The Land Report

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Talk of Change in Climate, Energy Use and American Farming, Cities and Attitude

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Cover: *Prairie (spring 4)*, by Jin Lee.

Want to share a story from *The Land Report*? Unless the writer objects, you may photocopy from the magazine or get the piece by e-mail. Write to Scott at bontz@landinstitute.org or our street address in the column at right, or call him at 785-823-5376.

The Land Institute 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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At the Land

Agroecology

As farmers and gardeners know, the space between plants can greatly affect yields. We're interested in the total vegetative yield as well as seed yield of our perennial grain crops in the making, because robust plants can give breeders more to work with, and because the natural systems agriculture we're developing will feed not just humans with grain, but animals with forage. So in 2006 we began a study separating into rows intermediate wheatgrass that had covered the ground and made dense sod. Wheatgrass is a perennial that we are breeding with wheat and also domesticating directly. We cut the soil about 4 inches deep in rows on 24-inch centers so plants had more space to grow.

We found this year that vegetative yield under the row treatment was 30 percent lower than from plots that had been left solid. We couldn't reach conclusion on seed yield—the variation among plots over both treatments was too great. The row-cutting also made the fields rough to work. A new trial begun this fall should greatly reduce that problem and the yield variance. Wheatgrass will be planted from the start in rows instead of solid stands.

Perennial Grain Breeding

Field results with wheat bred to wheatgrass were encouraging. Not only did the plots produce a good amount of seed, but after harvest we found among thousands of cut plants 40 that were growing again like perennials. In past field trials of hybrids this much like wheat, there was no regrowth. Twelve plants survived being dug up and moved for greenhouse production of seed this winter.

To see if our hybrid wheat proves perennial elsewhere, we are sharing seed for a coordinated trial by us and researchers at Washington State University, Texas A&M, Oklahoma State and Michigan State. Washington, with its own perennial wheat lines, will also share seed for the trial.

We also sent seed to organic farming researcher Anders Borgen in Denmark. The motto of his consulting company in that field, Agrologica: *"*It won't help you to increase the speed if you are moving the wrong direction."

With sorghum, we extensively field-tested the progeny of selected hybrid plants that survived the past two winters. The average grain crop quality of these plants is clearly superior to that of the perennials of their parents' generation. There are many more short plants, plants with more robust stems and compact heads, and, it appears, heads with larger seed.

Some of the hybrids made last year between the new-generation perennial plants and annual grain sorghum have very large seed. Those plants probably won't be perennial, but the potential to find perennial, large seeded plants among their offspring might be good.

We also made new hybrids between annual sorghum and the perennial johnsongrass. Those plants are very vigorous but, as expected, a bit "wild." Crossing them with current perennial lines will bring together genes from Eastern and Western Hemisphere johnsongrass strains and might generate more winterhardy plants.

The most interesting plots of sunflower this year have the progeny of hybrids made from parents of different species. The range of plant forms, head sizes and flowering dates is the greatest yet in this project.

This shows that versions of genes once separated by species boundaries have come together in new combinations not seen in either parent species. Many of these combinations make plants with problems, including failure to germinate, early death, deformity, sterility and extreme height or branching or lateness. But it encouragingly shows that our method is producing new kinds of plants, even if this year we don't get the sought for perenniality, big seeds and short, uniform growth. It confirms our expectation of two things. One, that this group of plants is developmentally flexible enough to produce healthy-appearing plants of many new and extreme forms, even though many are also sterile or otherwise unhealthy. And that crossing species is possible and results in new kinds of plants.

The new sunflower might end up looking different than either parent. The result need not be simply plants that look like annuals but have a couple of tubers stuck on. Or plants that look like one of the wild perennials, but have bigger heads. They might look different in almost every way, including new leaf shape and branching pattern.

Some of these plants are known perennials, transplanted from elsewhere. Others are the offspring of known perennials. Still others are the offspring of plants that may not have been perennial. However, many of these plants look like they might be.

We deliberately cross-bred many of these. The rest will be pollinated by bees, so the pollen parent will be a mystery. But if the plant survives winter, the seed saved from this year will be worth planting anyway. We emphasized crosses between freshly acquired varieties of annual sunflower and *Helianthus rigidus* or *H. tuberosus,* also known as Jerusalem artichoke, between proven perennial hybrids and unproven—but big-headed—hybrids, and between proven perennials.

Publications

Time gave a half-page profile of Wes Jackson and The Land Institute in an "Innovators" section of the magazine's October 1 issue.

Jackson and Bill Vitek, associate professor of philosophy at Clarkson University, are editors of *The Virtues of*

Ignorance, scheduled for release in April by The University Press of Kentucky. The book, subtitled *Complexity, Sustainability and the Limits of Knowledge*, is a collection of essays based on a conference we held in 2004. The writers include Wendell Berry and Richard Lamm. Jackson's essay, "Toward an Ignorance-Based Worldview," is at www.landinstitute.org, under Publications: General. Also find it in Land Report No. 81, Spring 2005.

New Staff Member

Marty Christians is a research assistant. He previously worked for a service that restores prairie, wetland and forest, and for an organic farm.

Presentations Made

July 24, Managing Director Ken Warren spoke to the Sierra Club's Topeka, Kansas, chapter. The talk was called "Living as if the Future Matters." The title for the Wichita, Kansas, Sierra Club chapter on September 14 and the Leawood, Kansas, Garden Club on October 23 was "Why Are Humans So Willing to Bite the Land that Feeds Them?"

At the Wheat Pasture and Grain Symposium in Ardmore, Oklahoma, August 2, plant breeder Stan Cox explained our work to develop perennial wheat.

At the annual gathering of the Lindisfarne Association fellows in Santa Fe, New Mexico, August 4, institute President Wes Jackson presented a broad picture of the need for energy, soil and water conservation, and of our work toward that with perennial grain crops. Jackson is one of the fellows. On September 25 he spoke to the Kansas Renewable Energy and Energy Efficiency Conference in Topeka, Kansas, on "What Will the Ecosphere Require of Us?" The talk addressed what to do about climate change and the difficulty people have in grasping it. At Duke University he spoke twice October 9, about our work and, at the Divinity School, about losing his own Eden to build a home, and civilization running down carbon and natural capital, in a talk called "When the Tree of Knowledge Becomes a Vine." Some of this is shared in the Prairie Festival essay on page 18.

In August, agroecologist Jerry Glover helped rough out a workbook for cities to make sustainable communities. This was through a workshop at the Ecological Society of America meeting in San Jose, California. The group didn't set concrete guidelines, but did establish categories including transportation, food production and housing. Glover suggested that communities should work to get food calories that are produced sustainably.

Presentations Scheduled

November 7, Chicago.
December 7, Kalamazoo, Michigan.
January 18, Albuquerque, New Mexico.
August 5, Winona, Minnesota.

For more, call us or see www.landinstitute.org.

This plot's range of plant forms, head sizes and flowering dates is the g

greatest yet in our sunflower breeding. The flexibility of offspring from different species encourages us. Scott Bontz photo.

Weather Report

Talk of Change in Climate, Energy Use and American Farming, Cities and Attitude

Scott Bontz

Answer: Convocation of sinners. Question: What does Wendell Berry call a gathering of environmentalists? So were teased attendees of The Land Institute's Prairie Festival Sept. 28-30. If all were environmentalists, the joke from institute Managing Director and festival emcee Ken Warren was taken in good spirits.

Good spirits are the festival's mark, despite the grim forecast often made by speakers—Warren promised a vote in the Doomsayer Cup Series. Facing the decline of fossil fuels after humanity's 200-year joyride seems to inspire our visitors. They benefit in community with the likeminded.

That community this year was about 650, less than the 800-plus last year, though still about double the turnout of other recent events. Most of the visitors were individuals, friends and family. There also were groups from Augustana College in Illinois, St. Olaf College in Minnesota, Iowa State University, Kansas State, the University of Kansas, Trinity Environmental Stewardship Team in Lawrence, Kansas, and Sustainable Green Country in Tulsa, Oklahoma. We want to enlist young people.

High winds prevented the usual bonfire, but we had the regular barn dance Friday night, the supper of mostly Kansas-grown food Saturday night, prairie photos by Illinois artist Jin Lee, singing by and singing along with Ann Zimmerman, and a day and a half of talks in the barn by speakers including writer James Howard Kunstler, who didn't spare the audience in his critique of American complacency, and one-time presidential candidate Bruce Babbitt, who polled listeners before picking his way through the burning field of ethanol.

Following is report of the presentations. If you'd like to hear them, complete, see the order form for compact discs on page 27.

Plant Breeding Goes Hollywood

Warren opened with what might be the first agroecology rap song. You can read to the genre's beat even if you don't recognize the parody of satirist Tom Lehrer's *Oedipus Rex*:

> There once was a root named Radicus rex;
> You may have heard about his odd complex:
> His name appears in the police blotter index
> Because he … loved the soil.
>
> He loved the soil with great affection;
> He wouldn't let go—he had a connection.
> One thing that you can depend is,
> He sure knew who a root's best friend is.
>
> They brought a charge of being obsessive,
> And he admitted that he was possessive.
> But he further stated without emotion
> That if he ever let go he'd be abetting erosion.

Developing perennial grain crops will take decades. Progress compared with that demanded by the world of corporate quarterly statements is paint-drying slow. But our scientists try to make explanations for their work and reports of progress seem refreshing annually.

