

THE LAND REPORT



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Spring 1985

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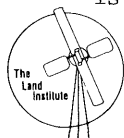
On the Cover

"Magical Prairie Dog Town where Time Turns all Faces at Once," is a pen and ink drawing by Harley Elliott, who teaches art at Marymount College in Salina, Kansas. Dr. John Schwartz gave it to us to adorn our classroom.

Other work of this artist, poetry, has graced The Land Report before. The author of several published books of poetry, one of which is reviewed in this issue on page 22, as well as children's books which he illustrated, Harley is recognized as an artist of unusual versatility.

More of Harley Elliott's sketches appear on pages 16 and 17, in the article about the Pipe Creek Shirt Co. Another drawing, "Dawn Jack," appears on the 1985 Prairie Festival invitation.

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THE LAND INSTITUTE IS A NON-PROFIT
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Interns at Work

Clockwise: Steve Ela measures, then he and Juli Kois saw railroad tie siding for new barn; Juli and Holly Winger listen to Mary Bruns make a point in class; Carol LaLiberte builds a raised bed in the garden; Lois Braun and Michel Cavigelli unload hay for garden mulch.



Mission Impossible?

Dana Jackson

In the mail one day, there was a check for \$50 from a young farm couple who are Friends of The Land. It was a generous annual contribution, considering the financial straits of farmers these days. It may have been a sacrifice. I felt a heavy sense of responsibility to that couple and wondered if what we were doing at The Land Institute fulfilled their expectations. The Land must represent something important to them, something they feel obliged to support.

Wes Jackson started The Land Institute in the fall of 1976 as an organization devoted to a search for alternatives in agriculture, energy, shelter and waste management. He wanted to teach a small number of students and have physical work be a part of the curriculum. Having taught the "ain't it awful" courses for three years in the Environmental Studies Center which he organized at California State University, Sacramento, he was eager to take a more positive approach. He wanted students to work on projects based on less energy and materials-intensive materials, to search for ways to provide for human needs without degrading the environment. He constructed a strange building made out of mostly scrap materials as a classroom, office and shop and recruited seven students. The building burned down in October, and Wes offered the students refunds on their tuition if they wished to leave the program. The seven students told Wes that the kind of education he was offering at The Land Institute was not dependent upon a special building, and they would stay. The group then began meeting in the Jackson house for morning classes. Members of the board of directors contributed some extra money to acquire materials and a few replacement tools, and the students continued their projects.

The loyalty of the students was matched by friends and neighbors in the community, and with their help, we began constructing a new building right over the old site. It took a year to replace the first building; by this time, I was thoroughly involved with Wes in the development of The Land Institute. He and I finished woodwork in the classroom, and Wes laid in new carpet just in time for the Smoky Hills Audubon Society to meet there for the post-bird count dinner in December, 1977.

Eighty-eight students and eight years later, The Land Institute is still in operation. From a budget of \$10,000 in 1976 and a staff of one, we have grown to a \$200,000 yearly budget and have six staff members. Instead of worrying about finding enough tuition-paying students, we choose ten out of approximately 100 inquiries and thirty good applicants to receive scholarships and stipends as agricultural interns each year (\$70,000 of our budget). We publish three *Land Reports* and one *Research Supplement* each



Dana Jackson

year, and have the copyright on a new book called *Meeting the Expectations of the Land*. Our annual Prairie Festival in the spring has become a popular event, and nearly 200 people came to our Fall Visitors' Day. I think The Land Institute is doing good work.

What haunts me is the knowledge that neither our nation, our state nor even our country is any closer to developing sustainable alternatives to a wasteful, ecologically damning way of life. There were a few years when it appeared that the need for renewable energy and conservation was understood by the majority of Americans, and that our wind generators and solar collectors at The Land were models people were interested in. During the height of interest in the National Agricultural Lands Study, I thought perhaps Americans would realize the absolute necessity of conserving soil and preserving land for agricultural use. For a while I believed the Stanford Research Institute study which concluded that voluntary simplicity was being chosen by a significant number of citizens. And then I thought that Jonathan Schell's book *The Fate of the Earth*, and later, the nuclear winter study, would make our leaders realize that an exchange of nuclear weapons would be planetary suicide and that more weapons just meant a greater likelihood of disaster.

Then came the 1984 elections. The American public elected a national leadership based on the question, "Are you better off now than you were four years ago?" The Reagan administration had officially declared four years earlier in the 1980 inaugural extravaganza that it was all right to be rich, to aspire to own a plethora of material possessions and rub elbows with other rich people. The administration pledged to free

businessmen to make more money through tax relief and the relaxation of government controls. Forget the poor. Forget the environment. Forget energy conservation. Greed and selfishness were in--and approved by God! What a contrast to the John F. Kennedy slogan in the 1960 election, "Ask not what your country can do for you. Ask what you can do for your country."

The headlines in January 1985 declared that personal income posted the biggest gain in two decades. Based on income alone, many U.S. citizens are better off, and The Land Institute is better off. But what about the security of the nation, the state of its natural resources, and the future of our children? Surely if we are richer than ever, we have surplus funds to address the environmental and social problems of the country. But we are not. In spite of all the patriotic rhetoric, the flag waving, Americans seem to function as individuals, not as fellow citizens with common goals for a just and sustainable society. Our elected representatives continue to approve budgets of unfathomable size for the missile-mad Pentagon and its President, increasing our national debt for the next generation to pay. Incredibly, the administration wants to cut the Soil Conservation Service in half, to reduce funds to states and communities for schools, community development and health care. We are being told that most of these services should be handled at the local level. The federal government only wants our tax money to buy more weapons.

The Land Institute and many similar institutions like it, plus the national and state environmental organizations, the farm policy organizations, the peace groups, etc., have been working to overcome policies of exploitation and injustice and to present alternatives. Why does mainstream America ignore the Worldwatch studies, the study by the Harvard Business School called *Energy Future*, the *Global 2000* report, and the information on nuclear winter described in *The Cold and the Dark* by Ehrlich, Sagan, Kennedy and Roberts? Our national policy seems to be "strength through exhaustion," fueled by greed. We can comfort ourselves by the line, "We are not called to success, but to obedience to our vision." Still, that too quickly dismisses our responsibility. The young farm couple donating \$50 would accept that line, but they would also like to have their \$50 contribute to at least some progress, if success is impossible.

How can we measure progress? We certainly cannot discern any by looking at national policies and trends. With the Wolf Creek Nuclear Generating Plant being fueled and Kansas farmers going broke, the state of Kansas does not show any progress. Closer to home, in Salina, the persistent developer and his lawyers gradually wore down the naive city politicians, and we will have a new mall replacing a wheat field and more chain stores to compete with our local downtown businesses.

I suppose that all of us do-gooders are trying to overcome greed, and it is a formidable opponent. Most of the great religions have warned humans of the folly of greed, although the Christian tradition according to Ronald Reagan would encourage it in the name of capitalism. It is hardest to recognize and admit at the personal level. When we look at the mission of The Land Institute from the perspective of battling greed, it seems presumptuous to expect success or progress, when centuries of church history show failure. But our times are different. Nuclear weapons have made the stakes much higher.

This essay is not meant to be a lament of the times, but a discussion of the mission of The Land Institute. Listing the obstacles can become a self-indulgence which leads to cynicism and hopelessness, or it can start a process of assessment and redirection.

The Land Institute was incorporated as an educational organization, and our unique program for college age students has worked so well that several other alternative organizations have mimicked it in the intern programs they have established. Three factors distinguish our program.

(1) We are value oriented. The Land Institute is openly critical of a social, political and economic structure which is destroying the long-term ability of the land to support a variety of life and culture. We seek alternatives based on the wisdom of nature rather than the cleverness of humans. We believe humans must accept limits by controlling their numbers, their consumption of the earth's resources, and their pride and greed which has led to the potentially disastrous nuclear arms race. Our students are encouraged to question and discuss the values underlying policies and actions at all levels of society.

(2) Our program involves only ten students at a time, an optimum number, we have found, for good discussion, effective work, the development of student-staff cooperation and a sense of community.

(3) We have a routine for the nine to five work day which involves two periods in the classroom in the morning and physical work related to research or maintenance and construction outdoors in the afternoon. From 9:00 to 9:45 A.M., we have what we call "warm-up." This period is characterized by wide-ranging discussion stimulated by individuals relating what they have read about environmental, agricultural, energy or peace issues to basic philosophical questions. We also divide up the afternoon's work at this time. After a ten minute break, the group comes back to discuss assigned readings in one of the three areas in our curriculum: ecology, genetics, and "Considerations for a Sustainable Society."

Most of the students who finish our 43 week program will be involved in social change during their lifetimes. They come committed, they leave committed; and, we hope, more directed.

These students make it impossible for me to indulge in cynicism and hopelessness.

The Land's educational program is inextricably tied in with our research into the potential of perennial polycultures to replace annual monocultures on sloping farmland. We are the first institution to devote our work to the challenge of breeding perennial crops which will be grown at an ecosystem, rather than a population, level. As an independent, privately-funded organization, we have the capability, the dedication and, therefore, a responsibility to continue our research program. What we learn could make the difference in food-production potential for our grandchildren, after the short-sighted industrial agriculturalists have destroyed our soil.

From the standpoint of a unique educational model, we could justify the continuation of our program for graduates or upper-level undergraduate students. From the standpoint of the accumulation of information at the basic science level, we could justify the existence of our perennial polyculture research. But without the impetus behind both, the passion to make a contribution towards a more sustainable society, The Land Institute would not merit the support given by our constituency. The young farm couple didn't send \$50 to support education or research. They sent it to support the values manifested in our education and research programs. As individuals or couples, we are limited in the impact we can have to create a more just, sustainable society. We must combine our efforts, join with others for moral support, and for financial and political impact. It is only a community of thinking people that will bring about change.

The farm couple have pledged themselves to the community of thinking people connected to The Land Institute. We thank them gratefully. We commit ourselves to a continued effort to deserve their faith in us.



GREETINGS TO ALL THE FRIENDS OF THE LAND
FROM YOUR FRIENDS AT THE LAND

Dana Price on Staff

Dana Price, who was a 1984 agriculture intern, has returned to The Land Institute as a junior research associate for the 1985 season. Dana completed a co-terminal bachelor's and master's degree in biology at Stanford in March. Dana will be following up on research she did last season and also undertaking new projects.

On Top

Gary Snyder

All this new stuff goes on top
turn it over turn it over
wait and water down.
From the dark bottom
turn it inside out
let it spread through, sift down,
even.
Watch it sprout.

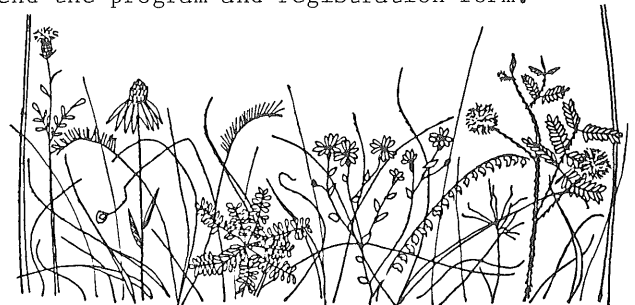
A mindlike compost.

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1985 Prairie Festival

The seventh annual celebration of the prairie ecosystem and prairie folk will be at The Land Institute June 1-2. Gary Snyder, who won the Pulitzer Prize in Poetry in 1975 for Turtle Island, and Gene Logsdon, farmer and author of many books and articles on gardening, farming, and homesteading will be the featured speakers. Thirty-five other persons have agreed to be speakers, panelists and discussion leaders. The program also includes a play, a dance performance, poetry readings, music and outdoor prairie events. The theme for the two day event is "Patterns and Traditions for a Sustainable Society."

Invitation-programs were sent to persons on The Land's mailing list early in May. Anyone who would like to receive one should write or call The Land Institute, and we will be happy to send the program and registration form.



New Edition

NEW ROOTS FOR AGRICULTURE

by Wes Jackson, Foreword by Wendell Berry

"This book calls essentially all till agriculture, almost from the beginning, into question, not because sustainable till agriculture can't be practiced, but because it isn't and hasn't been, except in small pockets scattered over the globe...Because of advances in biology over the last half-century, I think we have the opportunity to develop a sustainable agriculture. This bio-technical fix would be based on mixed perennial seed-producing plants that would make it easier for humans to solve many problems in agriculture at once."

Preface, Wes Jackson

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In the first edition of this book, published in 1980, Wes Jackson described how attempts to stop soil erosion had failed in spite of stewardship, success in increasing production, history and prophecy, and organizations dedicated to soil conservation. He was convinced that the serious problem of soil loss would not be solved by making adjustments in agricultural practices, and he proposed a totally new kind of agriculture modeled after the prairie ecosystem. In this new 1985 edition, Wes has included an afterword which gives some historical background on perennial grain crops and describes the research program that has been started at The Land Institute.

\$6.95 + \$1.00 shipping charge

MEETING THE EXPECTATIONS OF THE LAND

Essays in Sustainable Agriculture and Stewardship

Edited by Wes Jackson, Wendell Berry, and Bruce Colman

MARTY BENDER
WENDELL BERRY
JENNIE GERARD
STEPHEN R. GLIESSMAN
DANA JACKSON
WES JACKSON
HANS JENNY
SHARON JOHNSON
GENE LOGSDON

with essays by

AMORY B. LOVINS
L. HUNTER LOVINS
GARY PAUL NABHAN
GARY SNYDER
MARTY STRANGE
JOHN TODD
DONALD WORSTER
ANGUS WRIGHT

"Solving the problem of agriculture is not on the national agenda as a primary subject for discussion, but it should be. These essays attempt to address that problem. What we hope to have done, if only through illustration, is to have presented some fresh examples of the kind of thinking and work necessary for a new definition of agriculture, a new synthesis."

Wes Jackson

"The good farmer, like an artist, performs within a pattern; he must do one thing while remembering many others. He must be thoughtful of relationships and connections, always aware of the reciprocity of dependence and influence between part and whole. His work may be physical, but its integrity is made by thought. We will not understand what we mean when we say that he works with his hands, if we do not also understand that he works also with his mind."

