky than twins in Kansas." There is no doubt that in all of his novels, essays and poems, Wendell identifies with and expresses a "place" in Kentucky. The title of his latest book of poems, A Part, tells me how Wendell feels about his existence. The poems reflect his awareness of a part of the things in his environment and how he feels a part of them. (This is my interpretation, unconfirmed by Wendell!)

The title of The Land's first prairie program in 1979, "Prairie Roots/Human Roots: The Ground of our Culture and Agriculture," was inspired by Wendell Berry's book, The Unsettling of America: Culture and Agriculture. The program planners aimed to have the audience understand how the prairie ecosystem was the basis for contemporary culture, including the economy. At our third annual prairie festival on May 30-31, we will continue to promote an understanding and appreciation of this "place" where we live.

Early in December, The Land received the first "Pipe Creek Shirts Newsletter," produced by the Jagger family in the Minneapolis, Ks. area. Its purpose is "to bring pleasant, pertinent news from the Pipe Creek Valley of Kansas--memories, hopes, news items, nonsense and the latest offerings from Pipe Creek shirts." (One T-shirt has a map showing the Kansas rivers printed on it.) The newsletter contained a story of how the valley got its name (mapmakers changed the "k" in Pike for Lt. Zebulon Pike to a "p"), a story about hunting along the creek, and a family story about a favorite pair of workhorses. The Pipe Creek Valley is a "place."

Abilene, Kansas, the town where I grew up, is a "place." Although kids enjoyed exploring Mud Creek before the Army Corps turned it into a rock-lined ditch, I can't recall any adults expressing interest in the life of the creek. I never knew a naturalist in town. But Iralee Barnard and Gwyn Johnson, Friends of The Land, discovered a lively interest in learning the native wildflowers by people in Abilene. A city recreation commission class on wildflowers in 1979 is now the nucleus of a natural history group with a full schedule of programs and prairie field trips planned for this spring and summer. As Abilene people come to know the prairie flora better, they will intensify their "sense of place."

With this issue, we are introducing a new section in The Land Report. A SENSE OF PLACE will feature a plant or animal which is a part of the natural ecosystem of the prairie. We hope that the prairie and its life will be "claimed by feelings" of Land Report readers. "Our place in the order of creation is not everywhere, and our share is not everything," Wendell Berry reminded us. Though we humans have literally carved out a place for ourselves on the prairie with agricultural tools, we could continue carving until the natural ecosystem is destroyed, including the rich soils built by the prairie plants. When humans on the prairie become "all," instead of "a part," they will become nothing.

A Prairie Resident

By Annie Ronsse

When taking winter excursions through the prairie or open expanses in Kansas, many of us have marveled at the aerobatics of soaring hawks, or felt a stately presence when sighting a raptor on its domineering perch. The birds of prey are conspicuous fibers in the integral web of the prairie ecosystem. By learning to recognize the shapes and flight patterns of these birds, a person can easily become more familiar with the different raptor species of our area.

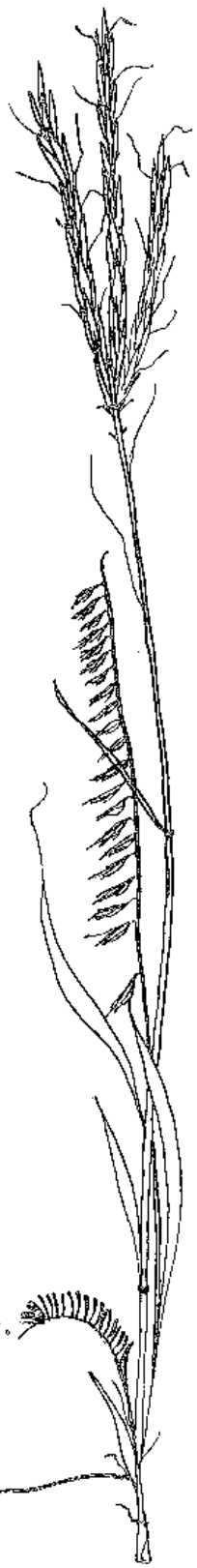
A common sight over Kansas pastures is depicted on the cover of this Land Report, a slender, medium-sized hawk flying low over the ground with alternating flaps and glides. The long wings tilt up in unsteady flight as the bird rocks and tips and zigzags close to the earth in its search for an unsuspecting critter. Briefly the bird might hover before plummetting to the ground, only to resume its unsteady flight and continual search for sustenance. This describes the flight of the Marsh Hawk (Circus cyaneus), a common winter resident of prairies, broad fields, marshes or similar open expanses. The low flight and conspicuous white rump patch near the top of its long slender tail makes this harrier easy to recognize. The male and female Marsh Hawk are dimorphic, having different adult plumages. The upperparts of the male are a bluish grey, becoming blackish on the wing tips, while his underside is white speckled with cinnamon. The female Marsh Hawk has dark brown upperparts with her underside being a lighter brown streaked with dark brown.

To be surrounded by unobstructed horizons and watch a Marsh Hawk gliding, as if a link between the prairie and sky, is a sight that lifts the spirits and fills us with a deep respect for the "place" that we live. By knowing the prairie residents, we know the prairie better.

Below

by Wendell Berry

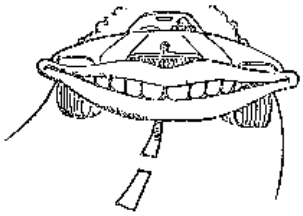
Above trees and rooftops
is the range of symbols:
banner, cross, and star;
air war, the mode of those
who live by symbols; the pure
abstraction of travel by air.
Here a spire holds up
an angel with trump and wings;
he's in his element.
Another lifts a hand
with forefinger pointing up
to admonish that all's not here.
All's not. But I aspire
downward. Flyers embrace
the air, and I'm a man
who needs something to hug.
All my dawns cross the horizon
and rise, from underfoot.
What I stand for
is what I stand on.



Alternatives in Energy

Three Cheers for Productivity!

by Mari Peterson



To conserve energy is hardly glamorous and even somewhat distasteful. At least we are encouraged to think this way by the newspersons, advertisers, and elected officials. Jimmy Carter had us turn down our furnaces, turn up our air-conditioners, and turn off our lights. All this is visible conservation but cause for many to curse in the cold darkness. Unfortunately this paves the way for Ronald Reagan to calmly dismiss conservation as an uncomfortable condition of being too hot in the summer and too cold in the winter. Off we go, full speed ahead with the more glamorous synthetic fuels and nuclear power.

I was disturbed by a recent Newsweek columnist who suggested that a great leader is a great simplifier. "A leader must stir our blood, not appeal to our reason." The simple, emotional approach to problem-solving is so often the first step towards rape, ruin, and war. Nonetheless, if this is the way the game must be played, let us come up with a simplistic, emotional, and challenging approach to conserving energy, but let us do it with full understanding.

To conserve is to avoid wasteful or destructive use of a quantity. The keyword is "wasteful." Does this need to be such a subjective consideration? What temperature should the thermostat be set for? What is the minimum acceptable amount of driving?

The truth is that people can use less energy without sacrificing a smidgen of comfort.

A physicist knows that energy consumption = demand (number of units) x specific energy (energy required to provide each unit demanded). For example, gallons of gasoline consumed = the number of miles traveled x the gallons/mile. The controversial solution to conserving would be to reduce the number of miles traveled. A more palatable solution would be to concentrate on lowering the specific energy. That is, improving the efficiency with which we use energy.

There are two types of energy efficiencies that can be improved. The first-law efficiency indicates how much of the energy input to a system is delivered for the desired purpose. The second-law efficiency compares the theoretical minimum energy required to the actual energy consumed for a given task.

To illustrate the first-law efficiency, consider a home gas furnace. Its first-law efficiency is about 60% (as probably indicated somewhere on the furnace.) This means that 60% of the energy input to the furnace is delivered as useful heat to the home. Modifying the furnace, or supplementing it with a heat pump will improve its first-law efficiency. Likewise, the first-law efficiency of the internal combustion engine in our automobiles is approximately 15%. Alternate engine designs such as the diesel, Rankine, Stirling, or turbo-charged engines can improve this first-law efficiency.

In the case of the gas furnace, the second-law efficiency is about 5%, meaning that far less energy is theoretically required to heat the house space than is currently used. This calls for more than furnace adjustments; it calls for a modification of the task. This is to say that the furnace is doing more work than is necessary to heat the home. Added insulation, double-paned windows, air-locked entryways, thermal curtains, and similar measures will improve the second-law efficiency of the furnace. With the automobile, the workload can be reduced through properly inflating the tires, reducing the weight of the car, using standard transmission, and reducing the aerodynamic drag in the design.

Any of the measures suggested above can save energy without sacrificing comfort. The first-law effiency indicates the work-potential, or energy lost, through a system (furnace, engine, industrial boiler, or refrigerator.) In the internal combustion engine, 85% of the energy may be lost along the way, most of it as heat through the exhaust pipe. The second-law efficiency indicates the work-potential, or energy, stored in the fuel that is wasted. Since an improvement on a system such as a boiler reduces energy waste, a first-law efficiency improvement inherently improves the second-law efficiency. But so much more can be done to reduce wasted work-potential. Pipes carrying the steam from the boiler could be insulated, and heat escaping through the stacks could be partially captured with heat exchangers.

The first-law efficiency of energy use in the United States is near 50%. The second-law efficiency is much lower. These reveal that there must be many creative ways we can reduce energy waste before we need to sacrifice comfort.

