

The Land Report

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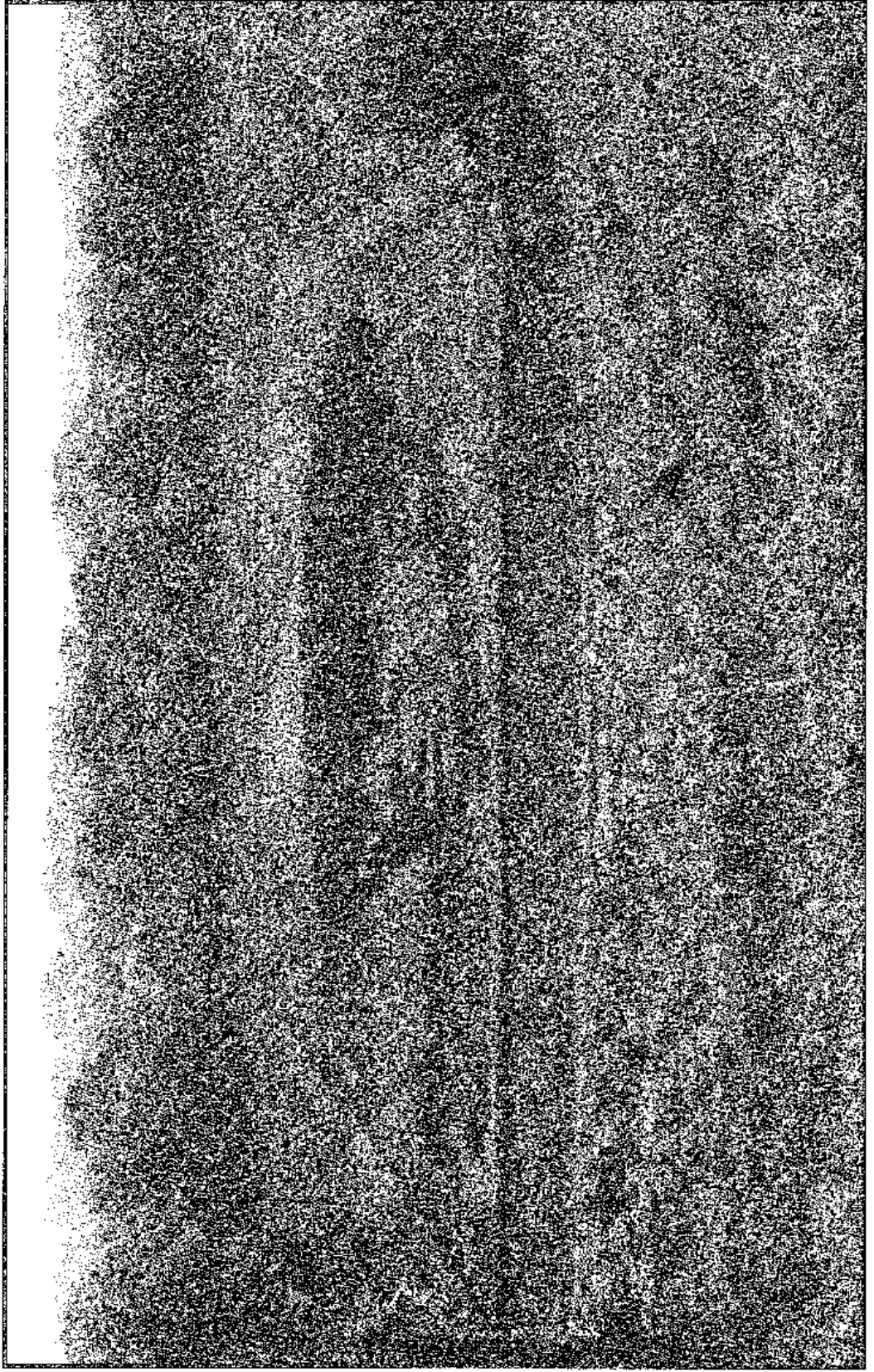


Table of Contents

ARTICLES FROM THE PRAIRIE

Aldo Leopold: Central Figure for Prairie Festival 1998
Wes Jackson 3

NEWS

From The Land Institute *Kate Worster* 4

ARTICLES

The Leopold Legacy and The Land Institute
Adam Rome 6

Agriculture in Nature's Image
Todd Dawson and Rae Fry 10

Prairie Festival 1998 *Kelley Belina* 12

Harvest Your Own *Melissa Arthur* 18

The Barn Dance *Kaelyn Stiles* 20

A Helping Hand *Terry Loecke* 21

Exploring the Prairie *Katie Goslee* 22

An Indian in Kansas *Suprabha Seshan* 25

Going with the Flow *Bernadette Jilka* 26

POETRY

Turkeys *Mary Mackey* 15

PEOPLE

The 1998 Interns 23

Natural Systems Agriculture
 Advisory Team Profiles 27

FROM THE DEPARTMENT OF ORGANIZATION

Donor Acknowledgments 29

Ways of Giving to The Land Institute 30



Marty Bender and daughter Ansley take a stroll during the 1998 Prairie Festival.

OUR MISSION STATEMENT

When people, land and community are as one, all three members prosper; when they relate not as members but as competing interests, all three are exploited.

By consulting nature as the source and measure of that membership, The Land Institute seeks to develop an agriculture that will save soil from being lost or poisoned while promoting a community life at once prosperous and enduring.

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On the front cover: Prairie Festival portrait of Aldo Leopold by crop artist Stan Herd, west of the Wauhob Prairie

Aldo Leopold: Central Figure for Prairie Festival 1998

Wes Jackson

Near sunset on Saturday, May 30, 1998, Prairie Festival visitors assembled on the hill near the Wauhob Prairie here at The Land Institute. Fifty-five feet below and some 200 to 300 yards to the northwest, a four-acre portrait of Aldo Leopold lay etched in one of our Smoky Hill River bottomland fields. Three of Leopold's surviving children — Carl, Nina and Estella — faced the audience. As the sun prepared to set, cello player Eugene Friesen brought his bow across the strings and began what proved to be a moving experience for those assembled. With portrait and music as background, the Leopold siblings read passages from their father's writings. When the concert-reading-viewing session had ended, it was quiet. Stan Herd, the crop artist responsible for the portrait, had worked diligently for weeks providing this perspective of Aldo Leopold so that it could be best viewed from the ground rather than from an airplane.

As the word went out that we were celebrating the legacy of Aldo Leopold 50 years after his death, we began to receive numerous questions which one way or another amounted to "Who is this Aldo Leopold you are featuring at the Prairie Festival this year?" I tried various answers: author of *A Sand County Almanac*, father of the conservation movement as we know it today, author of a brilliant and comprehensive statement on land ethics entitled, with deceptive simplicity, "The Land Ethic." My answers were always feeble, partly because the man's thought had been so comprehensive, partly because his life had been comprehensive as well. A typical follow-up question was "What does he have to do with sustainable agriculture or with Natural Systems Agriculture?" Again, my answer was always incomplete, partly because of the completeness of the man.

In all of my incomplete answers to a legitimate question about Leopold's relevance to agriculture, I wanted to use a term now enjoying increased usage. That term is "robust," not in the sense of a robust athlete but as a term with a formal meaning, something like a power law at work which holds for phenomena observed across a wide range, including such disciplines as ecology, economics, and physics.

Aldo Leopold was ahead of his time, ahead of the curve of those modern scientists ardently at work to discover the relatedness of the seemingly unrelated.

Leopold's insights were "robust" because he kept himself abreast of both the old and the emerging developments in ecology. He was also a student of history, society, and culture. Such a field naturalist is more than a student of predator-prey or host-parasite relationships, more than a student of trophic levels. The fact that he led an integrated life, one in which scholarship provided genuine insights, made him a minority member of the ecological academy. He recognized the *problem of agriculture* as a dilemma. It came from a realization of the implications of a reality inherent in all of nature's ecosystems, a reality at work since the early days of life on this planet. Through this special lens of his own fashioning he examined our history and fate as tillers of the soil.

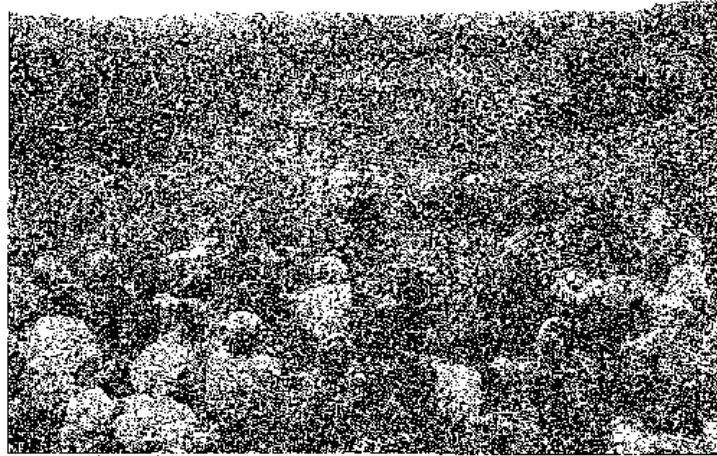
A bit about that lens and what it brings into focus. Yes, everywhere nature features nutrient cycling and energy flow, but disrupt a part of the land organism responsible for orderly cycling and flowing, and the ecosystem will lose some of its efficiency, meaning the harvest of contemporary sunlight will decline. The attempts by early agriculturists to meet specific dietary

requirements on a broad scale expanded the neolithic garden to the scale we call fields. Over time we continued to ratchet up the scale of fields even as we expanded into more of nature's lands. Leopold understood that agriculture short-circuits the way nature has worked over hundreds of millions of years of evolution.

Beyond Leopold's ecological awareness was a deep sense that the human, as sociopolitical creature, is either ignorant of, or cares little about, the discontinuity

between nature's way and the way of the agricultural human. His frustration about this reality is poorly veiled. His essay "The Land Ethic" is at once a philosophical discourse and at minimum a prototype for a moral code. It is a brilliant treatment to which little has been added since his death a half century ago. Beyond "The Land Ethic," my favorite of all his essays is "Odyssey." Here he follows an atom through the world of the Native American and then follows another atom through the world of the immigrant settler-farmer. The greatly accelerated speed of the latter tells the story of exhaustion through agriculture.

Aldo Leopold's ecological savvy turned him into a first-rate practical philosopher. We don't know if it was witting or unwitting, but his ecological insights de facto caused him to challenge some assumptions of modern science itself. More than any notable ecologist since Darwin, Leopold's mind ran against the tide of Baconian-Cartesian thinking. Bacon advocated that nature be tortured to reveal her truths. Descartes insisted that priority



With his father's portrait as a backdrop, Carl Leopold reads from Aldo's works while Eugene Friesen improvises on cello. Estella Leopold assists Mr. Friesen.

be placed on the parts over the whole. Bacon and Descartes had a 250-year running start on Darwin — a head start that has made the consequences of their thinking hard to overcome.

Darwin's ideas were not yet three decades old when Leopold was born. Eighty-nine years after *The Origin of Species*, Leopold died. In that short time, no one had internalized the evolutionary ecological world view more completely than Aldo Leopold or had moved ecology more toward becoming the discipline which would eventually challenge the world view spawned by Bacon and Descartes. Of course, agriculture was here long before Bacon and Descartes, but their scientific world view stands behind the eventual industrialization of agriculture.

A word about the intellectual climate of ecologists at the height of Leopold's career is in order. Ecologists

had flirted with the idea that much was to be gained if physics-envy could be discarded, but ecology suffered a great setback in 1935 when Tansley published a paper calling for a renewed emphasis on breaking up problems into their parts so as to put ecology "back on track." This is understandable. Soft thinking during the mechanism-versus-vitalism era had yielded a hard-won victory in the put-down of vitalism. The possibility of creeping vitalism caused ecologists to shrink back. I doubt that Leopold was a vitalist, at least of the dewy-eyed mystical stripe. But as numerous ecologists caved in, neither Leopold nor his friend Charles Elton was so easily tamed by Tansley's admonition. A good thing, too, for in the 13 years that followed, Leopold provided much of the intellectual framework certain to lead toward the eventual marriage of ecology and agriculture.

From The Land Institute . . .

Kate Worster

Natural Systems Agriculture Program

The Land Institute in the News. Several publications have recently featured The Land Institute. In an article which appeared in *Ecological Economics Bulletin* (First Quarter 1998), Jacob Gatschet explains our work in Natural Systems Agriculture and the philosophy behind it.

Wes Jackson's letter to the editor of *The Salina Journal* appeared under the title, "Hog farms a haven for mutant bacteria." In the article, Jackson points to the need to consider an evolutionary view of hog confinement. The long-term solution to the problem, he argues, involves a geographic dispersion of hogs to small, family farms.

An article entitled "Amber Waves of Granola, or How to Mimic Mother Nature" describing The Land Institute and Natural Systems Agriculture (NSA) research appeared in the July 6 issue of *Newsweek*. Author Thomas Hayden describes the ideas which inspired NSA and the research being performed at other institutions towards this effort.

Wes Jackson's article "Arches, Spandrels, and Genomic Architecture" appeared in the summer 1998 issue of *Whole Earth*, reprinted from *The Land Report* #60.

Natural Systems Agriculture Presented as Part of Lecture Series and Conferences.

In a lecture presented at Joliet Junior College in Illinois, Wes Jackson spoke about the scientific and philosophical basis for Natural Systems Agriculture. Ken Warren also spoke on the work of The Land Institute in a presentation to the Kansas Regents Honor Academy in Emporia, addressing a group of 150 of the "brightest high school students in Kansas."

Rural Community Studies

About 75 people, mainly Chase County residents, enjoyed an old-fashioned barn dance at the Matfield Green School on May 9. Bev Worster, Rural Community Studies Program Education Director, and Sue Kidd, Consortium Coordinator, organized the dance, complete with live music and caller Mike Rundle. The event was funded by a grant from the Kansas Arts Commission.

The Arts Commission grant also funded a song-writing program in April at each of the schools in the Matfield Green Consortium. Ann



Jen Fraulo visits with Dale Sharp on his farm near Fredonia, Kansas.

Zimmerman worked with students at Chase County High School, Cassoday School, and Marion Springs School in Baldwin.