Wendell Berry

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-----Alternatives in Agriculture-----

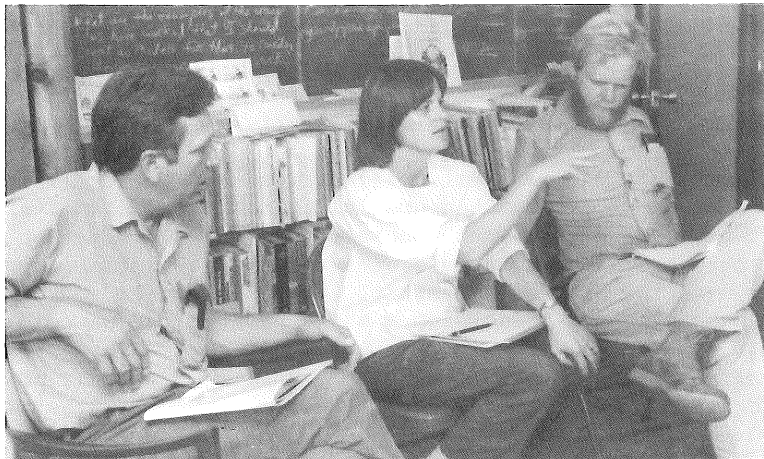
1985

Research

Season

Begins

Judy Soule



Wes Jackson, Judy Soule, Walter Pickett

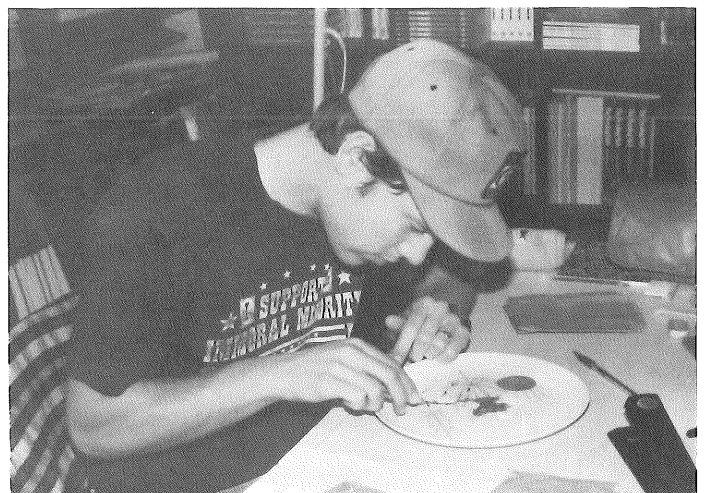
As the landscape begins to green up, the 1985 research season is well underway at The Land Institute. Over the winter break, Wes, Walter and I worked through a pile of proposed experiments generated by ideas from last year's interns, the Research Advisory Group (R.A.G.), and The Land Institute staff. We whittled this down to a mere 27 (well, it's fewer than last year's 38), passed these through R.A.G. for further refinement, made up a timetable of expected work on each and determined that this set was feasible to complete. The list of proposed Research Projects follows:

1985 PROPOSED RESEARCH PROJECTS

1. Yields of four and three-year old wild senna accessions
2. Yields of three and two-year old curly dock accessions
3. Maximilian vs. annual sunflower yield
4. A "complete" ecosystem design for seed production
5. Intra- vs. inter-specific compatibility
6. Multiplication of wild senna accessions from seed
7. Field collections of Illinois bundleflower
8. Effects of Maximilian sunflowers on subsequent plantings
9. Density effects on yield and vegetative spread in Maximilian sunflower
10. Sunflower harvest and cleaning methods
11. Insect and pathogen observations
12. Wild senna density trial
13. Illinois bundleflower density trial
14. Does wild senna have mast years?
15. Compare *H. grosseserratus* X *H. maximiliani* F1 hybrid with *H. maximiliani*
16. Heritability and year to year correlation of various traits in Eastern gama grass and *Helianthus*
17. Recurrent selection in *Helianthus maximiliani*
18. F2, F3 sorghum tetraploid *Sorghum bicolor* X *S. halepense* selection

19. Multiplication and selection in Eastern gama grass
20. Recurrent selection in Illinois bundleflower
21. Multiplication and comparison of *Leymus* spp.
22. Winter hardiness of Johnsongrass rhizomes
23. New species trials (*Hordeum bulbosum*, *Secale montanum*, *Althea Zebrina*)
24. Recurrent bulk selection in various grass species
25. Effect of *Maximilian* on weeds
26. Competition in a mixed sward
27. Biculture experiment - year three

While the interns are busy becoming familiar with their projects (each is responsible for two experiments), the pace of the season's work is picking up. New experiments are being planted, those carried over from previous years are getting a thorough weeding, and a bit of data is beginning to trickle in. Steve and Holly have been recording seed



John Richards-Laatsch counting seeds

weights, germination rates, and emergence dates from about 550 individual Maximilian sunflower plants to aid in our selection program (Expts. #16 and 17). Carol is recording germination rates of *Leymus* in an area previously occupied by sunflowers (#8). Numerous germination trials have been run by just about everyone, and we've settled on a scarification technique for Illinois bundleflower and wild senna seeds that gives good germination. Michel is keeping an eye on last year's Maximilian sunflower and weed plot (#25) and so far few weeds are present, despite an abundance of mustards and creeping charlie surrounding the plots. This lends support to our hypothesis of allelopathic suppression of certain weeds by this species. If the weather continues to cooperate, we're hopeful for an excellent season of research.



Steve Ela, Danielle Carré, Michel Cavigelli

Soil Surveyed in Experimental Plots

Juli Kois

On a blustery day early in March, Orville Bidwell, professor *emeritus* in soil science at Kansas State University, and Wes Barker, of the Soil Conservation Service, arrived at The Land Institute with maps and manuals in hand. After introductions, we all traipsed out to the bottomland on the 160 acres for a lesson in soil surveying. Our major purpose was to determine the uniformity of the soil where we will plant our new experiments this year. We wanted all the plots for any given experiment to be defined by soil homogeneity so that observed variations in the replications would be the result of experimental design rather than of soil variation.

Amidst the freshly sprouted wheat/alfalfa, we gathered around as Orville spoke about the differences even a slight incline can make to the nature of a soil, due to factors such as runoff or depth to bedrock. He pointed to visible clues, the physiological changes in the vegetation and the surface accumulation of limestone chips, that indicated a change in the soil below. These were the same features we had used in preparing for this visit. Judy Soule had staked out rough boundaries of the plots and Steve Ela had drawn up a tape and compass map of the area based on landscape characteristics. Orville then passed around soil from a newly dug pit so each intern could experience the "feel" method of texture analysis. He talked a bit about the classification of these prairie soils as Mollisols (from the Latin "mollis," meaning "soft"), and the deep, brown, crumbly clay aggregates were exactly as he described.

Later, Wes Barker drove the green Soil Conservation Service truck, complete with a machine-powered auger, into place and started taking samples. At the flip of a switch, a four foot core of soil was raised from the ground. Wes laid it down and began to determine the depth of each horizon, its texture, structure, color, and calcium carbonate content. He mentioned that the soil we were looking at was a

Tobin silt loam, which is fully classified as a fine silty, mixed, mesic Cumulic Haplustoll. (The first three terms describe its textural class, mineralogy, and temperature regime; Cumulic refers to the accumulation of organic matter and soil by deposition in the upper layer of the profile; the name Haplustoll can be broken down to mean a Mollisol that receives its moisture in the form of summer rains.) These soils formed in alluvium and have excellent characteristics for agricultural production because of their high organic matter content and water-holding capacity. A typical horizon, as described by Wes, was silt loam, dark gray brown (10YR 3/2), granular, non-calcareous.

All told, the situation looked promising. The areas we had marked off as desirable for our plots were not only sufficiently homogenous but of good quality. Thus, any inexplicable discrepancies we observe in experimental results next autumn are least likely to be blamable on poor soil conditions.



Wes Barker explaining soil survey to Juli Kois, Orville Bidwell and Judy Soule in foreground

The Making of Mollisols

Juli Kois

In my fall semester at New Mexico State University, where I am majoring in Soil Science, I had a couple of classes in which Mollisols were oft cited as illustrations to make a point. The Mollisols of the eastern plains of New Mexico hardly compare enough to these in central Kansas and I used to quip to friends that by going to The Land Institute, I would get to see a *real* Mollisol. Since coming to The Land, I have heard Wes discourse on the implausibility of the reductionist theory (whereby the essence of a "body" can be completely understood by knowing what makes up its separate parts), but I have yet to hear him cite a Mollisol as an example. The genesis of any given soil may not be discussed *except* in terms of the inter-relatedness of the five soil forming factors: parent material, climate, biota, topography, and time.

Although there are exceptions, a few general statements can be made regarding the activity of each of these factors. The type of soil formed depends on the nature of the weathered rock and whether it is transported or residual materials. Climatic changes, particularly in precipitation and temperature, are influential in physical, chemical, and biological decomposition. Animals and plants not only contribute organic matter but aid in the build-up and break-down of soil structure through the action of some burrowing mammals, such as the prairie dog, and penetration by roots. Topographical features, like slope or aspect, are important in regulating the microclimates associated with an individual site. The length of time necessary for horizon formation can be as short as a couple hundred years or as long as several thousand, but it is most dependent on the specific combinations of the other factors. My intent here is to briefly describe the specifics whose combinations have resulted in the Mollisols we see at The Land.

Kansas is situated so that its place in the geological structural framework of North America is in the stable interior. Approximately 127 million years ago, in the Mesozoic Era, a shallow sea covered this area. Sedimentary depositions into this sea created the Kiowa Shale and the Dakota Formation, and these are the parent materials for our soils. The Dakota Formation is composed of non-marine and sandstone sediments located on flatlands just above sea level, whereas Kiowa Shale is made up of marine shale and sandstone left at sea bottom. Upon further weathering, Dakota Formation breaks down into kaolinite clay, and Kiowa Shale produces both illite and montmorillonite, which are the major clay components of a Mollisol.

Climate is an important shaper of the soils and vegetation of a landscape. Repeated freeze/thaws during the cold season contribute

to the physical weathering of materials and building of structure. Warmth and humidity are conducive to optimizing rates of microbial activity and chemical reactions within the soil environment, in addition to determining where plants will naturally grow. The Kansas climate is classified as humid continental warm summer. This means it is one dominated by polar continental air masses from Canada in winter and maritime air masses from the tropics in summer. The unstable meeting of these two in spring results in the numerous thundershowers that provide The Land with the majority of our 72cm (29 in.) annual precipitation.

Grasslands are generally found in locations where evaporation by the vegetation exceed precipitation. Plants of the mixed prairie have adapted to this situation by developing massive root systems to tap water from their major supplier, the soil. The maximum root depth of three species--buffalo grass, blue grama, western wheatgrass--averages five to seven feet. It is widely known that the above ground biomass contributes significant amounts of organic matter to the soil surface when it dies, but the roots can often be twice as massive as the tops. The network of decaying roots provides an important source of humus as well as creates pore spaces needed for the movement of air and water within and between profiles. The thick sod mats, by recycling nutrients released from the original rock material, and by minimizing the erosional tendencies of water and wind, are paramount to maintaining the natural fertility of a Mollisol.

The Land is located in a topography that is transitional between the flat plains to the west and the rolling hills to the east. The influence of relief is site-specific and mostly through the regulation of moisture and temperature. Areas at the bottom of slopes, such as where our new experimental plots are, receive varying amounts of additional water, organic matter, and detritus depending on the degree of slope of the adjacent hill. This can be to our disadvantage when we are anxious to get our plots in the ground but the soil is still too wet to work. Further, the developmental rate of the vegetation will be different if a hillside faces south, rather than north, because the soil will warm and the bacteria become active sooner.

The formation of the Mollisols has been an on-going process since before the extinction of the dinosaurs and the rise of the angiosperms. Time is the canopy under which all the other elements interact both within and at the boundaries of the soil profile. It is important for us to remember that while there are five major factors influencing a soil, the soil, in turn, is but more major contributor to the dynamics of an ecosystem like the prairie.



Educational Programs in Sustainable Agriculture

Steve Ela

In the words of Wendell Berry, "A sustainable agriculture does not deplete soils or people." As interns at The Land Institute we are learning how to approach that definition of sustainability; however, The Land is not the only agriculture related organization involved in educating people about aspects of a sustainable society. From a list of the many fine organizations involved in this work, I have chosen three to use as examples of the diversity of educational programs available.

The first example is the Tillers Small Farm Program located on an historical/experimental farm near Kalamazoo, Michigan. It is a new program which is working on developing and modifying agricultural equipment and techniques for use in Third World countries. Their projects range from developing better oxen yokes (ones that are less injurious to the animals) to modifying farm equipment for use in a specific locality. Their most recent project was to develop seeder attachments, cultivator shields, flails, and leg-mounted corn knives for use by farmers in Togo, West Africa. Tillers offers summer and fall internships for people developing self-reliant food production methods for developing countries. Their address is Richard Roosenberg, Program Director, Tillers Small Farm Program, Kalamazoo Nature Center, 7000 N. Westnedge Ave., Kalamazoo, MI 49007.

A second example is Malachite Farm located near Gardner, Colorado. The purpose of this school is to educate people about sustainable, innovative family farming. The program stresses the interrelationships between plants and animals (including humans) and the need for conservation on a farm. The staff at Malachite attempts to foster a sense of community and cooperation among participants. Interns can focus on several specific areas of interest: crops, livestock care, beekeeping, metal and wood working, organic gardening, and a philosophy of the green world. Interns are expected to participate in all areas of the farm in addition to their formal instruction. For further information on the internships available, write to INTERNS, Malachite Small Farm School, A.S.R. 21, Gardner, CO 81040.

A third organization is the Meadowcreek Project, located near Fox, Arkansas. Meadowcreek is analyzing the nature of a sustainable society. They have identified six philosophical foundations for their work: 1) the stewardship ethic, 2) sustainability, 3) a sense of place and region, 4) community commitment, 5) place as a process (the maintenance of a clear sense of purpose and identity), and 6) connective education (avoiding

specialization by mixing disciplines and perspectives). As part of their work this year, they held a workshop entitled "Sustainable Agriculture: Revisioning Rural Places." The workshop topics ranged from the effect of agriculture on our culture to the prospects of an ecological agriculture and sustainable society. In addition to analyzing the nature of a sustainable society, students will be helping in the sawmill (which provides many of the construction materials for the project) and involved in establishing a permaculture for the farm. Meadowcreek's address is: The Meadowcreek Project, Inc., Fox, AR 72051.

Each organization working towards sustainability has a slightly different focus. Tillers is working with Third World countries. Malachite farm is teaching organic methods that are useful in the United States. The Meadowcreek Project is working on designing a sustainable community and farm. Other groups such as New Alchemy (237 Hatchville Road, East Falmouth, MA 02536), the American Farm Foundation (P. O. Box 288, Vienna, MO 65582), the Rodale Research Center (R. 1, Box 323, Kutztown, PA 19530), and the Farallone Institute (15290 Coleman Valley Road, Occidental, CA 95465) are also contributing to the goal of a sustainable society. It is from the collective effort of all these organizations that an agriculture will develop which "does not deplete soils or people."

The Kerr Center for Sustainable Agriculture

Wes Jackson

A golden parachute has landed in the midst of the alternative agriculture movement with the recent break-up of the Kerr Foundation of Oklahoma City. Kay Kerr Adair and her husband Bob, the principles in the new organization, are deeply committed to the goal of building a sustainable agriculture and have a wonderful opportunity to do work in that direction. The beautiful 4000 acre Kerr ranch and agricultural research center near Poteau, Oklahoma (about 40 miles southwest of Ft. Smith, Arkansas), will be called the Kerr Center for Sustainable Agriculture. The Adairs have insisted that they want the center to combine the spiritual with the scientific and practical work necessary to build a sustainable agriculture.

