

THE LAND REPORT

Spring 1991

Number 40



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Photographs in this issue were taken by Michelle Mack, Laura Sayre, Jake Vail, and Volker Wittig. Volker and Laura made the prints in The Land's darkroom. Photos on pages 15 and 17 courtesy of Classic Big Barn, Inc. Water in the West Project photographers are named on page 21. Sketch on p. 28 by Jake Vail.

On the Cover

"Sand Hills, plowed land, and grasses" by Gregory Conniff, photographed in the Sand Hills of Nebraska. Gregory Conniff and Terry Evans are collaborating in the Water in the West Project (see pages 19-23). A joint exhibit of their work, entitled "Haystacks," will be displayed in our gallery during the Prairie Festival.



Dear Readers:

The next three issues of The Land Report will be edited and produced by Jake Vail, who came to The Land as an intern in 1988 and has been education-research assistant since January 1990. Jake has written many thoughtful pieces and sketched illustrations and cartoons for this publication.

From July 1, 1991 to July 1, 1992, I will be on a leave of absence from The Land Institute to participate in the mid-career program in public administration at the Kennedy School of Government, Harvard University. The key feature of this program is its flexibility. Students design individual study plans appropriate to their professional experiences and goals. I hope to learn more about the making and administration of public policy that affects agriculture and the environment and take advantage of rich cultural opportunities in Cambridge, Massachusetts.

Last year I shared a Pew Scholar's award in Conservation and the Environment with Wes. Accompanying this honor is a three year grant to The Land Institute to be used solely for our professional development, thereby enabling me to spend a year at Harvard's Kennedy School. So long until issue #44!

Dana Jackson

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THE LAND INSTITUTE IS A NON-PROFIT EDUCATIONAL-RESEARCH ORGANIZATION DEVOTED TO SUSTAINABLE AGRICULTURE AND GOOD STEWARDSHIP OF THE EARTH

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At The Land

Why We Do What We Do

During our catch-up and planning time this winter before the new interns arrived on February 14, staff members met several times to work out the 1991 schedule. To assist in setting priorities, we listed five overall objectives for the 1991 intern program that are to be met as interns participate in our informal "warm-ups," discuss assigned readings in class, write for *The Land Report*, become involved in our research, and do the physical work necessary to conduct experiments, tend the vegetable garden, maintain buildings and equipment, or carry out special projects. We list these five objectives below as a way of acquainting readers with the intern program.

1. Help interns to become well-acquainted with The Land Institute's history, unique philosophy and mission.

2. Explore the concept of sustainability and consider its application in many aspects of society: agriculture, energy, technology, economics, social structures and ethical systems. (Continued on pg. 4)

1991 Interns

- Tim Coppinger:** Hampshire College (Massachusetts), working toward a degree in Plants, People, and the Environment.
- Adam Davis:** B.S., biology, Yale University.
- David Griffin:** B.S., plant and soil science, University of Massachusetts.
- Teresa Jones:** B.A., environmental studies and history, Yale University.
- Michelle Mack:** B.A./B.S., literature and biology, Evergreen College (Washington).
- Charles Pedersen:** B.S., genetics, Iowa State University.
- Laura Sayre:** B.A., literary studies, Simon's Rock of Bard College (Massachusetts).
- Sarah Williamson:** B.S., agriculture and life sciences, Cornell University.
- Volker Wittig:** M.S., agricultural engineering, South Dakota State University.
- Doug Romig,** an intern in 1990, is our research fellow/intern coordinator this year.



Peter Kulakow introduces interns to Illinois bundleflower: (l. to r.) Doug Romig, Teresa Jones, Tim Coppinger, Michelle Mack, Peter Kulakow, Adam Davis, Sarah Williamson, Charlie Pedersen, Dave Griffin, Laura Sayre, Volker Wittig.

(Continued from pg. 3)

3. Provide a background for The Land's emphasis on "Nature as Standard" and discuss its significance in agricultural research, especially our own work on perennial polycultures.

4. Provide an experience in agricultural research through one growing season guided by The Land's vision and contrast it with conventional approaches.

5. Instill a sense of the prairie as an ecosystem and a place with a cultural history.



Volker Wittig



Dave Griffin, Charlie Pedersen and John Jilka build pasture fence.

Professor Spends Sabbatical at The Land

The small solar office (sometimes called the battery shed because it once held batteries charged by the wind generator) now has a new resident, Mike Hamm. An associate professor in the Department of Nutritional Science, Cook College, Rutgers University, Mike is spending his sabbatical leave at The Land Institute. He arrived in February with the new interns and will be in residence at The Land until early July.

Mike's research has been on the effects of various dietary fats and cholesterol on cell membrane structure and function, but, in addition to nutrition courses, he has taught classes on science/society related issues. His interest in sustainable agriculture arose out of teaching an honors seminar on world hunger and a section of a course for undergraduates called "Agriculture and the Environment."

Wes Jackson is Blazer Lecturer

Among the many public lectures Wes Jackson gave this spring was a presentation as the 1991 distinguished Blazer lecturer at the University of Kentucky on April 15. The Blazer Lecture series brings in outstanding scholars in the humanities and social sciences to enhance the intellectual and cultural climate of the University and the larger community. On April 30, Wes Jackson repeated his talk, "An Education to Take Home," as a free public lecture in the greenhouse at The Land Institute. The text will be published by the University of Kentucky.

"My interest in agricultural ecology and The Land Institute comes from a combination of my world view and my background in nutrition. If food is not produced in a sustainable way, nutritional biochemistry becomes somewhat irrelevant in the not-too-distant future," Mike explains.

While at The Land Institute, Mike wants to develop a better knowledge of ecology, plant genetics and research strategies in the field. To meet his goals, Mike has been helping with field work and has sat in on some of the research-related classes.

Mike took responsibility for class discussions related to the books *Nature's Economy* and *Reflections on Gender and Science*, and has frequently participated in warm-up discussions.

Mike is the first member of a college faculty to spend his sabbatical at The Land Institute. The experience has been mutually beneficial to Mike and Land staff, suggesting that The Land should consider similar stays for other professors on sabbatical leave in the future.

A Field Guide to The Land Staff

Jake
Vail

Visitors to The Land Institute often drop by unannounced, and if we don't have time to show them around we give them maps of The Land for self-guided tours. The numbered stops and accompanying site descriptions give visitors a pretty good introduction to the place and some of the ideas behind it. But our self-guided tour leaves out the most important part of The Land Institute: the people who work here. To introduce them we have put together the following field guide, structured on what might be a typical visit to The Land.

When you arrive at The Land Institute signs will point you toward the Krehbiel House, which houses administrative and staff offices. As you enter, administrative assistant Linda Okeson will doubtless spin 'round from her computer and, with a cheery "Hello," welcome you to The Land. Linda, who has been an integral part of our operations for almost ten years, runs our accounting system, types Wes Jackson's speeches and books, and does a little bit of everything else. She may point you toward Beth Gibans, development assistant, who will briefly describe the place and some of its history, ask you to sign our guest book, and show you the areas adjoining the main offices. Beth came to Salina as an



Mike Hamm and Adam Davis.

intern in 1988, stayed on as intern coordinator in 1989, and now works with Tom Mulhern in fund raising and development. Sharon Thelander, our secretary/receptionist, may be busy answering inquiries or updating our mailing list, paying a few bills, or helping volunteers Fontella Hyde and Matt Hartman with data entry.

As Sharon smiles your way, you may suddenly find yourself amidst a swirl of activity — development director Tom Mulhern may brush past on his way from telephone to copier, Karen Smith might be leaving with a tall stack of papers to be copied downtown, Jon Piper may be thumbing through the latest issue of *Ecology* as he walks by en route to his office, and Wes Jackson may walk up and vigorously shake your hand. Tom, a Kansas native, oversees fundraising and outreach efforts for The Land, and has helped us grow steadily and strongly since he came on staff in 1989. Karen works part time making copies for us at Evans Grain Company, running miscellaneous errands in downtown Salina, and helping with bulk mailings. Jon Piper has been our staff ecologist since 1985. He studies the patterns and processes of the native prairie for their relevance to a sustainable agriculture that uses nature as its model, and is director of our research program. Wes Jackson is co-founder and president of The Land Institute, and author of *New Roots for Agriculture* and *Altars of Unhewn Stone*.

Self-guided tour in hand, you'll find your way downstairs to the research library and research staff offices. Mary Handley, our plant pathologist, and Peter Kulakow, our plant breeder, came to The Land from Davis, California, five years ago. They share an office, which they also often share with their children, Elliot and Hannah.

As you move on to the greenhouse you might get swept up by another tornado of activity—nine interns getting ready for an afternoon of field work, a couple of kids running around, a bearded fellow on a tractor talking with another fellow behind the wheel of a pickup truck, a young woman pushing a cart loaded with seedlings, another young woman starting a lawn mower, and three guys talking to each other beside the pickup truck.

That would be Tim, Adam, Dave, Teresa, Michelle, Charlie, Laura, Sarah, and Volker (see p. 3). The children are Winston and Spenser Goertz, who didn't have to go to school that day and are here helping John Craft, who is talking with John Jilka. Both Johns are Kansans; the former was a student at The Land in our early days, then a school teacher, a wind generator builder, and is now our operations manager. John Jilka was a farmer a couple of miles south of us, worked at Beech aircraft, and joined The Land to help with farm operations in 1990. The woman pushing the cart of seedlings is Berni Jilka,

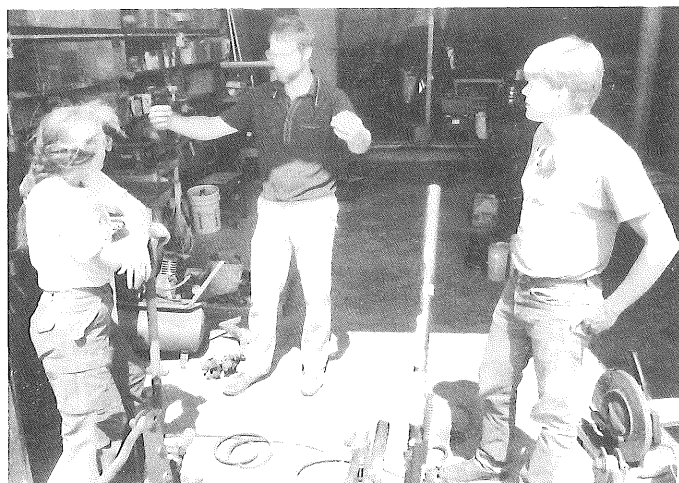
one of John's daughters, who was an intern in 1989, intern coordinator in 1990, and is now growing and selling organic vegetables through The Land's Harvest and working part-time as our horticulturalist.

Judy Logback is a Goessel High School senior who worked last summer as groundskeeper and will continue in that capacity this summer. At summer's end she will move north to attend Beloit College in Wisconsin. The three guys talking by the pickup are Doug Romig, of Santa Fe, New Mexico, an intern last year and our intern coordinator/research fellow this year; Mike Hamm, a professor of nutrition from Rutgers University who is here on sabbatical until July; and Mark Saville, a Salinan who volunteers as a garden and landscape assistant.

After introductions and a tour of the greenhouse you would walk west, across the herbarium to the garden and the classroom, where resident dogs Bobbins and Molly will greet you with great enthusiasm. In an office beside the classroom library you will probably find Dana Jackson working on *The Land Report* or Prairie Festival preparations. Dana is director of education and co-founder of The Land Institute, edits *The Land Report*, and coordinates the intern program. Seated at the computer in the office might be Jake Vail, dusty from working in the field

earlier in the day. A 1988 intern, Jake now divides his time between working on a USDA LISA experiment and helping Dana with *The Land Report* and class discussions.

But call ahead when you come out for a visit. With advance notice we will arrange for one of the staff or interns to personally give you a tour, and acquaint you with the place and the people better than any written description can.



Berni and Doug talk to John Craft in the shop.

Mangroves and Monocrops

Laura Sayre

Angus Wright's recent book concerning agricultural use of pesticides in Mexico, *The Death of Ramón González: The Modern Agricultural Dilemma* (see the review on pg. 24) is the final product of ten years of research. When Angus came to class on February 22, he immediately asserted his unwillingness to discuss any topic relating to pesticides. Having seen the book to print, he is on to other projects. A native Salinan and a long-time friend of The Land, Angus was nevertheless a new acquaintance for the 1991 interns, and on Friday of our first week at The Land he provided both a welcome respite from a numbing series of tours and introductions and a thought-provoking presentation of a few of the issues confronting contemporary agriculture on an international level.

Angus's current project, which he described to us in part, is an effort to create a book that highlights the political syndromes surrounding issues of land control in general by providing detailed examples from contemporary agricultural situations in several countries. By bringing together analyses of both good and bad examples of land use in Brazil, Mexico, and the United States, Angus hopes to address fundamental questions concerning the social manipulation of

agricultural resources and, in so doing, to promote wiser and more just forms of agriculture. In his presentation, entitled "Mangroves and Monocrops," Angus described two such examples, both pertaining to the production of luxury monocrops in Brazil.

The first scenario is from the state of Paraíba, in northeastern Brazil, an area dominated by large-scale sugar cane production. Although the sugar cane industry has, since 1830, experienced chronic crises due to overproduction, the effects of these crises have been substantially mitigated by legal and marginally legal subsidies from the Brazilian government. The primary focus of these subsidies is the ethanol fuels program, begun in 1976 as a means of reducing Brazilian dependence on petroleum imports. The program has succeeded in that respect—Brazil now produces sixty percent of its fuel needs—but there have been other casualties. With federal aid, sugar cane production is expanding into previously uncultivated areas, destroying native ecosystems and the local economies which depend on them. Along the Atlantic coast of Paraíba, for instance, rare mangrove swamps have been reduced by a third of their original area. Sugar cane producers introduce water buffalo to eat the mangroves and compact the soil, build

canals to drain the remaining wet areas, and transform independent fishermen into exploited sugar cane workers by disrupting their resource base. The World Wildlife Fund, in cooperation with local villagers, has implemented a program to fight conversion of the mangrove swamps and protect an endangered manatee, but the destruction continues.

The second scenario is from the cacao zone of Southern Bahia, the location of Angus's dissertation research. At that time his study focused on how and why the cacao industry managed to persist in the face of declining revenues and increasing social dissolution. Today, although cacao is still produced in large quantities, observers agree that a complete collapse of the industry is imminent. Not only are there vast stocks of cocoa powder, cocoa oil, and cocoa butter on the world market, but techniques for synthetic production of cocoa have recently been improved, leading some analysts to think that synthetic cocoa will replace natural cocoa for many of its uses. The Bahian cacao, moreover, is of low quality, and in May of 1989 witch's broom, a fungus that had been decimating cacao production in Indonesia and Africa and lending some advantage to the Bahian industry, appeared in Brazil.

The present terminal condition of the cacao industry, however, has led Angus to acknowledge its virtues. Because cacao is an understory plant, it is best grown among taller forest trees in a plantation system that somewhat resembles the native ecosystem (although cacao itself is not native to that region

of the continent). Cacao production, therefore, could potentially form one component in a diverse, sustainable agricultural system—even, it may be said, in a perennial polyculture. In addition, the predicted collapse of the cacao industry offers a unique opportunity for environmental conservation. Angus has been discussing with The World Wildlife Fund the possibility of convincing the Brazilian government to link remaining federal cacao subsidies to the creation of forest preserve corridors between plantation areas and existing forest remnants.