This year they included a taste test and tongue in cheek. The scientists were guests on *The Tomorrow Show*, with Warren taking the role of Johnny Carson, including a warm-up parody of Carnac—this time Carbuncle—the Magnificent, psychically reading answers to questions in envelopes. Including:

Britney Spears: What cut of asparagus (a perennial) is named for a region of France?

Coal-burning power plant: What plant will soon be placed on the endangered species list? To this there was great applause—though not as much as when Kansas Lt. Gov. Mark Parkinson later expressed the same sentiment.

You've got to be kidding: How large is the humor section in an environmental bookstore?

Ba-doom-pa—smote on snare and cymbal by research technician Liz Elmore, doubling as Carson sidekick Ed MacMahon.

The first guest, agroecologist Jerry Glover, invited festival-goers to go "6 feet under" in a nearby trench dug to compare the deep, living roots of perennial intermediate wheatgrass with shallow and faded subterranean ruins of annual wheat, both crops that were harvested this summer. (About 150 crowded in and around the pit after supper that day and kept Glover answering questions until dark.)

He told the *Tomorrow Show* audience that roots are the provider of nourishment to the below-ground organisms that keep soil healthy to feed us. Annual cropping, with roots in a relatively small part of the ground for a fraction of the year, break that supply line of sugars to soil community, and so lessen our resources. Farming makes up for it with fertilizer, but annual crops often let more than half of this go to waste and worse: Nitrogen, running off from farm fields into coastal waters around the world, feeds algae that

Heeeeere's science! Ken Warren, left, David Van Tassel, center, and Jerry Glover play talk show to explain domestication of wild—and wildly varying—perennial plants like this Maximilian sunflower. Scott Bontz photo.

use the oxygen which would otherwise be used by fish and other marine organisms. This make lifeless areas, including a New Jersey-size chunk beyond the Mississippi Delta. Perennials, the majority of Earth's natural vegetative cover, handle water and nutrients much better.

Warren-as-Carson asked why there wasn't a group to address this, and Glover said there is: Green Lands, Blue Waters. (See www.greenlandsbluewaters.org.) The consortium involves several universities and more than a dozen nonprofit organizations, including The Land Institute, and aims to get as much of the upper Mississippi watershed as possible under perennial cover, including forest, pasture and, eventually, perennial grains.

Next came someone giving Glover "prop envy," plant breeder David Van Tassel with an armful of sunflowers, some short and feeble, but another towering over the stage. One of each extreme came from the same species of perennial sunflower, Maximilian, and showed what a difference in growth environment plays.

It also showed what crop breeders do not want: The tall sunflower had wasted energy competing for sunlight at risk of toppling, rather than devote itself to making seed. Van Tassel compared this plant with an annual crop sunflower, which was a fraction of the height and set much more seed, and in one head, rather than among blossoms scattered along the stem where they would hinder harvest. In our work to domesticate perennials like Maximilian and in cross-breeding with annual relatives, we are selecting plants with bunched heads and branches to approach the annual's concentration and production of seeds, though not necessarily its single massive head.

Van Tassel said co-worker Sheila Cox had made hundreds of these crosses in recent weeks.

"She's an excellent pollinator." This drew laughter from the audience, and apparent discomfort in the host. But not as much of either as did Van Tassel's wry follow-up: "She does a lot of emasculation too." If you need scientific explanation of that joke, call.

Warren eagerly bumped Van Tassel for his next guest. Cindy Cox, the institute's pathologist and chromosome researcher, explained how she, Glover and a colleague at Washington State had written an article about perennial grain crops for the August issue of *Scientific American*, to reach a large audience and build a critical mass of supporters for breeding perennial grains.

Then she sketched how her lab work helps. With different dyes marking the chromosomes of each parent, she can see heritage proportion in offspring by freezing and examining cell division—this with a $50,000 microscope bought by an institute benefactor. Cox can also identify chromosomes responsible for particular habits of the plants, and screen problems like sterility. All of this will speed success in selection for traits to make perennial grains ready for the farm.

Tiffany Stucky, manager of the greenhouse, explained how that building helps: Its environment lets breeders control temperature, pollination and pests, and during winter cram in an extra growing season to halve the time of generational progress.

Senior scientist Stan Cox showed one route of that advancement, with props. A baseball represented the relative size of seed from johnsongrass, the contributor of perenniality to our cross-breeding with grain sorghum. Sorghum seed was expressed by a Superman ball, about six times the baseball's volume. A softball, about half the volume of the Superman ball, stood for seed size of current sorghum hybrids. To represent the gene-bending progress promised by companies like Monsanto, Cox held up a foam Nerf football. Unfortunately, he said, this also demonstrated the seeds' probable palatability.

Not so with intermediate wheatgrass, the perennial that we're domesticating directly and crossing with annual wheat. Breeder Lee DeHaan brought an electric griddle to Warren's desk, and in a few minutes had him trying wheatgrass pancakes that taste as good as wheat.

Climate and Energy Project: What We, a Rancher and Vermont Are Doing

Perennial grain crops will cut burning of fossil fuel, but their adoption is years away. Meanwhile, The Land Institute has begun something called the Climate and Energy Project. Its director is Nancy Jackson.

To reduce greenhouse gas emissions 80 percent by 2050, which scientists think will be needed to avoid drastic climate change, Jackson said the project aims to make sure Americans understand the connection between climate and energy, and to pursue efficiency and conservation as well as renewable energy.

Even while Jackson noted that people tend to see wind energy as sexy and exciting, a gust against one of the barn doors sent a stack of folded steel chairs crashing. This drew a big laugh from the audience before Jackson finished with this caution: "Our first, best shot is energy efficiency and conservation."

Jackson said the frightening prospect of global climate change, like other matters, starts in the head, moves to the heart, and slowly changes our behavior.

Transportation accounts for 25 percent of greenhouse gas emissions in the United States, she said. The vast majority of the rest is from generating electricity, and most of that comes from burning coal.

Some utilities are skeptical that Americans will substantially cut their energy use, Jackson said. In turn, some customers are skeptical that utilities, whose earnings are tied to sales volume, will pursue efficiency. The move is possible now because utilities and environmentalists see common ground. Policy changes can allow utilities returns on efficiency, just as on new power generation. With cus-

tomer support, Jackson said, utilities can forestall decisions about new generation until clean energy technology has improved. But efficiency will reach a limit, said Scott Allegrucci, the Climate and Energy Project's projects director, and then the cooperative opportunity will close, as utilities remain primarily obligated to serving customers. Allegrucci said the CEP is collaborating with utilities in earnest. But we all are responsible, Jackson said, or "In a sense it's like asking Nike to lead us toward barefootedness."

"We're not up here to ask you for perfection," Jackson said. But she suggested that the audience imagine the developing world, with one hour of electricity delivered at a random time each day. Americans might not have to live this way, but she said, "We absolutely must use less, and some of that won't be terribly pleasant." Key will be presenting this not as sacrifice, but as enjoyable challenge.

Efficiency can dramatically increase through better building codes and higher appliance standards, Allegrucci said. And the CEP will work with agricultural extension, which has a history of energy efficiency work and trusted agents in every county. It also will work with churches. Many recognize climate change as a pressing matter. Allegrucci and Jackson also plan a series of "stewardship suppers" to gather community decision makers.

The CEP Web site, www.climateandenergy.org, will launch in mid-November.

Pete Ferrell is a Land Institute board member, a fourth-generation Kansas rancher and a first-generation wind farmer. Beginning in 1994, he studied and deliberated for years before agreeing to allow 50 wind turbines, 387 feet tall, on his high ground in the Flint Hills, the United States' largest extant stretch of tallgrass prairie.

Ferrell said, "This is a tipping point in the history of our planet. … It is imperative that we change direction."

To realize the problem, he said, put the rate of fossil carbon formation and use on a human time scale. If fossil carbon's development over millions of years were compressed to eight months, he said, the time taken for us to burn it all will be over in eight seconds.

"Why boil ourselves alive?" he said. "The time to act is now."

Ferrell said that wind power is the most economically viable and ecologically benign electricity source available. The customers of Empire District Electric Company, a Joplin, Missouri utility that signed on for his farm's power, have collectively saved millions of dollars compared to what they would have paid for the same power if generated by natural gas.

Some think turbines unsightly, but Ferrell said, "I like the way they look, because of what they represent"—cleaner air. And, to applause: "Personally, I think flag-draped coffins coming home from the Middle East are unsightly."

He didn't tout wind energy as the No. 1 solution to what the nation faces on the down slope of fossil fuels. Nothing among renewables can match them. He said the most important step is conservation and reduced energy consumption—wind energy can only soften the landing.

Blair Hamilton said that Americans face not just a challenge to reduce energy use, but a global imperative. They must not just flatten the rising curve of consumption, but bend it into decline. "The cleanest kilowatt-hour is the one you don't use."

Hamilton is director of Efficiency Vermont, which gives technical help and financial incentives to reduce energy costs with efficient equipment, lighting, construction and renovation. It's the nation's first such statewide efficiency utility.

Eighty percent of money used for efficiency improvement stays in the local economy, Hamilton said, while 80 percent of that spent on energy leaves the local economy, and some of it the national economy. Vermont decided to institute an efficiency utility funded by a charge that is currently about 4 percent of electric bills. The nonprofit has 120 employees and 40 contractors helping homes and businesses become more efficient.