The staff which worked under the former organization will still be present to carry on the good work with local farmers and ranchers that has been done over the past several years. The new organization will have a larger budget, a much-expanded program, and provide a canopy that is compatible with the work now underway. The program will be getting defined over the next several months, and the new organization will become official in 1986. Welcome to the Kerr Center for Sustainable Agriculture!

Farm Debt

Wes Jackson

The farmer and the farm, as a unit, stands between the voiceless environment and the vociferous public. Farmers are not exactly quiet, of course, but because they are such a dispersed minority, in effect, they are. If we were to look at the American farm and farm family the way we look through a prism that organizes light into bands, we would see most of the visible spectrum of all environmental problems. That few have made the connection between the farm and the environment as a whole is not surprising. Even in the analogy, the average student who looks at light through a prism has to be told that those bands of color are the glaring white light coming from the other side.

It doesn't matter that numerous farmers who have gone or will go bankrupt have had or still have millions of dollars worth of assets. If we were to do a proper accounting, nature has trillions upon trillions of dollars worth of assets and is in trouble. What if we had to pay the energy cost for the solar irrigation we call rain, for example? The potential for exploitation has always been the most lucrative where the assets are greatest. It doesn't take a computerized cost-benefit analysis to show that to roll a beggar is a waste of time.

Even as the exploitation of the environment and farmer is going full bore, we vote money to "preserve" the air and the water and we vote money to "preserve" the farmer and the farm. Our success at both is about what one would expect when only money is thrown at a problem. The farmer and the farm *and* "the environment" are essential for our lives but taken for granted by the larger public. We love the farm and the environment, *mostly*, I suppose, because we are their children. We came out of both. Most of what we call the environment is what is left of the wilderness that we all came out of. All of us are but a few generations off the farm. And so we love the environment and the farm and the farmer in about the same way that we love Indians. It is a form of condescension; a poorly masked way of despising our source. We don't really want to live in wilderness except perhaps during vacation. But we do want clean air and water as a pristine vestige of wilderness. Most of us don't want to *live* on a farm either, though most of us would like to *reside* there. Most of us don't want to live with the Indians, or live the way they did prior to being on reservations.

Farm debt is a derivative of society's attitude toward the farm and farmers. Farm debt is like environmental debt except that with farm debt, the farmer gets hurt directly and can complain. But because farmers are so few and so dispersed, they are scarcely heard. The farmer and the farm, like "the environment," are looked

upon as a way to offset short term interests--like national balance of trade deficits. It is a place where we can externalize costs. For example, the cost of pesticides to the farmer and the cost of pesticides to the soil and groundwater are regarded similarly by the public: "a serious problem that something ought to be done about." Land prices, equipment prices, and fuel prices generate overdrafts when prices are low or yield is down. Talk within the smoked glass cubicles at the bank is serious then. Voices are low. (Now bankers are in trouble. It becomes a farm crisis when the banks are in trouble, not when the Russians back out of a grain deal.) An overdraft of fossil groundwater brings less discussion in Washington. The increased cost for deeper pumping will bring howls of protest, but the aquifer in decline can't protest even when 8,000 pounds of fossil water are withdrawn to grow the grain necessary to produce a pound of hamburger on a feedlot above it. In the longer run, the overdrafts at the bank and the overdrafts of the aquifer are the same.

Nitrates in the water from the commercial feedlot and over-fertilized fields are harmful and even deathly to baby pigs and baby people. The well is tested. The well is shut down. But long before the farm couple is regarded as cranky or strident about their "bad luck," their voices shut down and they scrape up enough money to buy into the rural water district subsidized by the Farmers Home Administration. The "new" water supply may already be showing signs of nitrate and pesticide pollution. Still Nature is speechless.

The farm problem is not a financial crisis so much as a failure of culture. It will not be--cannot be--solved by a new farm program so long as the farm family is the primary locus for receiving money. The farm family cannot exist in any dignified sort of way without rural community. It is like giving Indians monthly government handouts as they muddle along in a reservation that is the epitome of a destroyed culture. The very existence of such an abstraction, as a reservation boundary, has destroyed the chance for the return of Indian culture. Today's reservations are as lethal as measles, smallpox epidemics, and cavalry charges were earlier. And so Indians live on subsidy, without dignity. The abstract wall created Indian dependency. For today's farmers, the descendants of the white settlers who ruined Indian life, disaster takes the form of destruction of rural community by the industrial state.

Of course, the farmer and the rural communities bought into the industrial state willingly, but in much the same way that Indians traded for whiskey and smallpox-contaminated blankets willingly. Temporary relief to farmers came in the form of legislatively altered depreciation schedules and tax breaks so that this already over-capitalized segment of the society would continue to buy ever more equipment and other production inputs and keep equipment manufac-

turers solvent, even as the farmer and the farm was treated like a quarry (Maurice Telleen's term) and was mined deeper and deeper into debt. For a long time, the farmer thought that the pinch he was in was his own fault, and to a large extent it was, and so he didn't complain even behind the smoked windows of the bank cubicle. Ironically, the hat he was wearing carried an agri-business decal which advertised the fertilizer company or the seed house or the pesticide company or the farm machinery company partly responsible for putting him in that smoky glassed chamber. It is symbolically positioned to show who owns his frontal lobe. Whiskey and smallpox were faster.

Society is currently structured to accommodate the capitalist economy. This is why the Environmental Protection Agency can't protect the environment, the Bureau of Indian Affairs cannot protect decultured Indians, and the USDA cannot protect farmers. I am not saying we should get rid of any of the bureaus. They may help the environment and Indians and farmers cope within the capitalist structure, but none of them will solve the problems they are charged to solve. If we were really serious about protecting the environment, the discharge pipes and stacks of industry would all plug directly into the intake side, and costs would not be externalized to a voiceless environment. If we were really serious about helping the farmer, we would treat agriculture as inherently biological and cultural, not industrial. We would see more crop rotation, strip cropping, more animals on the farm and none in large feedlots, manure on the fields, and we would see more rural schools, rural churches, and rural baseball.

If the government is interested in continuing to subsidize agriculture, it should concentrate on supporting farmers as part of rural communities, instead of passing money through the farmer to subsidize agricultural businesses. Without rural community, the money paid as a direct subsidy to the farmer quickly finds its way back to the larger places. The government could pay the difference between the price of gas and groceries in the small communities and what they pay for both in the larger towns, thus keeping it circulating in the rural areas. But even that would be only a partial answer. Farm debt and ecological debt on the farm stands as a foreshadow of what is to come for our entire culture and the environment as a whole, unless we change, and fast. For the farmer and the farm, problems are still being added to the visible spectrum, problems which had their genesis decades and even centuries ago. Most of the rest of the American culture, though, still living in the white light of affluence, is so dazzled by the brilliance which emanates from a high energy society, that it is not yet able to see

the full spectrum of environmental and economic problems. Until we begin to acknowledge that giving the green light to capitalism prevents us from really solving the problems, the environment will remain speechless, soil will erode, and farmers will remain broke, dispersed, and relatively quiet.

I've said bad things about capitalism, but I have just about as many bad things to say about the socialist arrangements in the world. The point is, we need a new economic order which respects biological and cultural diversity. Our current economic order is better designed to exploit all of the bad situations than alleviate them.

Agriculture is over-capitalized and farmers have debt largely because the extraction or mining economy has moved to the fields. We need economic models which will account for the cycling of materials and handle the flow of energy--but not just any energy--contemporary energy (sunlight, non-fossil, non-nuclear) in an orderly and non-disruptive manner. This model can be found in nearly all natural ecosystems of the planet and is trustable because it was hard won in particular places over the globe during billions of years of evolution. Sometimes to cope is to change, but not often enough. We need to be carrying economic models of sustainability in our heads that can be found in nature or in primitive cultures, so that a proposal for a change to help farmers cope with a bad situation can be evaluated against some standard of permanence. In such a manner we may be able to change the context for every citizen and for the environment, rural or urban. Until then, nearly all that we spend on a problem--the environment, Indians, farmers--will be more for the purpose of coping than for change.

Salina Farm Expo shows capital-intensive agriculture.



Mary Bruns, Carol LaLiberte, John-Richards Laatch, Juli Kois, Lois Braun, Danielle Carre.

A Breakthrough in Wind Plant Repair

John Craft came to The Land Institute on February 21, 1985, to fix the Jacobs Wind Electric Plant, and I, in my fourth day as an Ag Intern, was asked to help him. John has a long history of experience with Land Institute wind electric systems--especially the Windcraft 3500 design, which is his creation. This time, however, our job of fixing the Jacobs may have added a whole new experience to the history of wind plant repair at The Land Institute, and, probably, elsewhere.

The Jacobs wind plant is supported by a 45-foot tower made of welded sections of six-inch steam pipe. It can be controlled from the ground by a mechanical on/off cable which is housed inside the tower pipe, linking the wind plant with a ground-level control lever. This cable had broken inside the tower, preventing safe manual stopping and starting from the ground. As we attempted to replace the cable (John worked atop the tower; I stayed on the ground), we realized there was a solid blockage two-thirds of the way up inside the tower. Attempts to lower a cable catcher wire into the tower pipe brought no success, even after we detached and pulled out a set of three electrical cables which may have been in the way.

After repeatedly dropping a heavy piece of solid, spear-shaped scrap iron into the tower to dislodge the blockage, still with no success, John decided the clog in the tower pipe was probably a mass of old birds' nests. This struck me as a little unusual, but John said that birds, usually starlings, like to build nests at the top of windmill towers. In our case, since the tower is a hollow pipe, the old unused nests eventually fall into the tower where they accumulate at one point or another.

We talked about several solutions, the least desirable of which was to make a hole in the tower to get at the nests. Then, it occurred to me that the tower pipe was being blocked by organic matter not unlike the way kitchen sink plumbing can become blocked. So I suggested using Drano to unclog the tower, wincing as I did at having proposed a chemical solution to anything in my very first week as an Ag Intern. However, after John, Weeden Nichols and I discussed this for a few minutes, we decided that it might actually be worth using a little lye to preserve the integrity of the tower.

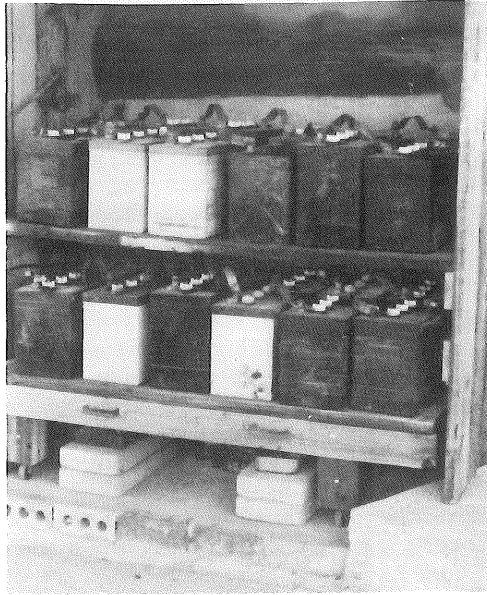
While Weeden and I scrounged up a can of lye drain cleaner, John poured a half-gallon of warm water into the pipe to first wet the birds' nests. Then he added half a can of the lye, and we quit for the day, letting the lye do its work overnight. The next afternoon, John climbed the

tower again, dropped the iron spear into the pipe a few times, and announced that the nests were breaking up but that the spear smelled awful. Many more plunges with the spear were needed to finally dislodge the mass which, along with the old broken cable chain and pulley, fell down inside the tower to the ground. We got all the cables reinstalled that same afternoon, and John made the final electrical adjustments so the Jacobs could be operated. Weeden has since put a protective cover over the top opening of the tower pipe to prevent another buildup of nests--and so avoid having to repeat the Drano technique.

Remodeling the Battery Storage Cabinet

In our second week as Ag Interns at The Land Institute, Carol LaLiberte and I were assigned to perform routine maintenance and inspection of the storage batteries for the 32-volt (2500-watt), D.C. Jacobs Wind Electric Plant which supplies electricity for lights in the classroom building. Our job required load testing, terminal cleaning, and checking the water level for each of 24, 6-volt, lead-acid golf cart batteries being stored in a four-shelved wooden cabinet in the lower-level porch of the classroom building. Our job also required replacing any batteries which failed the load test with newly reconditioned batteries obtained from Landsco Corp., a local supplier, where the rejected batteries would also be returned for recycling.

During the two afternoons that it took to do the job, Carol and I decided that although the design of the storage cabinet provided an excellent space for neatly storing the batteries, it was not really functional as a work space for checking and cleaning the batteries, which must be done once a month. We came to this conclusion after repeatedly getting battery acid on our hands and clothes as we disconnected, reconnected, exchanged, cleaned, and checked water on the four rows (or "banks") of six batteries, each occupying one of four closely-tiered cabinet shelves. When we checked battery water levels in the cramped, dark shelf space, we practically employed what could be called judgment by optical illusion, despite the aid of a carefully aimed flashlight. After discussing in detail the features of an elaborate extended-arm flashlight/water spout device we desired to invent to solve that problem, we decided the whole battery maintenance routine could be made much safer, more thorough, and less time consuming by an overall remodeling of the cabinet shelving to allow easier access to the batteries. Weeden Nichols, Operations Manager for The Land Institute, agreed that the cabinet



could be improved. I worked up a plan changing the cabinet from a four- to a two-shelf design, and Carol and I spent afternoons during the next two weeks remodeling the cabinet.

The new cabinet design places the four separately-shelved rows, or banks, of six batteries each onto two double-depth shelves, each holding two banks of batteries, thus bringing all the batteries within easy reach and view of a person at ground level. Then, to make it easier to reach the batteries on the lower shelf, Carol and I rebuilt it as a kind of rolling platform which can be pulled away from the cabinet, exposing the tops of those twelve batteries for easy maintenance.

We had to overcome some design and construction problems while remodeling the cabinet. These were largely a result of trying to change the original custom design of the cabinet. We had to do a lot of measuring and special fitting to build cabinet wall extensions and a rolling shelf strong enough to hold twelve batteries while fitting around a corner of the protruding cement step to the greenhouse. Since each battery weighs about fifty pounds, one shelf must now hold 600 pounds--safely!

After much effort unloading and reloading batteries, being careful to keep at least one bank of six batteries connected to the Jacobs at any given time, we re-spliced the connector cables to fit the new array design and, happily, reconnected the batteries, finishing late on a Friday evening. The project now awaits final touches of the last permanent cabinet wall braces and the reattachment of the cabinet doors. Also, we found we will have to install heavier duty, perhaps metal wheeled, casters on the pull-out shelf because the hard rubber casters currently installed are being crushed by the weight of their load. For now, the new battery storage design is operating satisfactorily, and, literally, awaits a rainy day for finishing touches by Carol and me.