Taken together, these two examples provide an instructive survey of the politics of land control. The production of sugar cane and cacao, like the production of luxury monoculture crops in general, is highly destructive of the surrounding natural and human environment. Sugar cane production demands dangerous working conditions and has historically been oppressive to workers. In Brazil, land wars and assassinations of labor leaders have led to the deaths of thousands; cacao production has been only slightly better. The demise of the cacao industry, according to Angus, cannot be lamented, in spite of the loss of employment it will entail for many. Angus hopes it can be turned to greater good through the conversion of some plantation areas into nature preserves. In light of the fate of the cacao industry, the ethanol fuels program can be recognized as a desperate measure to rescue the sugar cane industry from its inability to compete with high fructose corn syrup as a sweetener. Not only does ethanol allow Brazil to avoid implementation of a fuel-saving mass transit system, but it also places automobile use by relatively wealthy urban populations in direct competition with food for rural populations—a struggle whose disastrous outcome is easily predicted. Perhaps, Angus suggested, Brazil's situation contains a cautionary tale for ethanol programs in the United States.

Friends of The Land Gatherings

Eleven Salina Friends of The Land have hosted get-togethers to introduce their friends to The Land's work in sustainable agriculture. Guests have gathered in local living rooms to hear Tom Mulhern or Beth Gibans present an overview of our agroecological research, education and public policy, conservation, and intern programs.

Each gathering has been uniquely interesting, whether over wine and cheese at board member Ivy Marsh and her husband Charlie's home, a delicious luncheon at former county commissioner Penny Geis's, or an evening with the editor of *The Salina Journal* and the president of Kansas Wesleyan at Ron and Winnie Force's. Gatherings can be held outside Salina; if you would like to be a host, contact Beth Gibans at The Land.



Laura Sayre rakes mulch off sorghum hybrids.

New Roots for Agriculture

Consulting Nature

Jake Vail

"Would it not be well to consult with Nature in the outset? For she is the most extensive and experienced planter of us all."

So suggested Concord's eccentric ecologist, Henry Thoreau, over a century ago. Though of a far different era and ecosystem, these words of Thoreau guide the research in sustainable agriculture at The Land Institute. Addressing the problem of agriculture—soil erosion—rather than problems in agriculture led us to the idea of using the native ecosystem of the Great Plains, the prairie, as a model for a more sustainable agriculture. With nature as our standard we are developing an agriculture which, like the prairie, is composed of mixtures of perennial plants. Such a perennial polyculture, we hope, will hold or even build soil, naturally fertilize itself, and reduce the need for inputs of costly fertilizers and pesticides.

Each year our research staff designs about ten experiments to try to better understand the possibilities of perennial polycultures. The experiments, many in their fifth or sixth year, fall into three categories. First, we are studying the patterns and processes of the native prairie. Second, through plant breeding we are developing high-yielding perennial seed crops. Third, we apply what we have learned in our prairie studies and plant breeding to designs for perennial polycultures. A list of the 1991 experiments follows:

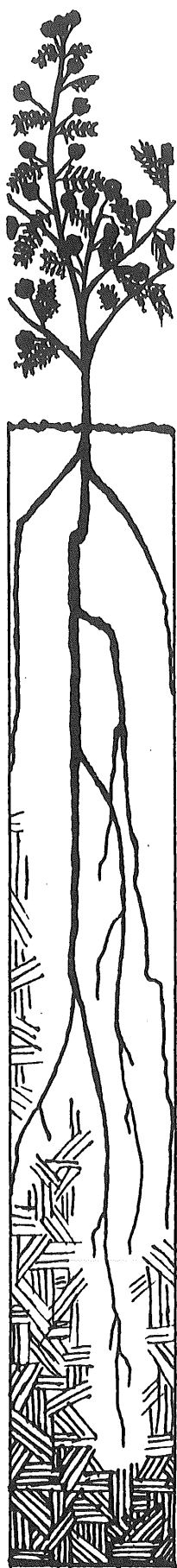
1. Vegetation structure of native prairie on different soils.
2. Illinois bundleflower breeding program.
3. Genetic variability in *Leymus racemosus*.
4. Perennial sorghum breeding.
5. Genetic variability in natural populations of eastern gamagrass.
6. Disease levels in native and cultivated populations of eastern gamagrass.
7. Maize dwarf mosaic virus in eastern gamagrass.

8. 1991 polycultures.
9. A comparison of legume nitrogen mineralization and uptake between annual grain crops vs. perennial grain crops.
10. Soil survey of Land Institute research plots.
11. Reopening the inventory phase.

Research at The Land couldn't be done without our interns. Each intern chooses an experiment to oversee during his or her ten-month stay and coordinates the necessary field work to see it through to completion. After observing, measuring, weeding, harvesting, cleaning, weighing, analyzing, and summarizing, interns will write up their experiments in *The Land Institute Research Report*, and present their conclusions to our Research Advisory Group. (See p. 40 to order copies of the *Research Report*.)

The prairie has built deep, rich soils, runs on sunlight and rain, and, as Thoreau would say, is the most extensive and experienced planter in this region. For five years we have been studying vegetative patterns on three sites of unplowed prairie at The Land Institute for insights into designing successful perennial polycultures. Last year we added a fourth site. This May, July, and August Laura Sayre will lead crews of scissor-wielding coworkers out to clip sections of prairie, sort what they find by species, study what they gather, and contrast it with data from previous years.

Our plant breeding work continues gaining momentum in 1991, with studies of eastern gamagrass (*Tripsacum dactyloides*), Illinois bundleflower (*Desmanthus illinoensis*), leymus (*Leymus racemosus*), and perennial sorghum. Dave Griffin will be at the helm of the Illinois bundleflower studies this year. We have been interested in the potential for domesticating this native perennial legume for nearly a decade, and each year we have found more interesting characteristics. In addition to observing new varieties gathered from native populations, Dave will be studying varieties of Illinois bundleflower that hold their seeds better than most. Like many native plants Illinois



bundleflower readily drops, or shatters, its seeds, but we have found two varieties that don't. Shatter resistance is an important trait for a potential grain crop, so all of the seeds may be harvested. Another part of this experiment will be making and observing crosses between high-yielding and non-shattering varieties of Illinois bundleflower.

Leymus racemosus, or leymus, is a cool-season perennial grass related to rye. A native of the steppes of southeastern Europe, leymus has large seeds and has in the past been eaten by humans when more traditional grains were in short supply. 1991 is the second year of a study describing genetic variation in leymus, which will be folded into the polyculture experiment described below.

Teresa Jones is the latest in a long line of sorghum breeders at The Land, crossing and back-crossing grain sorghum (*Sorghum bicolor*) with its wild perennial relative, *Sorghum halepense*. In a twist to the usual plant breeding approach, we are introducing wild genes into an already domesticated plant, to make it winter hardy. Crosses we've made over the past five years show desirable agronomic traits such as high seed yield and compact seed heads, and most of the sorghum crosses have rhizomes, underground stems that should help them overwinter. However, more promising lines do not produce sufficient rhizomes to survive the winter, so our efforts continue.

Plant breeding is a slow proposition, for one may proceed only as fast as the plants allow. Plant breeding with perennials, which may have growth cycles extending from spring thaw to fall frost, is especially slow — it may be 100 years before perennial polycultures have much to show. But compared to the domestication of corn, for example, 100 years

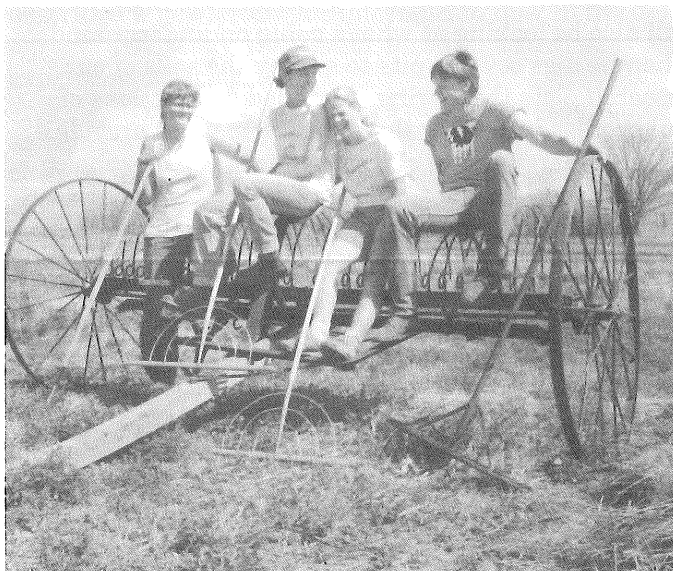


A greenhouse within a greenhouse protects bundleflowers.

seems fast. Eastern gamagrass is a perennial relative of corn with large, nutritious seeds, and is native to the prairie ecosystem. We have been observing variation in this warm-season bunch grass since our earliest days of using nature as the standard for agriculture. This year Charlie Pedersen will be describing differences within and among natural populations of gamagrass to locate traits such as high seed yield, disease resistance, and stalk strength.

Adam Davis will also be looking at natural populations of eastern gamagrass, searching for diseases. Adam's experiment compares levels of disease in natural stands of gamagrass with levels of disease on plants in our experimental plots that have been grown from seed collected from those same native stands. In addition to studying how environment affects disease levels, we hope to discover which disease-limiting mechanisms are important in eastern gamagrass and how they affect seed yield.

In 1990 we discovered more organisms infecting gamagrass than we had originally thought were present, including a virus that can be a problem in corn and could affect growth of eastern gamagrass: maize dwarf mosaic virus. Viruses are systemic and may spread from plant to plant or generation to generation through pollen, seeds, plant clones, or the actions of insects. This virus is spread by aphids. As a result of this discovery in eastern gamagrass, we



Teresa, Laura, Sarah and Doug enjoy a break.

will focus more on the dynamics of maize dwarf mosaic virus this year. Mike Hamm and Adam Davis will team up for this study.

1991 is the first year of a large-scale perennial polyculture experiment, which will combine many aspects of the aforementioned experiments in studying interactions among crops, weeds, insects, and diseases on two soil types over a four-year period. Michelle Mack and Volker Wittig will work together to establish three different polycultures, which will be grown on the level, uniform soil of the "72 acres" and on sloping, heterogeneous soil on our quarter-section. The treatments in the polyculture will consist of monocultures of Illinois bundleflower, eastern gamagrass, and leymus, using varieties that have performed well here in past experiments. The three species will also be planted together, in three ratios modeled on vegetation patterns observed on the native prairie. This is our first large polyculture experiment, and should contribute greatly to realization of our long-range vision.

We see Illinois bundleflower as a natural fertilizer for the polycultures. Like many legumes, it pulls nitrogen out of the atmosphere and makes it available to grasses growing nearby. 1991 is the second year of a nitrogen cycle study The Land Institute is doing in conjunction with Kansas State University and the Kansas Rural Center. Jake Vail started this experiment in the fall of 1989, and this year will turn it over to interns Sarah Williamson and Tim Coppinger. The objective of this study, which is funded by the USDA's Low-Input Sustainable Agriculture (LISA) program, is to compare the use of legume nitrogen by two annual grain crops, wheat and sorghum, and two of the perennial crops we are studying at The Land, leymus and eastern ga-



Dave works on soil samples.

magrass. Last year we planted five legumes; this year we have plowed under the legumes and planted wheat, sorghum, eastern gamagrass, and leymus. Through regular soil and plant tissue samples, Sarah and Tim will follow nitrogen from legume to soil to grass, and get information valuable to both our research and to farmers making the transition to low-input methods.

Research fellow/intern coordinator Doug Romig will also be looking at what's going on underground, when he digs several pits to survey the soils of our research plots this spring. Detailed descriptions of soil profiles in or near the experiments will provide a better understanding of the chemical and morphological characteristics of the soils and a better understanding of plant-soil interactions. The pits will also give us a good look at the root morphology of the perennials we are studying.

Doug will also be traveling back in time, back to the early days of our inventory of about 300 perennial candidates for inclusion in a domesticated prairie. We have devoted most of our recent breeding efforts to the perennials mentioned above, but to be sure we haven't overlooked other promising species, Doug is going to reopen the inventory. He will be contacting herbaria, seed banks, and botanic gardens to find perennial species that could grow well here and have high seed yields.



Jake and Charlie take soil samples.

— Routes to Sustainable Agriculture —

The Role of the U.S.D. A. Cooperative Extension Service

Adam Davis and Sarah Williamson

Where can a farmer turn for information and support in making the often difficult transition to a more sustainable farming system? The Land Institute has received many phone calls from farmers seeking information, but, unfortunately, it is not possible for us to serve as an information broker. Traditionally, farmers have turned to the cooperative extension service for advice about conventional agriculture. As interest in sustainable agriculture among farmers increases, the extension service could make recommendations for transitions to more sustainable practices and play a major role in facilitating change.

Dr. Charles (Chuck) Francis is an agronomist and extension educator at the University of Nebraska, as well as a long-time Friend of The Land. Recognizing that the attitude and structure of the extension service varies from county to county, as well as from state to state, we asked Chuck how extension can be most effective in promoting sustainable agriculture. He believes that it's important to assess the needs of their clientele and tap their energy for ground-up change.

Chuck promotes a model of farmer participation in the research itself. Thus farmers can bring their own specific knowledge and decision-making capabilities to bear on the research process. According to Francis, "Farmers have a large role to play in broadening the scope of sustainable agriculture." He described a new model for information flow in the agricultural sector that could encourage such an expansion of vision.

"I see one of extension's roles down the road as being a promoter of a network for information exchange. If you picture a circle, put extension as one of the nodes, or spokes of the wagon-wheel. Other nodes would be researchers, fertilizer people, chemical companies, non-profit organizations, the SCS, and the USDA as generators of information. If you put farmers at the center, I don't like it because it's too much like a target. But if you put the farmer out on the periphery, like everyone else, it puts everyone on the same level. There's no top or bottom to the picture. It lies in a horizontal plane. You could draw a line, connecting every node. Now let's go back to the classical model, which is information generated by the researcher, passed to extension, and passed to the farmer, with a little bit of feedback from that end. Contrast that with this interactive network, where

everybody in the circle is a producer of information, and also a user of information... I get very excited about that."

While this model is far from being a reality, there have been some pilot programs inspired by it. In 1989, Chuck and his colleagues ran an on-farm trial investigating nitrogen use in alternative cropping systems. The farmers grew out the experiments and provided material for the university to analyze and tabulate. The data were then given back to the farmers to interpret on their own with the assistance of extension if needed. This allowed farmers to make decisions based on experimental results, rather than on recommendations from extension.

The information gathered through research needs to be disseminated to farmers as efficiently as possible. Chuck is a big believer in the multiplier effect:

"There's no way we can do it one on one. We can't even do it one on twenty, which is why we need to spend more of our time writing. That's kind of a hard one for the traditional extension agents, because they grew up going out on the road and getting together one on one with farmers. That's good, but of course in the time that you could visit one farmer, you could be working on projects that could reach hundreds."

This strategy of multiplication can also work effectively within the extension service itself. To fulfill its role in an information network for sustainable agriculture, extension will need to provide comprehensive training in this area for its agents. The 1990 farm bill has authorized (although not yet appropriated) \$20 million for the purpose of extension education. As Chuck put it, "Everybody and their dog is jumping on this and nobody's got any funding yet. They keep asking, how do we get on board?" Chuck had some innovative ideas for establishing a national sustainable agriculture curriculum.