An example: They advised a dairy to invest $200,000 in more efficient refrigeration for a cheese-aging operation, with the efficiency utility paying half of the bill. The dairy's annual utility bill fell $100,000.

The efficiency service also worked with towns in successful drives enticing every resident to replace at least one incandescent bulb with a more efficient fluorescent. One small town installed 40,000.

While the national energy consumption rate climbs about 1½ percent each year, Hamilton said, Vermont's has slowed toward level and might, for the first time, decline next year. Every state—all others now lag Vermont—must increase to a 3 percent drop every year, starting in just 10 years, to reach the goal of 80 percent cut in carbon dioxide emissions by 2050, Hamilton said.

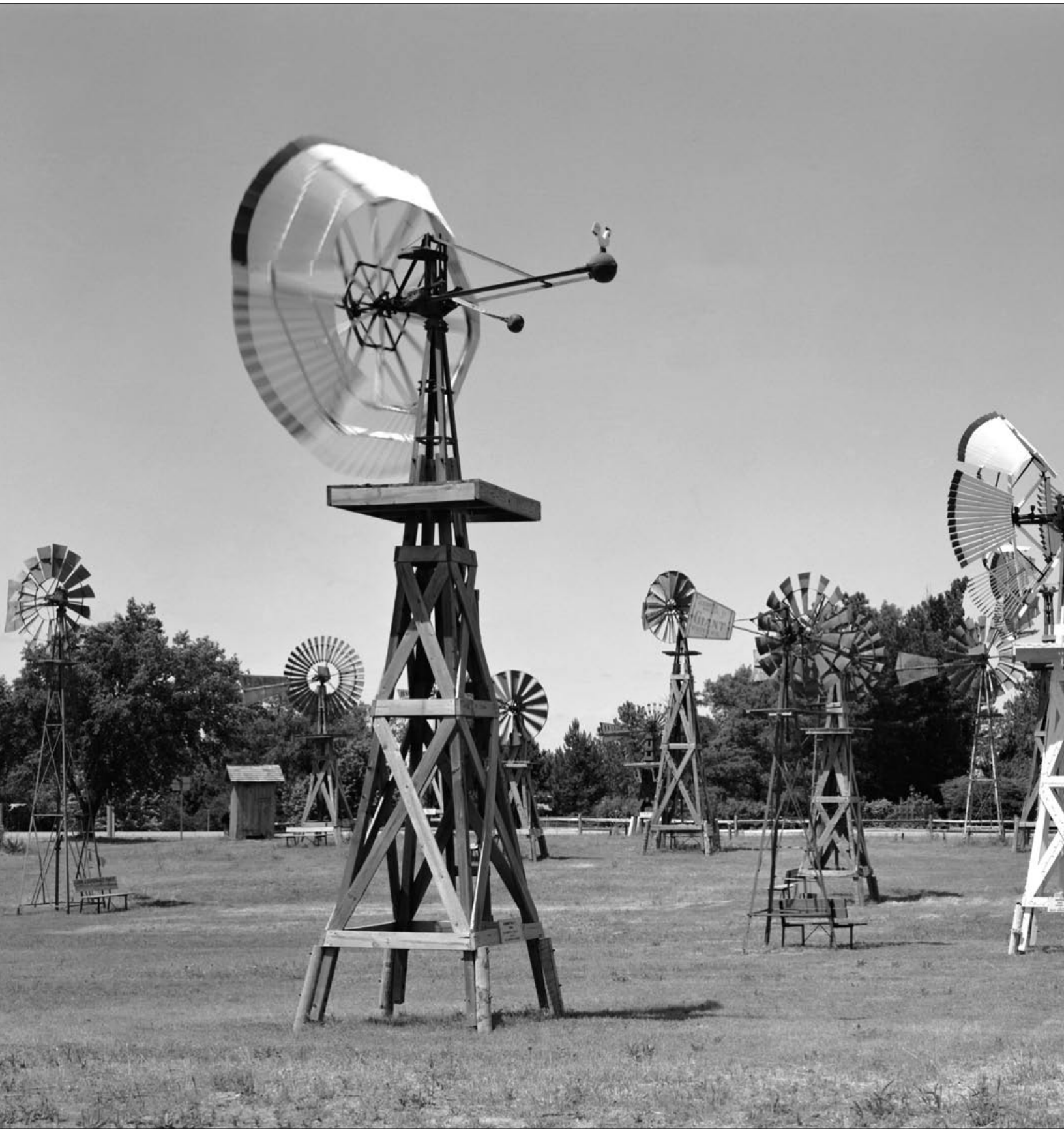
"It's an enormous ramp-up that's going to require tens of thousands of people," he said—technicians, contractors and educators for utility customers. The challenge is to make efficiency the cornerstone of planning for sustainability. That might include ubiquitous labeling of goods with disclosure of energy and carbon information.

Hamilton said, "Efficiency needs to be as easy to buy as energy supply."

Here Jackson returned to the lectern to say information alone is not enough. "If it were, no one would smoke and no one would be fat." She urged emotional commitment for behavior change, because, "This has to be all of us all the time."

Jackson looked to social movements that achieved longstanding change, and saw these things common:

- They promised something better.
- They had a moral or spiritual foundation.
- They were inclusive.



Shattuck, Oklahoma, Windmill Museum and Park. Scott Bontz photo.

On that last, difficult requirement: A job she had analyzing social division required talking with people whose views sometimes repelled her, but, "Even in the most egregious of those examples it was possible." She encouraged reaching out, not correctively or didactically, but with an open, curious spirit, with trust and respect. We need to enter a "post-partisan" moment about climate change, she said. Environmentalists must reach out to Hummer owners. "Conservation has to happen, and it has to be inclusive."

She encouraged festival-goers to think hard about how they will lead. And she noted that Lincoln said success or failure depend entirely on public sentiment.

James Howard Kunstler's Tough Love for America

James Howard Kunstler is the man who has forecast repeatedly and vehemently the collapse of suburbia and autotocracy, and who wrote *The Long Emergency: Surviving the End of Oil, Climate Change and Other Converging Catastrophes of the Twenty-First Century.* He came dressed in black. But in his lapel he wore a wilted little yellow sunflower. And he opened his Prairie Festival talk saying, "I don't want to hear talk of gloom and doom anymore. It's childish." Remember, he said: "Life is tragic."

He didn't quit dark forecasts, but basically said, Buck up, America! He castigated environmentalists for blame laying, college students who whine for hope that they haven't earned by action, and the whole nation for a debilitating sense of entitlement. The audience roundly applauded him throughout his speech, and afterward a crowd with a high proportion of the college-aged surrounded him for further talk and book signing.

Example of the perspective and attitude change that Kunstler pushed: The problem is not U.S. dependence on foreign oil, but the living arrangements that depend on that oil. Talking at conferences of environmentalists, he afterward gets and is frustrated by comments like, "I just got a Prius. Give me a medal." This shows that we accept the premises of and essentially want to do the same thing as the corporations and land developers we despise, he said. His view: Trying to develop hyrid or hyper-cars, and alternative fuels to run them, is a clinging to the idea that we can remain car-dependent. "What could be a greater exercise in futility?" he said. "That's not good enough. And it's very important to shut up about it." And, he said, don't make President Bush the whipping boy for American inattention.

Then Kunstler moved on to oil and grim expectations. (First, he rejected the phrase "peak oil," as one taking cultish overtones that allow it's dismissal. He prefers "global energy predicament.") He said the greatest amount of sheer liquid crude oil pumped was in May 2005. In July 2006 the total basic oil package, including natural gas condensates and other exotics, peaked at 85 million barrels a day. Now

production is 1 million barrels less. When Third World oil demand ends because rising prices put them out of the market, he said, the contest will really get under way in the industrialized world. Even as people become more efficient at finding oil, the world uses increasingly more, so, "We're also going to run out of our oil more efficiently." And for each 3 percent fall in production, he predicted, exports will fall 7 percent.

As a "poster child" for this he presented Mexico. The government relies on the national oil company for almost half of its revenue. Two-thirds of the oil comes from one big field. Production there is falling. Kunstler predicted that in one to three years America's No. 2 oil supplier will shut off pipelines running over the border, only to see economic convulsions send even more Mexicans north.

With its oil lines drying, and no alternative that can substitute, he said, Americans will no longer be able to prop up auto-dependent suburbia. "It amounts to a living arrangement with no future."

But: "You can't even imagine changing it or letting go of it." *New York Times* columnist David Brooks and countless others "who believe the earth has a creamy nougat center" think suburbia is what Americans want and deserve. Kunstler said this is part of our worship of unearned riches, including things like hybrid cars. It's all wanting something for nothing, he said, "a very dangerous idea."

In this critique he included gambling, now a major moneymaker for states. "Gambling doesn't belong in the mainstream of society," but at the margins, he said. Later, to a question, he included as gambling the stock market.

He also argued to stop calling Americans "consumers." "Consumers are just units that eat stuff," he said, and we could stand a diet.

Kunstler predicts that with the decline of fossil fuel will come a long emergency with lots of losers. Large cities will contract, some in ways very disorderly. Waterfronts that cities squandered for things like freeways will be needed again for maritime trade. Places like Las Vegas will suffer. "Phoenix is going to dry up and blow away."

He predicted that in 1 to 3 years Americans will be badly demoralized, angry and begging for somebody "to push them around." But, "You don't have to be crybabies

The man in black, James Howard Kunstler, with young people who want to hear more after his talk. Scott Bontz photo.

about this." We need to be brave to face the new conditions, he said.