Twenty-two teachers and artists from Kansas and Nebraska participated in the first Prairie and Community Studies Workshop at the Matfield Green School, June 14-18. The Land Institute and Emporia State University co-sponsored the event, entitled "Prairie, Plants, and People of the Flint Hills" (see article on p. 18).

In addition to the education program in Matfield Green, The Land Institute has begun an Ecological Community Accounting project with Robert Herendeen and Todd Wildermuth. Professor Herendeen, of the Illinois Natural History Survey, is the author of *Ecological Numeracy: Quantitative Analysis of Environmental Issues*. Todd, a student from the natural

resources and environmental sciences department at the University of Illinois, has been working with Professor Herendeen on this project since September 1997. Their goal is to develop a quantitative picture of how a community interacts with and depends on its natural systems, and to quantify the sustainability of that relationship.

Intern Program

This year's interns have traveled from south-central Nebraska to southeastern Kansas during the past three months to pursue a variety of educational experiences. In late March they journeyed to the Platte River near Kearney, Nebraska. For several days they spent sunset and sunrise viewing some of the estimated 250,000 sandhill cranes there. In the evenings the birds gather to roost on the sandbars in the Platte River, and in the mornings they leave to feed on waste grain in the surrounding corn fields.

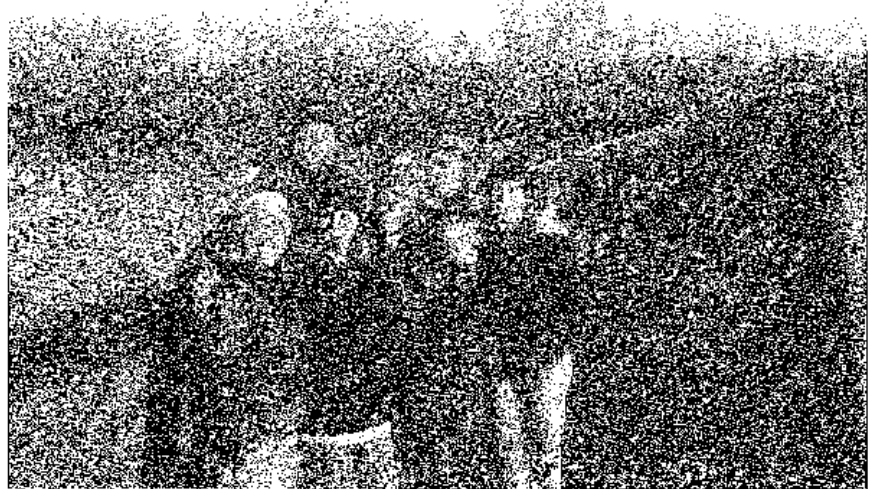
In order to see farm operations firsthand, the interns have visited a number of farms in Kansas. In April they traveled to a couple of conventional farms near Fredonia run by Dale and Alan Sharp. In May and June they visited two ranching operations. The first, near Minneapolis, Kansas, is run by former intern Kathy Collmer Scharplaz and her husband Jim Sharplaz; the second is located near Beaumont in the Flint Hills and is run by Pete Ferrell (see article on p. 22).

In June the interns toured two organic farms — the local community-supported agriculture (CSA) in Salina and the small, organic, mixed farm of David Heiens near Abilene. The CSA, Whispering Cottonwoods Farm, is owned and operated by Kirk and Diane Cusick. Kirk and his father, Jim, who together began providing organic vegetables to ten people in 1996, now have 70 subscribers. They raise a wide variety of fruits, vegetables, and herbs on their three-acre plot. David Heiens started to switch his farm over to organic practices in 1987, two years after taking over the operation from his parents. He has close to 400 acres with 60-100 free-range sows and piglets, about 40 cows and calves, and rotations of alfalfa, soybeans, wheat, milo, hairy vetch, oats, and forage sorghum. The organic soybeans he grows are exported to make tofu for restaurants in Japan. David was very encouraging to those who are interested in farming. He told the interns, "Farming is not hard work — it's fun. You just have to work with Mother Nature!"

A number of visiting scholars have spoken to the intern class this spring. Dick Levins from the Harvard School of Public Health (a featured NSA Science Advisory Team Member in *The Land Report* #60) led a class on agriculture in Cuba. Dr. Levins eloquently described how Cubans have responded to the collapse of the former Soviet Union, to the loss of agricultural subsidies, and to the long-standing U.S. trade embargo. The Cubans have responded by adopting a number of organic

farming techniques, converting beef cattle to draft animals, and increasing their level of urban gardening. Dr. Levins believes the Cubans' success is due to their whole-systems approach and their communal effort.

Dr. Levins also gave a public lecture, "The Problem of New and Resurgent Disease," at The Land Institute during his visit. About 40 individuals from the community, including several physicians, attended the event.



Kaelyn Stiles, Jeff Empfield, Kelley Belina, Courtney Smith, Terry Loecke, and Kate Worster on their crane-viewing trip to the Platte River

He explained the need to consider environmental health in the study of human health by comparing Kansas with Cuba. This public lecture served as a precursor to The Robert H. Ebert Lecture he presented in Wichita entitled "Looking at the Whole: Toward A Social Ecology of Health."

Charles Francis from the University of Nebraska visited The Land Institute on two occasions, once with several of his students to tour our research plots and to meet staff and interns, and again to speak to the intern group about land grant universities and the agricultural research being done at those institutions.

Rhonda Janke from the agronomy department at Kansas State University joined the interns to lead a class discussion on women in agriculture and science this March. Dr. Janke provided insights on her experience in a male-dominated department and elaborated on her research and interests both within and outside the university.

Don Morehead, former Director of Research at the Institute for Child Neurology at Stanford School of Medicine, spent three classes with the interns. He has just published an autobiography of his rural childhood in Montana entitled *A Short Season*, co-authored with his wife, Ann. He also writes a great deal of social commentary. Class discussion centered on his research into the origins of human evolution and culture, the nature and scale of human groupings, and the relation between culture and knowledge.

Visitors

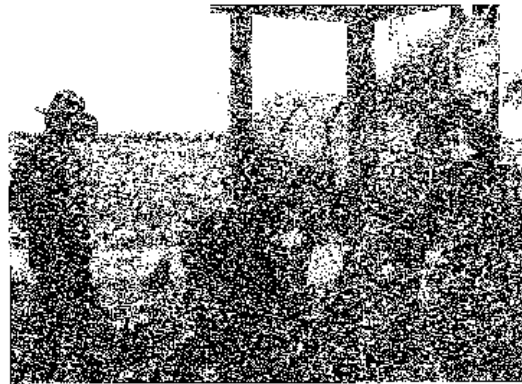
In our effort to educate people about The Land Institute, we have hosted a number of individuals and school groups these past few months. Two groups from Kansas State University visited in March. Andy Barkley from the agricultural economics department brought his economics class for a tour and discussion. Bob Hudgens in the International Agriculture Program and Professor Hans Kok in the agronomy department at K-State brought a visiting scholar, Dr. Julio Arias-Reveron, Director of the Center for Research and Development in Sustainable Agriculture at the Technical Institute of Costa Rica. They met with Marty Bender and David Van Tassel to discuss their work and the research being done here.

Ten students participating in a National Science Foundation-sponsored summer program called Research Experience for Undergraduates in Grassland Ecology at K-State visited with their professor, Dr. John Cavitt. During their visit they described their research, were given a tour of the interns' research projects, and shared a potluck lunch.

A couple of groups not only participated in tours and class discussions but also volunteered their labor. The first consisted of several University of Wisconsin undergraduate students and their professor, Ken Maly, who teaches a philosophy class on the writings of Wes Jackson and Wendell Berry. The second group, led by Elby Adamson, an ecology teacher from Clay County High School, included nine bright high school students who wanted to learn more about the research we do. Both groups worked for several hours cleaning brush and trash from the Wauhob property.

This May we were also visited by 35 University of Kansas staff on the second annual Wheatstate Whirlwind Tour, designed to introduce new faculty and staff to Kansas.

Jay Sanders, a local farrier, spent most of one day at the Sunshine Farm this June. During the farming season he visits us about every eight weeks to change the shoes on our Percheron draft horses. The interns learned about the process from forge to horse and had an opportunity to ask Mr. Sanders about the horseshoeing trade.



Farrier Jay Sanders shoes one of the Percherons while Jack Worman watches.

The Leopold Legacy and the Land Institute

Adam Rome

Adam Rome of Pennsylvania State University gave the following lecture at this year's Prairie Festival.

I am not sure when Wes Jackson first read *A Sand County Almanac* — in the early 1970s, I think. That was a critical period for Wes. In the late 1960s he had become passionately interested in environmental issues, and he soon became a pioneer in the field of environmental education. As a biology professor at Kansas Wesleyan College, he began to teach what he called his "Ain't It Awful" survey of environmental problems. He edited a pioneering environmental education textbook, *Man and the Environment*, first published in 1971. The same year, he left Kansas to found one of the nation's first environmental studies programs, at California State University in Sacramento. There, Leopold's influence first showed in Wes' work. No doubt inspired by Leopold's reflections in *A Sand County Almanac*, Wes decided to offer a course called "Toward an Ecological Ethic."

The new course marked the start of what Wes soon would call "a search for alternatives." He no longer was satisfied simply to enumerate the ways we were destroy-

ing the environment — the "Ain't It Awful" checklist of problems. He wanted to do something positive, and Leopold's classic essay "The Land Ethic" suggested a creative mission: Wes would contribute to the evolution of a new way of thinking about our relationship with the non-human world.

In 1974, after three years at Cal State-Sacramento, Wes intensified his search. He took a leave of absence from the university in order to return with his family to Salina. Here he had purchased 28 acres and built a small house, and he wanted to experiment on the land. In some obvious ways, his experiment was modeled on Henry David Thoreau's two-year stay at Walden. Like Thoreau, Wes sought to "front the essential facts" of life, to learn how to "meet the expectations of the land." Like Thoreau, Wes planned to write a book. Yet he wrote with Leopold in mind: he called his work-in-progress "Toward an Ecological Ethic."



Wes Jackson in conversation at the 1998 Prairie Festival

Though that manuscript never found a publisher, Wes offered a sketch of his ideas in a 1976 essay. From start to finish, that essay showed how deeply he had pondered Leopold's work. Here is the introduction:

Those of us who think about the need for an ecological or environmental ethic should take seriously the wise words of Aldo Leopold, who said, "nothing so important as an ethic is ever 'written.' Only the most superficial student of history supposes that Moses 'wrote' the Decalogue; it evolved in the minds of a thinking community, and Moses wrote a tentative summary of it for a 'seminar.'"

No ethic written this evening or tomorrow concerning the environment will be widely accepted. Rather it is for us, as colleagues in the "thinking community" Leopold mentioned, to do lots of hard thinking about that ethic.

The middle of the essay also drew from Leopold. As Wes considered what kinds of thinking would encourage an ecological ethic, he was drawn especially to two of Leopold's insights. First, Wes wrote, we need "to develop the point of view of the life-support system." Leopold already had pointed the way in his essay "Thinking Like a Mountain." Second, we need "to maximize our sense of organic interrelatedness both

among members of our own species and other species so that we can know and feel our rootedness in the land." Accordingly, we should plant vegetable gardens and install solar-heating systems. If we grew some of our own food and provided some of our own energy, Wes explained, we might avoid the "spiritual dangers" Leopold had described at the start of *A Sand County Almanac* — the danger of believing that breakfast comes from the grocery store, and heat, from the furnace.

In 1976, while working on that essay, Wes also was dreaming about establishing a mom-and-pop school of environmentalism. As the essay suggests, Wes defined the mission of The Land Institute in Leopoldian terms: he wanted his students to be members of Leopold's "thinking community."

Like Leopold, Wes understood that the development of a new ethic would require a kind of ecological thinking — the ability to make connections across disciplinary boundaries. The initial curriculum at The Land therefore included a remarkable range of readings. In addition to *A Sand County Almanac*, the students discussed E.F. Schumacher's rethinking of economics, *Small is Beautiful*; Robert Persig's philosophical novel, *Zen and the Art of Motorcycle Maintenance*; Amory Lovins' classic work on alternative technology, *Soft Energy Paths*; David Ehrenfeld's critique of anthropocentric thinking, *The Arrogance of Humanism*; Donald Worster's history of ecological thought, *Nature's Economy*; William Ophuis' reconsideration of political philosophy, *Ecology and the Politics of Scarcity*; and Christopher Stone's argument for granting legal rights to the non-human world, *Should*

Trees Have Standing? — and that's but a partial list.

The Land has changed a lot since 1976, but the classroom discussions still encourage the participants to think broadly about fundamental questions. Just take a look at Jeff Empfield's discussion of this year's curriculum in the Spring issue of *The Land Report*. Though the interns now give much of their attention to the challenge of remaking agriculture, the readings continue to come from a wide variety of disciplines, including ecology, literature, history, economics, and philosophy.

The Prairie Festival also is a gathering of Leopold's "thinking community." Hundreds of people come from across the country to share ideas, to celebrate, to renew a sense of purpose. In so many ways, the festival supports the essential work of evolving a new way of thinking about the land. And so today — and every day when people gather here to discuss our relationship with the non-human world — you can see one of Aldo Leopold's legacies at The Land.

The agricultural research at The Land is a second legacy from Leopold, at least in part. That may seem surprising. Few people think of Leopold as a great agricultural philosopher. Yet Leopold always was keenly interested in the future of agriculture. His concern is clear if you read Curt Meine's biography of Leopold or Susan Flader's collection of

Leopold's essays. If you look attentively, you can see signs of Leopold's keen interest in agriculture throughout *A Sand County Almanac*.

Leopold was appalled that a majority of Americans had lost touch with the nature of the countryside. "Your true modern," he wrote, "is separated from the land by many middlemen, and by innumerable physical gadgets. He has no vital relation to it; to him it is the space between cities on which crops grow." Accordingly, Leopold concluded that owning a farm was one way — perhaps the best way — to sustain what he called "an intense consciousness of land."