"There's a proposal out to concentrate a couple of really big chunks of this money in a couple of places, in particular the Rodale Research Center and the Aldo Leopold Center. That's not a bad idea; but with all due respect to those organizations, and I've worked with them closely, I think we've got to do it closer to home. Sending extension agents to a central location for training is very expensive, hard work, and removed from the real world. Our counter proposal is to set up a national curriculum that deals with all this stuff topic by topic in a fairly integrated way, tapping the expertise of people all over the country."

Chuck proposes a program of videotaped courses covering specific areas such as tillage, soil fertility, irrigation, and disease management. Experts in each of these fields would be hired to teach full-semester courses. Each forty-hour course would be broken down into modules of ten minutes.

"What we'd do is buy the time of, say, Dick Harwood at Michigan State. We'd buy perhaps a quarter of his time for a semester or half a semester. We'd have him develop a course in tillage, his area of expertise. And we'd pull in all kinds of stuff around tillage: soil physics, maybe a little fertility and irrigation.

There wouldn't be many talking heads — that's pretty boring, someone standing lecturing at you — but, rather, we would be out in the fields, walking around sounding authoritative, showing farmers at work. "

This curriculum would be designed for in-

service training of extension agents. It would also be available to university students as part of a bachelor's or master's degree program. Professors might find these modules helpful in building their own courses. They could also develop additional modules to address local growing conditions. This video network could itself become a sustainable system; it could grow through the generation of new modules and support itself through subscription fees.

The proposal is in its planning stages right now. Chuck is calling for a session with about twenty educators to discuss curriculum, priorities, design of funding strategies, taping and transmission logistics. He estimates that this idea would cost about \$500,000 of the \$20 million pot. By taking advantage of the multiplier effect, this project could make a large impact with a small amount of money. "The only limit is our imaginations," Chuck said. "That's what usually limits projects, I think, not the bucks."

Working for Sustainable Agriculture in Kansas

Dana Jackson

How can we convince the College of Agriculture in our land grant university and our Kansas Board of Agriculture that conventional farming practices are destroying the long term ability of our agricultural land to produce food? How do we promote sustainable agriculture in Kansas?

The Kansas Rural Center (KRC) organized a Citizens' Committee on Sustainable Agriculture to tackle this difficult mission in April 1988. The KRC wanted to extend on a statewide basis the advocacy efforts begun by a group of northeast Kansas farmers in 1986. Among the 18 or so persons who have worked on the committee the last three years are farmers, a church leader, representatives from environmental organizations, a retired university professor, and KSU graduate students.

The committee has undertaken projects in three main areas: (1) evaluation of research categorized by Kansas State University (KSU) College of Agriculture as sustainable farming research and the publication of three reports on the findings, (2) the sponsorship of public education programs about sustainable agriculture, and (3) conferences with officials in the KSU College of Agriculture to encourage them to take leadership in developing substantive sustainable agriculture research and education programs.

To urge leadership from Kansas State University in sustainable agriculture, the committee met

twice with Deans and department heads in the College of Agriculture in 1989. The officials claimed that KSU was already doing sustainable agriculture research; they looked upon the committee as a "special interest" that could not be favored over other special interests. Definitions of sustainable agriculture differed; the College of Agriculture worded theirs to include conventional farming practices and motivations, while the committee included values favoring environmental health and diversified family farms.

This year the Citizens' Sustainable Agriculture Committee decided to focus on extension. Farmers who need information and assistance to make the transition to sustainable agricultural practices should find that available from extension agents, but seldom can in Kansas. Some Kansas farmers have gone out of state—to Iowa and Nebraska extension services—to get that help. One hundred and seventy-five persons attended the Conference on Practical Farming in Kansas, co-sponsored last fall by the committee and several organizations advocating sustainable agriculture. Farmers at the conference expressed a desire to decrease their chemical inputs and lower input costs, but needed assistance.

On April 11, 1991, the Kansas Citizens' Sustainable Agriculture Committee met with KSU's Pat Murphy, Acting Assistant Director of Research, Agriculture and Natural Resources, and George Ham, Associate Director of Experimental Stations, to discuss the role of extension in promoting sustainable agriculture. Prior to the meeting, Jerry Jost, who coordinates committee business for the Kansas Rural Center, sent a list of recommendations to Murphy to discuss at the meeting. The committee recommends that extension do the following:

- provide tenure for a sustainable agriculture specialist position;
- provide sustainable agriculture recommendations, incorporating earlier KSU research on crop rotations, legumes, and non-chemical pest control, alongside the regular recommendations of Extension at educational meetings and in publications;
- involve sustainable agriculture advocates in the planning of Extension training on sustainable agriculture as recommended in the 1990 farm bill;
- develop a reference list for county agents on sustainable agriculture;
- strengthen cooperation with LISA on-farm demonstrations and sustainable agriculture educational initiatives involving the Kansas Rural Center and The Land Institute;
- conduct education and economic analysis on the conservation provisions, including the Integrated Farm Management Program, of the 1990 farm bill;
- integrate sustainable farming practices that include non-chemical weed control, crop rotations, rainfed farming alternatives, and legume research in a systems approach at every experiment station;
- set up regional demonstration farms that investigate how conventional farmers can make a transition to sustainable farming practices.

Although the committee was received politely and attentively, neither Pat Murphy or George Ham made any commitments to any of their recommendations. Strong leadership from university officials is needed if KSU is to develop substantive programs and integrate concepts of sustainable agriculture into extension activities. The 1990 farm bill authorized the spending of \$20 million to train extension personnel in sustainable agriculture. If the U.S. Congress does eventually appropriate money for this purpose, cooperative extension in Kansas should prepare to assist farmers making the transition to sustainable farming practices.

Working for Sustainable Agriculture in Kentucky

Toni Menk

In the summer of 1990, a Kentucky grassroots organization called the Community Farm Alliance (CFA) embarked on the Rural Environmental Educational Economic Agricultural Accountability Project, or REAP. Highlander Research and Education Center of New Market, Tennessee, is partially funding REAP as part of its environmental economic program. The main goal of REAP is to find out to what extent Kentucky's land grant college, including the cooperative extension service, and the state De-

partment of Agriculture, are accountable to the needs of rural Kentucky and if they have made any efforts to promote diversified, environmentally and economically sustainable agriculture. Questions REAP is researching include:

- What are the budgets of state agricultural institutions? Where does the money come from and how is it spent?
- How are University of Kentucky research projects chosen? Who are the decision makers, and what are their specialties and attitudes toward family-scale farming?
- What are the University of Kentucky and the Extension Service doing in sustainable agriculture, including areas such as chemical runoff, interplanting, and insect studies? How can we make the university more accountable?
- What is the University of Kentucky doing in the area of biotechnology?
- What are other land grant universities and grassroots organizations doing to promote more sustainable agriculture?

REAP members have interviewed faculty and extension agents, talked to farmers about their experiences with the extension service, and reviewed research projects at the university. None of us realized the scope of this project when we began, but we are now finishing our initial research and trying to "pull it all together."

Our biggest problem, aside from the unanticipated scope of the project, has been getting a handle on corporate funding. The Biotechnology Working Group is conducting a study of corporate funding in the land grant system. We hope that their report and our local research will give us some insight into the complex relationships between land grant institutions, government, and corporations, and how these relationships affect research.

We have found that university research is often determined by the interests of the faculty. Therefore, one way to promote sustainable agriculture would be to influence the university by influencing students and faculty. We know that there are already people working for land grant institutions who share the concerns of REAP.

When the research is completed, our next step will be to develop a strategy and an agenda to influence institutional reform. In 1990 the CFA lobbied for organic certification of produce in the Kentucky General Assembly, and the legislation passed. We are considering introducing legislation in 1992 that will address the accountability of state agricultural institutions and propose specific programs to promote sustainable agriculture in Kentucky.

Toni Menk works for the Community Farm Alliance, 200 Short St. # 10, Berea, KY 40403

—Roots of Conventional Agriculture—

A Prairie Barn and a Wheat Empire

Doug Romig

On the morning I traveled to Woodston, Kansas, I tried to imagine what it would have been like as a homesteader, facing that stiff northern wind. The gale seemed to push my car across the road as easily as it did the snow. January had given Kansas a balmy 55 degrees yesterday, but this day it was near zero.

I was on my way to visit Laurence and Lee Hull of Woodston, about 45 minutes north of Ft. Hays in Rooks County. Along with local historian Leo Oliva and Rev. Richard Taylor of Topeka, they are working to save a barn built in 1912 by their grandfather, W.G. Thomas. This barn of exceptional proportions is three miles east and north of Woodston in Ash Rock township. In 1985, Rev. Taylor had come for a Memorial Day service in Stone Church, which had been renovated in a community effort by farm families of the area. It was on this trip to the Ash Rock community that he first spied the relic barn. Having a passion for historic preservation, Rev. Taylor initiated a campaign to save the Thomas barn. He takes his mission seriously when he says, "Farmers here saved the church, and now the church will work to save the barn." I went that morning to learn more about the gambrel-roofed barn, the Thomas's farm, and the early pioneers of the Plains. Leo and Lee met me at Laurence's farm and we drove to the barn. It loomed on the horizon, growing on the prairie landscape as we approached. It is 100 feet long, 64 feet wide and originally 64 feet to the top of the cupola. The weathered barn, stained gray, has seen close to eighty Kansas winters, and with the efforts of The Classic Big Barn Inc., it could see many more.

Imagining a winter wind in 1913 was easy on the January day I was there. But conceiving of a barn that smelled sweetly of manure and echoed with the quiet sounds of horses patiently waiting for spring pasture eluded me. A crick in my neck developed as I stared at the barn, for it is uncommon on the prairie landscape to gaze upwards other than to keep a eye on a thunderstorm. Its height above the prairie drew my eyes to the quickening clouds with pieces of azure sky attempting to break through.

The biting wind put an end to my romanticizing. While Lee found the lights, Laurence and Leo began to tell the barn's story in its "hay" day. Fifteen stalls down the middle section of the ground floor held teams of Belgians. The east side had room for several brood mares; the west portion could hold 50

cattle. A steel track ran down the middle of each section and was all that remained of a manure collection system. The owner could maneuver a large bucket throughout the barn, place manure from the stalls into it, and then empty the bucket on a manure spreader to be taken to the fields. A workshop and three large grain bins were on the ground floor as well. I was surprised to learn about an engine room where a gasoline powered windlass was housed in order to pull the slings of hay into the haymow.

The hallmark of this barn, though, was upstairs. As we climbed, I felt a sense of pride gather in the men who were with me. We stood in silence for a while in the vast cavern made of wood. The space reminded me of the Cathedral of St. John the Divine in New York City. Only hushed words of praise and awe were allowed here. Five hundred tons of prairie hay could have filled this loft. Once again I was unable to grasp for an image.

By no means am I an expert in barns or engineering; fine carpentry is something I more often admire than actually create. Over forty feet above me hung a roof with no internal bracing crossing the space, not even a ridge pole. The construction of the massive trusses made of 2 X 12s resembled that of a narrow-gauge railroad bridge. The trusses were bolted together, crisscrossing within themselves, and worked like ribs to hold the gambrel rooftop. The end walls were exceptionally well braced to hold up against all but a tornado.

W.G. Thomas enlisted the help of a local architect, Robert I. Brittan, to design and build the big barn. Brittan's innate gift for carpentry was that of a master, yet he had little formal training. With the help of some correspondence courses, he became an outstanding designer and builder. The haymow was more than enough to convince me of that fact. Just to set those trusses fifty-five to sixty feet above the prairie must have been a monumental task. Lee told me a story that testifies to the barn's structural integrity. At one time, the northeast corner foundation had fallen away, leaving thirty feet around the corner without any support for about twenty years. When it was repaired, that corner had dropped only an inch.

The Thomas barn was thought to be the largest barn in Kansas at the time it was built. The dimension lumber, most likely the product of old growth forests in Oregon, was shipped on the Missouri

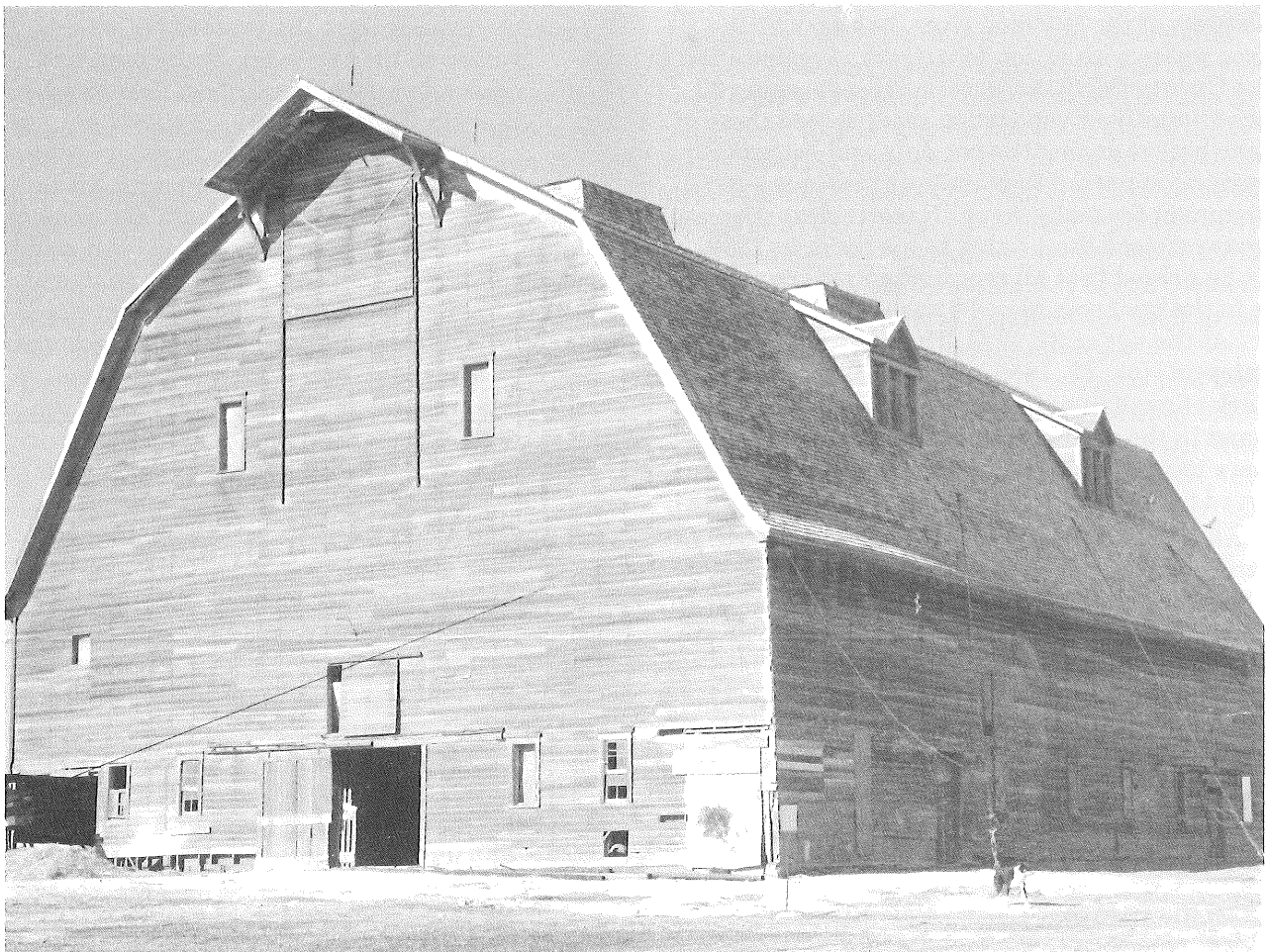
Pacific railroad. As W.G. selected his lumber for the building, he culled any that had knots in the grain. The cost per board foot in those days was three cents. The barn required 120,000 board feet of lumber, 7,000 pounds of nails, 1,200 pounds of bolts and 115,000 cedar shingles. It was painted only one time in its history, a battleship gray with white trim and white diamonds on the doors. The total cost of the barn in 1912 has been estimated at \$8,000. Today, it will take approximately \$100,000 to renovate.