Shop Briefing

Weeden Nichols

Our equipment is old and odd.
Please use it gently and carefully.
We wish to preserve
 both you and it.
If the job cannot be done
 without bellowing
 roaring
 vibrating
 bending
 binding
 breaking
 please stop and consult.
There must be a better way.

Please put everything away
 at the end of each day.
Please do this even if you plan
 to use the same item tomorrow.
This extends even unto
 placing each unused nail
 with its own kind.
Never simply stuff something somewhere
 just to get it out of sight.
Consult the equipment man.
Then at least he knows.

Notify the equipment man
 if anything goes wrong.
He may not get to it right away.
But at least he knows.

If you do not know how
 to do a job to use a tool
The equipment man may
 not know either.
But together you and he can
 probably figure it out.

In doing our work please do not risk
 your beautiful lives or bodies
 on something which may not
 matter tomorrow or next week.
Before you do
 please consult the equipment man.
He wants to know.



Weeden Nichols

A Sense of Place ----- The Pipe Creek Shirt Company

Carol LaLiberte

The concepts of bioregionalism and reinhabitation pervade the essays of some of today's most creative thinkers and writers. Peter Berg, director of the Planet Drum Foundation, explains reinhabitation as "undertaking the practice of living-in-place, becoming part of the bioregion again." Gary Snyder speaks of this country's "lack of commitment to spending time in place, to the building of a culture over centuries." And closer to home, Kelly Kindscher from the Kansas Area Watershed Council, a group promoting rediscovery of the ecological and cultural diversity of the prairie bioregion, emphasizes the council's belief that "sharing and further developing our prairie culture will strengthen our roots and give us a greater understanding of this land we call home."

With the thoughts of these writers in mind, I wondered about my recent arrival in Kansas from the coastal region of New England and previously from stays in Montana, New Mexico and Minnesota, recognizing both my strangeness to this prairie land and my own potential for uprootedness. Inadvertently I began looking for individuals who already had an understanding and appreciation of Kansas, for people who were already "reinhabiting" their "bioregion."

When Dana Jackson first introduced me to the Jagers, a family from Pipe Creek Valley near Minneapolis, Kansas, by sharing with me a copy of a newsletter that they publish, I realized that they were an example of the kind of people whose lives may already embody much of what reinhabitation desires to achieve: the Jagers celebrate the culture and environment of their locale.

Their newsletter is a well-designed collection of graphics, historical vignettes, anecdotal memories, poetry and nature commentaries. On the first page I read a quote from Shakespeare's *As You Like It*, a favorite of Fred Jagger (1875-1957):

"And this our life, exempt from public haunt, finds tongues in trees, books in the running brooks, sermons in stones and good in everything. I would not change it."

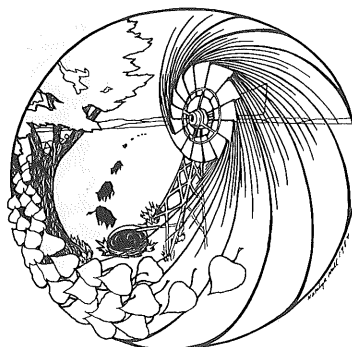
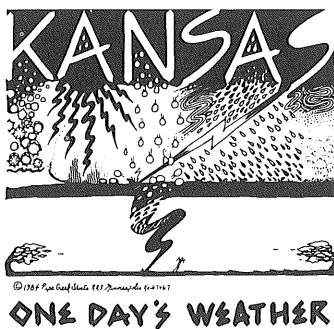
There is a sketch of the course of Pipe Creek in north central Kansas which underlies the words and graphics of this page.

Inside I scanned a short essay about the history of windmills in Kansas. I saw a map of Kansas rivers and streams, and then my attention was caught by a drawing of Cocopelli, the humpbacked flute player of Hopi legends who was known as a collector and distributor of seeds, podcorn in particular.

On the address label there is a small note which explains that the "Pipe Creek Newsletter is to bring you pleasant, pertinent news from the Pipe Creek Valley of Kansas--memories, hopes, news items, nonsense, and the latest offerings from Pipe Creek Shirts." Here one learns that the publication is primarily a catalog and order guide for John Jagger's silk-screened shirts--hence the abundance of artful graphics.

The contributors to the newsletters (there have been nine issues) are friends and family. Craig, John's brother, is a student at Cornell University. He wrote an article contrasting his urban and rural experiences, concluding that the intrigue of a place, whether urban or rural, is a reflection of the intrigue of the people choosing to live in that community. Elsewhere he describes his grandparents' farm struggles during the Depression, in part attributing their survival in Kansas to diversification, direct marketing, outside incomes, good land and family solidarity.

Peter Berg explains that "a first step (in reinhabitation) is to become familiar with the specific natural characteristics of the place where one lives." Revealing their strong basis in this area, the Jagers' newsletters extend widely into topics of natural history and geography with essays about floods, wild edibles and indigenous animals. Jim, John's older brother, is now a teacher in Stockton, Kansas. He writes about walking in the winter when the moon is full and describes the patience required when searching for morels along Pipe Creek. His cousin Fred Nelson writes of enhancing children's intrinsic appreciation for the land and discusses the essential art of "doing nothing" in the woods on occasion. Margaret, John's mother, writes stories from her past and from



her parents' past, and his father Joe contributes a wide range of local histories and narratives. John edits as well as provides articles. In one piece he sums up well the family's enthusiasm for the cultural and environmental richness of Pipe Creek Valley:

"Our journey through the history of Pipe Creek is fragmented--much like riding horseback at night and glimpsing the countryside by lightning flashes. Along the banks of Pipe Creek, deep rooted trees sway in the wind. Remembering forgotten trails and tales, they keep their counsel yet beckon us to seek the secrets of the years."

So what does imparting insight and pleasant reading have to do with selling T-shirts? Perhaps the proper question is what does selling T-shirts have to do with life in Pipe Creek. The newsletter tells us:

"At Pipe Creek Shirts we are creating images which capture the flavor and feel of rural America, designs that celebrate life on the Great Plains. Our designs feature landscape and portraits, may be factual or fanciful, and range from the historical to the hysterical."

The owner of Pipe Creek Shirt Company is John Jagger. When Dana and I went to talk with him and to see his work, we were lead through an old farmhouse that was filled with as many subtleties and perspectives as were the newsletters. A display of books about Kansas history, geography and people filled one corner of the living room. John took us through another room lined with antiques and books and finally to a small back room, his shop. There was no "industry" per se; rather, we entered into a craftperson's studio.

We began sifting through a stack of brightly colored T-shirts, admiring the detail of design. "If you work for detail," John told us, "you also bring in a lot of other good aspects." We came upon a shirt bearing an absurd looking pig with a huge pair of ornate wings. Designed by Harley Elliott, a local artist/poet, it is apparently a big seller among policemen and among people familiar with the expression "I'll do that when pigs fly."

John's attention to color equals his attention to detail. He matches each design with a specific shirt color and a specific ink.

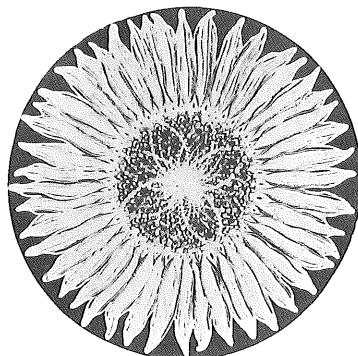
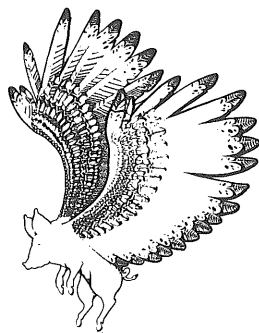
The resulting contrast enhances the design vividly. The flying pig, for example, is a gold on brilliant purple. A buffalo, also designed by Harley Elliott, is white offset with a deep brown background.

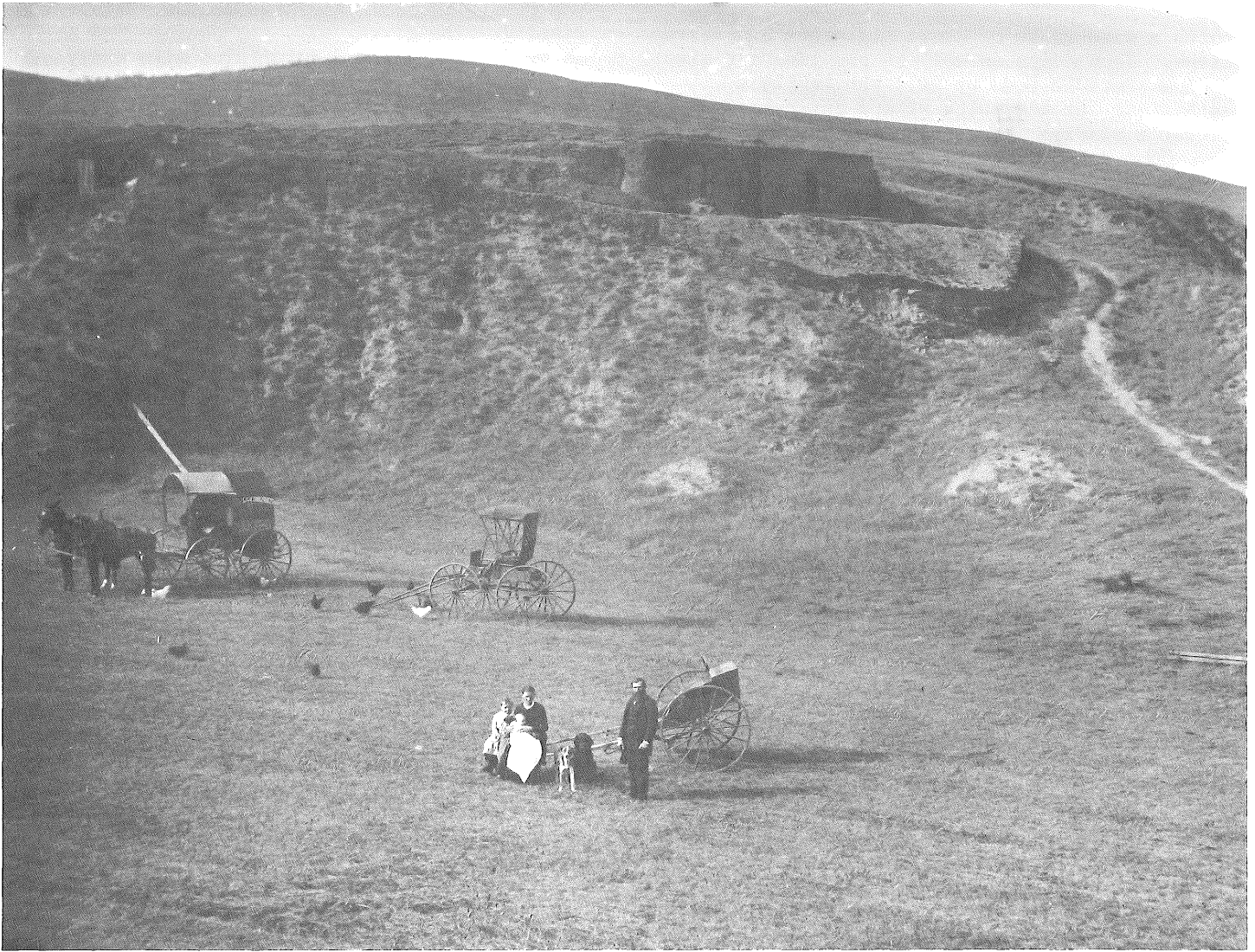
The designs are created by local and regional free-lance artists and are expressions of local and regional topics such as the Kansas wheat harvest, a sunflower, Kansas fish and one day of Kansas weather. The artists also illustrate more general topics such as a 1985/86 design marking the impending return of Halley's comet this coming April. "There were no Kansas T-shirts except for a few that made fun of the region," John explained. "I wanted to design T-shirts that expressed the inherent good of Kansas. Anyone can be amazed at the natural beauty of an area like Glacier, but in Kansas the qualities are subtle, more like a candle than a flaming torch."

John does regional business through Kansas retail outlets and by occasionally attending fairs and native American gatherings. The main source of business for this five-year old company, however, is from mail orders. The mailing list for the Pipe Creek Shirts newsletter was essentially compiled from personal requests. John does not sell subscriptions and has not purchased mailing lists from other companies. The business philosophy is aptly stated in the newsletter: "By pleasing ourselves we hope to please you."

It is fitting that John has chosen to remain a small-business craftperson, and that his newsletter and business combine the talents and sensibilities of both family and regional artists. It is fitting that his cottage industry became a vehicle for expressing his family's commitment to life in Pipe Creek Valley, a genuine merging of life and place which has already spanned four generations. If reinhabitation refers to regaining a connection to the land and community, then perhaps it does not apply to the Jagers; they have never lost their sense of place.

The address for Pipe Creek Shirts is
Pipe Creek Valley, Minneapolis, KS 67467.





Prairie Images

Terry Evans

In a way, Solomon Butcher, turn of the century photographer, would have fit well into today's "age of information" with his "aerial" views and his passion for photographically recording the culture of his time. For fifteen years, Butcher moved back and forth across the landscape of Custer County, Nebraska, scanning it like the satellite that now passes 570 miles above us scanning the same landscape every eighteen days. But unlike the satellite, Butcher felt the rutted roads through his wagon wheels, and the details he recorded about the people of his time were far more extensive than a satellite will ever show us about humans on the landscape. In 1886, Butcher began his photographic journeys around Custer County. During the next seven years, he made some 1500

images of the county's residents, also collecting narrative biographies and stories from the people he photographed.

Butcher's photographs of homesteaders almost always show the people small on the landscape, surrounded by the land and buildings of their homestead. What really interests me about Butcher is that he often took his photographs from an aerial viewpoint, such as from the top of his wagon, or the top of a hill looking down, or the top of a windmill. I find it intriguing that Butcher chose this aerial vantage point over and over again, because my own experience as a photographer looking at prairie has shown me that by looking straight ahead, I see mostly sky. It is only when I look down that I begin to really see the landforms of the prairie.

Forests and mountains and mesas would give more verticality on the horizon and thus more "background" for a photographer. Butcher and I made similar discoveries about the nature of photographing prairie. The prairie can only be thoroughly seen from above, from within the bowl of the sky containing it.

What else was Butcher thinking about besides the need for a background? At the same time that Butcher was working, artists were traveling around the country making Bird's Eye View engravings of towns. The view would show the entire layout of the town from an aerial perspective, often amazingly accurate. Thousands were made, including one of Salina, Kansas, done in 1873 by E. M. Glover. More Bird's Eye Views were done in Butcher's part of the country than any other place, so Butcher was most surely influenced by these maplike images which were quite popular at the time.