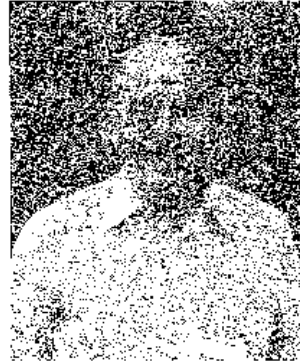
Leopold also believed that farmers might play a crucial role in the conservation movement. To be sure, he deplored the "maximum profit" mindset of the typical farmer. Yet he was convinced that a successful conservation effort would require the committed involvement of millions of private landowners, and farmers were the largest group of landowners in the country. He looked forward to a day when farmers would feel "shame in the proprietorship of a sick landscape" and "pride in the husbandry of wild plants and animals." He hoped that farmers eventually would become "proud custodians" of a variety of rich biotic communities, from marshes to dunes.

I imagine that Wes shared Leopold's hope that farmers would become conservationists, but I am sure that Wes was struck by Leopold's insights into the ecology of agriculture. Leopold supported what he called "biotic farming." He called for the introduction of "ecological concepts" into agriculture. Perhaps most importantly, he wrote often about the contrast between natural and agri-

Farmers, Leopold was suggesting, might learn to farm better by studying the workings of a natural system, the prairie.

cultural systems: in Wes' words, Leopold held up nature as a standard.

In the essay "A Prairie Birthday" — to begin with a simple example — Leopold described a lesson taught by the compass plant, *Silphium*. The common agricultural crops all had weak roots. But not *Silphium*. "*Silphium* first became a personality for me," Leopold wrote, "when I tried to dig one up to move to my farm. It was like



Three of Aldo Leopold's surviving children spoke at Prairie Festival 1998 (l to r): Nina Leopold Bradley, Carl Leopold, and Estella Leopold

digging an oak sapling. After half an hour of hot grimy labor the root was still enlarging, like a great vertical sweet potato. As far as I know, that *Silphium* root went clear through to bedrock. I got no *Silphium*, but I learned by what elaborate underground stratagems it contrives to weather the prairie droughts."

Since Leopold was writing at a time when the devastating droughts of the Dust Bowl years still lived in the minds of Americans, the lesson of the *Silphium* root obviously was relevant, and Leopold returned to the subject of roots near the end of *A Sand County Almanac*. In the essay "Wilderness," he used a prairie example to support his argument that wilderness had unappreciated value as "a laboratory for the study of land-health." Leopold noted that the ecologist J.E. Weaver had discovered "why the prairie flora is more drought-resistant than the agronomic flora which has replaced it. Weaver found that the prairie species practice 'team work' underground by distributing their root-systems to cover all levels" That meant that the native plants could use all the moisture in the soil. In contrast, "the species comprising the agronomic rotation overdraw one level and neglect another, thus building up cumulative deficits. An important agronomic principle emerged from Weaver's researches."

What a startling idea, especially at the time! Farmers, Leopold was suggesting, might learn to farm better by studying the workings of a natural system, the prairie. Leopold elaborated that suggestion in the essay "Odyssey," a poetic comparison of natural and agricultural systems. The essay tells the story of two atoms, X and Y. Though both began as parts of a limestone ledge, the two atoms joined the cycle of life at different times and in different ways: X became part of a prairie, while unlucky Y became part of a pioneer's field. Of course, their contrasting fates raised provocative questions.

But there is a more far-reaching lesson in the essay "Odyssey," a lesson fundamental to Leopold's thinking about the need for a new ethic. In "The Land Ethic" Leopold summarized the moral in a sentence: the native plants and animals "kept the energy circuit open; others may or may not." For Leopold, that meant that we should try, as much as possible, "to preserve the integrity, stability, and beauty of the biotic community." In agriculture, of course, we had done the opposite. Repeatedly, therefore, Leopold chastised farmers for forgetting the true nature of



farm fertility. Take a look at the essay "Illinois Bus Ride." Then look again at "The Land Ethic," especially at the discussion of then-new evidence about the food value of crops in the section on "land health." But perhaps the best example of Leopold's thought about fertility is in the essay "Round River."

Because the life-flow of energy depends on a complex set of interrelationships, Leopold argued in "Round River," we must acknowledge that any change we make in the land will have unexpected and perhaps unwanted consequences. We also must acknowledge the folly of trying to separate the "useful" from the "useless" in nature. "If the land mechanism as a whole is good," Leopold wrote, "then every part is good, whether we understand it or not. If the biota, in the course of eons, has built something that we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering." Again and again, Leopold concluded, we had failed "to think in terms of small cogs and wheels." To illustrate the point, he pointed to the soil:

What is the most valuable part of the prairie?

The fat black soil, the chernozem. Who built the chernozem? The black prairie was built by the prairie plants, a hundred distinctive species of grasses, herbs, and shrubs; by the prairie fungi, insects, and bacteria; by the prairie mammals and birds, all interlocked in one humming community of cooperations and competitions, one biota. This biota, through ten thousand years of living and dying, burning and growing, preying and fleeing, freezing and thawing, built that dark and bloody ground we call prairie.

In a handful of years, however, the pioneers had destroyed the biotic community responsible for the land's fertility. Their descendants also saw no need for "the native flora and fauna that built the soil." Instead, the up-to-date farmers of the 1940s depended on chemical fertilizers to sustain the yields of non-native monocultures. The result was a grave experiment. "Is fertility that comes in sacks sufficient?" Leopold asked. No one knew.

In several essays, then, Leopold questioned the nature of agriculture. He asked readers to think hard about the

critical differences between natural and agricultural systems. Decades later, Wes did just that. As he explained in *New Roots for Agriculture*, “we have yet to develop an agriculture as sustainable as the nature we destroy.”

Like Leopold, Wes was especially concerned with the problem of soil erosion. He read and reread Leopold's essay “Odyssey,” which he reprinted in the third edition of *Man and the Environment*. In the introduction to the selection, he noted that Leopold had explained the deepest cause of erosion. Of course, Wes went well beyond Leopold in proposing a solution. Leopold never argued, as Wes has since the late 1970s, for a new agriculture modeled on the prairie. But Leopold provided Wes with a solid foundation for innovative thought. That is a great, great legacy.

I see one more legacy from Leopold in the work of The Land Institute, not here in Salina, but in Matfield Green. The line of inspiration is not direct, and perhaps it does not exist at all. In fact, I have to confess that for a long time the Matfield Green project seemed to me to be the fruit of Wes' deep friendship with Wendell Berry rather than the result of a close reading of Leopold's work. As many of you know, Matfield Green is a tiny community, located in the Flint Hills, that once was a much more substantial place. The town grew to serve ranchers, not farmers, but otherwise Matfield Green exemplifies what Wendell calls “the unsettling of America.” About a decade ago, however, Wes began to think about the past and future of the town. Now, through the Rural Community Studies Program, The Land Institute is investigating what would be required to build a sustainable community in places like Matfield Green. Still, though Wes often uses the rhetoric of “unsettling” and “resetting,” the great challenge of the Rural Community Studies Program now seems to me to be more Leopoldian. I think what The Land Institute learns there will lay the groundwork for future restoration projects, broadly defined, and Leopold was a pioneer in the field of ecological restoration.

I began to think along these lines when I read more about Leopold's life in Sand County. In 1935, he bought a farm there of 80 acres. The land was terribly rundown — “sick,” Leopold thought — and he hoped to restore the place to health. As I read Leopold's descriptions of the work of restoring the Sand County farm, I thought at once of Wes' accounts in *Becoming Native to This Place* of the first years of work in Matfield Green. In the restoration work of both Leopold and Wes, I also realized, the idea of community was critical. Leopold sought to restore what he called “a biotic community.” Wes is even more ambitious: he aims to recreate a vibrant human community within a healthy ecological system. But that short summary hardly does justice to the richness of their visions.

For Leopold, “community” was the basic concept of ecology. “Ecology is the science of communities,” he once wrote, “and the ecological conscience is therefore the ethics of community life.” In the essay “Good Oak” in *A Sand County Almanac*, Leopold even wrote about fighting to maintain community. In the 1860s, he noted, “thousands died to settle the question: Is the man-man community lightly to be dismembered? They settled it, but they did not see, nor do we yet see, that the same question applies to the man-land community.” The new ethic that Leopold championed therefore began with a recognition that the land was not a commodity, but “a community to which we belong.”

For Wes, the greatest task now is to discover “to what extent human communities can be based on the way a relatively undisturbed natural ecosystem works. As we search for a less extractive and polluting economic order so that we may fit agriculture into the economy of a sustainable culture, community becomes the locus and metaphor to both agriculture and culture.” Accordingly, Wes devoted much of *Becoming Native to This Place* to a consideration of the nature of community.

But what is involved in “restoring” community? What is “restoration,” broadly defined? Restoration certainly does not mean going backward. It cannot be a form of nostalgia, a re-enactment of the past. We can't just recall some earlier time, some earlier place, and then try to copy that way of life. We can't step in the same river twice. Leopold knew that. He wrote about restoring the land community to health, and his metaphor is apt. We do not expect doctors to recreate what



The Matfield Green post office prior to its recent closing

we were in every detail before an illness. Instead, we want to be made healthy again, and health is a kind of functioning, not a moment frozen in time. Wes also knows that restoration does not mean turning back the clock. “This does not represent a call for a return to a former state,” he wrote near the end of *Becoming Native to This Place*.

“Quite the opposite. For if there is any lesson that we understand about the nature of the universe, [it is that] change is the rule. No species ever returns from extinction either, and though we may give tribute to the past by something like the restoration of the likeness of Colonial Williamsburg, Williamsburg is as extinct as the dinosaurs.”

And yet, though “restoration” rightly understood is not retrograde, the effort certainly is backward-looking, conservative. The urge to restore necessarily is tied to a deep discontent with aspects of the present. But I can be more specific. Restoration is a rejection — a very powerful and dramatic rejection — of the traditional idea of progress. The heart of any attempt at restoration is a sense of loss — a sense that, whatever we may have gained in the rush to progress, we have lost something important, something vital, perhaps even something that

we cannot live without. Again, Leopold knew that. He felt the loss of wildlife and wild places as a wound. In the preface to *A Sand County Almanac*, he directly challenged the American faith that a higher "standard of living" automatically brought "progress." In a similar way, Wes decries what he calls "the failure of success." We produce more and more, but at what cost?

To restore requires much more than to ask questions such as this, though. Restoration is more than putting up a yellow light, or a red — a warning to slow down, or a demand to stop. To make some part of the past an essential part of the present requires careful, sustained action. According to Leopold, indeed, the work of conservation involved "some art of management applied to the land by a person of perception." To conserve — and to restore — required both the skill of the specialist and the wisdom of the well-educated. In my judgment, Leopold had that combination. So does Wes, and so do those working at The Land Institute.

Agriculture in Nature's Image

Todd Dawson and Rae Fry

During the past 20 years or more, ecologists have joined agricultural scientists, farmers, and economists in search of sustainable solutions in contemporary agriculture. One ecologically-based approach, which has been scattered in the literature but only recently gained momentum, is to design agricultural systems "in nature's image," that is, to mimic the natural functions of the biota of the region in which the agricultural system is embedded.¹ In September 1997 an international workshop, "Agriculture as a Mimic of Natural Ecosystems," was held in Williams, Southwest Australia, to discuss the meaning and merits of this approach. The working premise for the discussions of this meeting was that the natural ecosystem of any region is adapted to key resource constraints and therefore provides a site-specific model for sustainability if well mimicked by agriculture.

Keynote speakers at the workshop were researchers who had deliberately attempted to mimic, in structural and functional terms, natural ecosystems as a basis for redesigning agriculture. Wes Jackson (The Land Institute, KS, USA) provided philosophical arguments for why we need this approach to agriculture, as well as his practical experience of constructing high-yield polycultures to mimic the perennial prairie which once occupied the Great Plains of the United States.² Jack Ewel (Institute of Pacific Islands Forestry, HI, USA) reported on experiments in Costa Rica, where he and co-workers used the successional regrowth that follows shifting cultivation as a template for a forest mimic; the natural structure was imitated in order to obtain its beneficial functions.³

In addition, the work of restoration requires a kind of imagination, a kind of inventiveness. As Leopold knew, the effort to restore a biotic community required a new science, and Leopold pointed the way as one of the inventors of the science of wildlife management. To try to restore what Thorcau called "an original relation to the universe," as Wes hopes to do, no doubt will require a host of new forms of thinking and doing. Like Leopold, Wes is working to invent a new science.

And so the upshot, to use Leopold's phrase: I am persuaded that Leopold's labors in Sand County and Wes' efforts in Matfield Green both derived from a great insight. The work of restoration is critical. We can't go back, but neither can we simply save a few remnants from the ceaseless "creative destruction" of our economy. If we want to live truly good lives in healthy and beautiful and enduring communities, we need to think about both conservation and restoration. Then we need to work hard, with skill and wisdom.

The workshop organizers, Ted Lefroy (CLIMA/University of Western Australia), Richard Hobbs (CSIRO Wildlife and Ecology, Western Australia), Michael O'Connor, (Curtin University, Western Australia) and John Patc (University of Western Australia) wanted to draw together a range of perspectives and experiences on mimicking natural ecosystems, but also to explore the relevance of the concept for southern Australia and develop a research agenda for that region. In southern Australia, the replacement of deep-rooted, summer-active perennial woodland and heath with shallow-rooted, winter-active annual crops has created a crisis: the rise of saline water tables threatens to wipe out large areas of farmland and remnants of native vegetation.

Chin Ong (ICRAF, Nairobi, Kenya) cautioned against a simplistic analysis of agroforestry systems. Alley-cropping has largely failed in Africa, he said, for two reasons: insufficient knowledge of where the plants extracted their resources and/or their phenological patterns of resource use, and insufficient attention to farmers' immediate economic needs.⁴ David Pannell (University of Western Australia) added to this point by outlining the broad range of social, economic, and institutional factors which influence adoption of agricultural systems.