Most successful will be small towns with good farm hinterlands.

He strongly pitched revival of a good passenger rail system for trips under 500 miles. He said this, not improved automobiles, is how the United States could make its biggest cut in energy consumption. "We have a railroad system that the Bulgarians would be ashamed of." He said a good rail system, preferably with electric trains, is the one thing needed to decongest American airports, and the best way to rebuild national confidence. "That would really benefit all classes."

Kunstler said we will have to inhabit terrain differently and grow food differently. Farming will reorganize on a social scale. Society itself will reorganize. It might become more hierarchical, and might require reallocation of land.

The United States will need to resume manufacture of the tools of everyday life, such as brooms and dustpans, but the old factories still standing will be inefficient and ill-suited to work on the energy down slope. And Kunstler said neither wind farms nor solar panels will go beyond supplying neighborhood dwellings.

And the role of population growth in all this? "There's not a damn thing to say about population"—no protocol will affect it.

He also dismissed as unworkable fantasy the proposals for independent local currency. His dollar stays on gold, silver and barter.

Kunstler's books include *The Geography of Nowhere: The Rise and Decline of America's Man-Made Landscape*, and novel scheduled for release in February, *World Made by Hand*, about life after the collapse of the world that oil made.

Food: Fast, Local and Middle Path

When transportation costs rise, the distance food travels from farm to plate—now an estimated 1,500 miles average in America—will fall. The festival invited three to speak about connection to food.

A century ago food preparation took time and expertise, Steve Ells said, and "Eating was much more of a ritual." Now most Americans needn't think about where their next meal is coming from. Eating is "just commodity fuel," and restaurants are seen as filling stations. We are more disconnected from food than at any time in history. Ells called this a shame, but accepts it, and said the thing to do is reinvent fast food. The time is ripe, as people ask how to be responsible and live sustainably.

Ells is chief executive officer of Chipotle Mexican Grill, which he founded 14 years ago and now has more than 640 restaurants serving 2.3 million each week.

"Today fast food is a derogatory term," he said, connoting a product that is cheap, highly processed, served poorly and sold by gimmickry. But it needn't be that way: "There's nothing wrong with fast." Lettuce picked from a garden and sprinkled with vinaigrette is fast. And it takes only seconds to put together a burrito. The difference is in good raw ingredients, Ells said. Put thought and time into making those, and the prepared food can be good. "The problem with fast food is not that it's fast. The problem is the food."

Ells said that Chipotle has always aimed for fresh food. But it initially didn't look at how it was grown. Seven years ago Ells saw a confinement hog farm, and set to getting pork only from farms that raised pigs humanely. Now, he said, all of Chipotle's pork, 75 percent of its chicken and half of its beef meet that standard. The chain soon will use no dairy products involving synthetic bovine growth hormone. Ells said Chipotle still imports avocadoes when they're not available from California.

The publicly traded company is doing the right thing, he said, but remaining profitable and maintaining shareholder value.

Kamyar Enshayan directs the University of Northern Iowa's Local Food Project, linking institutional food buyers to nearby farms. He gave this report on an eight-county area around his home in Cedar Falls, using research by Ken Meter, an economist at Crossroads Resource Center in Minnesota working with federal government numbers:

From 1999 to 2003, farms had $1.08 billion in sales. Expenses were $1.14 billion, or a net loss of $62 million. Federal crop subsidies over the four years totaled $692 million. And residents spent $2 billion on food, almost entirely bypassing local farms. Enshayan said this was typical of the Midwest.

His office connects food buyers and farms. Farmers tell him what they have weekly. He passes that along by e-mail to buyers. He also organizes tours and runs ads to make local foods more visible. There are signs for the farm markets, signs telling where food came from and posters in restaurants to advertise farmers who supply them.

In a decade, the Local Food Project has gone from enlisting one restaurant, one college and one hospital buying $111,000 in local food, to $881,000 in sales to 12 restaurants, five retirement homes, seven groceries, one elementary school and the college and hospital.

"These are ordinary places," Enshayan said, "not environmental food buyers. They knew fresh … and they knew that local purchases were helping local farms."

Enshayan held this up as example of what just one entity can do by devoting a little time to advocating local agriculture. For each dollar raised to run the largely volunteer 10-year-old Local Food Project, $7 has gone in sales to local producers—money that can say at home.

Still, despite the prime, highly productive cropland around them, area food stores carry few local products. Enshayan said the project has far to go. If, beyond institutional spending through the project, buyers at farm markets and

the like brought the local number to $3 million—Enshayan's rough guess—that's still less than 1 percent of the annual $500 million spent on food in the eight counties.

He thinks 10 percent can be reached without adding to the physical "food infrastructure." But for local food to find prominence on local grocery shelves will take local meat lockers, flour mills, freezers and canners. "It's not just 'I grow this you buy it from me.'" And that will take funding and a system with incentives, the same sort of investment that cities make to get big box stores, only to see them funnel money away. Some local food efforts sport slogans like "field to fork." Enshayan said, "We need to start a fork to legislature project."

Enshayan also is a city council member, and he said this has shown him that local government has a tremendous effect on how Americans live. For local food planning, he encouraged involvement beyond the pocketbook.

Fred Kirschenmann asked how eating affect landscape, and proposed that how we feed ourselves during the next century will be very different than the last, out of necessity.

Kirschenmann, a fellow of the Leopold Center for Sustainable Agriculture (see www.leopold.iastate.edu) and an organic farmer in North Dakota, ran a list of vital resources being depleted:

■ The stored, concentrated energy of fossil fuels, which began by giving us 100 kilocalories for each kilocalorie invested, won't be neared in capacity by any alternative.

■ Seventy percent of freshwater goes to agriculture irrigation. In China 80 percent of grain production depends on irrigation, but groundwater is dropping 10 feet per year. In India 60 percent is irrigated, also unsustainably. Likewise with much of America's High Plains aquifer.

■ The recent great rise in food production came in a century of relatively stable climate, but models predict destructively more unstable conditions, including more violent storms. Expected for Iowa: 50 percent more runoff.

■ Soil vitality loss is masked by fertilizers dependent on finite fossil fuels. And each year 2 million acres of U.S. farmland is lost to erosion, salt or waterlogging, and another 1 million acres to development.

■ Farmers with intimate knowledge of and care for their land are disappearing. The reported 2 million Americans still farming is misleading: In 2002, 1.6 million farmers made 6 percent of our food. Some 400,000—about one-tenth of 1 percent of the U.S. population—grew 94 percent of it.

"We're going to need some of the most creative, imaginative farmers that we have seen on the planet," Kirschenmann said. "Where is the human capital going to come from for that challenge?"

The shift will be difficult, but he said Cassandras are finally gaining notice. He showed a recent issue of *Crop and Soils* magazine with a story about crop and livestock diversity, something he said was unobserved by professional ag journals just a year ago.

Still, the recognition doesn't show on the land. "It's like, the party's not gonna be over."

Change happens not with the arrival of a Lone Ranger, Kirschenmann said, but with convergence of events. Will it be orderly and peaceful, because we prepared, or chaotic and violent because we didn't?

Direct connection of growers and eaters—farm markets and community supported agriculture arrangements—already has grown rapidly. Kirschenmann found his explanation for this from an unusual source, Rick Schneiders, CEO of food distribution giant Sysco Corp. He says buyers increasingly want with their food these three things:

■ Memory: Food so good, the eater wants to know where it came from.

■ Romance: A good story about the food being produced humanely and sustainably.

■ Trust: Confidence in the producer.

Pressure for these comes from colleges, schoolchildren's parents and hospitals, Kirschenmann said. "These are huge markets." But the country has essentially just two tiers of farming, he said: one, direct market, too small to much affect the land, the other, commodities, too large and detached to meet the particular demands for memory, romance and trust.

Independent family farmers are in the best position to make a middle tier. But the nation is losing them at the fastest rate. From 1997 to 2002, Iowa farms saw a 24 percent increase in the number of farmers with gross sales of $5,000 or less, a 17 percent increase in farmers with sales of at least $1 million, and an 18.5 percent decrease in farmers with sales of $50,000 to $500,000. In 2002, 27 percent of American farmers were older than 65, and just 6 percent were under 35.

Kirschenmann said a market of the middle can be established if capital is available, standards cut energy consumption and the number of farmers is increased by connection to markets.

For an example of what to do he offered Organic Valley Family of Farms. The co-op, founded in 1988 by seven farmers, now has more than 1,100, and Kirschenmann said it is successful not just because of organic food, but because it addresses Schneiders' demands. (See www.organicvalley.coop.) Kirschenmann said to serve the middle market farmers must aggregate like Organic Valley, reducing transaction costs and pooling products.

Also very important in the changes coming with resource loss, he said, will be the arts. "It can't just be the farmers alone." People will want to hang on to what they have, and will change only with reluctance. He said they've been brainwashed to think that the current status is the best that could be, so writers and artists must help them imagine a better life in a new food future.