So let us be skillful now that we know the score. If the word "conservation" has assumed a negative tone, then let's replace it. I suggest we speak of energy productivity. "Productivity" is a wonderful word to the industrious American people. We seem to be searching for ways to improve productivity as evidenced by the covers of Time and Newsweek. This need has arisen because labor productivity has become synonymous with productivity in general. Too often money is invested in mechanization, attempting to maximize the output per worker. A point of diminishing returns may be upon us. However, if we invest some of this money in improving energy productivity, there will be net savings of energy and money. With the terribly inefficient use of en-

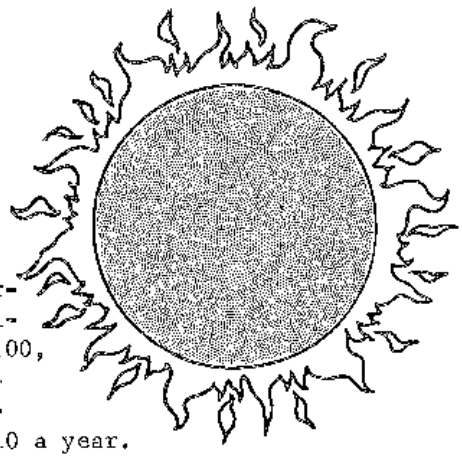
ergy in this country and in our homes, it will be some time before we hit the diminishing returns point on energy productivity investments.

Productivity and efficiency of energy use can become important considerations from the households to the factories since they fall in line so nicely with one of the cornerstones of our economy, "self-interest." Dollars are saved while jobs are created. Aside from the jobs relating directly to energy productivity investments, there is the added benefit that dollars not spent on energy can remain in the local community to employ people and bolster the local economy.

All this discussion is to prevent the baby from being thrown out with the bath water. Energy demand does deserve consideration along with energy productivity. However, energy productivity is more easily understood within the current economic framework. And while there is energy to be saved from improving 1st and 2nd law efficiencies, it is a laudable goal. Eventually we must adopt a new ethical system which places responsibility to others and to the life-supporting systems of the planet over our immediate self-interest. This will necessitate changes in energy demand.

Until this new ethical system evolves, let us tout energy productivity as a wholesome, American, profitable pursuit, intriguing enough to interest our new governmental leaders.

Solar Briefs



This sun belongs to Solar Utilization News, a monthly publication of The Alternate Energy Institute, P.O. Box 3100, Estes Park, Colorado 80517. Subscriptions are $10 a year.

For more good reading about solar energy, subscribe to Solar Age, the official magazine of the American Section of the International Solar Energy Society, for $20 a year. Order this monthly from P.O. Box 4934, Manchester, N.H. 03108. We also recommend Alternate Sources of Energy, published monthly at 107 S. Central Avenue, Milaca, MN 56363. The subscription rate is $15 for six issues, $27 for 12 issues. Sunpaper, the monthly publication of the New Mexico Solar Energy Association, P.O. Box 2004, Santa Fe, N.M. 87501 is very interesting. Membership dues and subscription are $15 a year.

Serious solar advocates should join the SOLAR LOBBY at 1001 Connecticut Avenue, N.W., Washington D.C. 20036. This organization will be fighting to keep funding for the Solar and Conservation Bank, and other solar incentives. The $15 membership dues brings the monthly Sun Times plus political action alerts. To support Solar Lobby's educational programs and deduct your contribution from taxes, make the check to the Center for Renewable Resources at the same address.

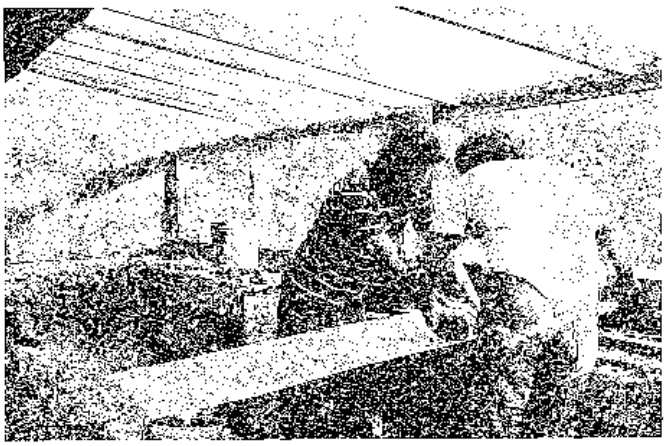
To support solar advocates in Kansas, join the Mid-America Coalition for Energy Alternatives, ($10) at 5130 Mission Road, Shawnee Mission, Kansas 66205. Good information is available from the less political Kansas Solar Energy Society and its irregular KanSUN News, 1509 Houston St., Manhattan, Kansas 66502.

Improving the Solar Greenhouse

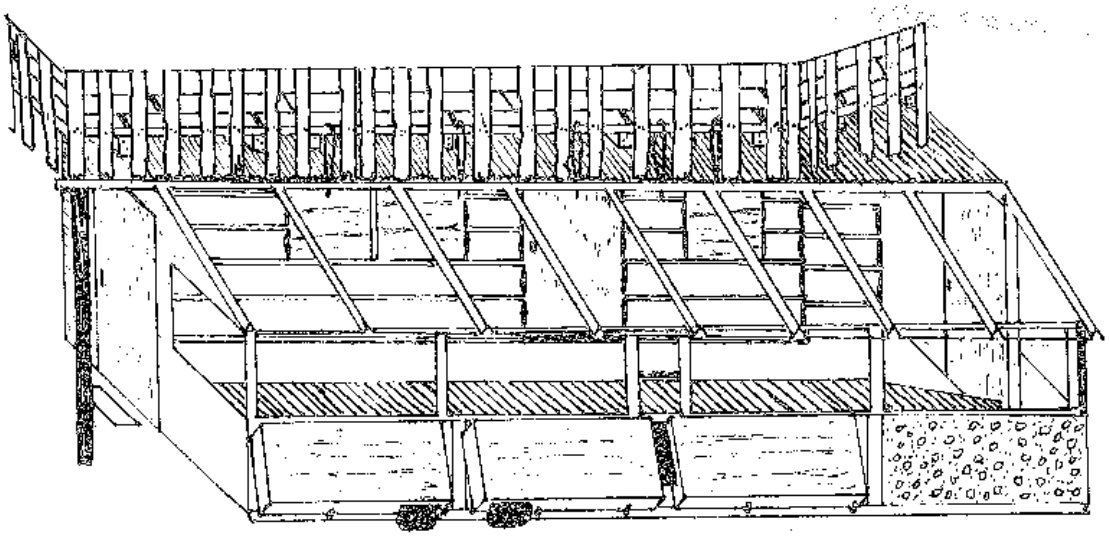
By Tom Mulcrone and Paul Rasch

If the solar greenhouse here at The Land could only speak, it would surely have some wild tales to tell. We are the third generation of students to work on this project, which was begun in the fall of 1979. When we inherited the greenhouse, the outer shell, made with double layers of patio doors, had already been completed. Our major tasks were to add the finishing touches necessary to prepare the structure for winter and install three donated Soloran air collectors complete with a rock storage system.

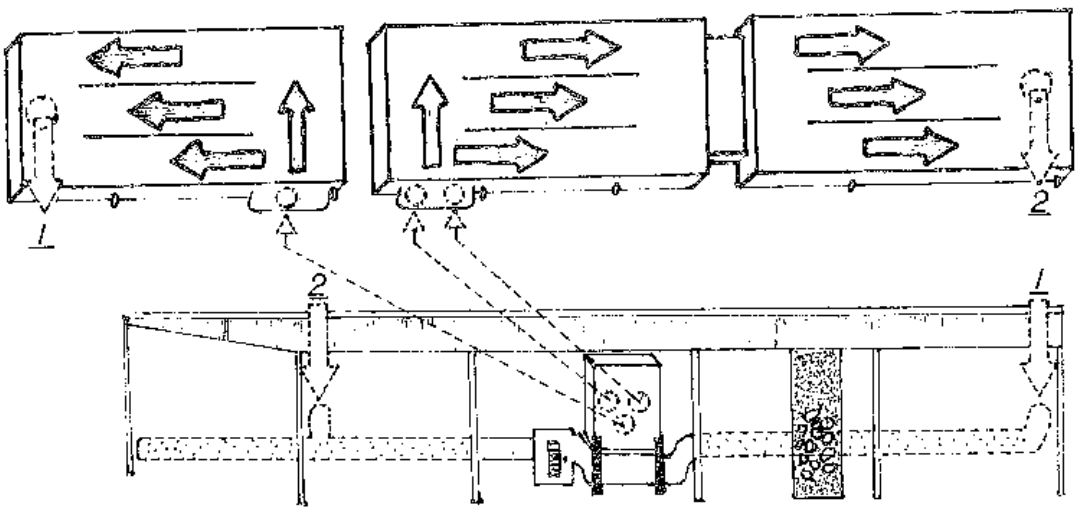
Our first priority was to mount the collectors in front of the greenhouse. Originally we had hoped to rely on the thermosiphon effect to move the air through the collectors and into the rock storage. However we decided to use a fan to increase the efficiency of the system after we discovered that the Land already had a 12 volt D.C. motor to power it. This motor will run on power supplied by the 32 volt Jacobs Wind generator. By allowing ourselves the luxury of a fan, we could now mount the collectors in a fashion which simplified the installation. Although a 53° tilt would be closer to the optimum tilt angle