Richard Joffe (Centre Emberger, CNRS, Montpellier, France) presented his analysis of the 800-year-old "dehesa" system of southern Spain, a sustainable system of sub-optimal production which is well adapted to the highly variable climate of that region.⁵ The dehesa is one example of a system which, though managed for harvest by humans, is sufficiently adapted to local resource constraints to be maintained over time. The importance of an historical understanding of ecosystem change was underlined by Bert Main (University of Western Australia), who asked: "How much biodiversity is enough?" In agricultural systems, "Enough for what?" is the crucial qualifier. If a mimic is to survive over time, the

key functions of the existing biota must be understood in evolutionary terms — that is, as responses to specific geological, climatic, biological, and cultural events of that region's past.⁶ "How much diversity?" then, is a question which can only be answered in context. Brian Trenbath (Agriculture West Australia) provided a mathematical approach for the design of successful mimic systems using species mixtures which complement one another for a higher combined yield.⁷

Jack Ewel discussed how successful mimic systems might look for species "complementarity" and also gave an example of a potential tree crop where the necessary functions would be adequately performed by a monoculture.⁸ In most cases, however, the "M5 rule" applied — Making Mimics Means Managing Mixtures. Meinc van Noordwijk (ICRAF, Bogor, Indonesia) added to this approach, calling for multifaceted and knowledge-based mimic designs within the "segregated-integrated" continuum that aim to find an integrated mixture with higher yielding ability.⁹

Perhaps the biggest gaps in our understanding of the differences between natural and agricultural ecosystems lie below the soil surface. Deborah Neher (University of Toledo, OH, USA) gave a picture of below-ground biological diversity and how it may change in response to different management regimes.¹⁰ Richard Stirzaker (CSIRO Environmental Mechanics, Canberra, Australia) looked at soil structure under mixed perennial cropping systems.

In most Australian ecosystems, water and nutrients are not only scarce, but spatially and temporally variable as well. The irony here is that "leakage" of water and nutrients is responsible for degradation problems like salinity and soil acidification, so a finely-tuned understanding of water and nutrient dynamics is important. John Williams (CSIRO Land and Water, Canberra, Australia), Ted Lefroy, John Pate, Richard Hobbs, Michael O'Connor, Pauline Grierson, and Mark Adams (University of Western Australia) are examining ecosystems of natural heath, woodland, and forest in southern and western Australia, where rooting structures in particular are providing some clues for the effective redesign of agriculture. Meanwhile, Todd Dawson (Cornell University, NY, USA), John Pate, and Murray Unkovich (University of Western Australia) reminded the gathering that the purpose of mimicking nature in agriculture is to mimic natural "functions," and that easy-to-apply yet powerful monitoring methods will be crucial in evaluating success in these terms. The use of stable isotopes and predictive modeling are two such methods. In fact, Tom Hatton, Frank Dunin (both from CSIRO Land and Water, Perth, Australia) and Bob Nulsen (Agriculture West

Australia) showed how insights gained from hydrologic model simulations and ecosystem-scale measurements in southern Australia have been useful in providing a comparative perspective of water uptake between cropping systems and perennial vegetative cover.¹¹

Ultimately, the demands of the species in the system must be met as much as possible from resources available within the system. John Passioura (CSIRO Plant

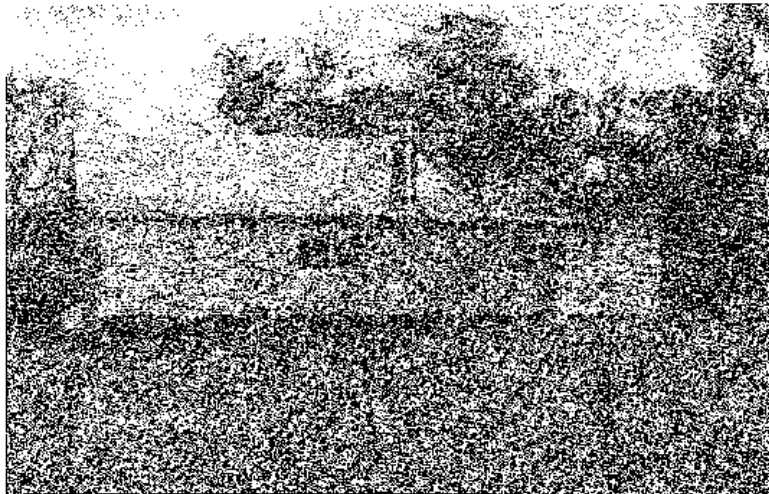
Industries, Canberra, Australia) pointed out that this is most likely to occur in perennial systems which persist in diverse mosaics where the "demands" of the plants in the mosaic closely match what the system can supply.

There will be no universal recipe for implementing successful sustainable agriculture: what works for the tropics is not likely to work for southern Australia because of different climatic, ecological, and socio-economic constraints. Some general ideas, however, did emerge from the presentations and discussions. Any mimic system designed with a view to sustainability should:

(1) be based on a scientific understanding of the functional characteristics of the main players in the model system. Ecologists, ecophysicists, soil scientists, and others can help agriculturalists identify the key functions and functional groups; sustainability will arise from successfully mimicking the "processes" through which those functional groups interact. Because "natural" systems themselves are dynamic, the native vegetation is not an ideal but a model for adaptation to the constraints of a particular landscape;

(2) mimic variability at the landscape as well as the farm scale — i.e., in a mosaic across space and time. Diversity at the farm and landscape scales can help manage nutrient and water cycles, stabilize and build the soil, and reduce "leakage" out of the system so that external inputs are minimized;

(3) be designed within an adoption framework, with clear links to the farmers who will use it. There may be long time lags between implementation and payback, so part of the mosaic should supply short-term profits for the farmer. Here, a mismatch of scales needs explicit consideration. Conventional agriculture is focused on short-term gains, with key decisions being made at the farm scale and industrial scale. Sustainability is a long-term goal that operates at different, generally larger, scales. Therefore we must identify the spatial and temporal boundaries within which the key functions of the agricultural system are to "match" the key functions of the natural system. The kinds of decisions that can be made by individuals within farm boundaries will be different from



Sheep-shearing shed in Australia, site of the international conference

those that can be made at, say, a watershed scale by some wider authority. A plan for adoption should provide a means of reconciling, in Levins' and Lewontin's words, the "boundary of consideration" and the "boundary of causation."¹²

The sustainability of mimic systems will depend on how well we work within the "natural" ecological, geological, and hydrological settings for the area under consideration. In Alexander Pope's words, we must "consult the genius of the place" to identify plant species that will provide a diversity of functional roles, accommodate environmental fluctuations, and grow well in mixtures. This meeting and the book which will come from it represent a first bold attempt to come to terms with one of the most important issues facing humanity: how to have agriculture without eroding nature.

Todd Dawson is a professor of ecology and systematics at Cornell University in Ithaca, NY. He also serves as a scientific advisor on The Land Institute's Natural Systems Agriculture Board. Rae Fry works in the Radio Science Unit of the Australian Broadcasting Corporation in Sydney, Australia.

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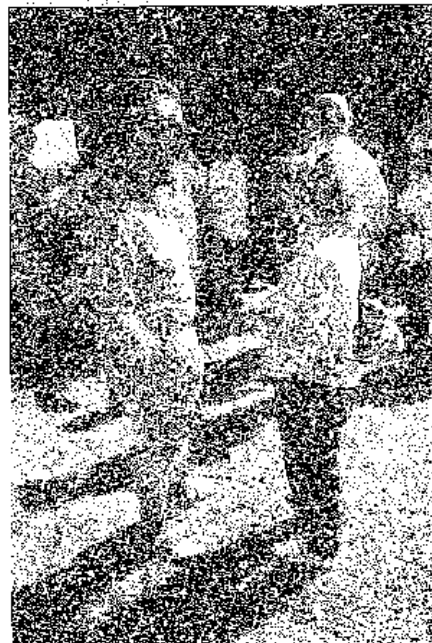
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Prairie Festival 1998

Kelley Belina

The Prairie Festival is The Land Institute's annual event of coalescence. It is a place where historians and scientists, philosophers and artists, and friends of The Land come together to blend work and share ideas. It is a time to address and reflect upon the inseparable bonds linking us to the land and to one another. In 1998 the



Angus Wright and Bev Worster chat outside the big barn.

Prairie Festival was also a celebration of Aldo Leopold, one of the great unifying thinkers of our time — a man who innovatively merged science, history, philosophy, economics, and aesthetics into an ethical synthesis regarding land. His essay "The Land Ethic" reflects the fruits of a life spent working, thinking, writing, and, most significantly, continuously moving across disciplines to examine human

land use. Leopold's exceptional ability to link ideas is directly reflected in the "wide net" cast at each Prairie Festival.

Aldo Leopold was a leading conservationist and an influential proponent of ecological thinking. He has been called "an American prophet and the single most outstanding spokesman for conservation the world has produced." Perhaps his most emblematic lines are: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." This oft-quoted excerpt from *A Sand County Almanac* is a summary of Leopold's land ethic — his call for the incorporation of land, including plant and animal life, into the human ethical system. Professionally, Leopold received a degree in forestry from Yale University and spent the bulk of his career in the U.S. Forest Service and later as chair of the game management department at the University of Wisconsin-Madison. While living in Wisconsin, Leopold purchased 80 acres in Sand County on the Wisconsin River and for the rest of his life spent weekends and holidays working with his family to restore the natural health of this previously overworked land.

Among the speakers at this year's Prairie Festival were three of Aldo Leopold's children, all renowned nat-



Melissa Arthur explains her research project on nurse crops for establishing perennial polycultures.

ural scientists in their own right. Nina Leopold Bradley, Carl Leopold, and Estella Leopold furnish a living link to their father, who increasingly has become an icon. They also provide a tangible inspiration for contemporary individuals looking to apply Leopold's ethics to their personal and professional lives. Nina Leopold Bradley, Aldo's elder daughter, currently conducts conservation work and restoration ecology at the Leopold Memorial Reserve in Wisconsin. Today the reserve consists of 1,500 acres, including the original Sand County farm, and is managed as an open space. At the festival, Nina spoke of time spent as a youngster at the farm and how her father instilled land and wilderness values into his children as they participated in restoring the landscape.

Carl Leopold, Aldo's youngest son, is a professor of plant physiology at Cornell University in Ithaca, New York, and works at ecological restoration in Costa Rica. Carl spoke of his project in Costa Rica and also about his concern over the influence of corporate interests and money on ecological research and restoration. Estella Leopold, younger daughter of Aldo, is a professor of botany and a paleoecologist at the University of Washington-Seattle. Estella spoke of Aldo's vision and its influence on applied ecology and sustainable agriculture.

Presenters also included two of Aldo Leopold's biographers: Curt Meine, a conservation biologist currently working at the International Crane Foundation in Baraboo, Wisconsin; and Susan Flader, a professor of history at the University of Missouri. Meine traced the origins of his personal interest in Leopold and spoke of the Land Ethic as a cumulation of Leopold's life, thought, writings, and questions. Meine seemed to have struck a chord with the audience as his book *Aldo Leopold: His Life and Work* (1988) sold out at the Prairie Festival Bookstore. Flader spoke on Leopold's view of environmental citizenship and discussed his usage of the



Katie Goslee explains the prairie ecosystem to children.

word "citizen" in his writings. Flader's book *Thinking Like a Mountain: Aldo Leopold and the Evolution of an Ecological Attitude to Deer, Wolves, and Forests* (1994) was used this spring in the The Land Institute's intern curriculum.

The Prairie Festival weekend featured additional speakers. Strachan Donnelley, President of the Hastings Center in New York, considered Leopold and *A Sand County Almanac* from a philosophical view and discussed Leopold's ethical individuality. Paul Johnson, former Director of the Natural Resource Conservation Service (NRCS), discussed the history and current work of the NRCS. Dennis Keeney, Director of the Leopold Center at Iowa State University, addressed the influence of Leopold's thinking on the development of The Leopold Center, and how Leopold's values apply to contemporary agriculture in Iowa.

Adam Rome of Pennsylvania State University discussed the impact of Leopold's ideas on the founding and current work of The Land Institute. Last, but by no means least, Mary Mackey of California State University-Sacramento brought an artist's touch to the festival with both amusing and sensuous readings of her poetry and fiction. She finished with some particularly vivid imagery which led Managing Director Ken Warren to comment on the suddenly rising temperature in the big barn. Festival-goers apparently approved, though, as Mackey's book *The Dear Dance of Eros* sold out quickly after her performance.

In addition to the presentations, attendees also enjoyed numerous Prairie Festival traditions: bird and prairie walks, a bonfire in the campground, a sing-along led by 1984 intern and Prairie Festival regular Ann Zimmerman, and Mike Rundle calling the barn dance Saturday night. Children's activities included crafts, music, and nature walks. And, of course, there was food — an abundant potluck dinner, a delicious catered lunch, and the Prairieland Food Co-op's refreshment stand, which rejuvenated the hungry and weary throughout the weekend. A visual feast awaited all who stopped by the art gallery, where the vibrant, colorful paintings of Frank Shaw and Mary Kay of Lindsborg, Kansas, were beautifully displayed.

Other program events were the Saturday tour of the The Land Institute's Natural Systems Agriculture (NSA) and Sunshine Farm research projects and an update on



Marty Bender discusses biofuels during the Sunshine Farm tour.

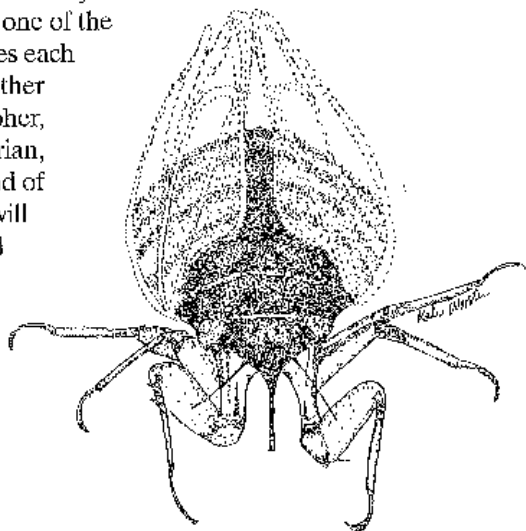
the Rural Community Studies Program based in Matfield Green. At the Sunday NSA update, Ted Lefroy from the University of Western Australia spoke on the unique agricultural situation in Australia and concerns associated with the implementation of NSA in his home country. The NSA update also gave plant biologist David Van Tassel an opportunity to express his thoughts for future research directions, and Wes Jackson the forum to present his vision of a multi-disciplinary NSA center where, in his words, "the biotechnicians must ask the ecologists if they may use the restroom." Also during this time, NSA Advisor and Harvard University



Jen Fraulo takes a break in the shade.