Kirschenmann thinks things can actually be better. He

Deep ecology: Kansas Gov. Kathleen Sebelius visits a trench dug for Prairie Festival visitors to compare roots of intermediate wheatgrass, a perennial stretching more than 6 feet down and alive year-round, to those of wheat, an annual reaching about 2 feet and dead by late June. Pointing and explaining is Land Institute agroecologist Jerry Glover. In the foreground is Lt. Gov. Mark Parkinson, at left Wes Jackson, and at center back, federal magistrate Judge K. Gary Sebelius, the governor's husband. Angus Wright photo.

said that Bill McKibben has written of Americans after 1950 getting richer but actually living more unhappily. We're in a yo-yo economy: You're On Your Own. He cited as relief Barbara Kingsolver's book *Animal, Vegetable, Miracle*, where she describes the riches of raising food as a family, in a sense of community. Kirschenmann asked, Wouldn't that be better than today?

The real transformation needed for farming is not to alternative energy, he said, but from a system dependent on stored, concentrated energy to one of "energy exchange." This is one that works as a dynamic whole instead of relying on subsidies. As an example he gave Virginia farmer Joel Salatin. Salatin does not just rotate cattle through his pasture to avoid overgrazing and to keep it healthy, but follows the bovines with poultry 90 hours later, when fly larvae appear in the cattle feces to feed the birds. He gets nature to help with his work. Kirschenmann said that exploring these kind of energy exchanges in the complex natural world is what most deserves research funding: We don't know what all is out there.

The problem is, as he heard Martin Luther King say, most of us sleep through the revolution. That's our challenge.

Bruce Babbitt's Policy for Prairie

Bruce Babbitt, an Arizonan, said he grew to appreciate land east of the Rockies when, as President Clinton's Interior secretary, he visited the Kansas ranch that would become the Tallgrass Prairie National Preserve. (See www.nps.gov/tapr) He saw the sealike waves of grass, the sunset, the 19th century limestone house. "I've been there, and I've been converted," he said. (And, to warm up the audience, in recollection of his visit to the limestone three-holer outhouse: "I'm thinking this really is national park material.")

Babbitt asked how it happened that 95 percent of the nation's 170 million acres of tallgrass prairie are gone, and what will happen to the other 5 percent. What he learned was that for nearly 200 years Americans have grappled with their relationship to the prairie, especially west of the 98th meridian. We've tried to strike a bargain, he said, but have yet to find an arrangement that's comfortable.

We can see the remains of past efforts: abandoned homesteads reflecting American optimism. The original frontier fell back under the region's hard conditions for Easterners and immigrants trying to make row crop country out of dry prairie.

A second wave came leading up to World War I, with the new dryland wheat and machinery. This enjoyed a deceptively rainy period. Then came the Dust Bowl, blowing all the way to the nation's capital what farmers had exposed in the great plow up.

A third wave came after World War II. The answer this time was pivot irrigation, running on new pump technology and cheap fuel. And with us this remains. But Babbitt said, "I think we all understand that this third wave is living on borrowed time. The day will come when reality will again be reaching across the arid Plains."

And now, Babbitt said, comes a fourth wave: ethanol. Before proceeding, he plumbed the audience: Any plain, unvarnished ethanol advocates here? Silence. Then laughter and applause. Babbitt said he would not let his listeners off so easy.

He said ethanol could make 10-15 percent of the nation's transportation fuel. Then he asked, rhetorically, Am I ready to banish ethanol from the land? From the audience came "Yeah." Babbitt emphatically answered, "No." "The fact is ethanol is with us," he said. "It's out of the gate."

He recognized the problems of growing corn for the fuel, but in an interview with the local newspaper before the festival, he said it should be treated as a transitional source from oil to something better. To the audience he held up the possibility of more benign ethanol production from cellulose—wood chips, crop straw, prairie plants. But this is unproven, and he was uncertain about it.

From then Babbitt made no more pitches for ethanol, and kept to means of preventing a fourth great plow up. He said the pressures for expansion will be enormous. Just from last year to this, he said, U.S. acres in corn went from 70 million to 93 million. That was not just conversion from another crop, but involved plowing of land that had been replanted to perennial vegetation in the Conservation Reserve Program, one of the few ways that the government

Bruce Babbitt isn't opposed to making ethanol from plants, but says stop crop payments to farmers who plow prairie. Scott Bontz photo.

encourages farmers to conserve resources rather than increase production.

What can be done to save that 5 percent? Babbitt harked back to the 1970s, when Agriculture Secretary Earl Butz encouraged farmers to plant fencerow to fencerow. Then the northern Plains' prairie potholes, vital for migrating waterfowl, began falling to the plow. Congress' solution, a "swamp buster" provision of the farm bill, denied deficit payments or subsidies of any kind to farmers who sacrificed their natural ponds. This essentially solved the ecological problem, Babbitt said. He argued that the same principle could be used to stop any plow ups of virgin prairie. "The sanctions should be called not swamp buster, but sodbuster." He said the government might also withdraw the 50 cent per gallon subsidy of ethanol.

Babbitt called for this to be approached as preservation, not prohibition. We shouldn't simply bar plowing prairie, he said, but reach consensus on why the prairie is there. And he thought that view should be as a source of energy for herbivores—"herbivory on a perennial landscape."

For an example he offered American Prairie Foundation's effort in northeast Montana to link public and private lands for a preserve of productive, full prairie ecology, with prairie dogs, bison, elk and wolves. (See www.americanprairie.org) Babbitt called the prospect "primeval," and said, "It will be a vision of what we lost."

"Now, am I advocating this for western Kansas? Well, no—not yet," he said, drawing from the audience a little laughter.

What do we do with land that is no longer prairie, but where farms shouldn't be? He suggested expansion of the Conservation Reserve Program, which he called the most underappreciated and underworked concept of the farm program. The difficulty with it is that it has no vision beyond controlling soil erosion. Farmers are paid to restore cropland to perennial cover, but, with the exception of during emergencies like drought, cannot use the land for agriculture—no grazing or haying.

Another problem: CRP is indiscriminately applied to flat land, the least susceptible to erosion. "We've got the wrong occupants of the halfway house," Babbitt said. And in the South, CRP plantings include trees, which grow quickly there, and after the 10-year CRP contract expires, landowners cut for a profit and go back to annual cropping.

Babbitt said he sees a pattern in American history, of complacency counterbalanced by heroic capacity to respond to problems. He said the makings of the current farm economy and the environmental movement came together around the beginning of the 20th century. Then there was the robber baron phase of the 1920s, followed by the Great Depression and New Deal of the '30s. He called the '50s the return of another robber baron phase, and said today we are at the very bottom of national indifference. "The center is dead. There is nothing productive going on in Washington."

This is where the seed flowers, he said, where the form starts to well up on the landscape: things like land trusts, debates about sustainability, mayors working on climate change. He said these are the harbingers of change flowing across the center.

Babbitt tells more about using consensus and federal carrot and stick to effect land use policy down to the local in his book, *Cities in the Wilderness*.

The Coal Question Answered

Before institute President Wes Jackson gave the festival's final talk, he invited to the lectern Kansas Lt. Gov. Mark Parkinson, who had accompanied Gov. Kathleen Sebelius for introduction of Babbitt, who was governor of Arizona before he joined the Clinton Cabinet. Parkinson's talk was among the weekend's shortest, but earned the loudest response.

Background: Sunflower Electric Power Corp. wants to build three extra coal-fired power plants near Holcomb, Kansas. Most of the project's electricity would go to Colorado. It would be one of the largest single producers of atmospheric carbon dioxide—an estimated 13 million tons per year—west of the Mississippi. Jackson has argued against it in public meetings and directly with Sebelius and Parkinson. Sebelius had taken flak for not clearly stating her position, but recently said that for health of Kansans, she was opposed. Days after the festival, she said she had not tried to sway the permitting entity, the Kansas Department of Health and Environment. And she again said that either way, the matter is headed for court.

After deprecating humor about the position of lieutenant governor, placing it in animal hierarchy somewhere below amoeba, Parkinson told the festival audience that Sebelius had asked him to lead the state's energy policy, which until now has been scant. Then he said that the administration believed Kansas could meet its energy needs "carbon neutral," without adding coal-fired power plants. To this, the hundreds in and around the barn rose to their feet in applause. Parkinson thanked the institute's Climate and Energy Project for its help, and said that in the next three years of the outgoing Sebelius administration, they hoped to show that energy needs can be met without "wrecking the lives of our children." There followed another ovation. It might be up to the courts, but we know where Prairie Festival-goers stand.

We know more about the movement of celestial bodies than about the soil underfoot. —Leonardo da Vinci

Economics and the Enigma of Eden

Wes Jackson

The writer's Prairie Festival talk.

Exhibit A: Uncle John, Who Played by Old School Rules and Lost Because the Economic Game Is Rigged

Uncle John's wife, Aunt Minnie, had died. Aunt Minnie was my mother's aunt. She and Uncle John had one child, a son named Luther. Luther, married only briefly, had also died. If my memory is correct, Luther's wife got the farm, which she immediately sold. Whatever had happened, Uncle John had little money and no place to stay, so he came to live with my Aunt Ruth, my mother's younger sister.

Aunt Ruth lived on the farm next to ours with the two of her kids who were still in school, my cousins Danny and Martha. They lived on the farmstead of my mother's parents. Aunt Ruth's husband, Uncle Art, had died during the war—not in the war, but during. Their oldest son was fighting the Japanese in the Pacific.

Uncle John had what he called a game leg, with an open sore that never healed. He had an upstairs bedroom in that big house Aunt Ruth had inherited, and took his meals with Aunt Ruth and her kids. I would go over there in the evenings to play board games and cards with Uncle John and whoever else was interested. Mostly it was Uncle John and me.