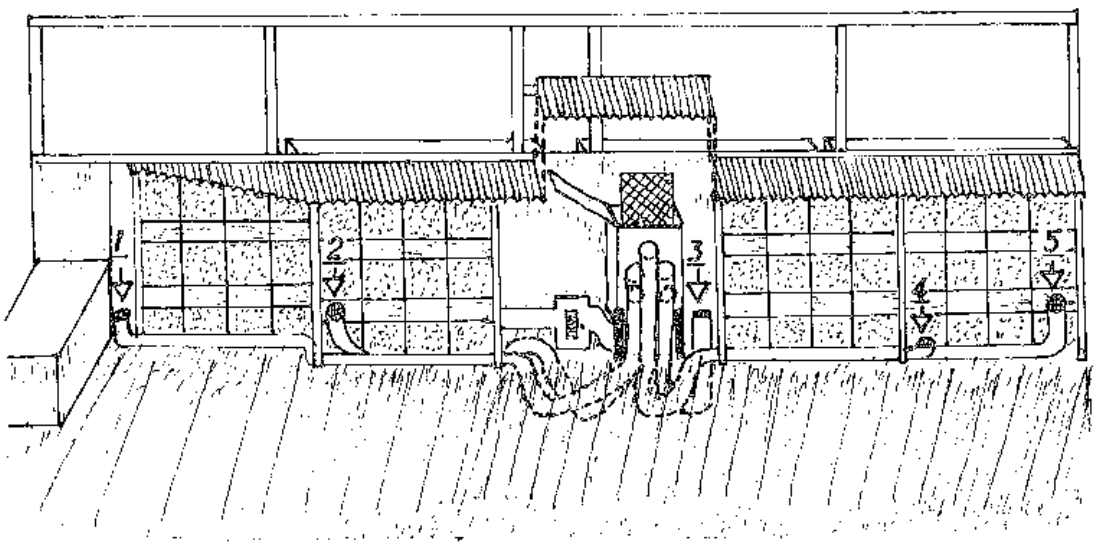
Ed Newman and Paul Rasch.



The Land Greenhouse, a retrofit, with three active air solar collectors and rock storage.



Air is pushed through collectors behind absorption plate (arrows) then gathered at east and west vents into greenhouse, losing heat to rocks through holes. The detail (labeled D) shows larger rocks piled immediately around the pipe to allow easier distribution of heat.



The cold air intakes (labeled 1 thru 5) provide the intake air to the collectors. This cold air is filtered before being delivered via a ½ hp. squirrel cage fan. Backflow of warm air from rocks in into collectors at night is prevented by U-shaped piping below lowest point of system.

(38° Latitude +15°) for winter use, we determined the difference in performance to be of minimal significance and thus opted for an angle of roughly 73° which was more readily adapted to the building.

The next problem we confronted was in the ducting layout. This proved to be quite a troublesome area; and after long deliberation and trial and error, we decided on our present layout, which required some sheet metal fabrication by a local shop.

With the outside details taken care of, we turned our attention to inside matters, namely the rock storage. Wes had acquired some second-hand metal chicken nests which we found to serve as excellent containers for the rocks. Before filling these containers (approximately 105 ft^3 total capacity), we devised a system to spread the heat from the collectors through the rock by means of a 5" diameter aluminum irrigation pipe connecting the two hot air ducts from the collectors. We ran this pipe through the rock bins and then perforated it with ½-inch holes at various distances. These holes, along with a register which we installed midway along the pipe, are the means by which hot air is exhausted into the greenhouse from the collectors. The distances between holes were decided by hit and miss. We ran air through the pipe and drilled holes until a fairly equal and sufficient discharge was felt all along the pipe. Naturally, the frequency of these holes increase at the far ends of the pipe.

The cold air supply to the collectors was obtained by drawing air from various low points below the rock storage bins through 4" flexible tubing. Five of these tubes feed the box which contains the squirrel cage fan and motor. Each of these tubes forms a "U," which extends a foot below the greenhouse floor before connecting into the fan box. This "U" is a technique used in Trombe Wall construction which prevents the warmed rocks from radiating their heat to the outdoors at night by reverse thermosiphoning. In this way, we avoided the expense of backflow-preventing devices, as well as a lot of additional hassles.

The final component of the system was the rock storage. We piled 2"-4" diameter pieces of broken concrete immediately around the pipe to prevent excessive hole blockage, and then filled the remaining portion of the bins with slightly smaller (1"-2") washed river gravel. With a little fine tuning, the system finally began to function in early November. Presently however, we are using a battery charger to run the motor until we get the Jacobs operating correctly and a cable run out to the batteries. The motor will soon be controlled by a differential thermostat, which will turn on the fan when the collector temperature exceeds that of the rocks by 18°, and turn it off when the two temperatures reach a difference of 2°.

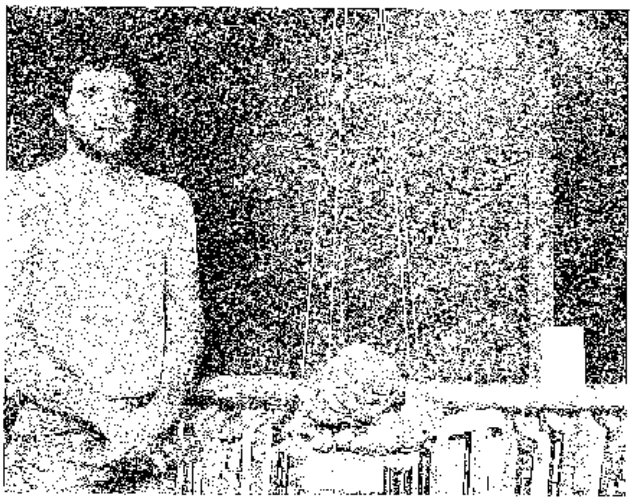
With winter rapidly approaching and many plants needing protection from the cold, we turned our attention to the weatherizing of the greenhouse. The windows were all caulked with butyl rubber and the doors refitted and tightly weather-stripped. These few simple, yet time-consuming conservation methods proved to be very valuable by greatly reducing the greenhouse heat loss.

During January, Dennis Ronsse placed more chicken nests filled with rock and painted black on the north wall for direct gain storage. This combination of passive and active heat storage prevents temperatures from plunging too low in the greenhouse at night. Several thermometers are in place, and we have begun keeping records of the temperatures at different times of the day.

On sunny days, the warmed air in the greenhouse moves along the tops of the door and windows into the building, and cold air flows back near the bottom of the door and the windows. The shop is still not a very warm room, but one can work there comfortably wearing a coat when the greenhouse is heating it.

Future plans for the greenhouse include installing insulating shutters and making wooden frames, which have better insulating properties, to replace the aluminum of the patio door frames. The shutters and wood frames will greatly reduce our nighttime heat loss and thus increase the efficiency of the greenhouse. We will also be laying a brick floor and building bins for sand, soil and peat moss.

In our training at Jordan Energy Institute last year, we learned a theoretical understanding of solar technologies, which often was inadequate while working on the greenhouse. Practical situations that arose required us to talk over various options and make decisions requiring carpentry and metal work skills beyond what we thought we had. This "hands-on" greenhouse education has proved to us that almost anyone with interest can pick up a basic understanding of solar technologies (through) the many reading materials available in bookstores and libraries), apply these theories to a given situation, and obtain a functional system to meet particular needs.



Each semester, classroom lectures are given on energy topics such as solar, wind energy, and alcohol fuel. In the photo, Tom uses cow manure as a visual aid in his lecture on methane gas.

The Integral *Suburban* House

By Ed Newman

In Berkeley, California, the Farallones Institute retrofitted a three-story Victorian house so that a sizeable portion of its energy came from energy efficiency and renewable resources. They devoted as much space as possible in the yard to food production, planting raised garden beds and fruit trees. The house has a composting toilet and a graywater system. It is a demonstration of the many modifications that can be made on city home sites to help the inhabitants be more self sufficient. They call this the Integral Urban House.

Many Americans live in the suburbs of cities, in houses that can be retrofitted to save energy or produce energy, on lots large enough to grow much of their own food. The students at The Land decided it would be instructive to others, as well as ourselves, to pick a conventional and affordable suburban house and make plans for turning it into an Integral Suburban House.

We chose a particular house to use for a model. It is located in what was initially housing for officers and married enlisted men adjacent to the old Schilling Air Force Base in Salina, Kansas. Now the houses are being fixed up and rented or sold. Houses like the one we chose sell for approximately $23,000 to $25,000, a relatively low price for a three bedroom home. We know a young family finds it very difficult to purchase a home these days, and this might be one of the few affordable homes available.

Like all the houses in the development, the one we chose uses natural gas for heating and cooking, and electricity to run appliances and air conditioning. The house has next to no insulation and therefore, extensive heat loss. It is hooked into a conventional sewer system and people who live there must pay to have their garbage collected.

Our project was to plan how to change this house from its energy gulping, waste spewing, sterile condition into a food-producing, waste cycling, passively energized household with minimal impact upon the earth's resources and environment. We looked over the actual house carefully and took measurements. Then we broke into two groups, one to work on conservation and energy production, and the other to deal with food production and waste management. Each person specialized in a particular aspect, and then we put them all together to form our version of an Integral Suburban House. The bird's eye sketches on the next page show how the house looks now, and how it could look.