Professor Dick Levins made a guest appearance and spoke about the research he conducted for the Kansas Health Foundation.

All in all, the weekend went smoothly. Interns and staff took time off from their duties to hear a talk or catch a short nap under a tree. The weather was very warm, in fact the hottest Prairie Festival on record, but also dry and breezy — a relief to the numerous campers. Over 350 people attended the festival this year. For many of them, Saturday evening's performance by cellist Eugene Friesen, composer of the Grasslands Symphony, proved to be the most moving and memorable event. On the Wauhob Prairie, overlooking crop-artist Stan Herd's portrait of Aldo Leopold, Friesen played eclectic, improvisational music while Nina Leopold Bradley, Carl Leopold, and Estella Leopold read in turn from their father's writing. Later, Friesen played the Sarabande from Bach's *Fifth Cello Suite* before the hushed gathering of several hundred. In the orange glow of a Kansas sunset, this collaboration was truly unforgettable, one of the many memories each person — whether artist, philosopher, scientist, historian, intern, or friend of The Land — will take along and treasure from Prairie Festival 1998.



17-Year Cicada

Turkeys

One November
a week before Thanksgiving
the Ohio River froze
and my great uncles
put on their coats
and drove the turkeys
across the ice
to Rosiclare
where they sold them
for enough to buy
my grandmother
a Christmas doll
with blue china eyes

I like to think
of the sound of
two hundred turkey feet
running across to Illinois
on their way
to the platter,
the scrape of their nails
and my great uncles
in their homespun leggings
calling out gee and haw and git
to them as if they
were mules

I like to think of the Ohio
at that moment,
the clear cold sky
the green river sleeping
under the ice,
before the land got stopped
and the farm got sold
and the water turned the color
of whiskey
and all the uncles
lay down
and never got up again

I like to think of the world
before some genius invented
turkeys with pop-up plastic
thermometers
in their breasts,
idiot birds
with no wildness left in them,
turkeys that couldn't run the river
to save their souls.

— Mary Mackey

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Prairie Festival 1998

ALDO LEOPOLD'S LEGACY AFTER 50 YEARS



Presented by The Land Institute • Salina, Kansas • May 29-31, 1998

Quantity	Session Title	Speaker(s)
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Saturday, May 30

___	S1	The Inevitable Fusion: Aldo Leopold's Path Toward a Land Ethic	Curt Meine
___	S2.1	Reflections on Our Father and His Work	Nina Bradley, Carl Leopold, Estella Leopold
___	S2.2	Reflections on Our Father and His Work <i>(continued)</i>	Nina Bradley, Carl Leopold, Estella Leopold
___	S3	Leopold and Environmental Citizenship	Susan Flader

Sunday, May 31

___	SU1	Climbing Leopold's Mountain	Strachan Donnelley
___	SU2	The Leopold Legacy and The Land Institute	Adam Rome
___	SU3	The Earth Declares the Glory	Mary Mackey
___	SU4	Translating the Leopold Legacy to Iowa Agriculture	Dennis Keeney
___	SU5	Leopold and the Natural Resource Conservation Service	Paul Johnson
___	SU6	Natural Systems Agriculture Update	Wes Jackson, Don Worster, David Van Tassel, Ted Lefroy

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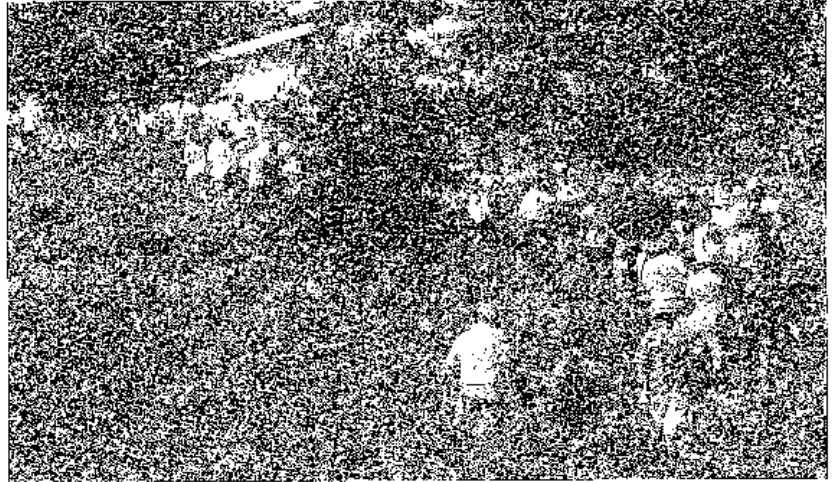
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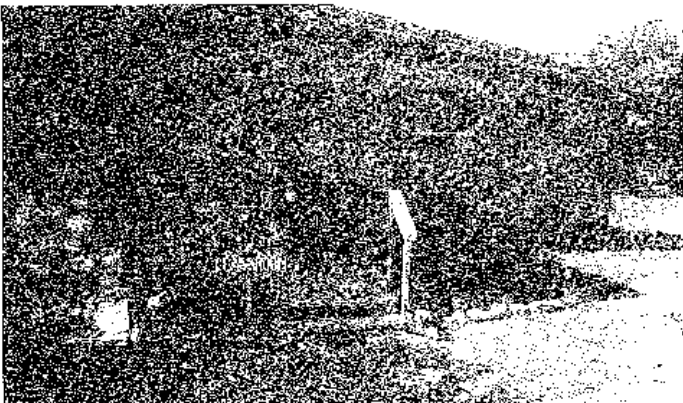
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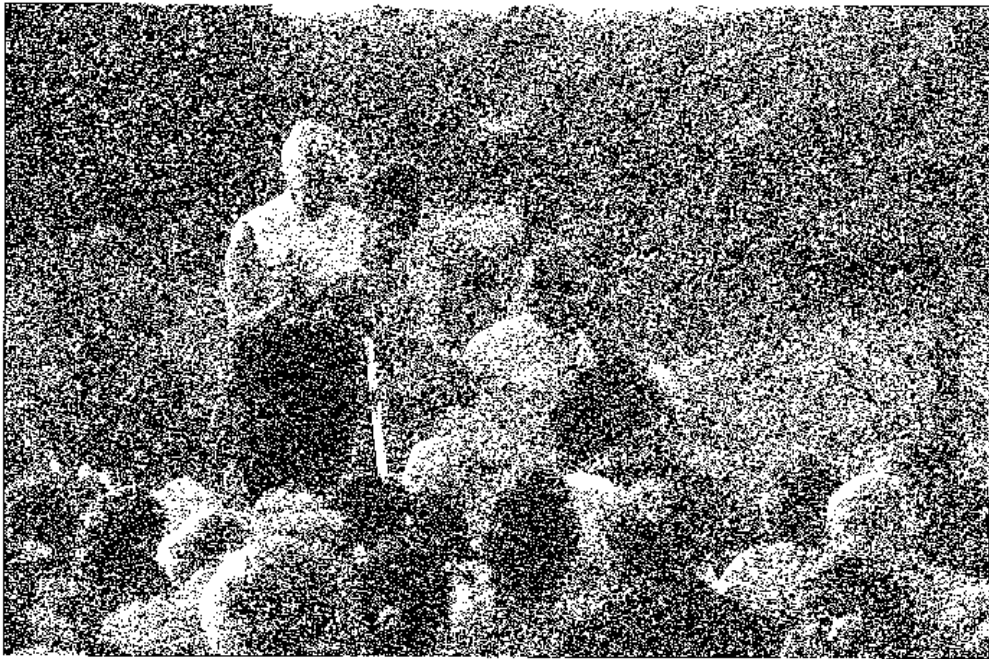


Clockwise from above: Jack Worman at the Sunshine Farm, the research tour leaves the NSA plots near the Krehbiel House office, folks pack in under the tent at the rear of the big barn to escape the heat, Kaelyn Silles leads children in a game of "the fox in the henhouse," Luke Matthews emerges from the classroom building after a snack





Clockwise from above left: young festival-goer; Claire Homitzsky explains her research project with the Texas longhorn cattle; Jim and Kathy Colliner Scharplaz and their two children chat with Jacob Gatschet; a full "big barn" at one of the talks; Emily Hunter and "Beef" Torrey; Nina Leopold Bradley, Estella Leopold, and Eugene Friesen next to the Wauhoh Prairie overlooking the Smoky Hill River



Harvest Your Own

Melissa Arthur

Sense of place was not something I had considered before leaving the Flint Hills of Kansas, where I was born and raised. When I went off to school in Washington state, I missed things about home which I had never consciously noticed. I delighted in the landscape and culture of the Northwest, yet in four years I never shook the feeling that I was just visiting. As part of an experiential program in ethnobotany at The Evergreen State College, I had the opportunity to work with Hazel Pete, master basket weaver and elder of the Chehalis tribe in western Washington.

Learning to weave baskets from Hazel inspired me to re-evaluate my sense of what it means to know where I live. Hazel knew her place, and through learning her art, I began the process of rediscovering my own awareness of home.

For hours, I watched Hazel as she wove. As the sweetgrass wound around the top of her basket, she trimmed off the tiniest bit of grass remaining at the end and carefully set it aside for later. "Don't waste any," she instructed, "this is gold." Her gold did not glitter, but it had served as food, clothing, and shelter to the indigenous people of western Washington for centuries. Resting on a wooden shelf behind her were six baskets representing the distinctive weaves of six generations. From her great-grandmother to her great-grandchild, the art is woven both through the family and to the landscapes of home. Images of mountains, bears, orcas, and — later — chickens and holy crosses document her cultural history. At 84, Hazel remembers a time when most of her material needs were harvested directly from the temperate rainforest. Today, though sweetgrass is sold in craft stores, she insists that the most important part of making a basket is harvesting your own materials. The interaction between the weaver and the source of the natural materials is essential to maintaining the cultural integrity of the art. As I gathered the sweetgrass, I began dreaming about what would shape my baskets, and some day my children's baskets. Perhaps I would weave the essence of gently rolling Flint Hills, the familiar drone of cicadas, the curving shape of a bison head. Sweetgrass was really not mine for the taking. My story would have to be woven in bluestem and cattails.

When I graduated from college and returned home to Kansas, I embarked on a process of rediscovery, interpreting my native landscape through a different lens. I was ready to leave the transient lifestyle of a college student behind and enter into a new relationship with the place I had always called home. To me, this meant not only becoming a responsible member of my community, but also extending the boundaries of community to include the ecosystem — in my case, the Flint Hills biore-

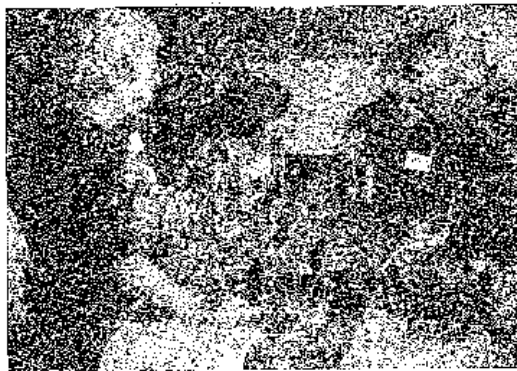
gion. While responsible citizenship was something I learned in junior high school social studies, examining the complex interactions between human and ecosystem remains a relatively abstract concept. As a native of Kansas, I have been shaped as much by the cultural and natural history of this area as I have been by the water I have drunk and the air I have breathed. I continue to be shaped by this place even as the decisions I make will shape the lives of those who come after me. When Hazel sent me out to gather materials for weaving baskets, I was interacting with and learning about the ecosystem which sustains her art, her culture, and her life. Through a recent workshop in prairie and community studies at

Matfield Green, I had the opportunity to reconnect with the landscape and culture of Kansas — to rediscover a place for myself at home.

From June 14-18 I attended "Prairies, Plants, and People of the Flint Hills," a four-day residential workshop based in the Matfield Green School and surrounding tall-grass prairie. The Land Institute and Emporia State University sponsored the workshop, which was organized by Bev Worster, Rural Community Studies Program Education Director.

The talents and hard work of the workshop staff, local naturalists, artists, and volunteers made this workshop a truly memorable event. Twenty-two Flint Hills enthusiasts, not only from Kansas but also from as far away as Virginia, participated in the program. With noses to the ground and ears to the wind, we were teachers, writers, students, and prairie lovers, drinking in the richness of the Flint Hills landscape.

The workshop explored the Flint Hills from an interdisciplinary perspective. Discussions and experiences focused on the uses of plants, prairie landscapes, and the people who have lived in the region. The workshop began with a field study introduction to prairie plants and their uses led by Professor Tom Eddy from Emporia State University's department of biology. Participants learned to identify several prairie plant species, collected specimens to press, and became more familiar with their uses in additional prairie walks later in the week. Thursday's lunch featured delicacies harvested locally and beautifully prepared by workshop participants. Wade Parsons, a naturalist and teacher at Wichita High School, further enriched our understanding of the area through talks on human habitation of the Flint Hills. On prairie walks with Wade, we envisioned how the landscape had changed through history as he led us to prehistoric chert-tool-gathering sites, Native American settlements, and the banks of Camp Creek, which Zebulon Pike crossed in 1806. After four afternoons with Professor Laurie Robbins, a fibers specialist from the department of biology at Emporia State University, I'll never take a wool sweater for granted again. A native of western Kansas, Dr. Robbins raises her own rare breeds of sheep, and spins, dyes, and weaves the wool into hand-crafted wonders. Her "fiber fever"



Pressing flowers at the Flint Hills workshop

proved to be contagious as she patiently guided workshop participants through all the stages of weaving with wool. Each of us took home a woven bag, dyed by hand with prairie walnut, wild blue indigo, and osage orange, as well as a wealth of historical and cultural information about fibers and weaving. Each evening featured local entertainment and a delicious, home-cooked meal prepared by the workshop staff and volunteers.