When I saw the barn, it was on the road to recovery. The imperative was to replace the roof and stop the water damage to the internal lumber. Workers had hooked large guide wires to the roof to stabilize and straighten the structure. Last summer they finished the arduous task of replacing the shingles. The barn is now more sound, but Classic Big Barn Inc. continues to raise funds to complete the foundation, rebuild the cupolas, repaint the entire structure and perhaps make it a horse museum.

In the fall of 1878, Benjamin F. and Rhoda Hetherington Thomas came to northwestern Kansas from Iowa to homestead in Rooks County. They

"The general pattern for rural America is simply to stand by and watch abandoned houses and outbuildings, including barns, go unpainted, and then watch the roofs leak, studs rot and walls lean. When the inevitable storm comes through, one by one, the walls fall in a heap. One day, often years after the building has collapsed, a bulldozer operator, hired to push out a hedgerow in order to expand the kingdom of wheat twenty more feet along a field's edge, spends a few minutes pushing the fallen building into a tighter pile. ...he strikes a match, and a portion of an early 1900s Oregon forest, sacrificed for the common good, goes up in smoke. The lumber for this barn could well have come from old growth forest trees 300 years old or more. Spotted owls may have hooted from the very trees which became the board feet necessary to build this barn. The owls are now as endangered as the barn...To let this barn go down is to lose a tangible source of memory for those early area farms and further desecrate the memory of the old growth forest..."

-Wes Jackson, in a letter to Rev. Richard Taylor



The Big Barn

brought with them their parents, six children, six horses and several cows. They came in a buggy and two covered wagons. The youngest son, William Ulysses Grant, known as W.G. to his friends, was fourteen when he arrived in the high plains. One of W.G.'s first tasks was to help build a sixteen foot square sod house with a loft in which they were to spend the winter. His namesake grandfather, William Thomas, was 72 when the families homesteaded in Ash Rock township. Following William's death in 1879, W.G.'s father, Benjamin, filed a timber claim in Ash Rock on land closer to relatives living in neighboring Osborne county. It was here that one of the first frame houses in the township was built.

The timber claim required that trees be planted and established on ten acres of a homesteaded property (160 acres) before the patent for the land could be received. Laurence showed me the original document, which read: "To encourage growth of timber on the western plains." Lawmakers in Washington who drafted the Homestead Act did not understand the Great Plains for what they were. This legislation that opened the frontier rested on the belief that "rain follows the plow," and that trees or crops could be grown anywhere. Ash Rock township, which straddles the watersheds of the north and the south forks of the Solomon river, has very little surface water with which to irrigate. Precipitation in Rooks County fluctuates erratically, averaging 23 inches annually. Evaporation rates exceed those of replenishment during the hot July and August sun. The prairie is partial to grasses; it provides a harsh environment for many trees. Nevertheless, Benjamin Thomas received final rights to his claim in 1888 when he proved that all requirements were met. Title to the land was issued by the President in 1890.

At the age of 21, W.G. Thomas married Anna L. Bates on Nov. 12, 1885. A problem they faced was the lack of available cheap land, as all the Homestead Act land in the area had been claimed. Two sections of every township in every state, though, had been reserved for the purpose of raising funds for education. This land was available for purchase in Ash Rock. They made a down payment on eighty acres just south of Benjamin and Rhoda's claim that year. Shortly before the marriage, W.G. built a soddy where he and Anna started their married life.

By 1887, W.G.'s hard work had paid off, for he received the patent on the land. He paid \$3 an acre and bought an additional eighty acres half a mile west, for a total equivalent to a quarter section (160 acres). In comparison to the fees to gain title for a homestead (approximately \$25), W.G.'s capital investment was exorbitantly high for the day. 1887 was also the year that Lillian May, the first of four children, was born to W.G. and Anna.

The Thomas farm "really went for the wheat,"

Lee Hull told me. W.G. was a thrifty farmer who made money growing winter wheat. By the turn of the century, the Thomas farm had expanded to encompass 580 acres, despite the economic environment that brought hardship to many families who had lost their land to creditors in the 1890s. Ash Rock farmers lost 27 quarter sections between 1888 and 1900, primarily because they had mortgaged their land to build houses or barns, or buy equipment, and then defaulted on their loans.

One hundred feet from W.G. and Anna's soddy, they built a new frame house in 1893. Two years later, the Kansas Agricultural Census reported that the farm had nine horses, 75 acres in dryland corn, 130 acres in winter wheat and 90 acres in native pasture. The cash value of farm improvements was \$1200. In the census for 1918, six years after the barn's completion, the Thomas farm reported having seventeen horses to plow and harvest wheat on 400 acres. William Connelley, the Secretary of the Kansas State Historical Society, boasts for W.G. in *Kansas and Kansans* (1919):

"It is as a wheat farmer that Mr. Thomas has been most successful in years past. All the improvements on his farm were made from the proceeds of wheat raised on his own land. If any man has reason to justify his faith in Kansas wheat, it is Mr. Thomas."

W.G.'s faith in wheat grew with his farm size. Connelley reported that W.G. had "accumulated a total of 1760 acres, all good Kansas land, and has made improvements on three farms valued at \$25,000." Lee speculates that W.G. and his sons-in-law worked the land together in a sharecropping arrangement that was common at the time. W.G., the landlord, probably received a third of the harvest from each of their farms.

Lee said his grandfather believed in land, as it was an economically sound investment -- not for its speculative value, but its ability to produce a crop. Connelley said that a plaque could very well be placed above the Thomas barn reading: "Kansas wheat built this barn." A man like W.G., a self-described progressive, would most likely agree with Bill Lacy's introductory remarks in *The Barn*:

A man's barn bespoke of his worth as a man. It expressed his earthly aspirations and symbolized the substance of his legacy to his children.

W.G.'s aspirations were as high as were his achievements; his barn is proof of his progressive faith. But W.G. was more than a farmer. In 1911, he



Thomas steam threshing rig (courtesy of Classic Big Barn, Inc.)

was elected president of the Rooks County State Bank in Woodston, which he had helped organize a few years earlier. He was a thrice-elected county commissioner to the first district, an uncommon achievement for Kansas Democrats. He was an outspoken Populist, "publicly spirited and respected by many for his management and judgment."²

Historian Donald Worster called this period in agriculture the "halcyon days," as it set the "standard of prosperity" for the nation's farmers.³ Between 1909 and 1914, farmers received equitable profits on their crops in comparison to the goods they bought from the nonagricultural sector of the economy. This condition was deemed *parity* by the Department of Agriculture, and became a benchmark to assess the economic condition of farmers. Leo Oliva told me that in this parity period, farmers constructed most of the barns around Woodston. Their profits on wheat were high due to an expanding market in urban centers. The farms' earnings were equivalent to the non-farm sector. This gave farmers the incentive to make capital improvements on their land. When W.G. built his barn he had confidence and hope in the future of Great Plains agriculture. Connelley reported Mr. Thomas's "unbounded faith...in Kansas, where he has made his fortune and where he believes it possible for any poor man, industrious and frugal, to make a better start at farming than anywhere else in the Union."

The description "industrious" strikes a note of irony. I have little doubt in W.G.'s work ethic; his accomplishments speak only of hard work and discipline. Yet the convention of industry changed during the nineteenth century. Prior to the industrial revolution, cottage industry was America's enterprise. The production of soap, candles, clothing and

the like was a central feature of any household, the industry of the cottage. Locally produced and consumed essentials helped maintain a self-reliant farm. As the nineteenth century became the twentieth, much of this production migrated from the farm to the factory, from the cottage to the commercial sphere. Commercial manufacturing was based on large scale and high production, a much different arrangement than cottage industry. "The transfer of manufacturing from the farm to the factory is the most significant aspect of the transition from self-sufficient to the commercial farm."⁴ This development in American agriculture set the stage for the concept of parity, as farm families began to purchase goods from the non-farm sector which their grandparents would have produced themselves.

The commercial sense of industry had begun to shape the minds of Americans before homesteads came west into the frontier. When the Civil War removed a million men from the countryside, farming communities were left with severe labor shortages. The slack was taken up by horse drawn reapers. By 1880, four-fifths of the U.S. wheat was cut by machine. The Plains were brought into production primarily with draft horses, bare hands, and strong backs. When the tractors arrived at the state agricultural fairs, farmers welcomed them as labor savers.

The shift from cottage to commercial production schemes laid the groundwork for the industrial agriculture. World War I merely accelerated the process when the government called upon patriotic farmers to grow wheat to win the war and guaranteed prices at \$2.00 a bushel. Farmers responded with the great plowing of the High Plains, facilitated by the tractor, but fundamentally driven by the industrial metaphors of "bigger is better" and high

production. These metaphors worked to settle the frontier and to feed a starving Europe, but they also set the stage for the economic and ecological catastrophes of the thirties.

The commercial industrial model opened the barnyard gate to the mechanical implements which revolutionized agriculture. W.G. Thomas incurred a large expense to build the "hay-burner" barn, but within six years his horses were displaced by a mechanical horse. In 1918, a gasoline powered tractor came to the Thomas farm, and W.G. owned three at the time of death in 1926. Lee Hull, W.G.'s grandson, captures the historical paradox: "It was ironic that the need for it [the barn] disappeared soon after it was built."

Indications of human hardship and failure appeared early in the pioneer history of Ash Rock township. Emigration from the township started soon after the territory was settled. In 1880, U.S. census workers counted close to five hundred citizens in the township. By 1915, over one quarter of them had left the area.⁵ Mechanization was partly to blame for this farm attrition, but the gasoline powered technologies which replaced horses and humans did not exist at the turn of the century. The technologies which surfaced were manifestations of a stronger process at work.

The patterns of land tenure and employment in Ash Rock illustrate that a larger force than technology caused community decline. Between 1905 and 1915, fifty farmers either moved out of the township or became agricultural laborers in other farmers' fields. In those ten years, over half the farmers who owned their land had mortgaged it. There was also a one-hundred percent increase in the number of farmers who rented land to work rather than owning it. Many farmers became laborers, either in the field or the city, as land ownership consolidated into fewer hands. In those same years, W.G. acquired an additional 240 acres for a total of 1,040 acres in the township. While the intention of the Homestead Act had been to distribute land equitably and create a large class of independent proprietors, economic and social forces worked against it. Underlying assumptions of the industrial revolution about the value of human work and the efficiency of technology affected agriculture as it had business. In the minds of the original settlers were the seeds of commercial industry. Once planted on the prairie, the seeds bore little for most of them except disappointment.

The Big Barn was built in an age of solar power; it represents a time when agriculture was more sustainable in an ecological sense. The barn reminds us that the balance between human activities and nature was more harmonious before the din of fossil fuel-powered technologies. Yet the vision of a

sustainable agriculture is not fully represented in this prairie barn. It was built on an industrial scale, with industrial intentions. The big barn is a monument not only to the horses that lost their jobs to the tractor, but to all the members of family farms who were casualties in the agricultural revolution.

W.G. Thomas was a successful farmer, as measured by commercial industry, but one could not say that Mr. Thomas was a sustainable farmer. He and his contemporaries built upon an industrial model of high production and economies of scale. That model could not and cannot allow farming in perpetuity. Mammoth farms cannot be farmed carefully, and they result in fewer people farming, as witnessed by the community in Ash Rock. The legacy of the big barn deserves monumental status, but so do the people that struggled to survive in a world they did not understand, a world that cared little for their humanity.

References and Notes

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3. William E. Connelley, 1919. *A Standard History of Kansas and Kansans*, Vol. 5, Lewis Publishing Co., Chicago, IL., p. 2418.
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5. This trend has remained constant. In 1980, only 74 people remained in 26 households in Ash Rock township. See Leo E. Oliva, 1983. *Ash Rock and the Stone Church*, Ellsworth Printing Co., Ellsworth, KS.
6. Acknowledgements:
I wish to thank Laurence and Marvel Hull for their warm hospitality and country meal on a cold January day. I appreciate the patient responses to my questions concerning the Ash Rock community and W.G. Thomas's farm by both Leo Oliva and Lee Hull. Their understanding of place and heritage is something we all should aspire to. Thanks also to the Reverend Richard Taylor, who spurred my interest and provided a plethora of information. The Kansas State Historical Library in Topeka provided vital materials for this story of rural Kansas in the early part of the century.

Classic Big Barn Inc. is a non-profit corporation seeking donations to save the Thomas barn in Woodston Kansas. Clifford Thomas, son of the builder, William G. Thomas, has donated fifteen acres and the barn in hopes that it will become a museum celebrating the rich cultural history of Kansas. Approximately one-third of the \$100,000 dollars needed to restore the barn have been raised. **Contributions are tax-deductible and can be sent to Big Barn, Box 2, Woodston, KS 67675.** There are also notecards, postcards, hats and posters for sale. Those donors who give over \$50 will be recognized on a plaque in the barn and receive a cardboard model of the barn.



Abandoned hot springs near Goldfield, Nevada, 1990.
Original in color.

Peter Goin

The Water in the West Project

The Water in the West Project is a collaboration of a group of photographers whose art shares strong ties to the landscape of the western United States. The project is generating photographs and essays that address our culture's complex and conflicting attitudes toward water in the arid West. Terry Evans, arts associate at The Land Institute, is among the photographers working on this project.

The project's primary goal is to create a body of work that will contribute to the increasingly urgent dialogue about the future and quality of life on earth, sustained by a shrinking number of limited natural resources.



Wild Rivers Water Park, Irvine, California, 1990.

Laurie Brown



Ogallala Aquifer Lake south of Gordon, Nebraska, near
Niobrara River, 1990. Original in color.

Terry Evans



Vicinity Gordon, Nebraska: Irrigation (4), 1990.

Gregory Conniff

As a collaborative project, Water in the West represents a wide range of interests and concerns from agricultural practices in western Kansas to water rights on the Paiute Reservation at Pyramid Lake in Nevada. At the core of the project is a concern for how water use and perceived needs have shaped our natural and social landscape.

Water in the West intends to serve as a clearing-house for ideas and as a structure to encourage collaborative and interdisciplinary work through the establishment of a comprehensive photographic archive, public lectures and symposia, and a continuing series of publications and exhibitions.

Project Members

Laurie Brown - Laguna Beach, CA
 Gregory Conniff - Madison, WI
 Robert Dawson - San Francisco, CA
 Terry Evans - Salina, KS
 Peter Goin - Reno, NV
 Wanda Hammerbeck - La Canada/Flintridge, CA
 Mark Klett - Tempe, AZ
 Ellen Manchester - San Francisco, CA
 Martin Stupich - Dorchester, MA



Santa Barbara Water Supply,
Lake Cachuma, 1990.

Wanda Hammerbeck



Roosevelt Dam and Bridge, Arizona, 1991.

Martin Stupich



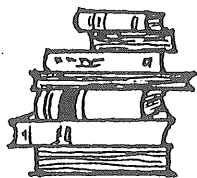
Across the Black Canyon
of the Colorado River, 1985.

Mark Klett



Marriott's Desert Resort,
Palm Desert, California, 1988.

Robert Dawson



Books

The Death of Ramón González

by Angus Wright

University of Texas Press, 1990, 337 pgs., hardcover.