Conservation and Energy Production

The first and most important task would be to seal up the house to prevent heat loss. Many of our planned changes or additions couldn't show up on the sketch since it only shows outside innovations, but they are described below.

Tom and Paul figured that the best way to insulate the walls would be to remove the siding, nail another layer of two-by-four studs on the edges of the existing ones, put the plywood and siding back on and fill the 7 inch space with cellulose insulation. A layer of sheet plastic would be attached to the wall and fitted around the studs for a vapor barrier before the second two-by-fours were added. The roof would have to be extended to fit over this addition. This would insulate the wall to R-20. By doing the insulation on the outside, the homeowner could do one wall at a time as could be afforded, and the work wouldn't interfere with living in the house.

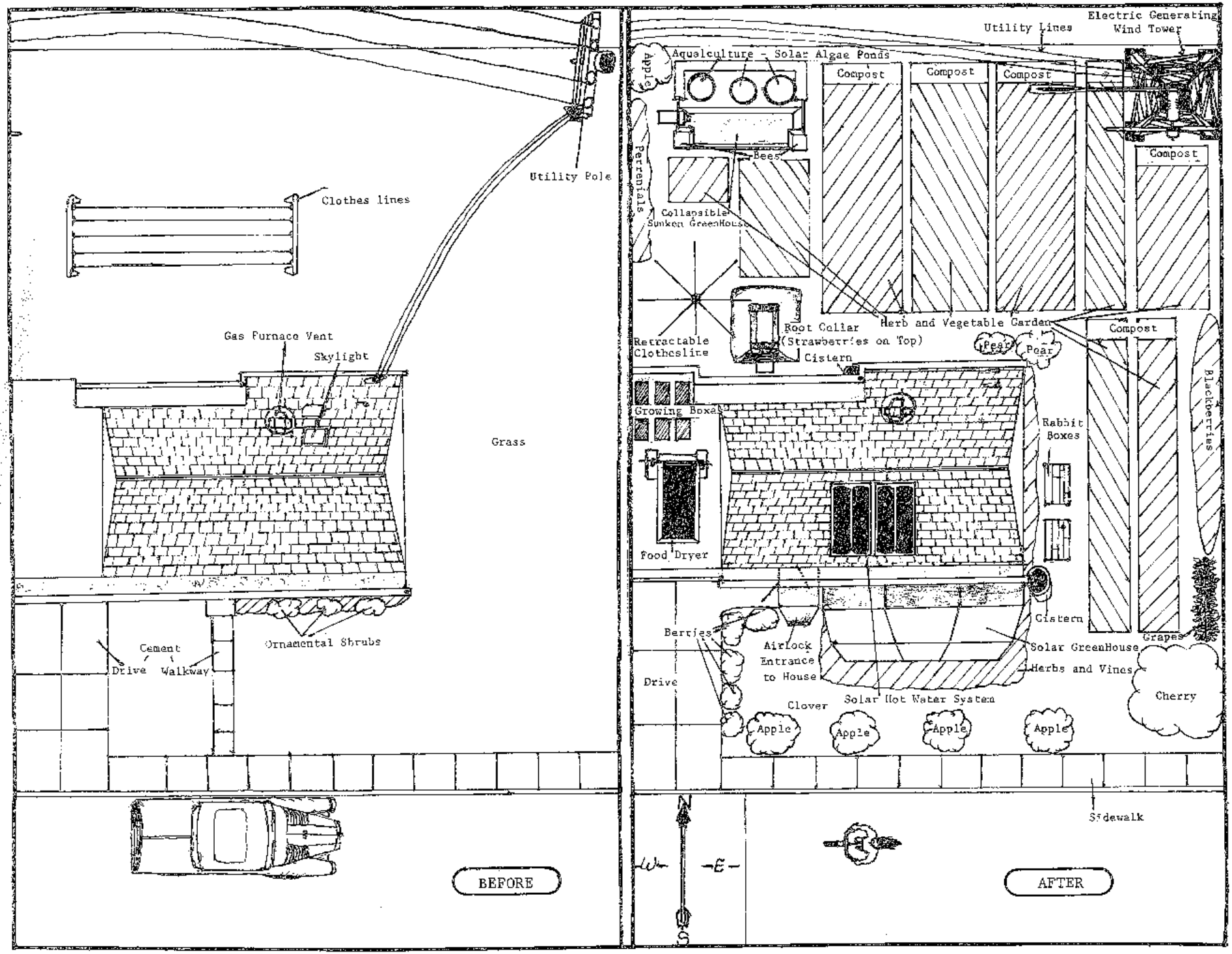
The vaulted "cathedral" ceiling in the living room would next be covered up by a lower ceiling, since a 12 foot height isn't very conducive to energy efficiency in space heating. A vapor barrier would be needed as it was on the walls, and then the space could be filled with insulation to a value of R-40.

The house has north windows which are really needed for light. These would be triple glazed, and the south windows would be double glazed. The windows do have storm windows now, but the airspace between the window and storm window is too wide. It has been found that the glazings must be close enough to one another to prevent convection currents from occuring. Special coverings or shutters could be made to cover the windows at night.

When we looked over the house, we discovered that it needed caulk on all of the windows, window frames, door frames, and wherever the house's siding meets. Weatherstripping would also help prevent heat loss around doors. In planning what to do with the house, we decided that the front door should have an airlock to prevent drafts from entering when it is opened on cold days. The back door might also have one, but we didn't add it on the sketch. During cold times, only the south door would be used.

We thought of several other conservation measures which could be taken. We could insulate around hot water pipes wherever feasible. We might be able to develop a heat exchanger system to capture excess heat from appliances such as the refrigerator, stove, or wash machine. A difficult task, but one that would really conserve energy, would be to dig out the dirt by the house footings and place styrofoam insulation around the outside of the footings.

After all the conservation measures have been employed, the house would still need a space heating system, so we would keep the natural gas furnace, but not expect to use it very much. The


Utility Pole
Clothes lines
Gas Furnace Vent
Skylight
Grass
Ornamental Shrubs
Cement
Drive
Walkway
BEFORE
Utility Lines
Electric Generating Wind Tower
Aqualculture - Solar Algae Ponds
Apple
Compost
Compost
Compost
Compost
Perrenials
Bees
Collapsible Sunken GreenHouse
Herb and Vegetable Garden
Retractable Clothesline
Root Cellar (Strawberries on Top)
Cistern
Pear
Pear
Compost
Blackberries
Growing Boxes
Rabbit Boxes
Food Dryer
Cistern
Berries
Airlock Entrance to House
Solar GreenHouse
Herbs and Vines
Drive
Solar Hot Water System
Clover
Grapes
Cherry
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AFTER

sketch shows a solar greenhouse added to the south side. On sunny days, this should collect heat and warm the house.

The natural gas hot water system would remain in the house, but water would be preheated in four 17-gallon barrels placed right under the roof and covered with double glazing flush with the roof. At night the owner would manually slide an insulating shutter into place between the glass and the barrels. The natural gas would only come on to heat water if water draining from the barrels was not hot enough.

Our integral suburban house would have a wind generator to supply electricity. It would be interconnected with the utility company so that excess electricity could be sold to the utility (on windy nights for example), and the house could still purchase electricity from the utility when the wind was not blowing, or it needed more than was being generated. The electric lines would be buried between the generator and the house.

Food Production and Waste Management

The illustration shows how thoroughly the yard space can be used to provide household food needs. The main goals in planning food production were to efficiently use yard space, develop a diversity of plants, promote good soil health, and produce a variety of healthful foods for the occupants of the house.

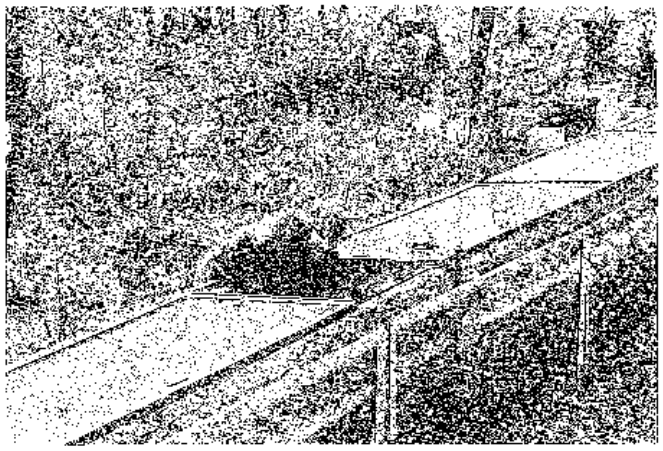
The garden plots are shown on the sketch as hatched rectangles. At the north end of each rectangular raised bed is a compost pile.

Trees and shrubs would all be food-producing. We would plant fruit trees in front of the green house to provide shade until the leaves fell off. Shrubs such as blackberries and raspberries and grape vines would border the yard, substituting for a fence and attracting birds.

To produce a variety of vegetables and fruits to feed a household of four for a year, it might be necessary to add special growing boxes on the flat roof of the garage and in the greenhouse in fall, winter and spring. Gourd and squash vines could be planted around the greenhouse for summer shading. Since this house does not have a basement, we decided that an underground storage should be built to store potatoes, onions, carrots, etc. for the winter. Strawberries could be grown on the soil covering the root cellar. Rhubarb and asparagus would be interplanted with perennial flowers such as peonies and chrysanthymums along the edge of the yard.