When bedtime came, Uncle John would hobble up the steps and Aunt Ruth would call after him, "Uncle John, did you apply the salve and dress your leg?" He would call back, "Thank you, Ruth dear, it is taken care of." He had not lied, for I had seen Uncle John expose his sore to the dog who dutifully got up, walked over and licked the wound. This, apparently, was all the treatment that Uncle John thought the leg needed. To this day I have no idea which might have been the most effective treatment. I have had people learned in the art of healing describe the merits of the dog treatment.

What brings Uncle John up is not the leg or the loss of his farm and his dear wife Minnie and his beloved son Luther, though volumes of tears would have been shed in that kitchen by the cookstove (if it was winter) over those losses. What I want to talk about is the game of Monopoly, which the two of us frequently played.

I won every time, and not, I think, because I was a child and he let me. Every time it would be the same story as we made the rounds as dictated by the roll of the dice. Uncle John might land on Park Place. He would look at the price, count his money, roll his cigar from one side of his mouth to the other and always decline. "That's a little steep for me," he'd say. But when Uncle John landed on a low-priced property, Baltic, for example, if he had the money he might snap it up.

You can appreciate where this story is headed. I ended up with the expensive properties. He ended up with the cheap ones. I put houses and hotels on mine every chance I got. He might sprinkle some houses on those cheap properties, but would decline the opportunity as often or more often than not. It wouldn't be long before he landed on one of my properties, often with one or more houses or a hotel. When that happened and he heard the rental price, it hit him like a force. If he was low on cash he would ask, "Can you hold off until I pass Go, Sharon?" (That is my first name, which I went by until college.)

At first I would "hold off." But then he'd hit another one of my expensive properties, and I'd suggest that he sell a house or mortgage one of his properties. At that moment the pain would become acute.

"Naw, I ain't gonna mortgage," he would insist. "I saw what happened to my neighbors in the Depression. I vowed never to mortgage my place and I kept it—me and Minnie. We just cut back." And then he would say, "I wish I had that place now. I could still make a go of it, even with my game leg, with a few chickens and my garden."

Well, that's how I beat him every time. I beat him because the game is rigged. I beat him because he was from the old school, operating, as Milton said, "according to the holy dictate of spare temperance."

Exhibit B: A Russian Welder and His Family —Resilience on an Industrial Edge

The Thursday, March 13, 1997, *Salina Journal* brought the following Associated Press story: "Russian workers cope as best they can." In Kurilovo, Russia,

> Each day, Nikolai and Galya arise in the dark and go about the business of making a living. They milk their cows, feed their pig, gather eggs from their chickens, tend their garden. They live off what they grow, and sell the rest for a few rubles here and there. From milk alone, they earn perhaps $100 a month. And when the sun rises, Nikolai heads off from his simple wooden house to his long-time job as a welder in a state-run auto repair factory. For this, he earns nothing.

The article continues, "People survive on their gardens and their wits, and the official economy primarily is a distraction." After some mention of an impending trade union

Prairie (spring 3), by Jin Lee.

strike and President Boris Yeltsin's concern about doing something about it, the writer says more:

> Across Russia, especially in smaller towns and villages, millions of workers have gone months without wages. Both the government and private employers have been unable—or unwilling—to pay them. Even retirees have gone without their pensions. Outsiders tend to ask how this is possible: How can a nation survive when its people are unpaid? Why would a worker show up for a job that offers no wages? Like many Russians, Nikolai—who hasn't been paid in three months—doesn't ask these questions. Why wouldn't he show up for work? "Where would I go?" he said. "There aren't any other jobs in this town. I'm too old to look for work in Moscow. This is a one-factory town; we have no other choices. And besides, what if the day I decide not to show up the managers start handing out wages?"

A message not explicitly mentioned in the article is that nature's economy in combination with traditional culture continues to feed the people and sustain the industrial economy.

Imagine nearly anyone but the Amish going with no wages in the United States for three months now that our traditional rural economies have been mostly undone. The collapse of the Soviet empire represents the first major failure of the industrial mind. We should more or less ignore the differences between capitalism and the Soviet brand of communism here, for both systems have sought to concentrate power and in so doing greatly reduce the number of people on the land and in small communities.

If we are to prevent the eventual likelihood of widespread social upheaval, we need to keep the people on the land and in the small towns who are already there, and we need to imagine and implement ways to get people back onto the land and into more traditional relationships with sun, soil and rural community. To do this, we don't have to junk every accouterment of the technological era.

Rural diversity, similar to what we see in Amish society today, is the last insurance we have for security. It is not to be found in the industrialized pig or chicken factory, not in huge feedlots, and not in the vegetable monocultures of California's Central Valley. These are the most brittle forms of food production.

Mathematicians and computer wizards at places like the Santa Fe Institute are at work these days on "sand pile dynamics," an elementary model that involves a steady stream of sand being poured downward to form a cone. As grain after grain slips onto the pile, nothing initially happens except that the cone becomes larger. At some point, however, a grain of sand will trip a cascade. Which grain it will be, and which grains will be caught in the cascade, is unpredictable, but that it will happen is certain.

The sand pile dynamics model has been used by biologists, economists, physicists and others to explore the various social, biological and physical problems of the modern world. Whether it is the application of farm chemicals to our land and water, cutting of the tropical rain forest or overhauling the architecture of the genomes of our major crops and livestock by introducing genes from long evolutionary distances, certain cascades are inevitable, because the resilience of nature is not infinite. The small cascades of the past become predictors of the future.

Meanwhile, we tend to ignore where true resilience lies. The Siberian welder and his family, with their garden, pig and chickens, have more to say about a sustainable future.

Exhibit C: John Morris, an Uncertified Professional

From 1958 to 1960 I was at work on a master's degree in botany at the University of Kansas in Lawrence. The Botany Department amounted to 26 people: a half-dozen were faculty, the balance were graduate students and the secretary, Sallye. One student was from India, one from El Salvador, two from Taiwan, one from Pakistan, one from England, one from Wales, the rest from the United States. A taxonomist headed the department. The newest hire, a cytogeneticist, was my major professor. There was one expert in algae and one in fungus. The senior member of the department, W. H. Horr, taught both ecology and plant physiology. And there was a paleobotanist.

I found a group photo a few years ago. Off to the right in the photo is John Morris, from Wales, who worked on a Ph.D. in paleobotany under the eminent professor Robert W. Baxter. John and his colleague in paleobotany, Art Cridland from England, would publish the Pennsylvanian *Flora of Kansas* as grad students. It is John Morris I want to talk about now.

In later years, whenever two or more members of that ancient tribe got together, the question would pop up, "Have you heard from ol' Morrie?" or "What ever happened to John Morris?" No one knew where he was. The question kept coming up because, though he finished the course work and his thesis, John Morris never took the final oral examination. Professor Baxter told several of us over the years that the doctorate was a done deal if only John would appear. He would emphasize that John had done great work deserving considerable note—though using more expressive language—and always end with a big sigh of exasperation. The question hung in the air. Professor Baxter died and John Morris was lost, at least as far as the KU botany tribe was concerned.

But then in early January of 1999, Jerry Weis, a recently retired professor of biology at Kansas State University in Manhattan, dropped in one afternoon for a visit. (Jerry and I had gone through Kansas Wesleyan University in Salina, Kansas, together as undergrads, and then with Jim Hutchinson the three of us descended on KU in the fall of '58 to begin our graduate training in botany.) And the old question came up, "What became of Morrie?" Jerry blurted,

"I got an e-mail from him recently. He lives in Bangor, Wales, and is retired. I'll fax you the e-mail." He did, and I called John—called him immediately, because Joan and I were headed that month for England, where I was to meet with various scientists and teach for a week. We all knew John had married Nancy, an American and a fellow KU student, and that she was an artist. Now I learned he had three grown children, one grandchild and another on the way.

A day after Joan and I arrived in London (seven hours with a tailwind from Chicago), we caught a train from Paddington Station and were at Bangor in three hours. We went to the house where John was born. We visited his mother, who still lived in the house where she was born 83 years before. We saw the now-abandoned school where John went, and the road to the grade school where he took it upon himself to learn the Latin name of every plant encountered. We saw the slate mining district where his father had worked. John had told me once, when he and I had been sent out to collect plants in western Kansas for the KU herbarium, that his father and other coalminers would read and recite Welsh poetry during breaks and as they ate their lunches. John spoke only Welsh to his children as they were growing up. Nancy learned Welsh, too, though she spoke English to the children.

After greetings that included hugs and laughter and descriptions of children and grandchildren, and going very roughly over what had happened during the past 36 years or so, I finally popped the question. Why hadn't he taken his degree? He was mildly evasive. It was not that he didn't want to say, but that—as I saw in retrospect—he did not want to run the risk of embarrassing me with his answer.

Finally: "Well, I had a plan. I wanted to come back and teach in my old high school. And, I knew that if I had a Ph.D. I would be overqualified and they would not give me a job."

Over the years he taught at two or three places, including his old high school, became a headmaster, and retired.

The mystery was solved. John had wanted to go home, or, I should say to be more accurate, to be close to home. As we drove away from the village in which his mother lived, which is only 10 miles from where John and Nancy live in Bangor, I asked, "Will you ever move back to the village?" From both there came an immediate "No!" There would be expectations to fulfill: church three times on Sunday, and others he did not describe.