Reviewed by Wes Jackson

(Reprinted from *Chemical and Engineering News*,
December 17, 1990)

Here's the sequence: Peregrine falcons, brown pelicans, and bald eagles go into a steep decline because their soft-shelled eggs break. Rachel Carson's *Silent Spring* appears in 1962. DDT, aldrin, and a few other persistent chemicals are restricted. Creatures like the pelican and falcon start recovering, validating the bad rap about pesticides.

The pesticide industry, nevertheless, continues to grow—doubles and redoubles. The persistent pesticides in its warehouses, plus the yet-to-be amortized equipment responsible for turning them out, causes management to look to the Third World as an attractive market for recouping its investment. *The Circle of Poison* by David Weir and Mark Shapiro appears in bookstores, sells smartly, and Americans become sufficiently outraged, or at least aware enough, that government officials respond by improving the mechanisms to check some of the produce arriving at U.S. borders. The highly persistent pesticides are phased out of nearly all domestic and incoming produce as Third World growers substitute less persistent, but much more acutely toxic, varieties.

The result: more and more sick farm workers in the Third World stand behind safer food for the American table. According to United Nations estimates, one million people, most of them farm workers, suffer from acute pesticide poisoning each year and 20,000 die from it. About half of these are in developing countries.

In the midst of this growth of the pesticide industry, a Union Carbide plant has a major explosion at Bhopal, India, leaving about 3,500 dead and another 200,000 injured. Meanwhile, a fifth of the wells sampled in the great central valley of California are declared contaminated with 1,2-dibromo-3-chloropropane, and a Sandoz warehouse at Basel, Switzerland, burns, sending 66,000 pounds of pesticides into the Rhine and the message that it isn't just the ill-trained people of the unwashed Third World who cause such accidents.

Enter Angus Wright, who very well could have

begun *The Death of Ramón González: The Modern Agricultural Dilemma* with two sentences buried in his introduction.

Every year chemical companies manufacture about five billion pounds of substances chosen for their ability to kill some form of life and intended to be cast rather freely into the air, soil, and water of our planet. For all our concern with toxic waste dumps and irresponsible disposal of hazardous materials, corporations, governments, and international agencies encourage the deliberate dispersal of this fantastic quantity of biocides into the environment.

Why do we do this? When Rachel Carson conducted a survey of nonchemical means of pest control, she concluded: "We allow the chemical death rain to fall as though there were no alternative, whereas in fact there are many, and our ingenuity could soon discover many more if given opportunity." As prophetic as her statement was and is, why are we where we are almost thirty years later? This is Wright's question as he flatly states, "When the growth of a technology seems immune to the consequences of disastrous experience and the invention of inexpensive and effective alternatives, we have to begin to ask why."

This seasoned professor of environmental studies at California State University, Sacramento, with his distant doctorate in Latin American history, using his fluency in Spanish and interest in land and people, enters Mexico and stays awhile. By making his fieldwork his homework, Wright goes beyond the pat conspiracy theory approach (which assumes that the promotion of pesticides must involve some sort of worldwide conspiracy), goes beyond the broad framework that almost anyone can take for granted, which is that any industry wanting to sell a product will do all it can legally to expand and protect its market. It is at this point that Wright breaks from the pack by providing us with the point of departure that makes his book unique. In one breath, he denounces conspiracy theories and supplies us with the subject for this book when he says, "For very large conspiracies to work over large geographical areas and for decades at a time, the conspiracy must be transformed into something else—a belief system, an ideology, a world view, a concept of proper professional behavior, even a crusade."

Some readers may tire as they wait for him to build his case, but eventually he hits his stride, and when he does, it is worth waiting for. At the point where we realize that this is not primarily a book about chemicals in our food supply, in fact, just as we realize that chemicals are almost incidental, suddenly

we see his real subject looming up before us—a world view that makes agrochemicals inevitable. Wright has distilled the assumptions of the progressive modern world: nature is to be subdued or ignored; the purpose of agricultural research and farming has been and still is to increase production; agriculture is to serve as an instrument for the advancement of industry. Given these assumptions, given the era of better living through chemistry, the chemical assault on the environment was inevitable. With these assumptions as part of our cultural mind, agricultural experts, large foundations, and agribusinesses entering Mexico or any other Third World country are likely to be as disruptive of time-honored patterns as the early Christian missionaries were centuries ago. Growing crops for cash from export instead of for local consumption may buy radios, but at the expense of soil erosion and chemical contamination of the land and water. But that's progress. Progressive fundamentalism is as bad as religious fundamentalism, for fundamentalism takes over where thought leaves off.

The industrial revolution has created the industrial mind so that the exploitation of the Third World's labor or the chemical assault on its people and its land, soil, and water all are mere consequences of the industrial mind, or in Wright's words, a "belief system," a world view. The tragedies he describes are wound together like a knotted ball of individual strings. Some are ecological, some cultural, many personal. But in the end, the tragedies are the consequence of what Wright calls the modern agricultural dilemma.

What is this modern agricultural dilemma? It comes in three parts. First, the requirements for nearly all nations that wish to industrialize rapidly and compete in the international economy automatically jeopardize the "highly localized adaptations needed for ecologically healthy agriculture and healthy, stable rural communities." Second, it isn't just a local phenomenon, as Wright goes to great pains to demonstrate. "The growth of industrially based agriculture in the Culiacan Valley and of industrial centers like Mexico City" have contributed to the environmental and social ruin of regions like the Mixteca hundreds of miles away. And finally, "Booming agricultural regions like the Culiacan Valley actually depend on the cheap labor produced by ongoing social and environmental disaster in other regions—and worse, the technologies being used to produce present growth make it likely that the new regions, the Culiacan Valleys, will follow the old into social and environmental decline."

Wright constructs a closely argued case that this world view necessarily leads to an exercise of power that is inevitably violent, both to people and landscapes. Furthermore, the limits of that violence

are not easily contained. As he described the brutal hardships imposed by the growers and their political agents on the Mixtec people who work the fields in the Culiacan Valley, I thought to myself, "Thank God, this has not yet come to the U.S." I felt somehow immune from the problem, or at least distant enough, until I came to the last two paragraphs of the book (which I'll leave to the reader to discover) and suddenly realized how skillfully this book had been crafted.

The insidious nature of the world view and the corruption of power that automatically attends what we have confidently considered the necessary economies of scale for industrialized agriculture are brilliantly, and I will say, passionately expressed. The countless hidden, and now not-so-hidden, costs are increasingly evident. Ramón González is a Mexican Mixtec who died in 1981 of acute pesticide poisoning, and many like him are still dying. But thanks to Wright's love of Mexico, love of the Mixtec people, love of decency and justice, combined with tedious fieldwork and skillful writing, it may all end sooner than it might have. Let's hope so.

Ill Fares the Land

by Susan George

Penguin Publishers, 1990, 261 pgs, \$8.95

Reviewed by Brooks Anderson

For the last fourteen years Susan George has written prolifically on the subjects of food, hunger, politics, power, poverty, and the links between them. She is author of *How the Other Half Dies: The Real Reasons for World Hunger* (Penguin, 1976); *Feeding the Few: Corporate Control of Food* (IPS, 1979); *Food for Beginners* (Writers and Readers Beginners' series, 1982); and *A Fate Worse than Debt* (Penguin, 1988). In 1990 Penguin released an expanded version of her 1984 book, *Ill Fares the Land*, a collection of lectures and letters addressed to a variety of organizations, such as the U.N. Food and Agriculture Organization and the International Council of Voluntary Agencies, between 1979 and 1985. Although the material is somewhat dated, her concerns are as relevant and important today as when they were written. Unfortunately, none of the problems she writes about have gone away.

In *Ill Fares the Land* Ms. George writes about the promises and problems of biotechnology, challenges the Third World faces in the area of education, imbalances in research and development priorities in the corporations and universities of the overdeveloped nations, and the growing awareness that the Green Revolution has been more of a curse than a

blessing. Two contentions frame Ms. George's examination of the issues. First she says, "In the late twentieth century hunger is no longer a scourge — it is a scandal. But it is not intractable; the causes are known, the remedies exist." She further contends that "The ways in which one explains the causes of hunger will determine the ways by which one seeks to do away with it." Only after this is understood and accepted can we work to expose and eradicate the forces which perpetuate hunger.

Ms. George's discussion of the importance of agriculture and land-holding patterns develops from her examination of the root causes of chronic hunger. A clear message in *Ill Fares the Land* is that modernization, mechanization, and further integration of the Third World into the global or free-market economy (playing the game of comparative advantage) is causing greater landlessness and hunger. These consequences are the result of increasing consolidation of land ownership and the concomitant concentration of control over the right and power to determine what the land will produce.

Frequently she makes the point that the era of the Green Revolution has brought about a drastic decrease in the number of subsistence agriculture operations, resulting in less food security for millions around the world. She also discusses the environmental and economic costs to Third World nations that have opted for imported machines and synthetic fertilizers and pesticides. Ms. George feels it is inappropriate for nations that are rich in human resources to choose methods of production best suited for nations like the USA that are endowed with much land but fewer people. Why, she asks, does India, which needs to maximize output per unit of farmland, use the same system of food production as the US or Canada, which attempt to maximize output per farmer? For countries like Bangladesh and the Philippines, agriculture that requires heavy inputs of expensive chemicals and machinery but utilizes few humans is a poor choice. One result of this trend has been the integration of the Third World's agricultural sector into the industrial and service sectors of their economies, making agriculture a more expensive profession and allowing more middlemen to cut into farmers' profits.

This path to development wastes not only the Third World's vast human resources, but also drains its scarce reserves of foreign exchange. While the Green Revolution yields large amounts of food at a price the poor cannot afford, it drains nations of valuable dollars and pounds, the currencies that most multinational corporations insist upon when selling agro-inputs. To earn more foreign currency, many underdeveloped nations rely heavily upon exports of cash crops. The more inputs imported, the more cash crops that the nations need to export. Cash crops

compete with food crops for land which, in a country of 850 million people like India, is being lost to pressures of population growth, desertification, and urbanization. Thus, Ms. George explains, the cycle goes.

Anyone who buys Western technology should understand that he is not just buying a product, but rather a distinct set of social relationships which have now become so embedded in the technology that they are nearly invisible. Along with the technology comes a hierarchical, authoritarian way of organizing production itself, and one which will dispense with human labour whenever feasible. Furthermore, the purchasers of technology are buying the end result of our inability in the West to create the desirable society, in spite of all our wealth. I will go even further and say that they are, in effect, buying a kind of crystallized failure — the failure of struggles of working people in the West to create full employment, a humane production process, consumption based on socially useful goods, and an unpolluted, sustainable environment in which all could live harmoniously. They are also buying, conversely, the crystallized success of the ruling elites in imposing productivity and profit as the only goals of human existence...

As a solution to the undesirable set of circumstances discussed in her book, Ms. George urges readers to do all that they can to support work in many areas: research the rich and the systems that make them richer; study complex, indigenous cropping practices that mimic nature; and encourage individuals and groups to divest themselves from this exploitive, extractive economy.

Being back in India for the fourth time in six years, I can see the problems Ms. George writes about right before my eyes. Here, the rapid dichotomization of society continues, the importation of fancy Western and Eastern goods has drained India's reserve of foreign exchange to an alarmingly low level, land ownership is becoming more concentrated, and the environment is under assault from pesticides, fertilizer run-off, machinery, and growing urbanization. One indicator of the direction that India is moving is evident at a nearby garbage dump. In just the last five years, the managers of the dump have stopped their practice of sorting compostable garbage from non-compostable. They say that the availability of chemical fertilizers has decreased the demand by farmers for compost to the point that it is no longer worth the effort required to sort.

Brooks Anderson was an intern at The Land in 1989. He wrote this while in Madurai, Tamil Nadu, India, coordinating the University of Wisconsin College Year in India program.

Prairie Peace

Natural Democracy

Jake Vail

When I started walking, the stars were shining brightly and I could see only in shades of black. Now, the sun climbing and my eyes overwhelmed by the colors of an awakened world, I lie down to rest, and to listen. Rest comes easy, but hearing the prairie requires some concentration. Slowly the sounds of a land struggling to heal itself peel away and reveal a gentle pulse. Over the hills hundreds of bison roam the prairie they know so well, eating breakfast. The sound of their massive molars grinding against the big bluestem is deafening.

Just a few human generations ago 75 million bison ranged the Great Plains; their dwelling place and source of life extended over hundreds of thousands of square miles from what we call Texas north to Manitoba, from the eastern foothills of the Rocky Mountains to Ohio and Kentucky. Here, belly to bluestem in the center of Kansas, I can feel that once-strong land — almost. Most of the bison have gone the way of their home, nearly exterminated for want of understanding and respect. Likewise prairie dogs, burrowing owls, fringed orchids, black-footed ferrets, elk, prairie chickens, Mead's milkweed... Daily it gets more difficult to sense real prairie. Eyes closed, I suck in the mingled breath of bison and bluestem and roll it on my tongue. A tumble bug crawls over my hand, confused. I smell the changes in the living soil as it darkly descends two, seven, twelve feet. Soil scientist Hans Jenny figures there is life equivalent to a dozen raging horses coursing through the soil beneath the acre the tumble bug and I mark the center of.

I realize with a start that the land is pulling me in. I am falling in love.

The ear-splitting arrogance of six military jets hurling overhead like wraiths shatters the world. A reflex as old as the prairie jerks me upright and thrusts a fist into the winds. Then, as suddenly as they appeared, the fighters are gone, silent dots above the horizon.

The U.S.-initiated war in Iraq has shaken me as much as those jet fighters shook the prairie. The war was not just a feverish move to regain "our" oil, not an effort to keep Kuwait democratic, for it wasn't, and it was not part of our energy policy, for we haven't one (except to use fossil energy as though it were unlimited). The war was a painful symptom of a failing democracy. Across the U.S. and Europe

millions of citizens demonstrated against U.S.-led aggression, in the streets and in prayer, before and after the fighting began. But our leaders chose not to hear. To them, the people are as silent as the millions of bison, for all intents extinct.

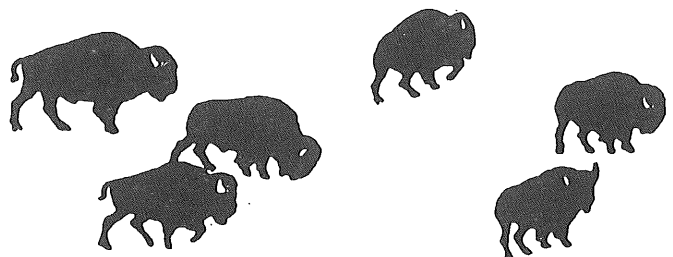
Some will point out that most Americans supported the war, and it is true that they did once President Bush's unilateral actions were underway and going well. The support came because, worried by our experience in Vietnam, we are now afraid of doing things half-fast. Moderation and deliberation were among the casualties in Southeast Asia.