Activities such as preparing native wild-plant foods and medicines or dyeing wool with colors derived from the prairie enrich our understanding of the natural and cultural heritage of the region. The process of following a native raw material from harvest through processing to human use has changed my appreciation of the land from an abstract aesthetic or roadside appreciation to a stronger sense of how humans have been and still can be intricately connected with their surroundings. I'm convinced there is not a history book anywhere that could give me a better understanding of preindustrial clothing production than the first 10 minutes I spent hand-spinning with Laurie Robbins. The kind of understanding that comes from place-based, experiential education can connect us to the way things used to be while engaging us to creatively re-evaluate and celebrate the ways in which the landscape shapes our lives today. It also invites consideration of how humans shape the landscape and so may



Delbert Armstrong leads a workshop tour through Matfield Green.

even inform our land management decisions. For example, I am not likely to take for granted a plant which I have used for medicine. I have not only appreciated its beauty, but

have dug it from the ground, smelled it, tasted it, often replanted it, and been healed by it. In return I would strive to preserve its habitat. As the sun went down in Matfield Green on our first balmy June evening together, I sat on the wooden floor of the old schoolhouse among new friends. The first day of the workshop was winding down. "Rocking Chair Tour With Crystal Deering" and "Walking Tour with Delbert Armstrong" were the evening's programs. With a full belly and a mind tired from the day's activities, I was gently captivated by the sound of Crystal's voice; the accent with which she spoke was my own. From her rocking chair, Crystal took us on a journey through space and time around the town she has inhabited for almost 80 years. Her face lit up as she vividly recounted the heyday of local businesses and told stories of the families who ran them. From the post office to the livery stable, from the lost little boy who was found sleeping in a bucket of nails at the hardware store to pranks pulled on the neighbor lady, Crystal knows the story of her place. While these

stories of Matfield Green now exist only in the memories of town elders like Crystal and Delbert, in their eyes are expressed a thousand reasons why Matfield Green remains a place they are proud to call home.

Throughout the workshop, participants shared ways they have interpreted the Flint Hills. Informal group discussions ranged from childhood memories of the prairie to recipes for cooking wild plums and from ecologically responsible ways to harvest wildflowers to school lesson plans. While some took back pressed plant specimens or a belly full of cattails, others discovered new ways of interpreting the landscape and perhaps gained a little bit of wildness, renewed childish wonder, or a deeper sense of place. As the caravan wound up and around the dusty gravel road to the top of the grassy hill where we looked for arrowheads with Wade Parsons, I listened to teachers from a small, rural school district exchange ideas about how they might bring information about prairie plant uses to their classrooms. They had struggled to preserve a patch of native prairie for an experiential education program at their school. They were thrilled to have found new words to describe to the school groundskeepers that the space is not overrun with "weeds" but rather is thriving with useful, interesting wildflowers, medicines, and foods. As we stepped out of our cars and looked out over the vast, verdant landscape, spirits lifted. A woman from Kansas City exclaimed, "So many times I've driven along the interstate and just wanted to be up here. Now I'm here. This is why I came!" As I looked around, the faces in the group expressed joy, freedom, intrigue, and the wonder that can only come from experiencing a wild landscape. The workshop had given us the time, the tools, and the permission to reconnect with our homeland and rediscover all the reasons why Kansas is a place worth loving, celebrating, and protecting.

As I spent time walking the prairie, I recaptured my own awareness of home. Here, I don't have to look at the calendar to know when autumn has settled in — I can smell it in the first crisp, cool breeze. From the blooming of the prairie blue-eyed grass in March to the cardinal flower blossoms in October, my prairie walks are visits with old familiar friends. The ecologist in me wishes I could name them all, yet to ask for a formal introduction is for new acquaintances. I wonder by what name did my pioneer ancestors call this plant. What was its relationship with the Osage or the Kaw? As the fireflies lit up the night sky, they transformed the darkness into the flashing green wonderland of my childhood. I remembered feeling the cool grass under my bare feet disappear as I leapt into the thick, humid summer air time after time, just to watch the green light flicker through my tiny fingers for a moment before letting it go. These days it is all too easy for the landscape to become a faint backdrop as I scurry about my adult life. I have to try harder now, leap higher, and hold on tighter to experience the wonder of childhood, but mostly I just have to take the time — time to look, to smell, to hear, to notice. With dreams for the future washed in wild blue indigo, osage orange, and deep brown walnut, I begin weaving my story in bluestem and cattails.

The Barn Dance

Kaelyn Stiles

A reflection on the internship at The Land Institute by Kaelyn Stiles, one of the eight 1998 interns.

I could hear the music long before I saw the band. I could taste the hot sweat and smell the big barn — sweet cane and sorghum, cobwebs, mold, gasoline, and dusty beams. I rounded the corner and tentatively peered through the darkness into the brightly lit dance floor. The dancers were spastic but lively, inspired despite a grueling day of dry heat and long talks. Their happy bodies trotted awkwardly across the dusty barn in staggered synchronicity. Their faces shone with enthusiasm.

I sat down with the rest of the interns, sprawled out across the hard metal bleachers, watching the dancers with blank stares. This was the culmination, the climax of Prairie Festival activity, the peak of exhaustion. We sat quietly in our fluorescent orange staff shirts and tried desperately to forget the long hot days of mowing that had preceded this event, the stress and chaos that ensued from inviting hundreds of guests to our intimate and weedy world. There were no signs of the emotional frenzy that preceded Prairie Festival, just tired bodies, ready to join in the dance.

The caller sang out instructions in a pleasant voice, a voice that everyone was content to obey. We shyly shuffled onto the dance floor. The band began to play, and our lines made waves through the still air. I started to relax. I noticed that the people around me were genuinely excited, happy to be walking, jumping, running, and bouncing together. My own enthusiasm was a bit strained. I was worn out from talking with so many people and confused by their exuberance. Our guests were thrilled by the Prairie Festival, but they had only been here for 24 hours. Did they really understand The Land Institute?

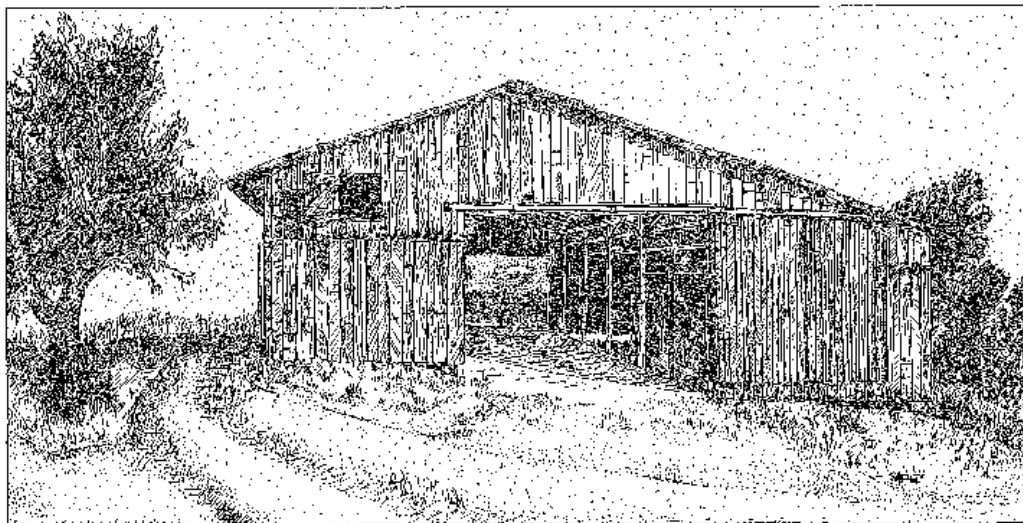
I began to reflect on the past few months. I remembered how I came to be at The Land Institute, in the big barn, dancing with strangers, united in a loosely defined but extremely emotional crusade. I didn't know very much about the internship in February when I first set out in my Buick Park Avenue to drive from New Jersey to Kansas. During that trip, I watched the landscape pour out in front of me and close in behind. I was an observer. I appreciated the beauty of the rolling hills, deep gorges, homesteads, and rangelands, but I was not invested in them. The other interns converged similarly on Kansas, the geographical center of the

United States. We came from California, Iowa, Ohio, Minnesota, Connecticut, New Jersey, and Kansas, all of us little-prepared for the adventure and education we were about to embrace.

Since then, we've settled into our routines at The Land Institute. We divide our days between chores, class, and research. We invent our own problems, questions, thrills, and agony — eight complicated minds with different pasts and sometimes conflicting goals. We were driven together by The Land Institute's message — a message that can be inspiring, cliché, dull, repetitive, groundbreaking, and emotional. Our mental activities are balanced by physical rewards and exhaustion. We weed, mow, clean, drive tractors, build walls, feed animals, plant flowers, and paint — all in the name of Natural Systems Agriculture and the Sunshine Farm.

My mind momentarily stopped wandering and returned to the dance. Our steps sounded deliberate, heavier, and more aggressive. My grip became stronger, and my thoughts progressed similarly. I came to The Land Institute because I wanted both an academic and a practical experience. I wanted to discuss current agricultural policy, economic development and sustainability, environmental philosophy, sustainable agriculture, and the impact of globalization on communities.

I considered the difficult lessons that I have learned at The Land Institute so far — lessons that are intimately connected to larger political themes but also devastatingly personal. As interns, we are searching for direction in our lives while dealing with these larger issues. We are questioning ourselves, our families, our role models, and the basic assumptions of our society. Even at The Land



Kaelyn Stiles

Institute we are influenced by the competitiveness and violence that we see in the media. We are not spared from the power dynamics that plague capitalism. We are fighting against the mold, the dominant paradigm, and stepping beyond sustainable agriculture. We are challenging each other, and questioning Walmart, Coca-Cola, and the imported coffee that opens our office on cold February mornings.

The dance quickened. I smiled at the other interns as we passed each other in the chain. I laughed wildly with

them. Our frustrations were diffused by the rows of people standing between us and so were no longer ours alone. Our guests were not blind to the mowing we had done or to our other preparations for Prairie Festival; neither were they blind to the disagreements or losses of inspiration along the way. All of them had similar frustrations in their daily work. Perhaps their distance from The Land Institute enabled them to see its possibilities clearly.

Their enthusiasm was genuine. They understood, and their perspective helped us understand.

The air in the barn became electric. The dancers moved closer together. The spinning became wild, loose, and free. I was thrown from partner to partner. I drank in their enthusiasm. I embraced the dance, and I was happy. And suddenly, without warning, I was swept back to my first days in

Kansas, to the sweet early mornings, to my open-armed embrace of the light blue sky. My spirits were cradled by the wind and lifted higher by the infinite horizon.

I was spinning in place and watching people fly all around me, grateful for their energy and passively delighting in it, sliding through slippery palms and wild faces. We spiraled towards the loft, held down only by the roof, defying gravity. The three tiers of the barn became inconsequential. I wove from one partner to another, first left, then right. Each dancer was new and exciting; each turn, a surprise. Occasionally I caught my partner's eyes and in them, saw hope.

Abruptly the music stopped . . .

. . . We spent the next day cleaning the grounds. We worked together to hang the barn doors back on their hinges. We were disappointed and yet somehow relieved to close in the dancers and return to our routine, to leave them to their spinning and twirling, cut off from our clumsy bodies. Such passion does not surface every day. It blooms and withers quickly in the hot sun. But it survives and will return.

Thank you for coming to the Prairie Festival; for motivating us to find and rethink our excitement, commitment, and inspiration; for motivating yourselves; and, of course, for dancing.

A Helping Hand

Terry Loeche

For the fifth year now the Leighty Foundation is supporting The Land Institute with a contribution equal to the full annual stipend for one intern. This year I am the intern sponsored by the Leighty Foundation, and I was chosen largely because of my roots — I grew up in Iowa only 45 miles from where the foundation was established.

The Leighty Foundation is dedicated to the wise allocation of human, financial, and natural resources. More specifically, the foundation partners with organizations that seek to deal with today's problems and opportunities in ways which meet current needs without compromising the ability of future generations to meet their needs.

During the 1998 Prairie Festival I had the pleasure of meeting Bill Leighty and his wife, Nancy Waterman. Bill is a board member of the Leighty Foundation and the son of the entrepreneur whose contributions established the foundation in 1985. Currently affiliated with Alaska Applied Sciences, Inc., Bill has long been interested in sustainable sources of energy. Bill also spoke on global energy at the 1997 Prairie Festival. Nancy's interest in the intern program stems in part from her own agricultural background. Having grown up on a dairy farm in New York state, she is happy to know

that we interns — many of whom have little if any farm background — are given a broad range of farming experiences.

My conversations with Nancy and Bill over lunch on Sunday at the Prairie Festival touched on why and how they became involved with The Land Institute's Intern Program. They told me the story of how they met near Juneau, Alaska, after Bill had moved there from Iowa to begin a shore lunch business and after Nancy had relocated there from New York. They also related how their personal experiences and those of their two sons have awakened in them a desire to help young people search for their life's work, and how their previous sponsorship of another young person inspired them to support a Land Institute intern.

In the past five years Bill and Nancy have corresponded with "their intern" during his or her internship and in the following years as well. This correspondence, mostly in the form of letter-writing, is a dialog of whatever interests either party. I can only imagine some of the stories that have evolved over the years, especially if my intern experiences thus far have not been atypical!

I was particularly fortunate to have met Bill and Nancy at this year's Prairie Festival (the first one for Nancy), and I feel that our correspondence will be made easier and more personal as a result. In fact, after I finish this article for *The Land Report*, I plan to write Nancy and Bill about how the Prairie Festival has renewed my spirit thanks to the people I met, the conversations I had, and the talks I heard.



Exploring the Prairie

Katie Gostee

For many of this year's interns, having moved to Kansas from New Jersey, California, Connecticut, and Ohio, the landscape of the prairie is unfamiliar. The wide open spaces and pervasive agricultural lands provide a contrast to the mixed forests and urban areas of our former surroundings. In order to study a system of agriculture modeled on the prairie, we must familiarize ourselves with the prairie; exploring ideas of "becoming native" to a place requires us to gain an understanding of our surrounding towns, topography, flora, and fauna. There is a great deal to learn even for those of us who are familiar with the Great Plains from having grown up in Iowa, Kansas, and Minnesota.