John now gardens and works at his lathe, turning beautiful wooden bowls. Nancy has become well known for the watercolors of her adopted land.

John Morris' affection for the Welsh mountains, the Welsh mountain sheep and the Welsh language, his desire to keep his feet on the ground and not be caught up in the prestige that comes with a full professorship with lots of papers and a few books, was part of a plan. He wanted the academic knowledge—the discipline. He wanted to be steeped in the academic tradition and to pass some of it on. But intellectually and professionally he was in business for himself, so to speak, because he was willingly a native to his place.

Exhibit D: The Women of Matfield Green: Rich Rural Culture with Little Money

In the early '90s I lived on and off in the small Kansas town of Matfield Green, population 56. The Land Institute had a presence there, and I acquired a few abandoned houses. At work on them, I had great fun tearing off the porches and cleaning up the yards. But it was sad, as well, going through the abandoned belongings of families who lived out their lives in this beautiful, well-watered, fertile setting. In an upstairs bedroom, I came across a dusty but beautiful blue padded box labeled "Old Programs—New Century Club." Most of the programs from 1923 to 1964 were there. Each listed the officers, the club flower (sweet pea), the club colors (pink and white), and the club motto ("Just Be Glad"). The programs for each year were gathered under one cover and nearly always dedicated to some local woman who was special in some way.

Each month the women were to comment on such subjects as canning, jokes, memory gems, a magazine article, guest poems, flower culture, misused words and birds. The May 1936 program was a debate: "Resolved that movies are detrimental to the young generation." The August program was dedicated to coping with the heat. Roll call was "Hot Weather Drinks," next came "Suggestions for Hot Weather Lunches," and a Mrs. Rogler offered "Ways of Keeping Cool."

The June roll call in 1929 was "The Disease I Fear Most." That was 11 years after the great flu epidemic. In those days children were still dying of diphtheria, whooping cough, scarlet fever and pneumonia.

On August 20, the roll call question was "What do you consider the most essential to good citizenship?" In September of that year it was "Birds of our country." The program was on the mourning dove.

What became of it all?

From 1923 to 1930 the program covers were beautiful, done at a print shop. From 1930 until 1937, the effects of the Depression are apparent. Programs were either typed or mimeographed and had no cover. The programs for two years are now missing. In 1940, the covers reappeared, this time typed on construction paper. The print shop printing never came back.

The last program from the box dates from 1964. I don't know the last year Mrs. Florence Johnson attended the club. I do know that Mrs. Johnson and her husband Turk celebrated their 50th wedding anniversary, for in the same box are some beautiful white anniversary napkins with golden bells and the names Florence and Turk between the years "1920" and "1970." A neighbor told me that Mrs. Johnson died in 1981. The high school had closed in 1967. The lumber yard and hardware store closed about the same

time but no one knows when for sure. The last gas station went after that.

Back to those programs. The motto never changed. The sweet pea kept its standing. So did the pink and white club colors. The club collect that follows persisted month after month, year after year.

A Collect for Club Women

Keep us, O God, from pettiness; Let us be large in thought, in word, in deed.

Let us be done with fault-finding and leave off self-seeking.

May we put away all pretense and meet each other face to face, without self-pity and without prejudice.

May we never be hasty in judgment and always generous.

Let us take time for all things; make us grow calm, serene, gentle.

Teach us to put into action our better impulses; straightforward and unafraid.

Grant that we may realize it is the little things that create differences; that in the big things of life we are as one.

And may we strive to touch and to know the great common woman's heart of us all, and oh, Lord God, let us not forget to be kind.

Mary Stewart

By modern standards, these people were poor. There was a kind of naïveté among these relatively unschooled women. Some of their poetry was not good. Some of their ideas about the way the world works seem silly. Some of their club programs don't sound very interesting. Some sound tedious. But their monthly agendas were filled with decency, with efforts to learn about everything from the birds to our government, and with coping with their problems, the weather, diseases. Here is the irony: They were living up to a far broader spectrum of their potential than most of us do today!

I am not suggesting that we go back to 1923 or even to 1964. But I will say that those people in that particular generation, in places like Matfield Green, were further along in the necessary journey to become native to their places, even as they were losing ground, than we are.

Exhibit E: An Enigma,
or Thoughts on The Natural History Of Eden

In the late '60s, while a professor at Kansas Wesleyan, from time to time I drove around Saline County looking at rural property for a small homestead to round out what I considered the perfect life of teaching at a small liberal arts college, coaching track and raising the three children my wife and I had planned and brought into the world.

On several occasions I found myself parked by an old iron bridge over the Smoky Hill River south of town a few miles. On the east side was a high bank that overlooked the river and a beautiful flood plain opposite. The strip along the high bank most attracted me. It was a strip that had been broken and farmed, but returned to native grassland. Two ravines, one major and one minor, cut their way toward the river, and from them spread trees such as burr oak, green ash, black walnut, hackberry and box elder. There were the usual accompanying poison ivy and grapevines. Gray dogwood and sumac spilled into the prairie.

It was an idyllic spot. My favorite place there was a high point where I could look down on a ripple created by an outcropping of Wellington shale. To sit there was an exquisite experience. I am tempted to say that I meditated on the wonders of nature, but I doubt that. I don't know what I thought. I do know that I was always alone. I never felt like having anyone with me. I was not interested in hunting the land's pheasant, quail, cottontails or squirrels. Nor had I any desire to fish the stream. The place was Eden.

I learned that an older childless couple, Bessie and Loyd Wauhob, owned this little strip. They lived across the river and across the road. I went to see them and expressed my interest in purchasing a small piece nearest the road, maybe three acres. Bessie's dad had told her never to sell any of her farmland, and she had stuck to that. While both Bessie and Loyd agreed with my assessment of the land as so erodible it had to be abandoned as crop ground, they remained reluctant to sell. They were not the kind of people one should push. But I returned to visit with them a few times and offered as much as $1,000 an acre for three acres. They finally agreed to sell, but protested that $1,000 an acre was too much and that I need pay only $500. A deal was struck.

Of course, I wanted to start building a house right away and raise the children in the country. My wife agreed. The permit office asked to see my plans. There was a tablet on the counter on which I drew the entire perimeter freehand, added a couple of doors, and declared "Here are my plans." They were approved.

For several months we did nothing to the place, for we lacked the money to start. My family and I frequently came out to picnic or walk around the Land. (That is what we called it and how the Land Institute got its name). We decided to put the house more or less parallel to a slope toward the river just north of the ravine, from which a poor quality coal had been mined more than a half-century before. I built a construction shack out of hollow veneer dormitory doors kicked in by not yet civilized boys at Kansas Wesleyan. I added a $25 lab bench from Wesleyan's old science building. Water came from a well my geologist friend Nick Fent dug across the road. Power and water lines went to the shack in the same trench.

The International Harvester dealer rented to me, at $5 per tractor hour, an industrial tractor with a backhoe and a front-end loader. I went to work digging the basement,

Prairie (summer 7), by Jin Lee.

which was to be a walkout affair, filled at the back but mostly open on three sides. After more or less mastering the backhoe, I dug the ditch for the lateral field and the hole for the septic tank. I dug the footing for the house, 2 to 3 feet wide and about that deep. Miscellaneous pieces of iron, including old bicycles and tricycles, reinforced the concrete walls poured mostly from self-built forms, intended to be 10 inches thick. (I measured one recently and it is closer to 11 inches.) The unconventional construction included local trees for beams and inside panels.

For rest, I often ambled over to the river, to the same spot where I had stood before construction began, and looked down and out and around. Nothing below had changed. The shale still generated the ripple. The rustic iron bridge, which should never have been a part of Eden but somehow was, still spanned the river. The fields across the water were the same. To my left remained the large woody ravine.

But Eden was gone. I tried to bring it back by opening and shutting my eyes, to image what it was, but it never returned or even came close. Apparently, the very exercise of what makes us human, in that place, drove what some would call "the spirit" away from me. A philosopher might call it a phenomenological experience. I begin to understand the biblical meaning of the angel with the flaming sword who denies access to Eden.

Arthur Zajonc in his book *Catching the Light* helped me understand that the very design of the experiment, a product of our cognition, in trying to determine whether light is a wave or particle, determines whether one will perceive a wave or a particle. There is a drawing, an optical illusion, that sometimes appears as a beautiful young woman, and at other times as an old woman. You can't see both at once. In the case of wave vs. particle, or beautiful maiden or old woman, it goes back and forth. For me, and my place of Eden, a cognitive switch had been thrown that has never been thrown back.

One interpretation of Genesis is that our fallen condition comes from insisting that we participate in the Creation. Because I participated in the Creation as a technological creature, I had destroyed something whole, which is to say, holy. My family and I, like all others, wanted a home. Who can argue against that motivation? Had I met the shelter need in a minimal sort of way, would Eden have remained? We'll never know. I do know that my perceived need at the time was probably not a real need. We could have continued to live in town. My perceived need was determined more by culture than by necessity.

Bess and Loyd continued to sell us adjacent land as we could afford it, until we eventually owned 28 acres. Back from the river now grow various trees bearing organic fruit—beautiful cherries and pears, and also wormy apples. The deer and wild turkey have increased since the early days. The habitat is still safe for them plus bobcats, quail, pheasants and nonverbal serpents, not at all tempting us, and less onerous and certainly less toxic than the poison ivy along the big ravine. Now on the river bluff under trees less than 100 feet away from where I first experienced Eden and lost it four decades ago, there is a sandbox, playhouse and merry-go-round for grandchildren. A sweat-of-the-brow flower and vegetable garden grows over the lateral field, and the shade and pleasing forms of native and exotic trees planted as saplings early on—all watered from the well Nick Fent drilled—bring delight to this participant in the Creation who sometimes thinks the loss of Eden was a bargain.