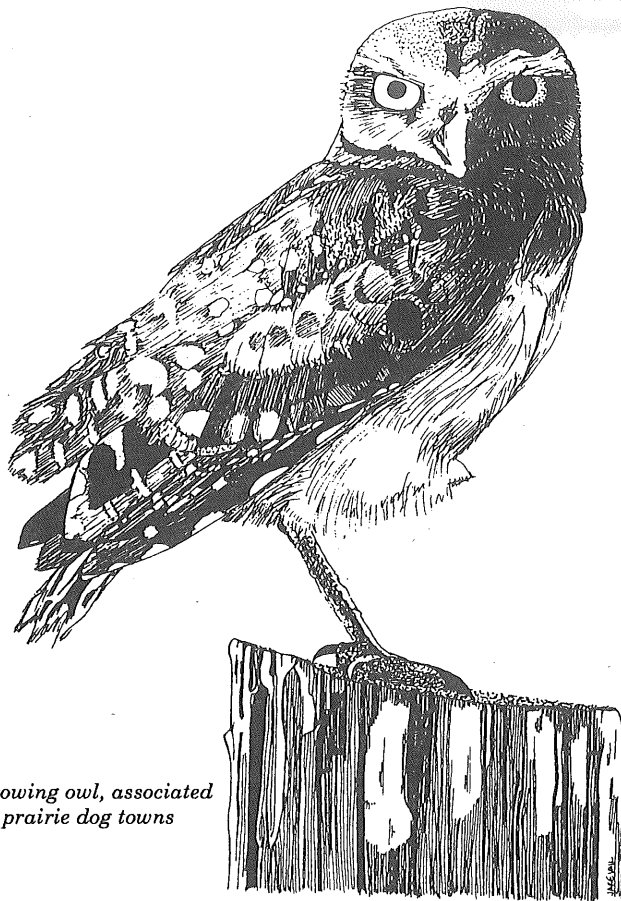
The war in Iraq was a failure of democracy, for over half of all eligible Americans do not vote. It's no wonder President Bush feels no democratic compulsions. He, like his predecessor, is a cheerleader and a manager, not a political leader or care-taker.

The conditions that promoted the prairie have led to its decline. Its once-rich soils are today depauperate, kept productive only through regular injections of petrochemical stimulants. The Great Plains feeds billions of people (and cows) instead of millions of bison, and that this is even possible is taken for granted or thought good. Neglect of the complexity and interdependence of the prairie ecosystem has led to astounding rates of soil erosion, and bleached the local genetic mosaic to a monocultural whitewash.

Similarly, the conditions that promoted the birth of a nation of the people, by the people, and for the people have led to its decline. Our once-rich ideals are today hollow, kept inflated through jargon and the stimulants peddled by Madison Avenue. That the Bill of Rights is just that, not a bill of duties or obligations, is taken for granted or thought good. Neglect of the complexity and interdependence of a real democracy has eroded its bedrock — citizen participation — and bleached the brilliant ideals of our founders to the grey thoughts of grey-suited bureaucrats.

An unfettered natural and social New World — the wild frontier — left plenty of room for centuries of irresponsible explorations. As a result, the mistrust of centralized power and wealth that fueled the





*Burrowing owl, associated
with prairie dog towns*

growth of the United States transmogrified into a virulent and imperialistic individualism. Today democracy and its freedoms are increasingly equated with capitalism and its freedoms, and as the capitalistic virtues of greed and stinginess infiltrate the democratic values of responsibility and cooperation, nature falls by the wayside. The decline of nature parallels the decline of democracy.

It would be folly to assert that the U.S. was once democratic but is no longer; it would be equally unwise to claim that we have successfully tamed a once wild land. Certainly, though, we are no closer to wilderness today than we were two hundred years ago. One might encounter more debate over the present state of democracy, for two centuries have seen the Declaration of Independence, the Emancipation Proclamation, universal suffrage, the Civil Rights Act, and many other radically democratic actions. But a spirited participatory democracy has been replaced by a watered-down and oxymoronic representative democracy.

Representative democracy has worked to the extent that it has largely because of scale: participatory democracy is difficult in a nation of 251 million people and 2.25 billion acres, even in the computer age. How can one vote make a difference? Convinced that it can't, active citizens become passive consumers, and delegate civic responsibilities to someone

they don't even know. Focused on making life better for ourselves, we ignore what we are right in the middle of and affections for community quietly fade. Ironically, our seemingly detached and independent self-maximizing quests concentrate political power and wealth in the hands of others: One percent of the U.S. population currently controls thirty-six percent of the wealth. We have come full circle, back to the inequality that citizens of the new United States thought hard and fought hard to be free from.

To break from this cycle and re-enter a more natural and democratic rhythm we would do well to heed the words of Wallace Stegner:

What freedom means is freedom to choose. What civilization means is some sense of how to choose, and among what options. If we choose badly or selfishly, we have, not always intentionally, violated the contract. On the strength of the most radical political document in human history, democracy assumes that all men are created equal and that given freedom they can learn to be better masters for themselves than any king or despot could be. But until we arrive at a land ethic that unites science, religion, and human feeling, the needs of the present and the claims of the future, Americans are constantly in danger of being what Aldo Leopold in an irritable moment called them: people remodeling the Alhambra with a bulldozer, and proud of their yardage...

If we conceive development to mean something beyond earth-moving, extraction, and denudation, America is one of the world's most undeveloped nations... As we prepare for the sixth century of our remodeling of this Alhambra, we could look forward to a better and more rewarding national life if we learned to renounce short-term profit, and practice working for the renewable health of our earth.¹

We Europeans may have once been excused for a lack of a natural democracy because we hadn't been on this continent long enough. But no longer. Now is the time to learn, to teach, to practice working for the renewable health of the earth, to unite nature and democracy, before all is unnatural and undemocratic. In so doing, we will discover many common threads; as we learn of nature we will learn again of strong, participatory democracy.

Thoreau said, "Give me a wildness no civilization can endure." Poet Gary Snyder asks more: "Imagine a civilization that wildness can endure."² The key to both thriving and resilient wildness and thriving and resilient civilization seems to be a thriving and resilient community — and part of that health and resilience is an individual's awareness of how to best fit into its community. Benjamin Barber points out that with strong communities come "possi-

bilities of transforming private into public, dependency into interdependency, conflict into cooperation, license into self-legislation, need into love, and bondage into citizenship."²³ This is true for human communities, non-human communities, and, especially, the places and times where the two interpenetrate.

The pulse of the prairie grows strong as day rolls into night. Bison lazily saunter away, silently moving back to their favorite dreaming places. Across the heavens nighthawks dive and pull sharply skyward, filling the air with ethereal buzzes. The

moon rises, and the silhouette of a red-tailed hawk perched high in a cottonwood tree becomes that of a great horned owl. Coyote, the Trickster, yips with gleeful approval, though he knows that without Owl there would be more rabbits to eat.

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The Little Bombing Range on the Prairie

Gerald Gillespie

The white man does not understand the Indian for the reason that he does not understand America. He is too far removed from its formative processes. The roots of the tree of his life have not yet grasped the rock and soil. The white man is still troubled with primitive fears; he still has in his consciousness the perils of this frontier continent, some of its vastnesses not yet having yielded to his questing footsteps and inquiring eyes. He shudders still with the memory of the loss of his forefathers upon its scorching deserts and forbidding mountain-tops. The man from Europe is still a foreigner and an alien. And he still hates the man who questioned his path across the continent... Men must be born and reborn to belong.

Chief Luther Standing Bear, 1933*

I had learned many English words and could recite part of the Ten Commandments. I knew how to sleep on a bed, pray to Jesus, comb my hair, eat with a knife and fork, and use a toilet... I had also learned that a person thinks with his head instead of his heart.

Sun Chief*

A handful of us had been sitting for nearly a half hour on the edge of the gravel road in front of the two drone missiles anchored face-down in the ground, silently praying and meditating. The two sentinels before us marked one of the entrances to the Smoky Hills Bombing (Weapons) Range situated about fifteen miles due west of The Land Institute.

My wife Mineko and I had been out to the range dozens of times in the two previous years (often with a Land intern or two as well as others from Salina and more distant parts of Kansas). Our work on global peace and justice issues had led us to examine more carefully the important local community connections to the militarism that powers much of our national mentality and behavior. We realized

that we had lived in Salina for several years, more or less oblivious to the "reality" of the bombing range. It was (and continues to be) "invisible" to the eyes of most Salinans; many have probably never seen the place. It was outside our awareness. Many people find that all right. "Out of sight, out of mind." The military, no doubt, also prefers that it be invisible. But to us, living responsibly in a place one cares about also means owning up to the discomforts and contradictions found there, making them visible, struggling with them toward some change and transformation.

We were to go back to the bombing range time and again to witness the reality we wanted changed, to resist the denial that threatens to overwhelm those who would look directly at the destructiveness of modern militarism, and to raise a greater awareness in ourselves and the community. We held vigils, organized public walks from Salina to the range, distributed leaflets, and coordinated some "tour groups."

Facing south into the sun that day, we reflected on the spectacle before us.

The Smoky Hill Bombing Range is the largest Air National Guard range in the U.S. (approximately 34,000 acres). *The Salina Journal* on February 11, 1991, reported that "nearly 25 percent of all Strategic Air Command range sorties are flown [to the bombing range]... More than 8,000 sorties are flown annually... making it the seventh busiest range in the United States and the busiest of the fifteen ranges managed by the Air National Guard." The Air Force, Air National Guard, and the Air Force Reserve meet their training requirements on the 7,000 acres reserved for year-round bombing and strafing practice. Planes from units in Kansas, South Dakota, Iowa, Missouri, Oklahoma, Nebraska, Colorado, and New Mexico regularly use the range, with units from other distant states also occasionally flying in for practice. The Kansas Army National Guard uses parts of the rest of

the extensive acreage, and farmers and ranchers lease some for grazing purposes.

As we sat there quietly praying and reflecting that day, the pregnant silence of this part of prairied Kansas called out to us like a prairie Siren to enter the gates and walk out into the grasses that waved flirtatiously on the distant rises. We sat and resisted.

Signs in front of us warned against trespassing. Signs on roads into the range warn that leaving the well-worn road tracks could put intruders "in harm's way" by unexploded ordnance. Driving out to the vigil site, we were also greeted by signs along the bombing range fence warning us to "Keep Out!" The message here is that the prairie is unfriendly and dangerous. Nature is conditioned to the human's condition, and we are at war. The mind of modern man had stopped us outside these gates.

Suddenly, a loud ta-ta-ta-ta-ta-ta-ta and a thunder of jet engines. The sound of the planes strafing painted parachute targets in the distance tore through the silence, so rapid a staccato sound that, up close, I felt the sound ripping up my midline. The roar of the planes banking overhead to make another bombing/strafing run stilled, as if with an iron curtain, the delicate song of the meadowlark and the hum of the bees and flies that just a moment ago were real to us.

This is the "normal" schizophrenic experience we have when visiting this particular piece of prairie in Kansas. The "thinking heart" here is confronted by two different sensibilities, two sets of attitudes and priorities, two different visions of reality, each in stark contrast to the other.

Just a few miles away, The Land Institute toils toward one of those visions, surprisingly also outside the consciousness of many Salinans. There, a nurturant relationship with the land weds itself to a different stream of human history. Thinking with the heart goes on.

Here, at the weapons range, the head alone sets the course. Modern man's mind is visible at the range, recycling its alienation into recursive habits of violence that have lasted for millennia.

At The Land, there is possibility and transformation; at the range, stilted vision and stasis. At one, work at healing the land is underway; at the other, seeds for new wounds to the earth are planted. One represents gatherings of light; the other, dispersions of darkness. The polarities of life forces and death forces throb at the heart of our community and across our land.

At The Land the role of the plow in "civilizing" our prairie lands receives a steady, serious critique. Practice for violence at the bombing range, however, gets little serious critique. Neither is the role of organized state violence seriously evaluated for its limitations on our human possibilities. Rather,

this nation resents a negative judgment on its growing militarism, just as it resents those who question the industrialism of agriculture. A-7s, A-10s, F-4s, F-111s, F-16s, B-52s, and B-1s pound the soil of this range with dummy bombs and bullets, amplifying the sounds of violence reverberating across human history.

When those militarist values go unquestioned, the metal war-birds overhead come to be seen as a "natural" part of the prairie ecology. Residents view the metal war raptors as having even greater claims to territory than the prairie raptors. We accept thunderous war noise to be as appropriate in the environment of the plains as are the prairie sounds and silence. The changing bird songs and the periodic flocks of cranes and geese passing overhead fail to remind us of deeper rhythms governing the land. It is all "serious business" in the service of "national security interests" that shapes the ecology of mind governing human behavior on the bombing range. Little attention is given to the changes all this brings to the prairie and to the folks that live around here.

At the bombing range the heart has little to do with the head. The cartesian split is incarnate. To travel from this view of life towards a vision such as The Land's means traversing a distance measured not in miles but rather in psychological parsecs.

But even one whose heart lives well away from these spellbinding contradictions can benefit by visiting gates of admission to places like the bombing range. Fragments of our cultural values lie there before us. We see, stripped of its disguise, the history of humanity's war against humanity as one with the human war against the earth.

The mind of man evidenced in our own Middle East policy connects directly to the values represented on the Smoky Hill Bombing Range. At this writing, the bombing of Iraqi facilities and positions continues like deathly rain — doing unknown, if not unimaginable, physical and ecological damage to that area. Kuwait oil wells blaze unchecked.

Here on the Smoky Hills Bombing Range our military practices forms of the violence that protect the short-sighted oil-based life of our communities, oblivious to the long-term consequences this value system portends. Here there is implicit praise for the "smart bombs" that give us a "quick and decisive victory." One can see this as an extension of the mind-set which praises ever-clever agricultural technology for giving us "quick victories" and "surgical strikes" over the incursions of Nature into the claims of "civilized" agricultural territory.

A truck drove up, as if to distract this private Chautauqua. I thought to myself that all serious reflections out in prairied Kansas, and certainly at the bombing range, seem to end with a pick-up truck

*Smoky Hills Bombing
Range. Aerial Photo
by Terry Evans.*



driving up.

"Who are you and what are you doing?" The voice was friendlier than I had imagined it would be. I explained, quickly condensing a very complex set of reflections, feelings, and motivations into a paragraph of sentences that barely made sense, even to me. He seemed to like what I said, though, and lingered longer to talk. Mineko and I learned that he and other Air Force personnel had just come up from Texas to walk the range in an effort to find and pick up ordnance strewn across the bombed prairie.

"We walk every darned foot of this land," he said with some pride and a great deal of exhaustion in his face.

"Do you see the prairie while you are walking on it?" I only thought to ask later. A very honest, innocent thought to me then, because I know of the many times I walk the prairie and am not really looking at it.

But those people were simply "doing a job." (The cartesian split again.) For a moment I felt a sadness for us all. I thought to myself, here at the bombing range people tread softly and carefully on the land, but with a different spirit of caring. One walks with a frame of mind steeped in a patriarchal

history of fear and suspicion, as a "foreigner and an alien." Here, the prairie is unfriendly and dangerous. Out there, the world is unfriendly and dangerous. It could all explode in our faces.

I talked some more with the man and found out that he shared many of my own reservations about the way this practiced violence would be used in other parts of the world. He was clearly impressed to find vigilers in such a lonely part of Kansas. He said he couldn't wait to get home to Texas. He was not at home on this range. The planes were coming in again.

As the pick-up was pulling away he said to us, "You should keep coming back here." I nodded. At the moment, though, a walk on "every darned foot" of The Land Institute prairie was what I needed most.

* REFERENCE: T.C. McLuhan, 1971. *Touch the Earth*, Pocket Books, NY, pp. 107-108.

Gerald Gillespie is Assistant Professor of Psychology and Coordinator of the Addictions Counseling Program at Kansas Wesleyan University in Salina, and a member of the Salina Peace Coalition.