Perhaps all mapmakers are Bird's Eye View artists in a sense. Mapping is an attempt to

see the whole, all of an area defined in relationship to its parts. Of course, maps never do show the whole of any area and can really only be defined as maps when they represent particular selections of information about landscape, agriculture, and culture. Solomon Butcher was mapping his time and place, and we can read his images for information as we would read a map. Butcher was searching for information and not pictorial beauty, but just as the information-oriented satellite images amaze us with their beauty, so do Butcher's images compel us to look at them again and again.

I am indebted to John E. Carter for information about Solomon Butcher. Watch for John's forthcoming book to be published in August, 1985.

Solomon D. Butcher: Photographing the American Dream by John E. Carter, the University of Nebraska Press



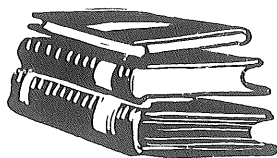
Looking Down on the Prairie

Do you know what the lines, or ridges, are in this landscape? You are looking at a photograph of the Santa Fe Trail! A Friend of The Land, Iralee Barnard, lives in Dickinson County, just east of Saline. She had heard that the remains of the trail could be seen south of where she lives, but had been unable to discern it from the ground. Above, in a small plane, she could see the trail. This April, she and her husband Ken followed it into Marion County and Iralee took several photographs. Some show

the trail moving to the edge of a cultivated field, then disappearing. In some cultivated fields, one can still distinguish a faint trail, indicating the ground has not been broken from grassland very many years.

Now Iralee can see the trail from the road by looking for terrace-like landforms. She has spoken to persons living along the trail and learned about objects they have found which the pioneers left behind. We hope to follow up on this with a story in a future Land Report.





Water in Kansas: a Primer

Mary Bruns

Water in Kansas: A Primer is a timely contribution to public information resources on Kansas water. The Kansas Rural Center has made the primer available at an important point in the adoption of a state water plan. On July 1, 1985, the Kansas Water Plan will become the state's official plan for managing, developing, and conserving the state's water resources. During the 1985 legislative session, the state legislature voted not to adopt the Water Plan as law, but to make the plan subject to annual review and updating. For this reason the water primer can be a valuable tool in educating Kansans about water resources and legislation so that the public can give input to improve the Water Plan on an ongoing basis.

The Kansas Rural Center, which issued the primer, is a non-profit research and education organization which studies policies on agriculture and natural resources. Mary Fund, Water Research Coordinator for the Kansas Rural Center, is primary author of the primer, and she was assisted by Marsha Marshall of the Kansas Natural Resource Council. Both researchers have testified before the Kansas Water Authority on the need for long-term conservation policies in the Kansas Water Plan.

The objective of the primer is to "broaden the public's understanding and awareness of water issues by providing the general reader with a basic description of state water resource data and water policy." The authors compiled the best and most recent information available in this comprehensive report.

The primer is divided into four parts: (1) water and its development in Kansas history, (2) physical aspects of water, its quantity, distribution, quality and use, (3) water law and regulation, and (4) conclusions on water policy needs for the future.

The first part of the primer describes how climate, agricultural development, and economic policies have shaped water use in Kansas. Throughout history, intermittent drought and floods have created an unpredictable water supply. Kansans have combatted the unpredictability in order to develop the state for agriculture, first with windmills and surface irrigation from rivers, then with reservoir construction and center pivot irrigation systems fed by groundwater. Finally, intensive irrigation technology brought about an increased agricultural production that drastically changed the economy of the once-arid western Kansas. Such technological

success promoted a perception of unlimited resources which supports an economic philosophy of consumption, growth, and development. Water law in Kansas, as well as in the rest of the western United States, reflects this *development and use* philosophy.

From the second part of the primer, the reader can gain an excellent understanding of the physical geography and characteristics of water and how it is being used in Kansas. Fund points out that some water supplies are non-renewable, e.g. water from the Ogallala Aquifer. Current statewide annual water use is estimated to be 7.6 million acre feet, 82% of which is used by agriculture. Of the three sources of water--precipitation, surface waters (rivers, streams, reservoirs), and groundwater--the annual *renewable* supply is estimated to be around 4.3 million acre feet. The difference between the renewable water supply and current usage must be provided by groundwater. This means that 3.3 million acre feet of groundwater are currently being used up per year. With a total of about 200 million acre feet of groundwater economically available, the current rate of usage could theoretically exhaust the groundwater supply within 60 years. Pollution of groundwater supplies can further reduce the amount of use-able water. In fact the Kansas Water Office has estimated that 14% of the water in Kansas is no longer acceptable for drinking!

In the third and fourth parts of the primer, the authors explain that early water law reflected the development and use perspective, which still strongly influences water policy and planning today. Current laws focusing on regulation and management are positive steps toward improved management and efficient resource use, but these laws still reflect a "use philosophy," not a "conservation and protection" philosophy.

Future needs for management and conservation of Kansas water are complex. Policy must recognize that every region of the state has specific, different problems of supply, distribution, quality, and utilization. According to Mary Fund, Kansas water agencies are shifting from discussions of the State Water Plan to specific water plans for the twelve water basin regions in the state. An eleven-member committee for each basin region will be responsible for developing water policy for that region. The public will therefore have opportunities to voice concerns on water policy on a more local level. The regional meetings will take place in addition to the annual hearings of the State Water Plan review.

Water in Kansas: A Primer will be a valuable source of information for those who wish to inform themselves and others about water resources. The primer can serve as a starting point in taking an active interest in promoting conservation and water protection in state water policy.

Darkness at Each Elbow

by Harley Elliott
Hanging Loose Press, Brooklyn, N.Y., 1981
107 pages, \$4.50

Reviewed by *Laura Jackson*

Harley Elliott is a regional artist. "Regional" might mean "restricted to subject matter of the region," but in Elliott's case, it does not. The poems in *Darkness at Each Elbow* use images of the Great Plains to express ideas that are larger than the region. Yes, the place and its history are subjects for celebration. But more important, they form the common ground on which poet and reader communicate.

One of the poet's strongest themes is that the human and biotic history of a place is a part of its contemporary reality. "March Landscape" describes the feeling of emerging from a long winter.

MARCH LANDSCAPE

Coming out of the long winter
in death mask underwear
we rejoice in the flat
brown backyard.

It is not long before
the children are calling
each other stupid.

Above growing civilizations of dirt
the sky undulates a piercing blue.
Such tiny feet on the
bird in the grass
and the child that
watches the bird.

The green geometry of lawns
grows underneath them

and deeper still
the prairie waits.

In "The Smoky Hills," we are engaged in a journey through the present and the past.

We are here through
waitresses and farmers;
the first crop of corn
rubbing leaves on a
blue eyed Vikings new
black Kansas land.

In passing fields the stones
of other farmers lie;
blue-grey flint knife
formed and lost
fossils printed on its blade.

...
this shifting memory of
ocean time where big eyed fish
wait quietly in stone.

We make passage through this light
and the rivers backbone
shining like a new
found arrow in the earth.

This is an important idea, and one that can hardly be expressed or understood except through the imagery of art. Elliott has shouldered the poet's burden of carrying on and contributing to our cultural heritage and our sense of place in nature over time.

Part of that burden is being receptive to inspiration and able to express it. Artists traditionally have portrayed this inspiration and empowerment as a complex relationship with a Muse. Muses are fickle; their friendship must be courted and cultivated. The poet must learn where the Muse can be found and how to recognize her presence. In "Straight Man To The Muse," Elliott sees the Muse "slip in and out" of his life "like a fox thru a fence," in unexpected places.

...
Scratching my neck in the
laundromat the hairs of
my body stand up and sing:

O Muse I feel a breath
against my face
and wake up out
here in the dark
yodeling your name.

Elliott treats the Muse's capriciousness with good humor. In "Struck on the Forehead By A Sparrow I Begin to Get a Clue," the groceries he is carrying are transformed: the cabbages fly away, the ketchup turns blue, the birdseed sprouts, and "the world opens up/like a fat mans laughter." But like any relationship, this one can't be taken for granted. There is a certain responsibility in the gift:

There is nowhere to go but on
forever right to the
fragile blue rim of the earth
with a glowing bird print on my skull.

Harley Elliott's writing is utterly accessible, even to someone who is normally intimidated by verses that don't rhyme. There is no need to master ancient literary references or Kansas place names. This is straight forward writing; forms and musical rhythms complete rather than complicate its message.

Darkness at Each Elbow is divided into four sections. The first section entitled "Blue Wind" contains one of Elliott's longer poems, "The Mountain Men of America." The mountain men, trappers, scouts and pioneers, "each lead and

arrowpoint investment accepted in scouting the land," show up in an American laundromat "to avenge their sudsy graves" and see their sacrifices reduced to

so many mouths full of dust
for these future
insanities of asphalt.

He names them and their Indian killers, and describes their reaction to the highways, factories, houses, air pollution of modern times.

And Broken Hand Fitzpatrick
falls back on the candy machine
eyes shot blind
in the face of his
old smothered land:

The scene is both humorous and serious, illustrating the special quality of this poet's imagination.

Another poem in this section, "The Backroads Tour," begins unforgettably:

Another midnight out
riding around in the cosmos
where smoky cats drift
across dark roads

and racoons lie struck out
upon the starry gravel

The "Weasel Killers" section contains several excruciatingly real poems about love relationships. The title poem describes all of a person's questions, problems, and various psychological baggage as weasels inhabiting one's body.

there goes

the weasel of rotten love
there goes the brotherhood weasel and
the weasel of fear in a
coat of nervous grease
woops there goes the macho weasel
the marriage weasel the poetry weasel

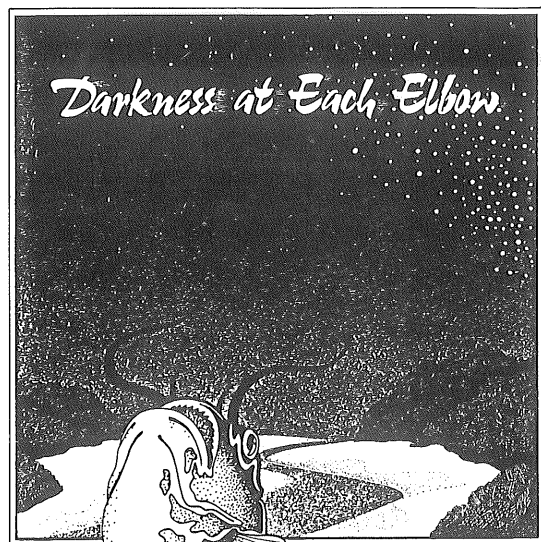
with a mouth full of dead rosebuds

"Old Man Finds the Spot," first poem in the third section entitled "Blood Money Manifesto," is one of the most compact, intense poems in the book. In just six lines the whole scene is set.

Iron red country road
turns to yellow clay

right angles of wheat
and the dusty car closed up
Our boots stop

on a bluff above the river.



by Harley Elliott

My favorite poem in the final section, "Straight Man to the Muse," is "Fall Entrance." This poem is special because it successfully evokes a Kansas thunderstorm and the feelings of people in a thunderstorm.

From simple grey swirls
the sky grows down until we
drive hunched in a lead-colored gloom.
In the once friendly west
a mass beyond the reach of Shakespeare
has begun to form up

something big and ghastly enough
to cause a zig
zag shattering of eyes
like the bones of the Indian
whose name was Ghastly Darkness.

Like many of the poems in this collection, "Fall Entrance" vividly recreates and then adds new meaning to an experience, without false elaboration or sentimentality. Those of us with roots in Harley Elliott's region may recognize and identify more specifically with the images in his poems, but the sense of drama and significance he brings out of seemingly commonplace experience will not be lost on a larger audience.

The reviewer, Laura Jackson, is a Salina, Kansas native. She is a graduate student in ecology and systematics and a member of the Ecological Agriculture Research Collective at Cornell University, Ithaca, New York.

Agriculture in Nicaragua

Debra Israel

This past winter I spent five weeks living with a family in Esteli, Nicaragua. Along with 35 other North Americans, I participated in the study program of the New Institute of Central America to learn about the situation today in Nicaragua.

Riding the bus from Managua north to Esteli, one is surrounded by fields on either side. On one ride, my seat companion, a car painter from Somoto, Nicaragua, pointed out the crops along the way. In a country where most of the income comes from agriculture, it's not surprising that people know about the crops. Just about everyone has a farmer or farmworker in the family. In the Esteli region where I stayed, the major cash crops were tobacco and cattle. Other major cash crops in the country are bananas, cotton, coffee, sugar and sesame (for oil).

Nicaragua is blessed with a large percentage of good farming country, many valleys with flat lands. Since the revolution when Somoza left in 1979, the Sandinista government has done a lot to distribute the land more fairly. Previously, the majority of the land belonged to a minority of people. However, the land reform program does not encourage breaking up land holdings into small individual parcels; rather, it encourages people to get together in groups to cooperatively own and work the land.

I worked on a cooperative farm run by forty members near Esteli. Their main crops are beans, corn, potatoes, tomatoes and garlic. Two afternoons a week I would go with other North American students out to Cooperative Gamez Garmendia and help with the task of the day. We were put to work hilling up the potatoes, weeding volunteer corn out of the potatoes and beans, or harvesting dry beans so they could be threshed. The threshing method that we saw on this cooperative and on two others that we visited was to have two men beating the beanpods with poles; the beans then fell through a screen while the pods stayed above.

Gamez Garmendia, the cooperative I worked on, didn't have its own tractor, though it did have a team of oxen which was used for planting and cultivating and carting. On the state farms in the Esteli area, they have fifteen tractors which are maintained for use on all the state farms in the area and also go out to the cooperatives for major plowing. Gamez Garmendia also has 180 head of cattle, both for beef and dairy. They milk eighty cows by hand, although during the dry season, only once a day.

This co-op has been in existence for five years, since just after Somoza fled. Before



Debra Israel at Gamez Garmendia

that none of the members owned their own land, although all the men I met on this farm had been farm workers all their lives. They didn't have any management experience, but learned from their early mistakes and are justly proud of their success. The land they farm belonged to a large landholder who abandoned it after the triumph of the revolution. However, two of his sons were later found to be living and working in Managua, so in the process of clearing the title to the land, the cooperative paid the sons for it.

Considering all the manual labor that is necessary for the running of this farm, their biggest handicap right now is that at any given moment, ten of their forty members are mobilized to fight the contras. The farther north one goes in the Esteli region, the more danger there is of a contra attack. At one cooperative I visited, Manuel Diaz y Sotelo, near the town Pueblo Nuevo, the farmers carried guns and kept a 24 hour vigilance. Farmworkers, along with health care workers and teachers, have been prime targets of the contras. Just recently in March, after my return to the U.S., I learned that another cooperative near Limay, which is southwest of Pueblo Nuevo, was attacked and their grains were burnt. The violence in the north has also affected the coffee harvest. Some plantations had to be abandoned due to the danger. The shortage of labor has also seen the formation of volunteer picking brigades, both with foreign visitors and Nicaraguan city dwellers.