We would have animals for food also. We discussed chickens and decided they took too much space but rabbit houses are located on the east side of the house. Bees and fish would be associated with a movable greenhouse in the back yard. The drawing shows three upright solar algae ponds and a sunken pond on the northwest corner of the yard. Beehives would be integrated into the corners of the greenhouse for winter warmth. The aquaculture system would produce fish for food and fertilized water for the garden plots. The collapsible greenhouse would be removed in the summer.

The garbage disposal system in the house would be removed, and all kitchen waste would be composted with the rabbit pellets, or fed to the rabbits or maybe worms. There would be fewer boxes, cans, and jars if homegrown food were preserved in reusable jars, but those packages which do go in the trash would be sorted and stored in special bins in the garage before taking to the recycling center.



Ed Newman, cleaning the storage batteries.

Water from the kitchen sink would go into a graywater system and used to water the grass and trees on the north side of the house. A cistern (or several, though only one is shown) would capture rain water and it would be used to water the garden.

A composting toilet might be installed for human waste, but it would probably have to be a special addition to the house on the roof of the garage, in order to have the space and height needed for installation and operation. This is not shown in the sketch.

Conclusion

This sketch shows how we imagined the house could look and function after we turned it into an integral suburban house. Our proposed changes are by no means all that could be made, and we could design and redesign for months. The average homeowner probably couldn't afford to make all the changes or improvements very fast. The conservation measures would cost money and the greenhouse and wind generator could be large capital investments. However, with patience, a nose for scavenging good, useful junk for building materials, and a real desire to be more self sufficient, many changes could be made in a house such as this which would help the owners create a more sustainable lifestyle for themselves and their family. The owners could give their lives more meaning and enjoyment by turning the affordable nondescript suburban house into an interesting, integral, suburban house.

Toward a Circular Society

By Paul Rasch

It seems rather easy to think or write about today's problems. Thinking of answers to these problems is more difficult, and implementing solutions is harder yet. We presently face no shortage of crises in our lives. The threat of nuclear war constantly hangs its heavy hand over us as we go about our business of gluttonously devouring the resources which make our life on this planet possible. We can imagine the devastation which nuclear holocaust would entail and are gradually beginning to witness the chaos which our program of resource depletion and pollution has bestowed on us. Both threaten the existence of civilization, one immediately, the other on a slightly longer time scale.

Overcoming these problems will require a reassessment of our relationship with the rest of our surroundings. Obviously this is no small chore, and nothing short of participation by all of us will yield the necessary change.

The power of change lies in the strength generated by a unified group of individuals - a community. I don't mean "community" as we now know it - a group of people bound by little more than geographic arrangement. Rather, I refer here to people combining their various talents and ideals as a means toward an enriching existence for all involved. Although various political doctrines would lead one to believe this is already a reality, a glance at the numerous systems in action will show that this is hardly the truth. In fact, for one reason or another humans have consistently based their organization on power rather than communion. The effects of this paradigm are obvious. If we are to overcome the serious problems besetting today's society, we must look beyond our power-oriented model for a pattern by which to form our communities. Since this pattern will become the foundation of a sustainable society, it must be one which has proven itself through the challenge of many years and remained viable. We need look no farther than the harmony of nature for our model.

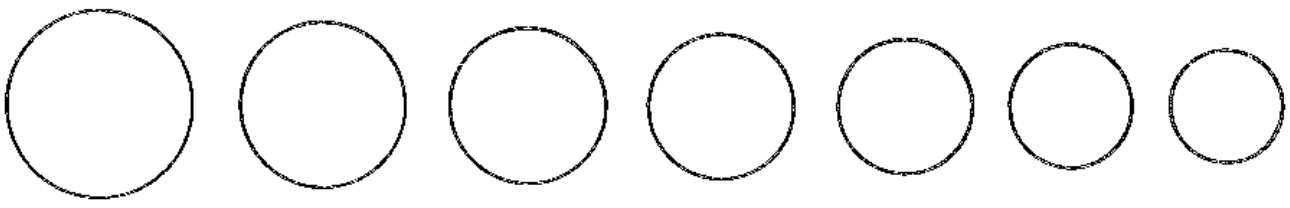
The Natural Model

Various people throughout history have drawn great strength and inspiration from the harmony of nature's cyclic processes. Nature efficiently utilizes the cycles of nature; Homo Sapien doesn't do so well. The dictionary defines a circle as "A series or process that finishes at its starting point or continuously repeats itself." So it goes in our natural surroundings. One object's demise is the beginning of the end for another. Today's waste is tomorrow's resources. A leaf's descent to the ground marks the beginning of a soil building process which will someday nourish a new tree. One needs only to look at the prairie to see how nature's citizens are interwoven in a pattern of circular interdependency. By this weaving, a community is developed which is both strong and flexible, able to change when necessary, yet firm enough to resist the winds of most detrimental changes. Humankind's strong influences have temporarily disrupted the natural system, yet the bottom line is that our survival hinges on our ability to fit into the natural circle and not vice versa.

A Circular Society

So far I've written about natural and human communities as distinct entities, but by molding our society to nature's pattern, we would become one with nature, a link in the natural circle. By no means would this advocate a return to caveman economics. Many changes, some drastic, would be necessary to adopt sustainability as our goal. However, even these drastic changes (mainly in values) would seem minute in comparison to the outlandish schemes which would otherwise be necessary to continue our present lifestyles. Indeed it is extremely doubtful that any scheme, regardless of its outlandishness, can save us if we continue our "forward stampede" toward the impending abyss.

As we draw nearer to this abyss, it is becoming obvious to an increasingly large number of people just where we are heading. Even our economic system is beginning to point to the necessity of a change in direction. Nowhere is this more notable than in the area of resource consumption. As oil supplies become increasingly limited and expensive, people are turning to conservation and renewable energy sources. However, we cannot afford to be complacent with this knowledge and hope that economic incentives will be our salvation. Both history and our present state of affairs show the ineffectiveness of human-made systems in adequately dealing with problems which will directly affect our future. It is both



tragic and astonishing that we have not yet recognized the beauty of nature's sustainable society and sought to become participants in it.

Re-circle-lating

We as mere mortals will never duplicate nature's simple yet immensely intricate workings. Nevertheless, we can expect enormous strides toward a sustainable future if we wed the rigor of science with the pattern of nature's circle. A methodology such as this would be particularly effective in the area of resource re-use. Nature's pattern has shown us the futility of regarding resources as "wastes." In the natural community one participant's refuse is another's fuel. Contrast that with our present system. In the U.S. alone we regard over 3.5 billion tons of resources as unusable waste each year![1] The words of the wise Chief Seathl, written over a century ago, bear a very appropriate warning, "Whatever befalls the earth befalls the sons of the earth...to harm the earth is to heap contempt on its creator. The whites, too, shall pass - perhaps sooner than other tribes. Continue to contaminate your bed and you will one night suffocate in your own waste."[2] Armed with the convenience of a throw-away-everything-mentality, we have created a problem which, quite literally, threatens to suffocate us. We have tried for too long to ignore this problem and it is becoming blatantly obvious that it is not something which can be thrown out of sight with the weekly garbage.

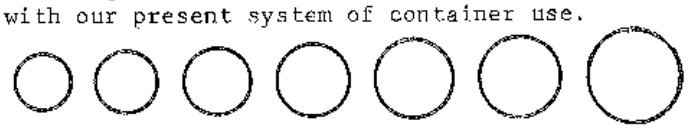
Using the natural circle as a pattern we can begin a serious resource re-use program. Not only is such a program essential to assure us the resources necessary to provide the material goods a community needs, it also suggests a benefit which few other solutions offer: a low cost opportunity to initiate a program of community self development. A recycling program is probably the wisest way to launch a community on a path of sustainability through communion. For not only does recycling yield immediate economic dividends, it also profits the community in a much more significant way by involving all of the people in the area. This sets the stage for further action by showing people that their help can make a difference. A properly organized resource recovery program is a community organizer's dream; it induces a healthy cash flow, creates jobs and directly involves the beneficiaries of the program.

A community-based recycling system can take various forms; however, two different ones are generally used. The first system deals with the discarded resources at the landfill site. No sorting by individuals is necessary since it is usually handled by sophisticated machinery. The second system relies on the community-participants to sort their own refuse, in addition to other preparations which may be required to ensure a buyer for the goods. Quite obviously the second method lends itself more readily to the smaller community which could in no way afford the enormous cost involved in sorting machinery. The main advantage of the first system is the ease of implementation. If the financial obstacles

can be cleared, it is simply a matter of putting the machinery to work and hauling away the product. Since few, if any, value changes are required to implement such a system, it would be much more readily acceptable to the uninformed people who would regard the second system as a threat to the false security afforded them by their automated lifestyles. It is for precisely that reason that we must avoid the first method. There is no hope of ever fitting our society into the natural circle if we cannot turn off the television long enough to reorganize our refuse. The one or two commercials' worth of time required by a household to sort its daily refuse would be repaid manyfold through savings in taxes, jobs created and the encouraging thought that indeed everyone can do something about the problem other than merely talking about it.

It is important to note that while both systems achieve the goal of resource recovery, the different means by which this goal is realized determines the effectiveness of the system. The first method is simply an extension of our current system which favors iron over muscle and silicon over neurons. It is precisely this approach to production which has so drastically limited our options for the future. The second method favors circles and like the natural model, it requires social interaction and avoids unnecessary complexity. Although this system cannot compare to the infinite efficiency of the natural circle, it is an essential starting point upon which we can develop a sustainable future.