Women and the Challenge of the Ecological Era

Dana Jackson

The environmental movement was officially launched by the Earth Day celebration on April 22, 1970. One year ago a worldwide observance of the twentieth anniversary of that first Earth Day reminded us to conserve resources, recycle, stop polluting, and protect habitats for non-human life. Yet environmental destruction continues, motivated by human greed, competition, and blind adherence to economic philosophies that consider increased domination of nature as progress. We exacerbate our war against nature when we wage war against other human beings to insure our supply of cheap oil, as in the recent Mideast conflict. We have not yet accepted the challenge of changing ourselves so that we can stop the aggression.

Meeting the challenge requires a new understanding of the human relationship to the rest of nature. We began to realize that in the 1960s, in the first stage of the ecological era. Though the word "ecology" appeared in about 1866, it did not enter popular usage for another hundred years. When it finally entered our vernacular, we started to look at the world and our participation in it differently. Now we are beginning what I consider the second stage of the ecological era.

To accept a new relationship with nature, we must at the same time change our basic psychological and cultural perception of gender. Coinciding with the ecological era has been the feminist era. Although the groundwork for modern feminism was laid in the nineteenth century, opportunities for women to develop their faculties and choose a wide variety of careers and professions were not available until this century. Women were not much more than chattel of men when they did not possess legal rights to own property or vote. As men treated women, they also treated the earth. The social structure justified the exploitation of women for men's comfort and the exploitation of all other living and non-living elements of the earth for human purposes and human comfort. The big obstacle to real transformation towards a sustainable society is still the underlying conceptual framework of Western society, a hierarchy of value that ranks men above women and ranks humans above all non-human life. As we look at the similarities between domination of women and domination of the earth, it is clear that we must

address both if we are to meet the challenge of the ecological era.

THE ECOLOGICAL ERA

In *Nature's Economy* (Anchor Press/Doubleday, 1979), Donald Worster writes that the Age of Ecology began "on the desert outside Alamogordo, New Mexico, on July 16, 1945, with a dazzling fireball of light and a swelling mushroom cloud of radioactive gasses." We had created a force capable of destroying the planet. Before Worster, in 1948, Fairfield Osborne in his book *This Plundered Planet* (Little Brown & Co., 1948) said that he had come to understand towards the end of World War II that humans were involved in another war, a war against nature. This was not the age-old literary theme of conflict with nature in which nature was a worthy opponent. Osborne and Worster both recognized that nature was now the *victim* of our aggressive actions.

We did not actually start the ecological era until this understanding became a part of general public awareness, something that happened in the mid-1960s. By the time of the first Earth Day in 1970, the thinking, reading public in this country had become acquainted with several ecological concepts and had extended them to the human experience. We could see ecological damage that humans had created; we began to understand that what we do to nature, we do to ourselves.

Rachel Carson's *Silent Spring* (Fawcett Publications, 1962), called attention to the flagrant misuse of persistent pesticides such as DDT, chlordane, and heptachlor, and to their devastating effect upon species other than insects. In the chapter called "Earth's Green Mantle," Carson explained connections between plants and animals and described the concept of the web, a metaphor popularized around the first Earth Day. Environmentalists greatly exaggerated the fragility of the web of life in developing arguments for preserving natural resources. Still, the image of a web connecting living things has been one that people could understand and explain.

Next it was carrying capacity that became widely discussed when Paul Ehrlich's book, *The Population Bomb* (Sierra Club/Ballantine, 1968) was published in 1968. The book stimulated people to ask questions like the following: How many people can the earth support? At what standard of living? By replacing what other life forms?

The idea of cycles in nature—nutrient cycles, life cycles, reproductive cycles—also entered public consciousness in the early stage of the ecological era.

This article has been adapted from a lecture prepared by Dana Jackson for the Tenth Annual E.F. Schumacher Lectures, October 1990, sponsored by the E. F. Schumacher Society.

The awakening of our minds to these and other ecological concepts led to an active grassroots environmental movement in the early 1970s and the founding of alternative organizations such as the New Alchemy Institute in 1969 and The Land Institute in 1976. The U.S. Congress passed environmental legislation to protect the air and water and established the Environmental Protection Agency (EPA) to implement it. The Arab oil embargo of 1973 increased awareness that natural resources were finite. We began to think about the fuel "cycles" of power plants, net energy balances, and experimented with conservation and renewable energy.

The ecological era continued into the 1980s, in spite of Ronald Reagan and James Watt. Three Mile Island, Bhopal, Chernobyl, Prince William Sound—these and other environmental catastrophes caused the public to increasingly acknowledge the inherent dangers of large-scale industrial technology. It became clearer that both capitalism and socialism externalized the environmental costs of industrial growth as we tried to clean up toxic waste dumps and find storage for radioactive wastes.

The relevance of ecology to farming became evident in the '80s as we studied the negative consequences of industrialized agriculture: soil loss, groundwater contamination and the demise of family farm communities. We began to realize that agriculture needed to be more in harmony with nature. In 1980, The Land Institute launched a research program based upon nature as the teacher and measure in agriculture. We set out to learn the wisdom of the prairie, a self-sustaining ecosystem which produced the soil that made Midwest corn and wheat fields productive. We continue our efforts to bring ecology and agriculture together as we attempt to develop prairie-like mixtures of perennial plants that produce seeds for people and livestock. We expect these domestic prairies to replace conventional crops on highly erodible soil and to be more dependent upon processes of nature for fertility and pest control than upon agricultural chemicals.

Beyond The Land Institute, discussion of ecology in agriculture has increased as some researchers study predator-prey relationships to control insect pests and try to better understand nutrient cycles. Funding for low-input sustainable agriculture research from the U.S. Department of Agriculture reflects the desire of farmers to change to more ecological practices and the public's growing concern about groundwater contamination and pesticide residues on food.

Now it's 1991. We are into the second stage of the ecological era. The Earth Day celebration on April 22, 1990 launched this second stage with its focus on the worldwide nature of environmental problems such as acid rain, the greenhouse effect,

and ozone depletion. The challenge of the first part of the ecological era has largely been to recognize and understand our dependence upon nature, upon ecological systems, and to realize that humans cannot continue to ruthlessly exploit the non-human world to satisfy our needs and greeds. The challenge of the second part of the Ecological Era—from 1990 on—is to transform our society so we can act on our ecological knowledge, change destructive patterns, and develop a sustainable society. If we are to do more than pick away at the symptoms of ecological disruption, we must change the conceptual framework that rationalizes human exploitation of nature. We can begin to do this by changing the framework that rationalizes exploitation of women by men.

THE FEMINIST ERA

The ecological era has been simultaneous with the feminist era. Women's perception of themselves and their opportunities changed drastically in the 1960s; the struggle to improve the status of women became widespread. My own experience and the influence of women writers and feminist activists make me see the world in an entirely different way than I once did. My daughters, my son, my daughter-in-law and the young women and men interns at The Land Institute continue to enlighten me. Though I share much with women of color and lesbians, I am aware that their experiences have been in different contexts and know that they have other opinions and proposals for change that I cannot adequately express.

Though I choose to describe the feminist era as beginning in the mid-sixties, parallel to the ecological era, the groundwork of feminist philosophy was laid by women in the nineteenth century, and feminist activism was born of the suffragettes in the early twentieth century. How much we owe to our foremothers: Sojourner Truth, Elizabeth Cady Stanton, Charlotte Perkins Gilman, Margaret Sanger and others for revealing the realities of sexist oppression. And how deprived our whole culture has been by the suppression of books such as *Woman, Church and State*, written by Matilda Joselyn Gage, first published in 1893 (reprint edition, Persephone Press, 1980).

I did not learn about these women when I was in school, nor in college. No one taught me that women abolitionists who attended the international anti-slavery convention in 1840 were forbidden to sit in the conventional hall with the delegates or even participate in the deliberations. Many women abolitionists were also among the early advocates for women's rights: they spoke against the injustice of the common law doctrine that considered wives to be chattel of husbands, that denied women the right to own property, that would not allow women to vote or hold office. When African-Americans were given the right to vote, white men still denied women—of all

racism—the same right. Why did the textbooks clearly teach the immorality of African-American slavery but not the immorality of women's oppression?

Women becoming adults in the 1950s, like me, did not question much. Textbook stereotypes, women's magazines and movies, all reinforced the belief that "women's place was in the home." This attitude kept women from competing for jobs with men who were World War II veterans, and it stimulated the consumer economy as women made a career of purchasing household goods for life in suburbia. Women who went to college and earned academic honors were not as much of a success by societal standards as those who dropped out after "catching a husband" and became adept at home decorating, dinner parties, and raising well-scrubbed children.

In one brief period when I was twenty, I read Henrik Ibsen's play *A Doll's House*, first performed in 1879, and realized the tyranny of patriarchy. I was horrified and depressed. But there was no one to talk to about my feelings. So, soon I was again absorbed by the culture, became engaged to be married, bought a copy of one of those glossy bridal magazines and a cedar chest and became a Mrs.

Betty Friedan's book *The Feminine Mystique* disturbed me when I read it in 1966; it caused me to question the helpmate role I had chosen. My mother-in-law approved of my teaching job by saying that I was earning a PHT degree, Putting-Hubby-Through (a graduate program). She expected me to again become a fulltime homemaker and stay home with our two preschool children when my husband finished his Ph.D. *I expected this of myself*. Yet my friends in the Graduate Student Wives Club and I discussed our dissatisfactions, our buried intellectual interests, and the conflicts we felt because of our belief that it was the mother's duty to be home with the children, rather than pursue her own interests.

The involvement of many women in the environmental movement has been an extension of the motherhood role. Historically, women have led reform movements which they saw related to the welfare of their home and children. From promoting spittoons in the streets of frontier towns, to prohibition of alcohol, to working for air pollution abatement and the safe disposal of hazardous or radioactive wastes, family well-being has been the impetus for action.

Friends and I arranged a "teach in" for homemakers at the Salina, Kansas, YWCA on Earth Day 1970, which then led to the organization of the Salina Consumers for a Better Environment. We lobbied grocery stores for less plastic packaging and more recyclable containers. We also set up a speakers' bureau and addressed community clubs about all the environmental issues of the day, everything from overpopulation to pesticides to declining fossil fuel

supplies. My own interest in the issues—the personal environmental crusade I took on—kept me busy for most of the next decade as a professional citizen. The challenge of learning about many new subjects so we could give speeches and lobby lawmakers eased some of the suburban homemaker dissatisfaction Betty Friedan described. While still loyally homemakers for our husbands and children, we could also spend our days working in common cause with other women environmentalists. Undoubtedly we did some good, but from another perspective, our involvement in working for the public good and our children's future sidetracked us from seeking personal fulfillment and independence.

Women became very important in local chapters of mainstream environmental organizations in the 1970s. Too often they left the leadership to men and fell into the housekeeping chores: telephoning, licking stamps, baking cookies, writing letters. This volunteer work force declined in the 1980s as more women took fulltime jobs and professionals did more of the lobbying and office work. If we are to think globally and act locally, we need to revitalize grassroots organizations. But who will do the important volunteer work?

This brings us to the challenge for the next phase of the feminist era. The women's movement to this point has affected the kind of work women do, the nature of marriage and family relationships, and especially women's aspirations and expectations for themselves. In contrast to the 1950s, women expect to find careers in business, medicine, politics, and law. But greater equity in the workplace has not transferred to equity in the home. Studies show that women do a disproportionate share of the housework, take most of the responsibility for children, and get less personal support from men than they give. Our nation has made important advances in social justice, except in our basic social unit, the home.

This inequity persists because the underlying conceptual framework for society puts men at the top. Men are considered more important than women. They pursue more important work. Men's patterns of thinking and making moral choices, of organizing ideas or work, of determining justice, of judging esthetics, have been the standards for Western culture and the Judaic Christian tradition.

These standards, expressed by industrialization, have molded the workplace in our country. Industrial values dominate: high production for profit is the bottom line, growth and competition for more growth is the major goal, bigger is better. People must work at least forty hours a week—or fifty or sixty if they are aspiring corporate executives or academics—in order to hold jobs with decent pay. We cannot ignore the fact that many women are employed outside the home not because they have

fulfilling work, but because the family needs two salaries. Men—and now women—on that treadmill cannot establish a proper relationship with their families and communities, let alone with the earth.

Women increasingly understand that working for their own release from male dominance cannot succeed unless they work to eliminate the dominance of one race over another, one age group over another. Sexism, heterosexism, ageism, racism, classism, and naturism are all the same problem. The goal is not to replace male dominance with female dominance, but to correct the problem of dominance, to get rid of the model that justifies and promotes domination.

The environmental crises we face have been the result of human domination of the natural environment. Humans have exploited non-human life forms as the "other," just as the dominant race has treated people of color as the "other," and just as men have treated women as the "other." The difference is that the consequence of our subjugating nature could be the destruction of ecosystems and the extinction of people of all races as well as many other species.

We must conclude that to live within the limits of natural ecosystems, to live in a sustainable way, will require an entirely different way of relating to each other and the earth. Rather than set up hierarchies of value, we must learn to deal with differences (gender, racial, species) by a process Riane Eisler in *The Chalice and the Blade* (Harper and Row, 1988) calls "linking" instead of "ranking." We must reestablish relationships with the natural world that will make us sensitive to the needs of the "others."

A FEMINIST ECOLOGY

We are now in the second stage of the feminist era, and the challenge is the same as that of the second stage of the Ecological Era: to change destructive patterns so that we can develop a sustainable society. In this period, we must learn from nature and from women, but we cannot learn in a system that oppresses nature and women. The first step away from this system is to elevate in importance some of the qualities and values most generally associated with women and women's work that can help us abandon our suicidal patterns. These are not innate characteristics, and they are not universally found in women, but they are identified more often with women than men, even though men express them also. Often men have been criticized for exhibiting such qualities because that identified them with the "inferior" gender. But as we face a large number of environmental threats, not the least of which is still nuclear annihilation, we desperately need new standards of human behavior. The feminization of our culture has already produced beneficial results in many workplaces, which leads one to believe that women's cultural patterns also can benefit society on

a broader scale and help restrain ecological destruction. The qualities of women's culture are described in various ways, but I've grouped them in four general categories, each of which includes a number of related traits.

First, women are expected to be nurturers. They take care of the physical and emotional needs of their families, but their strong nurturing impulse extends to all living things. They tend to place individual growth and fulfillment above abstractions about society. Women are attentive to the needs of non-human growing things, such as pets, garden flowers and vegetables, houseplants.

Second, women see the world in terms of relationships. Psychologists say that men are more likely to think of themselves as individuals who must accomplish things independently. Women tend to see themselves as wives, mothers, friends, members of groups and communities; they exhibit more of a cooperative individualism. Women empathize with others and are more adaptable and cooperative in group situations. They tend to integrate rather than separate and prefer networks to hierarchies.

Third, women have an attachment to the day-to-day process of sustaining life. They provide the food and watch over the health of family members. They do the nitty-gritty work of keeping the household in good condition. Women are used to taking care of many details at the same time and handling ambiguity.

Fourth, women have a preference for negotiation as a means of problem solving which springs from an antipathy to violence. Women tend to make moral choices based on causing the minimum of hurt, while men will tend to make moral choices based on rights and justice. Carol Gilligan points out in her book, *In a Different Voice* (Harvard Univ. Press, 1982) that women do not like to make moral decisions based on dichotomies. They prefer to look at the context of a problem and find a way out that causes the least hurt for those involved.