As a way of acquainting ourselves with the landscape and ideas of the Great Plains, part of the intern curriculum includes field trips to various types of farms and natural history sites throughout Kansas and Nebraska. Three of the trips have allowed us to gain an understanding of the degradation of grasslands and the management efforts concerning the small amount of remaining grasslands. These trips were to Kansas State University's Konza Prairie outside of Manhattan, Kansas; to Jim and Kathy Collmer

Scharplaz's ranch near Minneapolis, Kansas; and to Pete Ferrell's ranch near Beaumont, Kansas. In varying ways and with different incentives, these three management styles are exploring ways to maintain the health and integrity of the prairie ecosystem.

Lloyd Hulbert founded the Konza Prairie in 1971 in order to observe and research prairie ecosystems. Depending on the source, it is estimated that less than one to two percent of the original tallgrass prairie in the United States remains. The Flint Hills of Kansas contain the largest continuous acreage of never-plowed tallgrass prairie because so much of it is in pasture for cattle. The Konza, however, represents one of the largest areas of native prairie which is not grazed for production and which exists in a relatively pristine condition. With the exception of nine miles of trails, which gave us a wonder-

ful opportunity to see New Jersey tea, western slender glass lizard, chinkapin oak, aromatic sumac, and many other plants and animals, the Konza Prairie is closed to the public in order to maintain the most favorable research conditions.

The research consists of various management techniques aimed at simulating the effects of the grazing and fires which occurred before European settlers, largely as a result of native bison herds and lightning strikes. The Konza is divided into two main areas for management: a 2,400-acre area grazed by a managed buffalo herd, and a 6,200-acre area where the research focuses on various burning regimes. The area subject to burning is divided into watersheds, each of which is treated according to a specified schedule. The watersheds are burned at different frequencies — ranging from yearly burns to one burn every 20 years — and at different times of the year. The areas that are burned annually have produced the greatest grass yields in terms of biomass, while those that are burned every four years have had the highest species diversity. Interestingly, these latter findings reflect the "wisdom" of the burn frequency before European settlement, which occurred every 3-5 years on average.

The Konza is managed for research purposes and conservation of the prairie ecosystem and provides a control for prairie management. In contrast, ranching, which occupies considerable acreage on the Great Plains, generally focuses on the economic concerns of cattle production.

Nevertheless, both the

Scharplaz and the Ferrell ranches manage to combine productivity with the health of the land, although they do so in different ways.

The Scharplaz ranch is a second-generation ranch consisting of 3,000 acres of mixed-grass prairie. It contains both plowed and never-plowed areas. Jim Scharplaz and Kathy Collmer Scharplaz manage multiple herds of cattle on the traditional ratio of 10 acres per cow/calf pair. As much as they are able, they direct-market the beef and avoid using chemicals. (On animals that they will eventually send away to a feedlot for finishing, they use antibiotics when needed, but still avoid hormones.) In addition to these measures, Jim and Kathy keep a close eye on their land to monitor restoration of the prairie. In the mid-1950s Jim's father was part of a government-subsidized program to help restore the native prairie in plowed



Interns at Pete Ferrell's ranch note the differences between his rotationally grazed land (left) and a conventionally managed pasture (right).

areas. Under this program, which was designed to respond to a wheat glut, Jim's father planted what are called the "big five" grasses: big bluestem, little bluestem, switchgrass, Indiangrass, and sideoats gramma. Still, the cattle prefer to graze on the never-plowed areas, which continue to have higher levels of species diversity. Some of the herds are rotated through four pastures, and some part of the ranch is burned nearly every year. For the most part, however, Jim and Kathy are simply letting the prairie processes work for themselves, with the help of the cattle. In their view, it will never be possible to replicate these processes, so the best approach is to hope that the land will restore itself and be healthier with less intervention.

Pete Ferrell has designed his ranch management techniques to address economic needs, the ecology of the land, and range management — in that order. In fact, Pete believes that if it were possible economically, ecology should be the first priority. He further believes that if economics and ecology are handled properly, range management usually falls into place. In its management scheme, the Ferrell ranch employs time-controlled or pulse grazing — rotating herds of yearlings or cow/calf pairs through temporary paddocks every one to three days depending on the conditions of the land. At any given time more land remains ungrazed than grazed, and each piece of land is allowed to rest more than it is grazed in any given season. The cattle are essentially forced to graze evenly on all species, while they are kept away from plants too young to withstand grazing. According to Pete's description, such plants are in phase one of their life cycle, during which time they should never be grazed. (This phase also describes the state of a more mature plant after it has been grazed.) Phase two is when the plants are mature enough for grazing. In this phase they are perfect for grazing because they contain the nutritional elements cattle need and because they are developed enough to survive after grazing. At phase three, a plant has begun to develop lignin (which hardens plant cell walls) and therefore has become woody. Because ruminants are not able to digest woody plants, cattle will not eat plants in phase three.

By utilizing intense rotation techniques, the Ferrell ranch is able to limit the grazing activity of cattle to areas which contain only plants in phase two. Such grazing maintains even cover, whereas conventional grazing practices encourage the rapid maturation of ungrazed plant species and the elimination of overgrazed species. Over the years, Pete has seen an increase in species diversity and in percent cover such that his ranch is now nearly devoid of bare soil. These methods are all a part of his effort to maintain the integrity of his pastures and the native prairie and to prevent the encroachment of deciduous trees.

The methods employed at the Konza Prairie, the Scharplaz ranch, and the Ferrell ranch are successful in different ways and to varying degrees in maintaining the prairie. To a group of interns mostly new to the prairie, visits to these places helped us to become more aware of the history and the value of the prairie, as well as some possibilities for its future.

The 1998 Interns: In a Class by Themselves

Born in Manhattan, Kansas, Melissa Arthur was first drawn to the study of grassland ecology in high school because of her interest in hiking and ethnobotany. She graduated from The Evergreen State College in Olympia, Washington, in June of 1997 with a degree in ecology. Her work last summer at a hair salon inspired her to design new prairie landscapes; at The Land Institute, she is responsible for planting prairie wildflowers and managing the seed room. Melissa's intern project is a pilot study using nurse crops for establishing perennial polycultures. Her hobbies include cooking, walking, throwing pots, and summing up her life in one paragraph.



Kelley Belina grew up in Minneapolis, Minnesota, before graduating from the University of Wisconsin at Madison with degrees in botany and conservation biology. She first became interested in agricultural research while working for the UW-Madison agronomy department, which she enjoyed considerably more than her previous one-day stint as an Arby's employee. One of Kelley's most recent crowning achievements was helping to coordinate the Prairie Festival this year. Currently Kelley is working with Dr. David Van Tassel on The Land Institute's plant breeding program through research on the inter-species hybridization of sorghum. She hopes to use her Land Institute experience to further prepare her for a graduate degree in plant breeding.



Jen Fraulo earned her B.A. at Harvard University, where she studied biology and the history of science. During college she lived in the 35-member Dudley Cooperative house, engaging in an education in communication and community processes. At The Land Institute, she is hoping to learn more about ecological and agricultural issues. Jen is concerned that social patterns have been constructed without consideration of more fundamental ecological relationships. She is drawn to the issue of how we can nourish



ourselves as biological beings without depleting and destroying the biological world, and she sees Natural Systems Agriculture as an exciting key to a solution. Her future interests include work in public policy on issues of environmental health, public health, and agriculture.

Kentuckian **Katie Goslee's** initial interest in agriculture began in her childhood but was thwarted when her older brother announced to her that farmers were becoming obsolete. Years later, Wendell Berry's *The Unsettling of America* renewed her interest and highlighted the potential truth and danger of her brother's prediction. At Earlham College in Richmond, Indiana, Katie specialized in biology and peace studies, focusing on agriculture as a system which combines biological and cultural functions. After graduating, she taught environmental education in Utah, New Hampshire, and Wisconsin. At The Land Institute, she is researching possibilities for rapid establishment of perennial polycultures by examining nurse crop use and plant-soil interactions. She is currently looking into graduate school in conservation biology and ecology.



Claire Homitzky, a native of Hoboken, New Jersey, is a recent graduate of Cook College at Rutgers University.



While there, she assisted Dr. Jean Marie Hartman in numerous plant ecology experiments in central New Jersey and the Everglades of southern Florida. Claire also worked under the guidance of Dr. Michael Hamm, Director of New Brunswick Urban Ecology, supervising students in the Youth Farmstand Project, and later serving as an intern at the Cook College Organic CSA. Upon discovering last fall that post-collegiate life required a "next step," she sought the internship at The Land Institute. Despite her city roots, Claire has quickly adapted to life in semi-rural Kansas. This is due in large

measure to her daily work managing a herd of Texas longhorn cattle in a short-duration rotational grazing system. Her fondness for these "darlin's" and the work they involve may just keep her in Kansas beyond the internship.

Terry Loccke, a.k.a. "the guy intern," came to us from Manchester, Iowa. After becoming disenchanted with his schooling in conventional agriculture at Iowa State, he transferred to the University of Northern Iowa to study biology. His work under Dr. Laura Jackson, incorporating native plants into a rotationally grazed pasture, rekindled his interest in agriculture. At the Land Institute, he is continuing the long-term soil quality research on the Sunshine Farm Project. His future plans include graduate school in either soil ecology or microbial ecology.



Hailing from Berkeley, California (for which she receives an unfair amount of grief from jealous Land Institute staff), **Courtney Smith** spent two years at the



University of Massachusetts playing soccer before transferring to the University of California at Berkeley to pursue a degree in conservation resource studies. Her interest in The Land Institute was inspired by her ecosystemology course with Dr. Arnold Schultz. Courtney's research at The Land Institute is divided between the stripcropping experiment at the Sunshine Farm and a first-year study looking at the use of

Maximillian sunflower as a nurse crop for the establishment of Illinois bundleflower. After December, she plans to escape the extreme seasons of the Midwest and pursue a graduate degree in agricultural ecology.

Originally from New Jersey, **Kaelyn Stiles** graduated in 1997 from Oberlin College with a degree in biology and a minor in environmental studies. Her resume resembles a travel brochure: she has studied howler monkeys in Costa Rica, conifers in California, wolf ecology in Minnesota, acid rain and global warming in Massachusetts, land practices in China, lemurs in Madagascar, and bromeliads in Florida. Her interests include economic development and sustainability, environmental philosophy, and the impacts of globalization on communities. At The Land Institute, she is starting a long-term study that will compare soil and ecosystem health of Conservation Reserve Program lands, native prairie, and lands that are currently in conventional agriculture. She also enjoys field hockey and lacrosse, studio art, and Spanish.



An Indian in Kansas

Suprabha Seshan

Six years ago I had the remarkable opportunity to be an intern at The Land Institute. Looking back, I am still occasionally astonished that I, an Indian from India, spent a year in the heart of America, walking the tallgrass prairie while pondering new ecological paradigms. Others are surprised, too. "What took you there? Why Kansas of all places?"

Had it not been for Wendell Berry's writings, I would not have heard of The Land Institute. *The Gift of Good*



Suprabha enjoying sunshine in a garden

Land and Home Economics came into my life when I was searching for wilderness and the vanishing links between people and nature in India, and for ways to address the ecological, social, and spiritual crises of our time. This search took me to many places, and it was in a tiny bookstore in the remote Orkney Islands off the coast of northern Scotland that I chanced upon *Meeting the Expectations of The Land*, a collection of essays edited by Wendell Berry, Wes Jackson, and Bruce Colman.

One thing led to another, and with a bit of luck and some inspiration, I found myself at 2440 E. Water Well Road, Salina, Kansas, in January of 1992 along with seven other expectant interns, ready for action.

I do believe I enjoyed every moment of our year together at The Land Institute. The intern program was fun and challenging although much of the time I was ignorant of many issues particular to North America. Everything was new (despite my familiarity with Americana abroad), and I often felt like I was on some strange anthropological mission, trying to make sense of an exotic society, learning new idioms, expressions, customs, work ethics, foodings, modes of learning, and dialogue. The whole thing — living, learning, working — was an amazing adventure!

Yet I was more often struck by the feeling of commonality which manifested itself at deeper psychological and philosophical levels. I was constantly

being shown that the essence of humanity was the same everywhere and that beneath all the cultural and intellectual differences were the unifying processes of consciousness at play. So, alongside following the progression of maize dwarf mosaic virus in the eastern gamagrass plots, I learned about human nature and, therefore, myself.

The fact that I had no trouble, philosophically and practically, in identifying with The Land Institute's underlying concerns helped me to make the most of my time there. Always at the back of my mind was a cluster of

related questions: "How can this experience be relevant to another part of the world? What are the parallel processes and issues in India? How can one translate from prairie to monsoon? What makes sense both locally and globally?" Fellow interns and the staff at The Land Institute were patient in helping me understand local issues, and this process of looking for parallels (and also differences) while exploring the particular has stood me in good stead even later. I continue to be fascinated by agro-ecosystem design based on the natural standard as this seems to be one area where human intent and wild nature have a viable meeting point. In my current work at the Gurukula Botanical Sanctuary in the rainforests of Kerala, India, a tropical garden with over 2,000 native species, "nature as measure" continues to be the guiding principle,

and I am increasingly confident that there exists a creative relationship among nature, land use, and livelihood.

Is a sense of a global community just a fiction? I don't think so, though it is most often grossly misdirected as globalization. It seems, from my experience at least, and also given the times, that it is as real and tangible as the local ties to nature, land, and culture. When Ted Schuur, Michelle Mack, and Darryl Short — all former Land Institute interns — visited me in my remote niche in the Indian woods, I felt that my year at The Land Institute had generated something lasting and precious in the form of friendship. When I hear from or write to other Land friends, however infrequently, the affection, humor, and common experience that bind us are crystal clear. And these, along with the inquiry and concerns that permeate our lives, made my journey across the planet to Salina, Kansas, a profoundly worthwhile and enriching experience.

Suprabha Seshan was an intern in 1992. She currently works at the Gurukula Botanical Sanctuary in Kerala, India.