A community-based system of resource recovery is indeed an essential starting point. However, this effort by itself is grossly mismatched to the enormous task facing all of us in closing the circle of resource use. A proper attempt at solving the resource depletion crisis will require a total program which goes beyond the reach of individual communities by attacking the problem at a national level. There are many possible ways to promote a more sustainable resource use policy through federal legislation. One logical place to begin is with our present system of container use.



Closing the Container Circle

Disposable containers have become such an integral part of our throwaway society that tremendous value changes will be necessary to end their use. An extremely powerful container industry, backed by a variety of government subsidies which favor virgin over recycled materials,[3] has led us to believe that we must continue to discard our natural resources with little regard to the future if we are to maintain our present standard of living and continue to increase the GNP. And though we constantly frown on the consequences of "convenience" packaging (in the form of litter, pollution, and over-crowded landfills, the public does not understand the full effects of this highly entropic practice. Despite this, all indicators continue to point to container deposit laws as the answer to the problems created by our annual disposal of 46×10^9 bottles in this country. It is imperative that we force the packaging industries to comply with the wisdom of the complete circle through federal legislation. A national beverage container act has been proposed but never passed.

Various states have been successful in enacting legislation which reduces the amount of disposable containers in circulation through various economic incentives (deposits) aimed at the consumers. The success of these so called "bottle bills" is a subject of much controversy. The container industries contend that these measures have had minimal effect on reducing litter while raising the cost of the product due to increased handling costs.[4] On the other hand proponents of the bills point to significant evidence of reduced litter, jobs created and cheaper products through the use of returnable containers.[5]

I believe that we must go beyond these bills and propose national legislation to require standardized containers that are designed to be durable and readily re-used. One of the major benefits of these generic type containers would be that products would be judged more on their merits than on their flashy containers. Other advantages would include lower handling costs through this standardization, as well as a significant savings in raw material usage. Indeed, it would be well within our technical ability to produce a system of a limited variety of containers which are designed to overcome many of the hassles presently associated with disposable containers. The impediments to a plan of this nature lie not in the technology but in the political process necessary to enact this crucial legislation. Thus, our role as circle weavers requires exerting our influence in Washington as well as at home.

Circular Industry

So far, this paper has discussed the potential for a community based recycling program and national legislation as ways to close our resource use circle. Both of these measures are extremely important and in fact essential to our extended survival on the planet. The final area I will explore in this paper as a potential circle closer is the industrial sector of our society. This area has, by far the most to gain by resource re-use. The table below exemplifies some of the potential energy savings possible within the industrial sector.[6] In addition to these enormous energy savings available to industry through the use of recycled materials, many other savings are possible. These include lower materials costs, lower production costs, and lower "waste" disposal expenses.

Many industries are beginning to use recycled materials in their processes. However, there is a great amount of misinformation present today which

ENERGY SAVINGS WITH RECYCLING

Production Energy Btu/Pound

Material	Virgin Inputs	Recycled Inputs	% savings	Tons recycled in 1976
Steel	8,300	7,500 (40% scrap) 4,400 (100% scrap)	10 47	46,111,452
Aluminum (ingots)	134,700 108,600	5,000 2,200-3,400	96.3 96.9-98	1,433,000
Copper	25,900	1,400-2,900	88.8-94.6	1,423,591
Glass Containers	7,800	7,200	8	n.a.
Plastics (polyethylene)	49,500	1,350	97.3	n.a.
Paper	11,400	8,800	23	10,158,000

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is preventing a serious resource re-use program. Most of this misinformation is the direct result of the curtain of subsidies and tax write-offs which veil the true advantage of recycled over virgin materials.[7] These industrial welfare programs defer much of the true cost of virgin materials from industry to government. While recycled materials are carefully scrutinized for cost effectiveness and quality, the use of virgin materials remains common practice, even when energy savings realized by reusing resources exceeds 95%! If our new presidential administration is really serious about getting government off the backs of industry, here is the place to start. Let's strip away these subsidies and tax write offs and let the free enterprise system work!

You as a Circle Weaver

This article has taken only a brief look at the multitude of ways to promote sustainability through resource recycling. Indeed, volumes could be written on each of the three main areas covered, as well as on numerous other possibilities. The problem is one of such proportions that it appears almost overwhelming.

The most essential element in this quest is our set of values, the ethic which guides our daily affairs. The change in these values necessary to obtain significant results must be obtained through true education, a process of wedding practical working experience with the common sense of the natural circle. Education of this nature does not require schools, but only students willing to learn. The teacher for this course in planetary preservation is all around us, straining to show us the wisdom of the circle. True education yields internalized knowledge which produces the action necessary to effect change.

Our role as circle weavers dictates a quest for this internalized knowledge and a committment to action based upon it. This is where the importance of strong communities becomes very obvious. For each of us to become circle weavers is nothing until we combine our individual pieces and secure them together with the glue of communion. A truly strong community will both require and produce the internalized knowledge offered us by nature's wisdom. And, as mentioned earlier this knowledge will produce action and within this community action lies our hope for a change in direction. The various social threads of technology, economics and politics are not the real impediments to this change. Rather the job for us is to weave these various threads of society into the most beautiful of patterns - the Natural Circle....

References and Notes

1. "Recycle," League of Women Voters, (1730 M St. N.W., Wash. D.C. 20036, .25 per copy). Pub. No. 132, pg. 3.
2. Letter from Chief Seathl to President Franklin Pierce concerning the sale of land which is now the state of Washington. Taken from Man and Environment, 3rd Edition, Wes Jackson, (William Brown Co., Dubuque, Iowa. 1979).
3. Our present laws and regulations offer a multiplicity of incentives which encourage resource extraction. Examples of these are depletion allowances which allow mining companies compensation for the extracted product. These mining industries are also allowed to shirk their responsibilities for the environmental degradation due to their operations. Other aids to resource depleting businesses occur in labeling laws, use of federal lands for exploitation and lower transportation costs for virgin materials. See "Recycle," The League of Women Voters. Pub. No. 132. pps. 11-18.
4. The beverage industry favors a measure similar to one passed in the state of Washington which taxes products to pay for litter cleanup. A study financed by anti-deposit law forces claim a 66% reduction in litter in that state, but this study has been widely refuted, even by the state's Litter Control Act Director. See "Bottle Bill Shifts to Ohio," Audubon, Sept. 1979, pps. 154-157.
5. The E.P.A., in a recent study claims that a nationwide bottle bill would reduce litter from 5.3 to 1.6 billion containers per year. The state governments of Vermont and Oregon, where bottle bills have been enacted, claim a 36-40% reduction in litter, and substantial savings in container costs. A recent federal government study shows that a national deposit law would save 70-80,000 barrels of oil per day, reduce solid waste pollution by beverage containers 86%, and create 30-40,000 new jobs. See Audubon, Sept. 1979, pps. 154-157.
6. Reprinted by permission from Soft Energy Notes. ("Junk Power" by Matt Biers). Oct/Nov. 1980. pps. 10,11. (Friends of the Earth, San Francisco, Ca.).
7. See Reference 3.

A Recycling Business in Salina

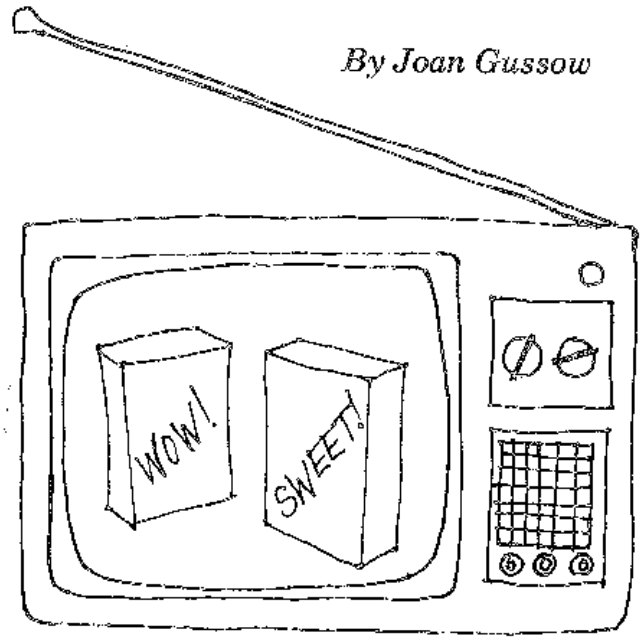
The potential for recycling businesses is great. In Salina, National Plastics is one year old and growing rapidly. The company handles only 3% of the city's refuse, but this amounts to over 170,000 pounds of newspapers, cardboard, magazines, aluminum and polyethylene (plastic products such as bread and trash bags, milk jugs, liter-size pop bottles and handy wraps) per month.

Don Acorn and seven employees operate this business located near the corner of North 3rd and North Street . Individuals can bring in their pre-sorted refuse from 8 to 5:30 Monday through Friday, and 8 to 12 on Saturday mornings.

National Plastics has arrangements with some of Salina's businesses to supply containers for refuse and empty them when necessary. These businesses benefit not only by reduced collection costs to disposal companies, but also by the revenue generated from sale of this former "waste" to the recycling industry. Non-profit organizations receive special rates for materials collected in recycling drives. The company even provides the trailers for such drives. The Prairieland Food Co-op has become a collection site for the recyclable materials. Members of the community can donate any of the above-mentioned items and are asked to sort them into the appropriate bins in the store.