At Cooperative Manuel Diaz y Sotelo, the women are members of the cooperative and participate to some extent with the farm work. The other cooperatives have only men as members, although at Gamez Garcia they were planning on starting to raise chickens and have the women involved in this project. The government has a program to promote regional self-sufficiency in

which the slogan is, "Let's all go and plant the land." A woman in Esteli, Berta Zeladon, is an extension agent for this program. She helps people start gardens, provides seed at cost and lends tools.

While trying to maintain the level of export production, the government also is striving for Nicaragua to be self-sufficient in the basic foods. Traditionally, it has been the small producers who grow most of the beans and corn. Now credit is available to these small and medium-sized producers as well as the large land owners. Farmers are encouraged to form credit cooperatives when applying for loans.

Although tractors are used, a major problem is replacing parts, especially for the John Deere tractors, due to the U.S. economic boycott. On our plane flight to Managua from Florida, we met a group of Canadian farmers, being sponsored by the Canadian government to teach Nicaraguan farmers how to repair tractors. They brought down equipment to start a shop where the farmers could weld parts themselves. This is the kind of constructive aid the U.S. could be offering.

I did meet a group of North Americans in Managua who are associated with the New World Agriculture Movement. They are doing a number of projects both in research and extension in Nicaragua. Pam Anderson, an entomologist, has been teaching farmers about Integrated Pest Management, which employs fewer chemicals to control pests. She says the Sandinista government is very supportive of more research in this area, especially on food crops where such research is especially lacking. Other New World Agriculture Movement staff are researching corn diseases. As Mr. Barreda, the regional director

of the Agrarian Reform Ministry in Esteli, said to us, "We don't have the luxury to say we won't use pesticides." Their first priority is to feed the people. They spray with fungicides, insecticides and herbicides on most of the crops, but the government would like to lessen dependence on these inputs both for economic and health reasons. The farm I worked on used both herbicides and hand weeding methods. Nicaragua does have a law which prohibits using any pesticide which is banned for use in the country which sells it.

The farms I visited use commercial fertilizers. Although two of the cooperatives also have cattle, they mainly graze in the pastures, so there isn't manure to collect and spread on fields. However, they did let cattle graze in harvested cornfields. I didn't see much evidence of soil conservation measures, such as planting on the contour; however, I also didn't see many hilly slopes in cultivation. Mostly flat land is used for agriculture.

The period between November and May is the dry season. During the five weeks that I stayed in Esteli, it only rained twice, and then only sprinkled for a short time. Irrigation from both groundwater and river water is necessary. I saw electric-pumped irrigation systems, bicycle-pumped and windmill-pumped.

Amongst their struggles in reorganizing their country, agriculture as the economic backbone of the country has received much attention. Trying to strike a balance between giving land to the landless and keeping the large landowners investing and producing in Nicaragua has proven difficult. Peasants get frustrated when they see landowners neglecting their land--and indeed it is against the law to decapitalize and



Workers/owners of

Cooperative

Gamez Garmendia

The author of this article, Debra Israel, was a student at The Land in 1983. She is currently working on the *Clearwater*, sailing the Hudson River teaching environmental awareness.

TENANCY AND POPULATION OF THE LAND
(NICARAGUA 1973)

Type of Farm	Area	No. of Farms	No. of Families
+850 acres	41.2%	0.4%	-95
85-850 acres	44.1%	20.5%	20,794
17-85 acres	11.2%	27.4%	27,976
-17 acres	3.5%	50.8%	51,936

Source: Cepal-FAO-OTI, "Tenancy of the land and rural development in Central America," EDUCA, 1973.

STRUCTURE OF TENANCY OF THE LAND (1984)

Individual Owners	Percent of Total Area
+850 acres	11.3%
85-850 acres	42.1%
17-85 acres	6.8%
-17 acres	1.8%
<u>Cooperatives</u>	
Cooperatives of Credit and Services	10.0%
Cooperatives of Production	8.7%
<u>State Owned</u>	
Businesses of Agrarian Reform	19.3%

Source: UNAG bulletin: The National Union of Agriculturalists and Cattle Producers of Nicaragua, Oct. 1984

neglect one's farm. As the figures on the tables accompanying this article show, many more farmworkers now have access to their own land.

Also important is that farmworkers can organize for better working conditions, whereas under Somoza unions were repressed. With the falling world prices for their export products, Nicaragua would be in a hard economic position,

like their Central American neighbors, but they have the additional strain of having to defend themselves from U.S. backed terrorists. It is time we learned the lesson of being a good neighbor, not to butt in when we aren't wanted, but to be ready to lend a hand when it is needed.

Turning Central American Rainforests into Hamburger

The U.S. government and business operations promote the destruction of rainforests in Central America to create pastureland for production of export beef. U.S. support of the Central American export-beef industry has the following negative effects:

1. U.S. TAX DOLLARS FINANCE COMPETITION FROM PRODUCERS RAISING BEEF IN CENTRAL AMERICA:

*U.S. Government organizations such as the Agency for International Development (U.S.A.I.D) and the Department of Agriculture (U.S.D.A.) are using U.S. taxpayers' dollars to support the production of beef in Central America for import to the U.S., competing directly with the sale of domestically-raised beef.

* These agencies actively assist export-beef producers by supporting programs to eradicate cattle pests such as screwworms, vampire bats, and ticks. Without this technical assistance, cattle production in Central American tropical regions would be impossible.

* Additional U.S. tax dollars are used to directly finance increased Central American beef production via international loan programs administered by the heavily U.S.-supported Inter-America Development Bank (IDB), the World Bank, and the United Nations Development Fund. From 1971 to 1977, the World Bank and the IDB together provided over \$1 billion in loans to improve beef production and processing in Cen-

tral American nations. (References 1,2,3, & 4)

2. PRODUCTION OF CENTRAL AMERICAN BEEF FOR EXPORT HAS NEGATIVE NUTRITIONAL IMPACTS IN BOTH PRODUCER AND CONSUMER NATIONS:

* Because of increasing beef exports to higher-priced foreign markets, local beef prices in producer nations increase, and domestic consumption falls accordingly.

* In Costa Rica, although 71% of all new farm--land is committed to beef cattle, per capita consumption of beef fell from 30 to less than 19 pounds between 1959 and 1972, while beef production doubled.

* While it is estimated that at least two-thirds of arable land in Central America is now used for cattle production, the region's per capita beef consumption continues to decline.

* On the U.S. end, beef imported from Central American nations must be spot-tested to detect intolerable levels of toxic residues from DDT and other pesticides that are used with poor controls on croplands in the producer nations which may then be grazed by cattle. The amount

This article was adapted from a fact sheet compiled and prepared for Central America Week by the Land Student Rainforest Preservation Committee: Holly Winger, Carol LaLiberte, Lois Braun, Mary Bruns, Danielle Carre, Vern Steifel.

of beef rejected by U.S.D.A. inspectors for reasons of contamination has doubled in recent years. Currently, around 2.4 million pounds are rejected annually.

3. DESTRUCTION OF RAIN FORESTS CONTRIBUTES TO A BUILD-UP OF CARBON DIOXIDE IN THE EARTH'S ATMOSPHERE

* Vast expanses of tropical rainforests in the Central American nations of Guatemala, Panama, Honduras, Nicaragua, Costa Rica, Belize, Mexico, and El Salvador have been cleared to establish export-beef operations. Since 1950, when U.S. beef consumption began to increase significantly, an estimated two-thirds (or about 152,200 sq. miles) of the rainforest area have disappeared from the region.

* Currently, these Central American nations together employ at least 42,500 sq. miles to produce 218 million pounds of export beef per year, 90 to 95 percent of which will be imported by U.S. companies.

* Enormous amounts of carbon are locked into tropical rainforests. When these forests are burned or cut down, carbon dioxide is released into the atmosphere. Fewer trees are then available to take up CO2 from the atmosphere to turn it into oxygen. As a result, our atmosphere contains increasing levels of CO2, which may eventually lead to a "greenhouse effect" -- a general warming of the earth's atmosphere with resulting climatic instability. (References 1, 9)

4. CONVERSION OF RAINFORESTS TO PASTURELAND DESTROYS THE ECOLOGICAL BALANCE AND GENETIC DIVERSITY OF PLANT AND ANIMAL LIFE IN CENTRAL AMERICA:

* Fragile rainforest soils cleared for beef production can sustain grazing for only 7 to 10 years due to soil impoverishment from nutrient-leaching and erosion. Once these tropical soils are worn out, new land must be cleared and the former "pastures" are left as eroded wastelands. As a result, export-beef production is a primary factor in the current loss of over 1,500 sq. miles of Central American rainforest annually.

* Rainforests are valuable as sources of genetic diversity, because they contain the greatest variation of life on earth (over 3 million species of plants and animals). In addition, thousands of migrating species visit these forests annually. (References 1,4, & 9)

5. U.S. CONSUMERS CANNOT IDENTIFY BEEF PRODUCTS IMPORTED FROM CENTRAL AMERICA:

* The average U.S. citizen consumes 105 pounds of beef each year, of which around 2% is imported from Central America.

* By far, the largest outlet for imported beef is in the convenience and fast-food industry. Several fast-food chains have admitted to using imported beef for hamburgers.

* Even so, once a cut of imported meat has cleared initial U.S.D.A. inspection, it becomes intermingled with general U.S. domestic beef

products and is no longer required to be labeled "imported."

* It is thus virtually impossible for consumers to tell when they are purchasing beef or products containing beef imported from Central America. Considering that beef imports have caused a depression in prices earned by U.S. beef producers (in the case of hamburger, by 5 cents a pound), and that beef imported from Central America runs a risk of contamination by DDT and other toxic substances, a consumer who would prefer to "Buy American" has no way to do so.

* Consumers who also want to identify Central American beef in order to avoid contributing directly to rainforest destruction are similarly hampered by the absence of follow-through labelling for imported beef.

WHAT CAN YOU DO TO PREVENT FURTHER DESTRUCTION AND MISUSE OF CENTRAL AMERICA'S RESOURCES?

1. Contact your Congressional representatives and ask for legislation that would
 - Require labeling of all imported beef and beef products.
 - Stop all U.S.-funded development projects that promote beef production in Central America.
 - Require environmental impact studies by organizations like U.S.A.I.D. before development projects are started.
2. Contact the managements of fast-food chains and urge them to use only domestic beef in their products.

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Going Fission ————— The Dark Consequences of Wolf Creek

Ivy Marsh

In *Night Country*, anthropologist Loren Eiseley writes of mankind's warfare with the dark. "It began when man first lit a fire at a cave mouth and the eyes he feared...began to blink and draw back. So he lights and lights in a passion for illumination that is insatiable." That insatiable need led to our current folly--an instrument of darkness called the Wolf Creek Nuclear Power Plant.

Standard dictionaries define "dark" in a variety of ways--absence of light, threatening, concealed, unenlightened, uncivilized, evil or wicked, sinister, secret, uninformed, murky, unclear. All of these apply to Wolf Creek in one way or another. What began in a blaze of optimism and unenlightened corporate decisions soon generated dark uncertainties. Earlier *Land Report* articles detailed the conception and construction "progress" of this 1,150 megawatt plant near Burlington.¹ Early on, construction was stopped because serious safety-related defects were found in the concrete base mat,² but the real cracks in the foundation were the erroneous assumptions that led to the corporate decision to build the plant. "We bet the company," said Kansas Gas and Electric (KG&E) chief finance officer, Howard Hansen.³ Not really. They bet the ratepayer's money.

A Risky Investment

The Kansas Corporation Commission (KCC) staff recently recommended that about 50% of the plant be allowed to be passed on to ratepayers. The staff, aided by reports from two independent consulting firms, concluded that by 1981 an evaluation should have made it clear that the plant should be stopped and abandoned. Imprudent management decisions and waste, they say, led to cost overruns of about 55%.⁴ Construction plus the costs of operation, maintenance and disposal (decommissioning) will total an estimated \$5.4 billion.⁵

From the 1968 in-house estimate of \$200 million⁶ to the KCC staff "final" construction figure of \$3.008 billion,⁷ flashing yellow caution and red stop light signals were ignored all along the way by the parent utilities, the Nuclear Regulatory Commission (NRC), the governor, and the Kansas legislature. "20-20 hindsight," scoff company executives. But at NRC construction permit hearings and at the 1980 Kansas Electric Power Cooperatives (KEPCO) hearings before the KCC, critics pointed out obvious factors and changing conditions which made the plant a risky investment and argued that, even though construction had begun, it should be stopped. There was testimony about reduced demand, rising construction costs, unpredictable interest rates, unproved technology, and the existence of more cost-effective alternatives. Plant proponents remained blind, deaf, and mute.

Early centuries (roughly from 400 to 1000 A.D.) were called the Dark Ages because of the intellectual darkness that characterized the period. The mid-seventies were the Dark Ages for three Kansas electric utilities--KG&E, KCPL (Kansas City Power and Light), and KEPCO. The eighties brought a sudden awakening to their customers. Once the reality of impending economic consequences began to penetrate the prevailing "surely-the-companies-know-best" mindset, the light began to dawn and a diverse set of special interest groups began to work together to sift through the debris and see what could be salvaged. Following announcement of KG&E's initial estimate of a 95% rate increase over a period of five years, such established organizations as Kansas Natural Resource Council (KNRC)--concerned about long-term effects on state energy policies--and the Kansas Nuclear Awareness Network (concerned about inappropriate use of nuclear technology) joined forces with newly formed groups such as Alliance for Livable Electric Rates (ALERT--business people concerned about the effect on area economy) and Electric Shock (consumers concerned about the effect on residential ratepayers) to try to contain the damage.

Safe Enough to License?

On March 11, 1985, the NRC granted a license for low-power operation of Wolf Creek (up to 5%) to KG&E, the lead utility with responsibility for both construction and obtaining NRC licensing. Loading of uranium fuel started immediately and the job was finished March 17. The company hopes to produce its first nuclear energy in June and to be in commercial operation by September.⁸ In February, 1985, letters to the NRC from 103 Kansas legislators, the governor, the attorney general, and U.S. representatives Glickman and Slattery expressing concern over unanswered questions about Wolf Creek brought a belated response (one day after the license was granted).⁹ NRC stated that all safety-related investigations had been resolved but that continuing investigations will be reviewed before a full power license is issued.

The final decision about granting a full power operating license for Wolf Creek is up to the NRC, which has no lack of critics. It is under investigation by two grand juries and a federal court for decisions in recent cases under its jurisdiction. The Kemeny Commission (appointed to study Three Mile Island) concluded that if future accidents are to be prevented, "fundamental changes will be necessary in the organization, procedures and practices, and above all in the attitudes of the NRC." The Union of Concerned Scientists says that the NRC has repeatedly delayed dealing with technical

problems and consistently attempted to limit public participation in license hearings, and has failed to enforce its own rules strictly and consistently.¹⁰ Their opinion is shared by the Governmental Accountability Project, a Washington, D. C., law firm that works with whistleblowers. GAP has said that NRC stands for "Nobody Really Cares."¹¹ One of the five current NRC Commissioners, James Asselstine, recently charged that the other NRC commissioners are breaking laws and ignoring nuclear safety problems.¹²

Wolf Creek in the Rate Base?