Why are these qualities associated with women? I think they are the consequences of the history of women's position. We've had to learn these patterns as subordinates, in some cases as techniques for survival. They are needed to take care of children and manage households, tasks traditionally relegated to women and passed on from mother to daughter. Society at large has benefited from the expression of these qualities when they help groups work harmoniously and efficiently. They balance characteristics associated with the dominant gender, such as aggressiveness, competitiveness, and the tendency to prefer large and sweeping solutions or generalizations. But these qualities of women's culture have generally been disdained, and many women have forsaken them to become "honorary men" and succeed in the

business or academic world. If gender differences are wiped out by women becoming men, then the earth will get a double whammy from human aggression.

A recent article in *Working Women* by Thomas J. Peters, one of the authors of *In Search of Excellence*, said that women are feminizing corporate offices, introducing different ways of organizing work and relating to other employees that are now being appreciated by employers. In education and medicine women's patterns also have an influence.

Does this place women in a new trap? Since women's culture could be a dose of good medicine for society, are women responsible for solving our problems? Does this mean that women must be the earthkeepers and work out the truce in the human war against nature? This sounds like women are expected to clean up after men again. But we don't want to do that anymore. We want to share the clean-up jobs as partners and equals. The organizer of Earth Day 1970, Byron Kennard, told me that he preferred to work with women because they were the "conscience of a community." But women should not carry this role alone.

For progress to be made in the new stages of the ecological era and the feminist era, men and women must cooperate. It is time for the old domination structure to crumble, time for men to share the housekeeping and earthkeeping tasks, unglamorous as they may be. Instead of women sacrificing their talents and goals to enable their husbands to succeed, it is time for husbands and wives to help each other. But partnership and sharing must be extended beyond the household. Just as more working men now share the laundry and shopping with their working wives, more men must share the tasks of community building, of earthkeeping.

What then happens to children? Who takes care of them? We will not be improving upon the cultural framework if children in the household are denied loving attention because the parents' full time work and volunteer schedules make them too busy. We need to provide different work patterns: shared jobs, combinations of part-time work, flexible working hours, and better childcare programs would enable both genders to express our nurturing natures.

Many fathers now do take care of their children. As a father in my food cooperative told me one Saturday morning, men like him are not babysitting; they are parenting. As men consider childcare a shared responsibility and are able to be with children, a pattern unfolds that benefits men and the whole society, as well as women.

If we are to accomplish anything in the second stage of the ecological era, humans must remake the relationship between nature and culture. As Ynestra King, teacher and feminist writer, said in a conference speech in June 1988, "Our hope lies in

becoming natural beings, in the deepest sense, rather than beings against nature."

SOCIAL LEARNING AND SOCIAL CHANGE

The scope of our environmental problems is enormous: we must address our excessive faith and dependence upon technology, the over-consumption and waste of resources, over-reliance on non-renewable energy, destruction of habitats, and above all, the question of how many people the earth can support. We must redefine national security and subdue costly militarism. We have so far been unsuccessful in turning around our bent to destruction, and we will not be successful until we quit believing that an increasing domination of nature is a measure of human progress.

In a book by Lester Milbrath called *Envisioning a Sustainable Society: Learning our Way Out* (State Univ. of New York, 1989), the author discusses the concept of social learning. Although social learning is impossible to define in a phrase, one can explain it by saying that social learning occurs when society comes to a sufficient understanding of something that a dominant institution or practice can be replaced by another. We are in the midst of social learning about the relationship of men and women and our human relationship with nature, but we have not reached the point where significant social change is imminent.

Milbrath suggests that our collective mind might be opening up for social learning to take place because of a "slowly accelerating cascade of unfortunate developments." More industrial accidents like those at Bhopal and Chernobyl, increased ozone depletion, cancer threats, contaminated drinking water, population growth and famines, etc., will finally convince us. As stories accumulate that show that the modern, industrial world does not work, we will finally come to our senses. Then social learning can soak in, and we have the potential for a sudden shift away from the dominant social paradigm.

David Ehrenfeld concludes "The Conservation Dilemma" in *The Arrogance of Humanism* with a similar position. "Prevailing cultural attitudes will have to change," he says, "in order for us to accept non-humanistic arguments for conservation." The change may only come by a miracle, that is (he quotes Lewis Mumford), not by "something outside the order of nature, but something occurring so infrequently and bringing about such a radical change that one cannot include it in any statistical prediction." He reassures the reader that those who have considered the non-humanistic arguments for conservation of nature will be ready to take advantage of favorable circumstances. In a broader context, those of us who have considered the advantages of a world in which patriarchy is no longer the conceptual framework and

people understand and value our linkage with the natural world, will be ready for the miracle, and we can help it happen. In the meantime, we should continue our work to effect social learning.

HOPE FOR TRANSFORMATION

Social learning is underway in many parts of our culture. I am encouraged by what I see as the integration of ecology and feminism into agriculture, religion, and the arts.

Most people begin to understand their connection to the natural world when they learn about food production. I think social learning has begun in agriculture as the adverse environmental consequences of industrial farming have become public information. The connections between heavy use of agricultural chemicals and drinking water contamination has led to a movement for stricter regulation of pesticides and groundwater protection. Consumers are concerned about food safety. Farmers themselves are looking for a way off the personally dangerous and costly input treadmill. Many have begun the transition from conventional agribusiness to sustainable farming, and others seek help in doing so.

In the grain/livestock agriculture of the Midwest, farmers such as Dick and Sharon Thompson and their fellow members of the Practical Farmers of Iowa, talk about and implement practices that will prevent soil erosion and nurture soil organisms. Unlike large-scale hog confinement operations, the Thompsons emphasize care and attention in their livestock programs. Each year, several hundred farmers attend the Thompson field days and learn about their crop rotations, and most importantly, their philosophy of working with nature. Similar learning goes on in sustainable agriculture organizations and on-farm experiments in Wisconsin, Minnesota and Nebraska.

The Land Institute goes farther than other organizations in aiming for long term sustainability in agriculture and culture. We want to develop crops that can feed us when cheap fossil fuel is no longer available. This means creating a partnership with nature in which elements of the ecosystem contribute to soil fertility and insect and disease control. Our focus on bringing ecology and agriculture together naturally embraces some of the qualities of women's culture that I mentioned. For example, our researchers must pay close attention to the growth habits and particular needs of each species and their pest species. We must think about how our crops will relate to each other and the places where they grow. Nurturing the plants where they are, rather than conquering the environment where we want them to grow, will be our emphasis. Though the mixtures of grain crops we develop will mimic the prairie of the Plains and Midwest, the ecological principles we

learn might be applicable to agroecosystems in other parts of the world.

The historical connections between food, religion and women may be revitalized as churches recognize a new role in the ecological era. While churches and synagogues in the United States mostly ignored the first Earth Day in 1970, they actively participated on April 22, 1990. From a concern about hunger and rural justice, religious leaders have long seen connections to soil and water stewardship. Now they regularly preach environmental messages from the pulpit and urge a higher ecological consciousness among their members. Jewish and Christian theologians are trying to renew a philosophy of nature and establish ethics for the human/nature relationship.

The hierarchical structure of organized religion still prevails, but some erosion of that is occurring. Ten years ago, women clergy were scarce, but now women are spiritual leaders throughout several Protestant denominations, and gender-inclusive language is found in church ritual. Books on theology by women have opened up discussions on the similarity between the domination of women and the domination of nature, and the role of church doctrine in perpetuating domination.

The arts contribute to social learning and will help us change our conceptual framework for human/earth relations. The emotional response that the arts elicit is important in social learning. Of course, the arts should not be expected to serve a particular moral vision or political position. However, artists respond to the world as they experience it, and the ecological era and feminist era have been part of their experience. I think it is significant that more works of women artists are being published and exhibited, and that ecological themes are commonly expressed by both women and men.

Terry Evans, arts associate at The Land Institute, is a photographer whose book *Prairie: Images of Ground and Sky* (Univ. of Kansas Press, 1986) has taught an esthetic understanding of prairie to many people. She is collaborating with nine other landscape photographers, four women and six men, in the "Water in the West" project, which will depict water use (much of it for agriculture) in Western states. All of the artists are interested in human use of land and water in the arid West. The project is unique in the way these artists work independently yet learn from each other as collaborators.

Simone de Beauvoir said: "Representation of the world, like the world itself, is the work of men. They describe it from their own point of view which they mistake for the absolute truth." Representation of the world, from the context of women and their propensity to nurture life may be important to our survival. We need an alternative to what Ynestra King calls the "androcentric master narrative."

THE CHALLENGE

The war in the Mideast has brought forth the worst in our culture. A false dichotomy (if we don't fight Hussein now we'll have to fight him later) took American troops to Saudia Arabia. World leaders competed on the TV stage, boasting and threatening like high school bullies. Women as well as men drugged themselves on military propaganda and patriotism, an opiate that still keeps us from acknowledging that our bombing killed tens of thousands of Iraqi men and caused untold suffering to women and children whose supplies of food, water, and energy we destroyed. Our non-civilian targets devastated sanitation and water systems, so Iraqis could die from disease, not bombs. Long term environmental damage from oil wells burning and spilling into the Gulf will plague us far into the future.

"We fought for freedom," our Marines say in television interviews. In reality, we fought to reinstate a dictatorship in one country and protect one in another. We fought to retain a hierarchy in which religion and the state endorse the oppression of women by men. We fought to protect our "rights" as U.S. citizens to consume as much oil as possible, increase global warming, and hasten the end of nature.

The values of a dominant, macho culture rule

at this time, but the seeds of change still exist within our communities, our institutions and our homes.

For seeds of change to germinate in the current climate, we may need the miracle David Ehrenfeld talked about. In the meantime, it is important to keep making the connections that will enable social learning to take place. The Mideast conflict has illustrated quite clearly that the underlying conceptual framework for society, both Western and Mideastern, will guide humanity to its demise. As long as we accept the hierarchy of value that ranks men above women, that ranks our society considerably above others, and ranks humans above all non-human life, there can be no sustainable society and no habitable planet.

The traditional qualities in women's culture, combined with ecological concepts, are needed to transform society. But this can only begin at the most basic political level, the smallest social unit, the home. Here is where effective action towards social transformation begins—with partners in households helping each other develop as individuals, as individuals in relationships with others and with the natural world. By acknowledging differences, yet caring for each other and sharing equally in the tasks of living, we undermine the old hierarchal framework that keeps us on the path of ecological destruction.

Eulah Laucks-- Peace Activist and Friend of The Land

Tom Mulhern

Eulah Laucks is a remarkable person. As a persistent advocate for world peace, she eloquently argues the need to restrain technology and recognize human limitations. However, she herself seems to regularly overcome the apparent limitations of age. At age 46, she gave birth for the first and only time. She earned her Ph.D. from the University of California at Santa Barbara when she was 68 years old. Today at 81, she directs the activities of the Laucks Foundation, she is involved with numerous civic activities, she just finished writing one book and she's working on another. The Land Institute is one of her many interests.

She met Wes Jackson about six years ago when he was on a panel at the Community Environmental Council in Santa Barbara. There have been several meetings since then, both in California and at The Land Institute in Kansas, and the two regularly exchange letters and telephone calls.

"My visits to The Land Institute have always been exciting and inspiring," she says. "That's where

I met people like Wendell Berry and Donald Worster, who have stimulated my thinking about human perspectives and limitations, and the need to live within the rhythms and rightness of the biosphere."

She sees The Land Institute as a place with a vision for the future. "The idea of looking at the prairie as a standard for agriculture is a really splendid one. We need more people with such visions." Laucks describes Wes Jackson as a "practical visionary."

The same term might well be applied to Eulah herself. With her husband Irving until his death in 1981, and by herself since then, she has worked with a gentle but persistent determination for world peace and the well-being of the earth and its inhabitants. Irving Laucks was a chemist and researcher who was named a "father" of the plywood industry by the American Plywood Association for his discoveries leading to the manufacture of cheap water-resistant plywood. However, the shock of the 1945 bombing of Hiroshima impelled him to turn all thought and effort toward endeavoring to alert people to the perils inherent in the development of nuclear weapons. This commitment led Irving and Eulah to move to Santa Barbara in 1964, where they began a long association with the Center for the Study of Democratic Institutions. In 1969, they established the

Laucks Foundation.

The Laucks Foundation is a relatively small family enterprise that is more oriented toward taking action itself than making grants to other organizations. Its stated aims are to promote world peace and equity, to try to clarify the relation between technology and human values, and to encourage environmental responsibility.

A central activity of the Laucks Foundation is the dissemination of reprints of published material that Eulah feels might contribute toward better understanding of issues affecting peace and the well-being of the earth and its inhabitants. She started this when she became President of the Laucks Foundation in 1978. For the past several years she has sent out a bimonthly mailing of reprints to 450-500 people in leadership positions—editors, educators, and so on—and to others who have simply asked to be on the list.

Eulah was born in 1909 in Gold Hill, a small mining town in Nevada that was known as "Slippery Gulch" in the winter because of the precarious state of the long wagon road that led past Gold Hill on its way down the great canyon of the Comstock Lode. Her father was a hard-rock miner, and Eulah just finished writing a book that tells the story of growing up in the mining towns of the American West. She wrote from her own memories and from interviews with each of her siblings. This past Christmas she gave the manuscript *Saucer Eyes: The Story Of Becoming* as a special gift to the members of her extended family. At their urging she's now trying to get it published.

Having finished the book describing her own first years, Eulah is now writing about her daughter Mary's early life. She kept a detailed diary of Mary's life up to age eight, and she is using this "... carefully written account of what happens to a child as she develops ..." as the basis for her next book.

Her interest in children and child development was reflected in the thesis for her 1978 Ph.D. in Interdisciplinary Studies from the University of California at Santa Barbara (UCSB). She surveyed three different graduated classes of UCSB to find out what children mean to people at different stages of their lives. Her results were published in a book by Westview Press called *The Meaning Of Children*.

Eulah has always done her writing on a typewriter, but at age 81 she is getting a computer. She did some word processing on a computer when visiting her daughter recently and was impressed with how it speeds up the editing process. When asked about friend and author Wendell Berry's well-publicized resistance to the computer and the continued use of a manual typewriter by Wes Jackson, Eulah simply says, "I don't want Wes and Wendell to be so opposed to technology that they



Eulah Laucks

refuse to use things that are helpful."

She has spent much of her life warning against the threat to peace posed by unrestrained technology. "Technology is a blessing when it is within the human capacity to handle it, but we get into trouble when technology exceeds the control of human ingenuity. There are physical limits to what we humans can *do* more so than there are limits to what we can *imagine* or *think*."

When asked about the prospects for world peace at this time of war in the Middle East, she is not optimistic. "It gets back to human limitations," she says. "If we could use nature as a model and see the limitations that nature imposes, then we could find our happiness living within those limits," she says, using some of the language of The Land Institute. However, she is not certain that people will do this, reflecting her fear that humans may instead choose self-destruction.

While this possibility has shaped her thinking for half a century, the result has not been despair but a lifetime of constructive action. "I cannot be despairing," she says, "but face what comes and find many things to be thankful for." Certainly those who know her can be thankful for Eulah Laucks.



Prairie Festival to be June 1-2

The theme for the thirteenth annual Prairie Festival at The Land this year is "The Value of Nature." Baird Callicott, Stephanie Mills, Lewis Hyde, Bryan Norton, and Dean Freudenberger are featured speakers. Storyteller Mac Parker will entertain with "Tales of Rural Life." Call The Land Institute for more details about registration.

The Land Institute Research Report on the 1990 field season will be available this summer. Order by mail for \$3.00 a copy postpaid.

Left: Sarah Williamson, Mark Saville, Teresa Jones and Tim Coppinger after an afternoon of fence building.

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- ___ Setting up a memorial fund
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