Some Impractical Thoughts on Television and Nutrition Education

By Joan Gussow



I have the uneasy feeling that what I am about to say is not "practical." But I find myself in age, increasingly disinclined to continue to advance in public ideas which I have gone beyond in my private thinking. My husband sometimes quotes a line of Robert Frost: "I never dared to be radical when young for fear it would make me conservative when old." I was - incautiously perhaps - very conservative when young only to find myself like Frost growing radical with age.

My message is very simple. Much as I would like it to be so, I am very much afraid we cannot teach children - on television - what they most need to know about food in the last fifth of the 20th century. Having said so much, I would like to tell a couple of relevant anecdotes.

I spent some time this spring as a visiting professor in Berkeley. My husband and I lived there in a lovely flat which had no television set. Friends offered us sets, but since we watched so little TV at home, we preferred not to bother. We were, of course, also cut off from easy access to the New York Times - a circumstance that tends to cause acute withdrawal symptoms in my husband. We did hear about the Olympics somehow - probably on the six minutes of national news one could get on the "all news" CBS radio station. (You know how it goes, "The Ayatollah Khomeini has reiterated his opposition to the release of the hostages," followed by a detailed story on a cable-car derailment.)

About three weeks into our stay, when the Olympics were over, I was lying in bed one morning listening to some over-wrought sports announcer "recapping" the excitement over the U.S. Hockey team when suddenly I realized that all across the country were millions of human brains filled with a series of common images. Some of them I supposed would be images of slender women flashing about on the ice, of heavily padded men jumping up and down pummelling each other, of clots of waving, shouting, hysterical fans. The most persistent image, I imagined, must have been of a stocky figure, hunched over, legs thrusting out behind him against the ice over longer and longer daily distances.

As I lay there, I realized we had been so removed that I couldn't even remember the name of the nice young man who had won five gold medals in speed skating and was "probably the greatest athlete of all time" until the next media event came along. And I turned to my husband - we always tried to stay in bed long enough to hear that five minutes of news on the hour - and I said "Do you realize that when they do a review of 1980 and show those little snippets of events that are supposed to evoke the elation all over again, it won't mean a thing to us? Do you realize that those Olympic images mean something to damn near everyone in the country except you and me?"

Now it happens that there is someone who has written seriously about this phenomenon. His name is Jerry Mander and his book Four Arguments for the Elimination of Television says that television cannot be reformed because among its other inherent problems it controls the images we carry around in our heads. I believe it is one of the important and serious books of our time; even if it is wholly "unrealistic" as I have been coldly informed, to eliminate TV. I think that fact may be more of a commentary of our relationship to our technologies than it is to the irrationality of the proposal. In this society, as Phillip Slater has pointed out, "We poke our noses out the door each day and wonder breathlessly what new disruptions technology has in store for us. We talk of technology as the servant of man. But it is a servant that now dominates the household, too powerful to fire, upon whom everyone is helplessly dependent."

What I am saying for openers, then, is that as a result of my recent personal detoxification, I have become intensely aware of the drawing power of the universal images which some people with ratings in mind have chosen for us to live by. My husband and I hardly see television. Yet even we sensed the difference when we were cut off from the great communal image maker in the sky. How different are humans whose childhood images are projected on the front of a cathode ray tube from all the other humans in history who grew up having as their shared visual experiences only the blinding globe of the sun and the cooler disc of the moon and the changing sky and the rain and the look of still water and a few other objects in nature like rocks and insects and some plants and birds and animals? It scares me to realize that

those commonalities through which all humans were linked to natural cycles have been so largely supplanted by technological commonalities wholly removed from authentic experience. "We resemble one another in what we see together," Camus once wrote. When the TV is left on by accident and I walk in on "The Price is Right" I tremble at the thought that these are images that link us.

I have a second anecdote. Several years ago we had a newspaper strike in New York and found ourselves dependent upon the electronic media for information as well as pictures. One evening when I was alone in the house I went downstairs to watch the local news. Just as the picture came on, I caught the end of a story about two young men who the day before had jumped off the Brooklyn Bridge. They did it for a lark, not intending to kill themselves, apparently, but one died. The other was being interviewed in his hospital room and all I caught was one sad sentence: "We just wanted to share the experience." I was astounded by that remark, and intrigued - as an observer of this extraordinary culture - and I wanted to know more.

So I flipped to the other channels to see whether they might be carrying the same story later. All through the local news, I kept flipping from channel to channel, trying to pick up the rest of the story. But no luck. And then it struck me. I was curious, and television inevitably frustrates curiosity. You can't ask questions of a television set. You can't say "Wait a minute, I want to see that a bit longer," You can't say "I didn't catch the beginning of that, let's go back." (Unless you remembered beforehand to turn on your Betamax!) Whether what is passing in front of your eyes is good or bad, touching or brutal, you must look at it at the pace someone else has chosen and in the order someone else has decreed, complete with commercial breaks which you can only walk out on, not skip. You cannot omit the ads as you can in the paper - or start reading from the back forward as I do with the New York Times hoping magically to get through the paper more quickly. That the literalness replaces the imagining which books encourage has been said too often to be worth repeating. But the sense of being out of control, of having to view passively, without active curiosity, strikes me as ominous. You simply cannot control the rate or content, and if you turn it off, you have missed it. You cannot decide in 10 minutes that you are now ready to watch what you were not ready to watch before.

In short, television has inherent characteristics, its tendency to fill our heads with "unnatural" communal images and its inability to let us inquire information at a "natural" pace which, I believe may make it incapable of teaching any of us what we need to know about food if we are all to survive.

Let me acknowledge that people with a Betamax can, "go back and start over," and many people hope that the pictures in our heads may have less power when we can choose them from a wider selection, when they are not necessarily shared coast to coast, and when we can, in the coming interactive cable revolution, punch our black boxes and talk back to them. But I don't think we know whether these innovations will free us in important ways any more than we know whether or not in a time when questions get more complex, television is responsible for the drop off in people's ability to do complex problem solving. It's the fact that nobody knows that ought to scare us as we keep moving on.

Now many of us have been hopeful that we could "fix" things by using the media for positive messages. There is no question about the power of television to model good behavior as well as bad. There is no question that television can teach - so long as we are not asking it to teach "information" like "normal body temperature is 98.6°." This means that we could in theory teach nutrition on television if nutrition was understood as consisting of modeling for people appropriate behavior toward food (and perhaps sneaking in a little information on the side about why certain foods are appropriate).

My own history of involvement with nutrition public service announcements is long. Food activist Robert Choate and some others including myself once made a set of PSA's called "On Second Thought." They said essentially, "America, you're overeating!", "You're eating too much sugar!" and "If you eat too much sugar, you'll get cavities!" They said these things with sophistication and humor and they were pretty good technically; it seems questionable whether they would have changed eating behavior even if the stations had been willing to run them. Their messages were not news. Most people who are overweight know a lot more about calories than I do. They know they're eating too much sugar and that sugar causes cavities. There's little likelihood that one more 30 or 60 second lecture--even an amusing one-- will have much effect.

Since that time I have worked on various sets of short public service announcements with ABC. Some of their earlier spots were about various things kids might eat that would be more nutritious than what they were currently snacking on. Some of my students tested those, and we learned that they were probably much too fast and too information-packed for small children.

So we all got smarter. We began to realize that a major part of the problem to be solved was that most people, especially children, were eating too much and too often, as well as eating the wrong things. We weren't going to help the

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Joan Gussow will be a guest speaker at The Land Institute on May 30 in a special Prairie Festival Food and Nutrition Seminar.

"So we came up with some other ideas about what to say to kids: for example... 'When you fall down and skin your knee, ask for a hug instead of a cookie.'"

too-much-too-often problem by reminding them to eat, even if what we were reminding them of was nutrient-packed. Such favorite "substitute" snacks as nuts and cheese, for example, are high in calories.

So we came up with some other ideas about what to say to kids: for example, "When you feel like snacking, why not do something else, like play ball" or "When you fall down and skin your knee, ask for a hug instead of a cookie." And now we have some new ones like "Don't Drown Your Food" which was based on the notion that children ought to like a variety of tastes and that since most commonly used sauces (mayonnaise, sour cream, catsup) are high in sugar, salt or fat, or all three, we would be accomplishing a nutritional good by reducing their use. And we have another spot called "Chopper" about chewing food thoroughly as a way of encouraging children to eat more high fiber, low calorie foods while giving their teeth some exercise.

Finally, I am one of those nutritionists working with American Institute for Research and Needham, Harper and Steers (the ad agency) on a USDA ad campaign designed to encourage healthier snacking in children. It is impossible to say at this point how widely the resultant spots will be aired. In addition, I have attempted to collect and look at most of the PSA's related to nutrition that have been around over the last few years, so I think I have a fairly good idea of the potential range of topics, approaches and strategies of PSA's designed to teach "nutrition."

I am convinced that under the right circumstances TV, including PSA's, can modify behavior. What are the right circumstances? The anti-smoking PSA's were so effective that they drove cigarette advertising off the air (ultimately with the cooperation of the tobacco companies who were losing customers). But they had two advantages nutrition PSA's don't have. First they had to be run head on with the tobacco ads. But as I understand it, the ruling that required such "equal time" has been overturned in the courts so that there is no Fairness Doctrine support for insisting that a PSA on the joys of eating raw carrots be placed next to a commercial celebrating frozen "meat and potatoes" dinner. Even ABC which has certainly tried harder must be aware that their nutrition PSA'a (our nutrition PSA's) are no match for the sea of scrumptiousness in which they float.