While still bound by Kansas statutory limitations, the KCC now has broader, more flexible powers thanks to HB2927, which the Kansas legislature passed in 1984 largely because of the pending Wolf Creek case. It was a self-serving move for it passed the buck (and the political heat) to the KCC, but it is a strong bill which enables Commissioners to keep all or part of costs relating to excess generating capacity and managerial imprudence out of the rate base (costs paid by customers rather than investors). It allows plant costs to be phased in, and discourages premature shutdown of a utility's older (cheaper) plants.¹³

The interpretation and implementation of HB2927's provisions depend on the discretion of the three commissioners, and therein lies an unfortunate tale. Chairman Michael Lennen has exactly two years' experience at the KCC, Keith Henley barely one year, and Margalee Wright only three months. None has a background that includes a good working knowledge of the utility

regulatory process, which has a lingo and special issues all its own. Impartiality, intelligence and good intentions, while essential, are not enough. Even those who have worked with utility issues closely for years find the strange terminology and the obscure, tortured arguments too complex for a consistently accurate understanding. This trio will have to sit with a dictionary in one hand, a prayer book in the other, and a hefty supply of aspirin close by. The people of Kansas have been short-changed by Governor Carlin's appointments. Expertise was available but he chose to ignore it--ironic for a governor who was elected initially for his strong stand on utility issues. At least one commissioner should possess enough knowledge and experience of the mechanics of a major rate case to help guide the others, and Wolf Creek is by far the most complex case to ever come down the Kansas pike. Ratepayers and utilities alike deserve better. The fault lies with Governor Carlin, not with Lennen, Henley or Wright.

Utility Doublespeak

The good news/bad news is that in the long run, logic, reason and even legal briefs won't really matter. In his remarkable book, *Dynamos and Virgins* (Random House, NY, 1984), David Roe describes the joys and frustrations endured in dealing with electric utilities and regulatory bodies and concludes that the legal strategy of utilities--"wrapping the company in corporate dignity and refusing to engage in squabble--shows a deep grasp of bureaucratic reality." They may hire attorneys and so-called expert witnesses, but utilities really put their faith in regulatory inertia. Anyone who has sat through hearings or read the volumes of transcripts from a single case is bound to laugh and nod agreement at that familiar, bittersweet description. It's not only accurate; the strategy works. It's Murphy's Law, Catch-22, and Doublespeak all wrapped into one. Build a plant for which there is no need; finance it with AFUDC (allowance for funds used during construction, a creative-accounting device by which a loss becomes a gain--and even collects interest!); talk about load management (which means lowering the peak to consumers and raising the valleys to utilities); have a co-op president explain to the press that as the cost of a utility plant escalates, so do your savings; and you have a situation in which up means down, black becomes white, loss is gain, and light, darkness. It's hard to know whether to laugh or cry.

Another paradox will become familiar to small business and residential ratepayers--the more you save, the more you spend. Some of Wichita's large industrial plants have begun to supply part of their own power because of the coming Wolf Creek raises. Love Box Company installed a windmill and is planning a natural gas turbine co-generation system. Vulcan Materials Company supplies some of its own steam



needs and is investigating co-generation. Boeing Military Airplane Company monitors its electric usage by computers to hold down costs. Boeing and Vulcan account for nearly \$40 million (10%) of KG&E's 1984 sales.¹⁴ Cities of Olathe and Newton have considered ways to get off the KG&E grid.¹⁵ This means that the smaller users who have fewer alternatives eventually may have to pick up the tab. Bills will rise as consumption declines.

"Nuclear Follies"

Forbes magazine ("Nuclear Follies," Feb. 11, 1985) detailed problems of nuclear power.

"Nuclear power was killed, not by its enemies, but by its friends: the federal government and the NRC, the equipment manufacturers...the contractors and subcontractors, the designers, engineers, and construction managers, the utility executives who believed that no matter what happened to cost and construction schedules the rate commissions would somehow provide the revenues to bail them out...The failure of the U.S. nuclear power program ranks as the largest managerial disaster in business history...An Office of Technology Assessment study last spring came to the conclusion, 'Inadequate management has been one of the major causes of construction cost overruns and erratic operation...Quality control inspectors have been intimidated, documents have been forged, operator training records have been falsified...Wolf Creek even managed to document as inspected a weld that didn't exist.'"

The article predicted Wolf Creek would cost \$2.9 billion at a cost of \$2522 per kilowatt of capacity.

The integrity of Wolf Creek's construction has been called into question. Those issues cannot come before the KCC; only the NRC is empowered to deal with safety matters. But, as KCC spokesman Gary Haden said, "The staff will have the opportunity to recommend...that certain costs related to preventable delays not be passed on to ratepayers."¹⁶ *Inside NRC*, a biweekly newsletter that covers nuclear industry events, reported on October 29, 1984, that "NRC inspectors have found missing and deficient

welds at Wolf Creek which KG&E records show were approved." J. O. Arterburn, former KG&E superintendent for nuclear development who was the company's senior official at the plant, was quoted in the Feb. 12, 1984, *Wichita Eagle-Beacon*, "In spite of all arguments that may be put forward, the poor productivity, the lack of adherence to schedules and control of costs were being caused by lack of management." A year after making his complaints to KG&E and its construction firm, a frustrated Arterburn resigned from KG&E.

The KCC issued a tough order in October 1984. It determined that Wolf Creek must operate at 100% power for 250 hours before rate-payers begin paying for it. The utilities had hoped for 50% power testing.¹⁷ This was a milestone decision because once a plant is committed to public use, it stays in the rate base even if it isn't operable.

Excess Generating Capacity

The issue of excess generating capacity (XGC) will be central to the rate case. In 1975 both KG&E and KCPL reported to the NRC that if Wolf Creek were not on line by Aug. 1, 1982, both companies "would be operating with practically no reserve." But in 1982 both reported to the Federal Energy Regulatory Commission that each had 28% more power than needed at peak period--without Wolf Creek power!¹⁸ In order to provide a dependable power supply, a utility must maintain a reserve higher than the amount of power it needs on its busiest day--the "peak" demand. Should a negative reserve margin occur because of outages, shutdowns, increases in peak consumption, etc., utilities meet that demand through power purchased from other utilities--power pools. Most power pools require between 15% and 18% reserve.¹⁹ Anything beyond that is considered "excess." The KCC estimated that KG&E will have 57.7% over peak summer demand when Wolf Creek comes on line, and KCPL, 46.6%.²⁰ To no one's surprise, KG&E announced on April 4 that it was closing two of its "old" generating plants (combined 159 megawatts). Mary Abbott-Mills, Electric Shock spokesman, said KG&E was closing two perfectly good plants "to mask their excess capacity." Wolf Creek will add 541 megawatts to the KG&E generating system.²¹

It is not only nuclear plants whose XGC and exorbitant cost overruns cause problems for regulators. One giant headache has been the Sunflower Electric Cooperative (SEC) Holcomb #1, a 296-megawatt coal-fired plant that went on line Aug. 16, 1983. When the KCC authorized its construction in Oct., 1978, the projected cost was \$277 million. The final cost was \$460 million and gave SEC approximately twice its required capacity.²² Sunflower requested that only 50% be placed in the rate base in 1983, with the rest gradually phased-in, to avoid rate shock. The KCC allowed 47%.²³ Sunflower differs from Wolf Creek in two important ways--it has no stockholders to whom costs can be

NEED HELP?

KG&E	- Kansas Gas & Electric Co.
KCPL	- Kansas City Power & Light Co.
KPL	- Kansas Power & Light Co.
SEC	- Sunflower Electric Power Cooperative
KEPCO	- Kansas Electric Power Cooperatives
DS&O	- Dickinson, Saline, Ottawa Cooperative
NRC	- Nuclear Regulatory Commission
KCC	- Kansas Corporation Commission
REA	- Rural Electrification Administration
KNRC	- Kansas Natural Resource Council
ALERT	- Alliance for Livable Electric Rates

deferred, and the KCC approved its construction. (When Wolf Creek plans began, Kansas had no siting act so the KCC had no jurisdiction.)

The sleeper-issue connecting the two is the precedent set by the aggressive marketing of electricity which develops as a result of the co-op's XGC. The KCC not only approved but encouraged Sunflower to find ways to sell its glut of electricity and get on a more firm financial footing. How far they could go became the issue. "Innovative rate design" was the company's description of its proposed structure in their recent hearings. It offered customers added kilowatt hours above historical use at one-half the cost of the company's current base rates in order to stimulate economic development in Western Kansas.²⁴ The KCC's dilemma was that allowing excess capacity in the rate base would cause rates to rise substantially; not allowing it could cause the co-op serious financial problems. Allowing declining block rates and "cut-rate" deals would encourage consumption and endanger on-going conservation programs. At the Colby public hearing, Oakley resident Stan Clark testified that in 1977 wheat at \$1.85 a bushel bought almost twice as much electricity as \$3.29 wheat does today. He opposed the proposed declining block rate structure. "We cannot consume our way out of this problem. I am 30 years old. Please, please do not restructure the debt to make my grandkids pay for it. Let the people who are gung ho for the plant pay for it, run it, and profit from it."²⁵

In a surprising April 2, 1985, decision, the Commissioners used some of their new powers: they did not allow any XGC to be put in the rate base, and they found management imprudent in its failure to closely monitor some of Sunflower's affairs. They allowed only \$7.38 million in the rate base--not only lower than the \$17 million SEC sought but even lower than the KCC staff recommendation. They allowed another 10% of Holcomb to be billed to customers, making a total of 57%, for only 57% of SEC's power is needed. The Commission tried to appease both sides of the consumption/conservation debate. It rejected the declining block rate proposal, saying "Nothing in the Sunflower order should be construed as a sign the Commission is going back on a commitment to energy conservation," but at the same time said, "There needs to be controlled promotion with the ability to phase out promotional rates when capacity and demand begin to balance."²⁶

The inevitable conflicting reactions surfaced after the decision was announced. Sunflower management was understandably unhappy while conservation proponents did not like the promotional aspects it incorporated. But Stan Clark was a happy man. "This has to be one of the few times the public actually had input on the decision. The commissioners heard not only the emotion but also the statistics on what our situation is in Western Kansas."²⁷

There is no doubt that the attendance at the public meetings was the greatest factor in

the favorable decision. Approximately 600 people attended the January hearings. The KCC order said, "In rejecting both the Cooperative's arguments and the staff recommendation the Commissioners noted that the costs of Sunflower's electricity are already at the fringe of what consumers can pay...The testimony from 67 public witnesses at five public hearings... was crucial in the determination of the Commission...Consumers repeatedly told of the difficulty they had in paying Sunflower's rates... Many consumers indicated their intent to produce their own electricity should Sunflower receive additional rate increases."²⁸

When a utility has a huge surplus it is bound to throw conservation programs out the window, substitute artificially low price structures, seek new markets, and try to stimulate demand. This spiral leads to a flawed rationale for building new plants; after all, figures now indicate a "need." It should be obvious that rate forecasting is a self-fulfilling prophecy. Forecast low and conservation results. Forecast high and you get deceptive rate designs that disguise subsidies and cause the glut to be consumed. Declining block, promotional, and other "innovative" rate designs are nothing more than clever camouflage for a bailout.

Deregulation

On a national scale, abuse of regulatory powers on such issues as rate design, plant construction, and economic bailout plans could trigger a ground swell demand for deregulation of electric power generation and transmission. Economies of scale once justified granting exclusive generating franchises, but no more. Consumers may have to give up the traditional luxury of reserves and reliability. That is preferable to propping up a failing system with deceptive, artificial rate designs, high pressure marketing techniques to stimulate use, and federal subsidies such as REA-guaranteed loans--all designed to keep in place an obsolete growth demand paradigm.

Rural Electric Co-ops Eaten by Wolf

KEPCO is a generating and transmission utility that sells electricity wholesale to its 25 rural electric co-op members. It owns 6% of Wolf Creek, with a price tag of nearly \$200 million.²⁹ KEPCO's wholesale rates will rise an estimated 40% when Wolf Creek goes on line.³⁰ At the 1980 hearings (in which KCC granted KEPCO public utility status so it could buy into Wolf Creek) KEPCO leaders testified repeatedly that the cost projections were on target, demand existed, and the co-op really needed it. Wonderful savings were promised.³¹ But today, as *Rural Papers* pointed out, "KEPCO continues to project a cost analysis of the Wolf Creek project and its total power supply program but no longer maintains any savings analysis records."

Before purchasing 6% of the plant, KEPCO locked its member co-ops into a 40-year full power purchase contract.³² Prior to signing

this, some of KEPCO's co-op members had enjoyed lower rates than others. The Dickinson-Saline-Ottawa (DS&O) co-op was one of those. In May, 1983, KEPCO imposed a "uniformity" clause to equalize rates among its 25 member co-ops. In the first rate case after uniformity--a \$1.5 million increase--DS&O's rates went up \$174,451 while Sedgwick County co-op rates went down by \$560,754. (Those were the two extremes within KEPCO.) The KCC staff testified that co-ops who got higher costs were generally within the KPL area, while those whose costs went down were outside KPL.³³ (KPL's Jeffrey Energy Center #3, a coal-fired plant, came on line in 1983 at a per kilowatt cost of \$613³⁴ compared to Wolf Creek's \$2522. The plants were planned and begun at roughly the same time.) In signing the 40-year KEPCO contract, DS&O, which had formerly qualified for KPL wholesale rates, lost that advantage as well. The three co-ops that rejected KEPCO membership in 1980 (Kaw Valley, Nemaha-Marshall, and Doniphan Co.) must be celebrating their foresightedness. DS&O customers should be very angry. Hindsight is not involved here; there was good testimony in the 1980 hearings that for some co-ops there would be no savings, no independence, no reliability, no control.³⁵ They wouldn't listen. A Feb. 1, 1981, *Wichita Eagle Beacon* article by Gary Haden quotes Commissioner Pete Loux, "KEPCO's own evidence shows that it is not to the benefit of co-ops now buying power from CTU and KPL to have ownership in Wolf Creek, and they are the majority of KEPCO." The article continues, "He suggests that some of the co-ops need to be protected from themselves, but Ross (Charles Ross, KEPCO Chief Executive) stresses that ownership in Wolf Creek will not cost any co-op member extra money. Ownership in Wolf Creek is virtually an obsession with Ross, as his testimony during the summer hearings showed."

The KCC staff summary for the KEPCO hearings warned, "Hanging in the balance is the financial and power supply fate of virtually all

of rural Kansas." That was prophetic. A recent study by Kansas State University's Farm Management Association concluded that proposed utility rate hikes (especially in the KG&E and Sunflower areas) could be the final financial blow that puts some farmers out of business. "Electricity costs traditionally have been a minor farm expense, but when utility expense already is an average 28% of your net income, a higher bill could be the final straw. Utility costs may become a major farm expense if these rate hikes go through," said Leonard Parker, head of the Kansas State study.³⁶

Waste Storage & Decommissioning

A *Denver Post Magazine* article (June 3, 1984, by Steven Singular) on Wolf Creek tells of State Senator Joe Norvell's concern about nuclear waste.