Going with the Flow

Bernadette Jilka

As children, my siblings and I were river rats. As often as we could get away with it, we would play in the murky waters and on the banks of the Smoky Hill River. The old river slowly wraps around the farm fields clinging to ash, cottonwoods, and an occasional oak. Several river miles downstream from where we played, the current picks up speed, with enough gradient to cause a visible ripple. On the high bank above that point is The Land Institute. Analogous to the movement of the river, this place appears calm and pastoral from a bird's-eye view but is actually a place for change, a place causing ripples in our agricultural society. I knew very little of The Land Institute in my youth. Yet I harbored a vague interest in exploring that "different" place which, at that time, seemed to be a hidden mystery at the dead end of an unnamed road — especially while the old river bridge was out.

After college, while living and working in the Ozark Hills of Missouri, I had a longing to be back on the prairies, to learn more about the prairie plants, and to be involved in prairie research. After reading *Altars of Unhewn Stone*, I was intrigued by Wes Jackson's concepts relating to perennial polycultures. They were a radical change from what the local farm paper, *Grass and Grain*, reported for the future of agriculture.

My experience as an intern at The Land gave me knowledge of the prairie ecosystem, but more importantly it gave me a community of people with whom I could share thoughts, values, and challenges in a world of changing needs.

I came to The Land with a background in horticulture, and since my 1989 internship I have continued my horticultural interests with an emphasis on native plants at home in Tucson, Arizona. I met my husband, Gary Maskarinec, in a round-about way through Laura Jackson, who at the time was living in Phoenix. Gary is a long-time seedsman who has collected seeds of native plants throughout the intermountain West. With his vast knowledge of plant species and their habitats, he offers restoration consultation, site-specific collections, and seed mixes through a home business. While working and learning from Gary, I began a small business myself — a backyard plant nursery. I specialize in growing native plants from seed. In five years my business has slowly and steadily increased. I occupy the yard adjacent to our home and raise a variety of desert wildflowers, shrubs, and trees for the wholesale nursery market. In addition, I cultivate native plants by contract for restoration projects. Currently I am germinating a number of tree species and native grasses for The Nature Conservancy. They are attempting to restore part of a cienega land they have acquired. My other summer crops include *Larrea tridentata* (chaparral bush — a common

desert shrub), *Psoralea argophylla* (smoketree — a low desert tree that hangs out in the far western washes near the Colorado River), and a variety of native grasses.

Our botanical interests and work have connected us to a wide variety of ecosystems and places in the Southwest. The thrill of the hunt is finding a prairie species from the Plains also rooted in the Huachuca Mountains in southeastern Arizona — the most northern of the Sierra Madre range — or witnessing the vast range of little bluestem, from the Connecticut River Valley to the low desert valleys of southern Utah near the Virgin River. We challenge ourselves to look for and collect seeds of common and unknown species in order to encourage people to "bring back the wild garden."

Recently we have found ourselves more at our home in Tucson than out in the wild as our lives have become centered around our two children: Luke, who is two years old, and Cerelia, who is one. Childcare keeps work hours limited. Gary has taken advantage of the time at home to transform the yard from a Bermuda grass, beer-bottle trash dump to a desert oasis of honey mesquites, ironwood trees, wildflowers, and an adobe playhouse that is still in the making.

Attending part of the 1998 Prairie Festival entertained my senses:

the unmistakable odors of the classroom basement, the sounds of the creaking greenhouse vents, the light and dust filtering through the big barn, and familiar faces of faithful Land Institute supporters. These sensations evoked in me many memories of a place with varied and deep connections. The place and its structures remind me of the interns I was privileged to share time with, and also of their varied interests and unique personalities. I'm reminded of particular staff persons and visitors who left a profound impact on me. Since my time at The Land, which was not so long ago, the trees have grown, the gardens have been transformed, buildings have improved, and ideas have expanded. There are many new faces, too. I feel strength in being part of a large, extended family of interns and staff who have left their mark. And it is gratifying to see that through continuity and perseverance The Land is slowly, steadily progressing through change, just as the river changes its course from time to time yet continues on its way. I'll take this opportunity to say a warm hello to all my old (and new) Land acquaintances and invite you to visit if you ever find yourselves wandering this way.



Bernadette with Cerelia and Luke

The Land Institute's Natural Systems Agriculture Advisory Team

Our Natural Systems Agriculture Advisory Board comprises over 60 scientists and practitioners in ecology, agriculture, and policy who are willing to endorse the potential of our work, to discuss its need and potential benefits to national policy, to assist in articulating its feasibility to funders, to critique the research program, and to offer suggestions as the work unfolds.

Todd Dawson

Todd often tells his students, "You need to make ecology part of what you do, how you think, and how you live, and then take this and use it, in prescriptive ways, to insure a sustainable future." Presently, Todd teaches a course on ecology and the environment at Cornell University, where he has been an associate professor since 1996 in ecology and systematics.

Todd's research is focused on three broad areas. One is the interface between plant ecophysiology and community and ecosystem ecology. His interest is in how the ecological and physiological characteristics of plants can influence the structure and function of the communities and ecosystems they compose. In particular, his research goals are aimed at understanding the roles that specific species play in determining the hydrological and biogeochemical processes at the community and ecosystem levels. This area of research has grown out of his work in the temperate forest ecosystems of the north-eastern United States, in the coastal redwood forest of northern California, as well as in the semi-arid woodlands of Western Australia.



A second area of his research focuses on the interface between plant physiological ecology and evolutionary biology. Recently he has extended this work into a research area he calls plant evolutionary physiology. This work focuses on the adaptations which confer drought tolerance in an endemic group of plants for which the phylogeny is well resolved. His goal is to see that the information obtained on the functional characteristics among a diverse set of ancestral and derived taxa in this clade (evolutionary branch) can be mapped onto the phylogeny.

Todd's third area of research falls into the category of agroforestry. His discovery of "hydraulic lift" (the movement of water up and "out" of plant root systems into the soils they inhabit) in sugar maple trees has led to his attempts to intercrop maple with native ginseng (which uses the water provided by the trees) and alfalfa.

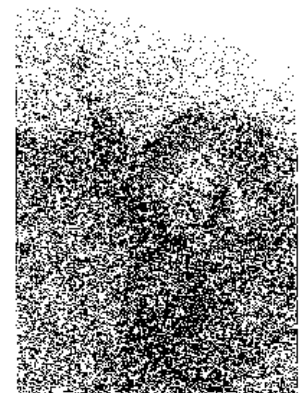
Todd received an A.A. from Santa Barbara City College and later a B.A. from the University of California at Santa Cruz in Biology. He earned his Ph.D. in 1987 in physiological plant ecology from the University of Washington. He has worked as an instructor, consultant, and researcher during the past 22 years and has field experience in ten U.S. states and eight countries. In addition to teaching classes, Todd is the Director of the Cornell Laboratory for Isotope Research and Analysis.

Laura Jackson

Laura is an assistant professor of biology at the University of Northern Iowa in Cedar Falls. She received her Bachelor's degree from Grinnell College in biology in 1983 and then went on to Cornell University, where she earned a Ph.D. in ecology and evolutionary biology in 1990. After receiving her Ph.D., Laura spent three years studying the effects of agricultural development on the mesquite-desert saltbush scrublands of central Arizona at the Desert Botanical Garden in Phoenix, Arizona. At UNI Laura teaches the following four courses: Applied Ecology and Conservation, which covers regional environmental and conservation issues and basic conservation biology principles; Ecology of Agricultural Systems; a new upper-level course in Conservation Biology; and Environment, Technology, and Society, a general education course required of all majors.

Currently Laura's research in Iowa is geared towards understanding how historical changes in farming, including industrialization, have affected Iowa's native biodiversity. Since 1994 she has been involved with two farmers of the Practical Farmers of Iowa group and works with them to incorporate native prairie plants into their pastures. She is working with a third farmer under a USDA-SARE farmer-initiated grant on non-chemical methods of quackgrass control. In 1995 she received a grant from the Leopold Center for Sustainable Agriculture to work on incorporating native plant communities on farms for forage and wildlife.

In 1994 Laura published a paper in *Ecology* entitled "Predicting evolutionary consequences of greater reproduction effort in *Tripsacum dactyloides*, a perennial grass." This paper serves to answer, in part, one of the four basic questions that guide Natural Systems Agriculture research at The Land Institute, namely, "Can a perennial grain species yield as well as annual crops?" Key to this paper was the discovery of an eastern gamagrass (*T. dactyloides*) mutant which produces more female flowers and therefore more seeds. This increase in seed production also takes nothing away from the perennial features of the plant, despite the



theory that increased seed production would drain resources from other parts of the plant, especially the roots. She presented this paper as part of the Natural Systems Agriculture symposium of the Ecological Society of America's annual meeting in 1997.

Last year Laura also presented a paper about the impacts of large-scale swine production on water quality to an Iowa Farmers Union. She is beginning a project to look at the water-quality consequences of large-scale hog confinements compared with alternative swine systems.

William Martin



For the past 20 years Dr. Martin has been the Director of the Division of Natural Areas and a full professor of biology at Eastern Kentucky University. However, since 1992 he has been on leave from these positions in order to serve as Commissioner of the Kentucky Department for Natural Resources. As Commissioner, Dr. Martin has served as co-chair of the Biodiversity Task Force and the Technical Committee for the

Comparative Risk Assessment Project, a major component of the Kentucky 2000 Project. He is also currently chair of the Heritage Land Conservation Fund Board, which provides funding for the acquisition of significant natural areas, wildlife habitat, and recreational areas.

Dr. Martin received a Master's and a Ph.D. from the University of Tennessee in botany with a focus in plant ecology and later a soils minor for his doctorate degree. His research and teaching interests have been in composition and dynamics of forests and grasslands of the southern Appalachians and Midwest. At Eastern Kentucky University, he developed a number of graduate and undergraduate courses in ecology as well as courses in environmental ethics and surface mine reclamation. He is active in a number of professional organizations, including the Ecological Society of America, and he is a former president of the Association of Southeastern Biologists.

For a number of forest management issues, Dr. Martin has served as a consultant to the National Park Service, the U.S. Forest Service, and The Nature Conservancy. While working with his state's Division of Forestry within the Department for Natural Resources, Dr. Martin has been a leading member of the team developing the Kentucky Forest Stewardship Act.

An award-winning three-volume series, of which Dr. Martin was the senior editor, was published in 1993 under the title *Biodiversity of the Southeastern United States*. Most recently he has received awards for his conservation efforts, including the 1996 Public Servant Award from the Kentucky Environmental Quality Commission and the 1995 Distinguished Service Award of the Kentucky Association of Conservation Districts.

New Natural Systems Agriculture Advisory Team Members

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University of Michigan

Professor Jim Hancock, Department of Horticulture,
Michigan State University

Professor Hugh Iltis, Botany Department, University of
Wisconsin

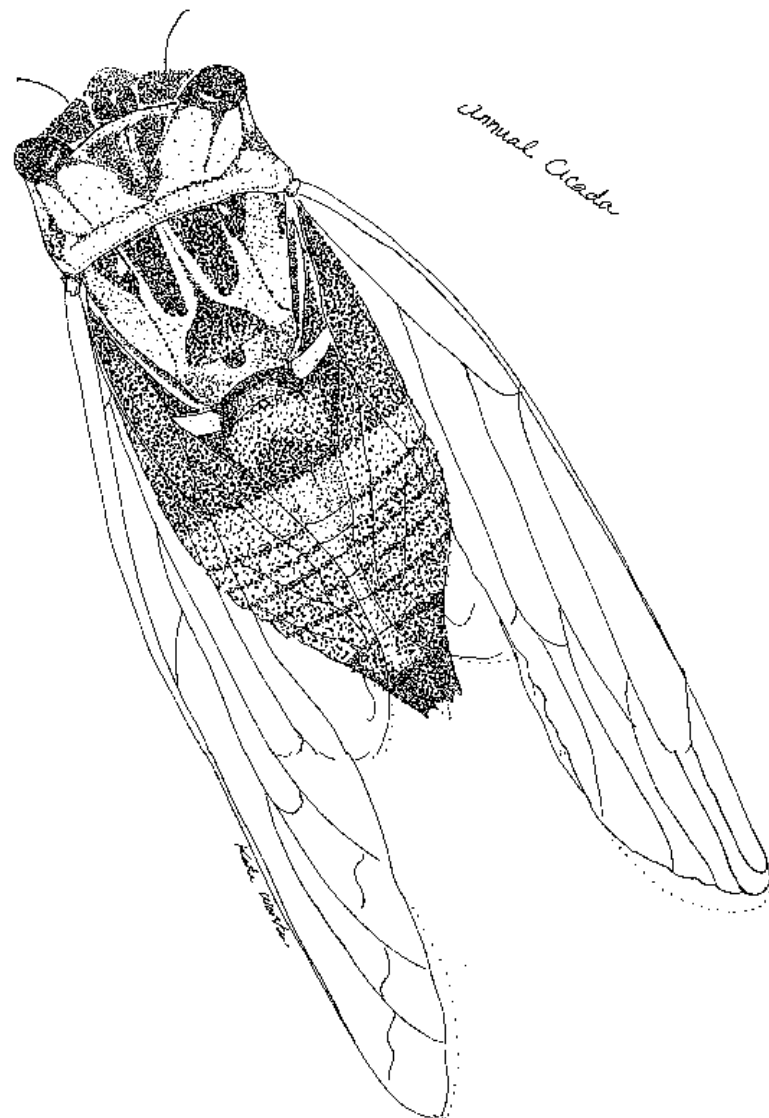
Professor Joan I. Nassauer, School of Natural Resources
and Environment, University of Michigan

Professor Marvin Pritts, Department of Fruit and Vegetable
Science, Cornell University

Professor Gerald Smith, Museum of Paleontology,
University of Michigan

Professor John Vandermeer, Department of Biology,
University of Michigan

The Land Report #58 listed all the members on board at that time, while subsequent issues have included only new additions to that list.



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A non-profit institution such as The Land Institute is under tight budget constraints that stretch our ability to enhance daily operations. For this reason, we are asking Friends of The Land for tax deductible donations of any of the following needed items:

- good dissecting microscope
- empty 5-gallon pickle or paint buckets (plastic)
- dorm-size refrigerator for research projects
- tools for our workshops (woodworking, welding, general maintenance)
- a portable tape recorder for Land Report interviews

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