But the more difficult problem has to do with the nature of the product. Eating is not a bad habit. Unlike smoking, eating is not something you can give up altogether. It is something you must learn to control. We are assaulted by temptations to eat - either we develop strong characters or we overconsume. Yet it is very difficult to promote thoughtful self-control on a medium which is devoted almost entirely to selling mindless self-indulgence. "In order to exist economically as we are," Jules Henry once wrote, "we must try by might and main to remain stupid." Television assists us in that effort. Self-indulgence, not self-restraint is what makes the economy go. I don't watch much TV, as I said, but I would be interested in hearing about any shows in which moderation, self-restraint, non-consumption and conservation are the characteristics of a contemporary hero figure.

As a nutritionist, I must ultimately ask myself what it is I would like children to learn about food and nutrition. Allow me to repeat what I said last year to a judge when I testified for the FTC on regulating advertising to children. "Since there is absolutely no evidence that a very young child can self-select an adequate diet except when the possible choices are limited solely to whole, nutritious foods, a child faced with today's bewildering food supply must obviously have someone else select the foods from which the child may then determine how much she or he will eat. Therefore, as a beginning, one wants a very young child to believe mother knows best about food selection. Beyond that, we want children to believe that the foods adults eat are appropriate foods for a child, that humans eat a wide and varied selection of vegetable and animal substances and that a child need not, beyond infancy, have certain special "child foods" in order to enjoy eating. Certainly we would want children to be willing to taste and like a range of whole, unsweetened, unprocessed, unfortified, naturally-colored and naturally-flavored foods. And finally, in this day of increasing pressure on the world food supply, we would want children to know where food comes from, how it grows, how dependent we are on the knowledge and skills of farmers. Children who do not learn these things will not know enough as adults to protect the sources of their food."

Now what is overwhelmingly clear is that television is not even attempting to teach any of the lessons I have outlined. Food advertising is, in fact, attempting to teach the exact opposite. Using authoritative male spokesmen, food commercials urge on children a selection of just-for-them products which for the most part adults could hardly be induced to eat. These products appear to be rootless, to have grown in no soil, on no farm. They are derived from no plant, except for a food processing plant which is completely remote from the child's experience. The foods come pre-wrapped, many of them in four-color boxes designed to appeal to children. Their flavors and colors are like nothing in nature, their sweetness so overwhelming as to "spoil" a child's taste for something more naturally subtle." I think it must be clear to every watcher of TV that there is very little food on "adult" television that might serve to modify these learnings.

I would like to believe that television could do something to correct these inappropriate teachings, since it would make me more optimistic. But since I believe the most important perception has to do with understanding - really understanding - the slow cycles of nature and our total dependence as humans on the continued functioning of those cycles, I am not at all sure that it can. It is the nature of the medium to separate us from real experience. And since I tend to believe with Jerry Mander that TV is not very good at dealing with such complex issues, I find myself wondering whether the best thing we can do for children's nutrition education four years from 1984 might not be to run "Crockett's Victory Garden" 24 hours a day and encourage people when they get tired of seeing it to go out and work in the soil. As I said, that may not be "realistic." But that's my message.

(Continued from pg. 15)

billion and an annual pumping cost of $482 per acre foot.

These "interbasin transfers" are tremendously expensive proposals. Could anyone ever take them seriously? Unless food prices become high, farmers cannot afford to buy such expensive irrigation water. But industry could pay the price. Wes suspected this was a "hidden agenda" behind the High Plains study. Another "hidden agenda" could be to link up the water lines with the coal slurry pipeline, which will pass close to the delivery areas. What if, when the coal is gone, they pump that water up the coal slurry line for industry to use in Wyoming?

These are not just conspiracy theories. One engineer at the Missouri River Conference in Jefferson City February 27-28 suggested that such a plan should be studied.

Surely these ideas will die of their own weight and expense. Yet the Corps has been known to successfully complete other ridiculous schemes, and no one should assume this one will be discarded.

PRAIRIE FESTIVAL 1981

The third annual Prairie Festival will be the weekend of May 30-31 at The Land. The registration fee for the two days is $2.50 per person or $5 per family. Camping spots at The Land can be reserved by out-of-town guests. People are responsible for their own food, but the Sunday dinner will be a shared potluck at 1:15 P.M.

Saturday's events will begin in the afternoon when Joan Gussow, chairperson of the Nutrition Education Department at Columbia Teachers College, will direct a seminar on Agriculture and Nutrition. The evening program, after a "bring your own" picnic, will feature "Bluestem" music and presentations by prairie activists.

The Sunday schedule will begin with an early morning bird walk. There will be a potpouri of other activities, including group sessions on wind energy, solar energy and gardening. Those interested in the prairie habitat can go on wildflower walks, attend a riparian habitat session on the Smoky Hill River, or listen to talks about raptors or snakes on the prairie. There will be nature walks for children and tours of The Land.

Special guests for this year's festival will include William Irwin Thompson, author and chairman of the Lindisfarne Association, and Keith Critchlow, author, architect, and lecturer at the Royal College of Art, London, England. Festival participants can meet with them in group sessions. Alan Gussow, painter and President of the Friends of the Earth Foundation, will make a presentation following the potluck dinner.

The Land will send out invitations in April, but be sure to mark your calendar now and reserve this weekend to attend the Prairie Festival.

Friends of The Land

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

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

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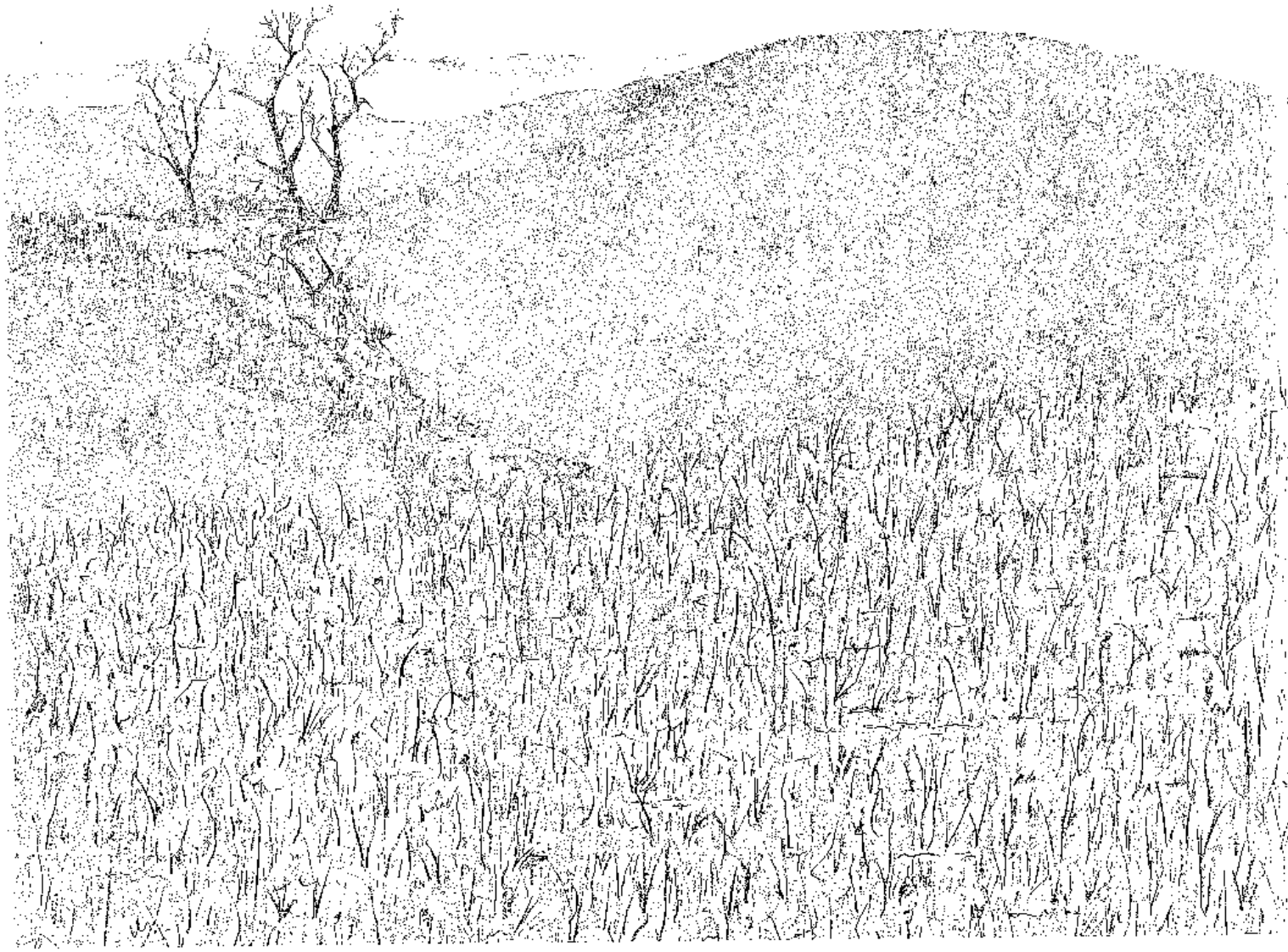

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