"Wolf Creek will have a productive life of thirty years but only the capacity for twenty years of fuel storage. For the next 300 to 2000 years this waste will be extremely dangerous. Who will pay to store this for the next 2000 years? People are worried about the rate increase at Wolf Creek, but that is only the tip of the nuclear iceberg."

Norvell raises an important point. As staggering as the \$3 billion construction figure is, that does not include costs of permanent disposal of spent fuel or of decommissioning Wolf Creek. A nuclear plant that size has never been decommissioned so there is no precedent. Responsible estimates range from \$750 million to \$3 billion.³⁷ At the 1980 KEPCO hearings, KG&E testified that approximately one-fourth of the 4% depreciation rate was a provision for decommissioning; that would generate around \$400 million. Nationally-known energy analysts Amory and Hunter Lovins stressed at a KCC luncheon in January 1984 that decommissioning money must be set aside in an external sinking fund so it will be there when needed. In addition to unanswered questions of how to decommission a nuclear plant, there are equally important, unanswered questions about disposal of spent nuclear fuel. Pacific Nuclear Systems, Inc., proposes to use the Carey salt mines at Lyons, Kansas, for a low-level nuclear dump which would house some of Wolf Creek's radioactive wastes.³⁸

Public Hearings

After all this background, the important, current news is that the KCC has set dates for public hearings on Wolf Creek from June 4 to June 20, 1985, in twelve cities served by KG&E, KCPL, and/or KEPCO. Technical hearings begin in Topeka May 13. They will deal with "generic" issues common to all three utilities. There will be a break for the public hearings, then technical hearings (on company-specific issues) resume in Topeka. The KCC hopes to wind up all testimony by July 5. Attendance at the June public meetings is important. The size and temper of the crowd and the quality of the testi-

PUBLIC MEETINGS ON RATE INCREASES RELATED TO WOLF CREEK

6/4	Wichita	Century II Hall	*9:00 am
6/5	Wichita	Century II Hall	*9:00 am
6/6	Lindsborg	Bethany College	1:00 pm
6/6	Newton	Bethel College	7:30 pm
6/7	Meade	Veterans Bldg.	1:00 pm
6/7	El Dorado	Butler Comm.Coll.	7:00 pm
6/10	Topeka	State Capitol 313-S	7:00 pm
6/11	Paola	Paola High School	7:00 pm
6/12	Pittsburg	Memorial Auditorium	7:00 pm
6/13	Overland Pk.	JohnsonCo.Comm.Col.	*9:00 am
6/18	Iola	Bowlus Fine ArtsCtr	7:00 pm
6/19	Independence	Memorial Hall Ctr	7:00 pm
6/20	Beloit	Municipal Building	7:00 pm
			*all day--to 7:00 p.m.



ALERT asking for a list of their members' names, addresses, occupations, members' individual state and federal income tax returns and information on whether they have ties to any corporation. The groups asked the KCC to declare the request invalid. Mary Abbott-Mills was not amused. "It's KG&E asking for a rate increase," she said, "not us. It's an attempt by them to scare us, so to speak, and we don't intend to be scared."⁴⁴

Going Fission

So the Wolf is going fission--complete with license and fuel rods...with hooks (thousands of pipe hangers had to be redone after they were incorrectly installed), line (transmission line standards were lowered), and sinkers (the sunk costs and sinking utilities KNRC Executive Director Mary Peterson described). Using the bait of lower costs ("too cheap to meter!") the three owner-utilities hooked unsuspecting stockholders and ratepayers by consistently underestimating the costs and completion dates. On this nuclear-style prairie fire, radioactive materials will be fired up and served to their customers, who are sure to suffer heartburn when they are handed the bill. This fission trip was costly; only time will tell if it was also fishy from a health and safety standpoint.

"Cry Wolf" will take on a whole new meaning when the shocking electricity bills begin to arrive this fall in the 457,000 home and business customers of the three Wolf Creek utilities. Tears will flow, but not enough to wash away the painful memories of those who tried to stop Wolf Creek and suffered taunts, hostility and angry accusations ("You're just crying 'Wolf'") which came from some of those same, sad, too-late-smart ratepayers. There's no doubt we are sadder; are we any wiser? The dark consequences of Wolf Creek lie not only in its nuclear waste and devastating economic impact but in the patterns and precedent established. To sell its glut of surplus electricity, the utilities will encourage consumption, delay conservation and set aside constructive rate designs. A few years down the pike, as surely as night follows day, these phony figures will be used to prove the need for Wolf Creek II. What then, folks? Ready to "Cry Wolf" again? Ready for the "you-don't-understand-the-real-world"...the "anti-growth!" accusations?

One prescription for this kind of radiation sickness: follow the issues; no more fission trips; visualize a second dark tower rising up on our sunlit prairie and get angry about it; determine to keep the lights burning in Kansas via soft technology that is available;⁴⁵ refuse to accept another Wolf Creek legacy of debt and darkness.

See references on the following page.

Danielle Carre' drew the sketches for this article.

mony will have a real impact, giving Commissioners a first hand impression of how involved Kansas ratepayers are with this issue. Public testimony at the Sunflower hearings dramatically altered the Commission's decision. Anyone who cannot attend can express an opinion in a letter to the Inquiry and Mediation Section, KCC, State Office Building, 4th Floor, Topeka, KS 66612. The letters will be reviewed by the Commissioners during their deliberations. The Inquiry & Mediation Dept. phone number at the KCC is 913-296-7765.

At the hearings, the KCC staff will represent the public. Attorney General Robert Stephen will intervene on behalf of the customers of the three utilities.³⁹ ALERT, Electric Shock, Boeing,⁴⁰ and twenty others have filed as intervenors. The KCC must render its decision by September 30. The plant is expected to go on line October 1. If the utilities get everything they ask for, KG&E rates would increase 101% and KCPL's by 65%.⁴¹ Any unexpected delays can drive these figures up, however, since combined construction and interest costs run about \$50 million per month. In 1982, Commissioner Pete Loux said Wolf Creek wouldn't come on line until the fall of 1985,⁴² and over a year ago predicted the final cost would be close to \$3.3 billion.⁴³ His figures are more accurate than any the owners came up with. What a loss for Kansas it was when Loux resigned from the Commission in December 1984. His wisdom, courage, friendliness and courtesy will be missed.

Already it's becoming clear that all sides are getting ready to play hard ball. In March 1985, KG&E sent letters to Electric Shock and

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 The author of these articles, Ivy Marsh, is a member of the Board of Directors of The Land Institute. She represents The Land on the KDHE Environmental Awareness Council and on the KCC Consumer Information Board.

Environment Awareness Council

Ivy Marsh

Yet another committee on the environment? Yes, but this one fills a very special need. It's the Environment Awareness Council (EAC) created by the Kansas Department of Health and Environment (KDHE). An earlier *Land Report* article (#20, Winter 1984) dealing with hazardous waste detailed criticisms of the KDHE by a number of people--lack of public participation in the decision-making process; absence of governmental accountability--and concluded that "KDHE channels of communication, both internal and external, were badly lacking." Since then there has been an obvious change in the KDHE under the leadership of its new chief executive, Sec. Barbara Sabol. On June 4, 1984, an environmental workshop was held in Topeka. Following that meeting, Sec. Sabol announced the formation of a citizen Environment Awareness Council "to aid KDHE in streamlining bureaucracy, developing sound environmental policies, and educating the public on environmental issues," according to the KDHE press release.

Approximately thirty people were nominated by a variety of organizations and institutions throughout the state, each with its own newsletter. By meeting with key KDHE personnel, hearing presentations, asking questions, stating opinions, and relaying information back to their constituents, EAC members serve as a liaison between the public and the state. The Division of Policy and Planning (Rosemary O'Leary, Director) co-ordinates Council activities. KDHE's Charles Jones and Jeff Beach work closely with EAC members, helping set the agenda, mailing out legislative-tracking summaries of key bills, and generally keeping in touch.

EAC members will meet quarterly (more often if the need arises), usually at KDHE headquarters at Forbes Field. Members are aware that for the first year, at least, they will concentrate on learning about the KDHE and defining the EAC's educational role. At the four meetings held, all of these KDHE personnel were informative, open, hospitable, and supportive. In February, members and guests toured the KDHE facilities and talked to the personnel. In each division (Bureaus of: Air Quality and Radiation Control, Oil Field and Environmental Geology, Waste Management, Water Protection; and the Environmental Organic Chemistry Section of the KDHE Lab) staff expertise and interest was evident. The tour also showed the need for more space and better quarters; some of it borders on the primitive.

At the April meeting, the council discussed water programs and problems, hazardous waste, asbestos, pesticides, and the state budget. Sec. Sabol has attended every meeting, helping bring EAC members up to date on current affairs of the KDHE. Her presence has provided tangible proof of the new open-door policy of the state agency that most affects the daily lives of Kansans.

Mari Peterson, Kansas Natural Resource Director, is the elected chairperson of the Environmental Awareness Council. She believes the Council has great potential:

"EAC members must represent an organization that has a flow of information to its members; they are voices for the groups of people affected by KDHE policies and actions. As such, they have the potential to bring useful information to KDHE decision-making. And to the extent values play an increasingly important role in environmental decision-making, this type of public education is essential for the development of better environmental policies.

Agricultural Intern Program

This program runs from mid-Feb. to mid-Dec. During spring and fall, mornings are spent in the classroom, and afternoons are used for physical work related to research, construction or maintenance. Research work dominates the summer session but occasional field trips and seminars are scheduled.

Each term ten interns receive tuition scholarships and stipends of \$93 a week. They find their own housing in Salina and bike or carpool to The Land for the 9:00 to 5:00 day.

The Land admits students of any race, color, national or ethnic origin. For more information, write The Land or phone (913) 823-5376.



This Blue Funnel Lily bloomed profusely on the hillside behind the mobile home across the road during the week of April 15.

Missing Pages in # 22?

Did page 3 appear where page 15 should have been in your last issue of The Land Report? We were very sorry to learn that we had made this mistake in collating, and that some subscribers did not receive a complete copy of number 22. Please let us know if your issue was missing pages, and we will send you the pages omitted.

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The Post Office does not forward 3rd class bulk mail. Please inform us if you change addresses. If 23 appears on your label, your subscription expires with this issue. PLEASE RENEW NOW.

The Friends of The Land have been extremely important. Many helped collect materials to build the first classroom/office/shop; many donated their time and labor to begin reconstruction after the building burned in October 1976. Friends donated books and money to help develop another library and began contributing to the general support of The Land through yearly gifts. The Land needs these friends, and new friends, too.

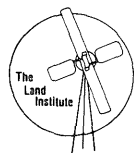
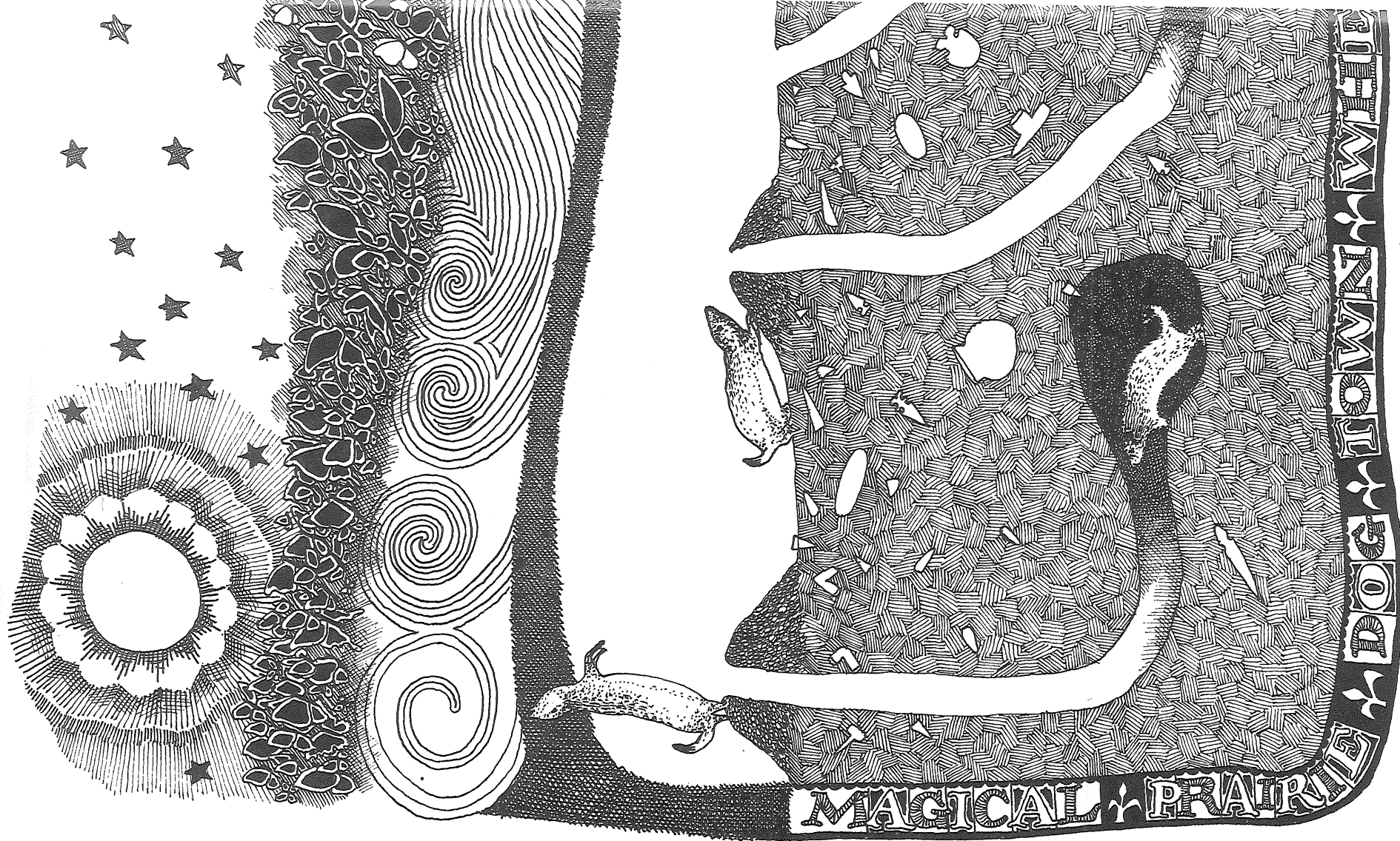
The Land Institute is a private, educational research organization. In recent years, several private foundations have awarded grants for special programs. These would not have been made if The Land had not shown a record of broad-based support from individuals who make annual contributions. Continued financial support from Friends of The Land is vital.

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