As we peer into society's future, we—you and I, and our government—must avoid the impulse to live only for today, plundering for our own ease and convenience the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without risking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not to become the insolvent phantom of tomorrow. —President Eisenhower, in his farewell address

Careful With Words and Land

Scott Bontz

Jim Scharplaz lived on a gravel road called Justice. He was what others call a cattleman, but Jim didn't see it that way. "His philosophy was he was not a cattleman, he was a grassman," said his wife, Kathy. The cows were harvesters, making something that humans can't eat, but which naturally covers the Plains, into something they can. "To him, rancher meant somebody who manages prairie."

Scharplaz

"He always had the big picture in mind," said Ted Zerger, who attended Salina Mennonite Church with Jim. They talked about an essay I'd written critical of adulation for the first nonstop solo flight around the world. I'd noted the gallons of fuel burned. Jim wondered if more was used by environmentally concerned people, he among them, getting to The Land Institute's Prairie Festival.

Does that also show Jim's wry humor? Tom Corman, a stonemason and Methodist pastor in Ottawa County, where Jim ranched, asked if he'd ever lost calves to coyotes. Answer: "Just one. Coyote hunter ran over one."

Corman said Jim took care of neighbors. He mowed, he loaned equipment, he showed local boys how to blacksmith on a forge he built—Jim a self-described "gear head." Corman, who frequently plied him about ranching, sought and got witness to a birth, including how to help get the calf out with a come-along. For me, Jim showed how windmills and their wells work. He helped install my pipe and pump. He saw farmer Jim Keating struggle in severe back pain down from a tractor, and, unasked, with his hired hand made a 30-mile roundtrip for more than a week to bale and cultivate while Keating went to the hospital and therapy.

Even those who didn't know Jim well remarked on his dignity. He gave his opinion seldom and cautiously, but then with command of attention. "He was a quiet, kind and gentle person," said Lori Schmidt, who plays piano at Jim's church. "But when he said something, it was kind of E. F. Hutton." Sister-in-law Sheryl Collmer rebuilt a stone barn on the Scharplaz land to make a house. Jim, an engineer, would listen to her various ideas for this. She knew one was too farfetched if afterward his mouth simply stayed shut. Zerger, who described himself as of opposite temperament, said the peaceful Jim could say two words to settle him: "Well, Ted …."

So when the Army proposed making a chunk of Ottawa County its training grounds, residents formed Save Rural Kansas and elected Jim president. In an address at the local community college, fellow rancher Don Koster said, the reserved range man "aced it." Kathy said, "He thought he was not a public speaker, but he was a great public speaker." He also wrote persuasively about rural community for The Land Institute's Prairie Writers Circle, seeing publication in newspapers as distant from his worldview as the *San Francisco Chronicle*. To read those pieces, go to www.landinstitute.org.

Kathy Collmer was a Land Institute intern opposed to the Army's plans. After the college presentation, she and Jim got to talking. Next year she and the longtime bachelor rancher wed. They had two boys, Danny, now 14, and Tom, 10. The Army plan failed.

Jim's father, Ben, bought his first cattle land in 1955, and replanted to native grass hilly ground that had been eroded by tillage. The land ethic impressed his son. "His concern was always the long-term health of the prairie," Kathy said of her husband. "He was a very conservative rancher. … He wanted to watch and wait to see what the land did over a generation." Other cattlemen change breeds, but Jim stuck with Herefords. He thought they were well adapted and well behaved. And Kathy said, "That red against the green grass—he would remark, 'Oh doesn't that look nice?'"

"He didn't use his land enough," Koster said—grass would be undergrazed, rather than overgrazed as on so many ranches. Koster and Jim rode together to move cattle, and as they rode, they talked. "He was my sounding board. He was my encyclopedia."

Jim's father gathered sandstone around the property to stack for building. He lifted larger rocks into his truck by painstaking use of a jack. Jim told his hired hand, Aaron Reinert, that as a young man he loathed helping with this work. But when his sister-in-law chose to remodel the stone barn, Jim started stacking rocks. And he told Reinert: When you get into your 50s, this urge will come upon you.

Jim was a few months shy of 55 when, a year ago, he and his bride held a 15th anniversary dance. In January, doctors found kidney cancer, which spread through his abdomen. He died September 27.

In the months until then, sometimes at the hospital, sometimes in the house his father built of stone, Jim's rangy 6-foot, 1-inch frame thinned, and being too weak to work depressed him. His sister-in-law learned not to mention around him things that needed fixing. But he enjoyed visitors. He'd appear to sleep through conversation, only to open his eyes and share his thoughts. Even if too tired to add anything, Jim said, he liked hearing others.

After May's plentiful rain, I asked about his pasture, wondering if he'd been able to see it. With a wide smile, he announced growth of the tall grass.

My Kingdom for a Horseless Carriage?

By Robin Mittenthal

We must move our nation beyond fossil fuels. But let's not be suckered by the promoters of biofuel alternatives like corn ethanol and soy biodiesel.

Large companies that stand to reap billions in subsidies and tax breaks from these energy "sources" are selling them as the way to a healthy planet and energy independence for the United States. For two reasons, don't believe it.

First, consider "energy return on energy invested," or EROEI. This is how much energy we "earn" for every unit of energy we "spend" to get it.

Gasoline's EROEI ranges between 6-to-1 and 10-to-1, says Cutler Cleveland, director of the Center for Energy and Environmental Studies at Boston University. In other words, we get anywhere from six to 10 gallons of gasoline for every gallon we use to find oil, pump it out of the ground and refine it. But the EROEI of corn-based ethanol, the most common U.S. biofuel, is a mere 1.34-to-1, the Agriculture Department says. So even though an acre of corn can make 360 gallons of ethanol, only 90 gallons of that is "new" fuel.

Expand this to a larger geographic scale. Researchers at the Gund Institute for Ecological Economics calculate that planting the entire state of Iowa to corn and using it for ethanol would give us enough new fuel for about five days' worth of U.S. gasoline use. For policy-makers, this should be a red flag signaling that even enormous increases in ethanol production would do basically nothing to improve America's energy independence.

Second, consider the environmental effects of biofuels.

The corn used to make the ethanol at your local gas pump exacts a heavy price from our land and water. The fertilizer required for high corn yields starts as a resource, but once it leaves farm fields—and most does—it essentially becomes poison, polluting our lakes and rivers, harming drinking water, and creating a huge lifeless zone at its final destination, the Gulf of Mexico. Corn production also uses actual poisons in the form of pesticides, and these too can end up in our water and even our food.

And corn plants have wimpy roots that do a poor job of preventing erosion. Millions of tons of superb, irreplaceable Midwestern soils are lost from fields every year because of corn.

And other biofuels? Soybean-based biodiesel has an EROEI of about 1.9 to 1, according to University of Minnesota professor David Tilman and his colleagues. That's better than corn ethanol, but still a poor return, and soybeans carry much of corn's environmental baggage.

An unproven form of biofuel production would wring several forms of energy, including ethanol, from grass, tree pulp and other plant material we can't eat. No one yet makes fuel this way with an acceptable EROEI. Efficiency might improve over time, but the environmental goodness of the resulting fuel will depend on the kinds of plants used.

Tilman favors growing diverse mixtures of long-lived, deep-rooted native plants on damaged, unproductive farmland. These prairie-like mixtures would mean much less erosion than corn and soybeans. They could also pull more of the nutrients they need from air and soil than do common crops.

Unclear, though, is whether they could meet a significant fraction of our energy needs. The Agriculture Department's Michael Russelle and other researchers suggest that Tilman overestimates the EROEI of these mixtures and the amount of damaged land available. They also say it's difficult to establish and maintain these mixtures. Tilman disputes these arguments, but it's very much an unsettled question.

So where do we turn? Wind and solar energy will get us part of the way. These technologies have EROEIs of up to 20-to-1 and fewer unpleasant environmental side effects than biofuels. But a big answer is conservation: We need to use much less energy in the first place by living in smaller homes, buying smaller cars, driving less, trimming our general consumption, and being obsessive about energy efficiency.

We must move beyond fossil fuels. But biofuels are not the answer. Let's pursue real solutions that are easy on our planet.

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The significant problems we face cannot be solved at the same level of thinking we were at when we created them. —Albert Einstein

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The Writers and Artists

Jin Lee is an art professor at Illinois State University. Her photographs are included in the permanent collections at the Art Institute of Chicago, the Los Angeles County Museum of Art, and the Museum of Contemporary Photography in Chicago. The pictures here were among those exhibited at our Prairie Festival.

Angus Wright is a Land Institute board member, professor emeritus of environmental studies at California State University in Sacramento, author of *The Death of Ramon Gonzalez: The Modern Agricultural Dilemma*, and co-author of *To Inherit the Earth: The Landless Movement and the Struggle for a New Brazil.*

Robin Mittenthal is a Land Institute graduate school fellow and was an institute intern. He has worked on farms, taught high school biology and now pursues a doctorate in entomology at the University of Wisconsin.

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Prairie (summer 4), by Jin Lee.

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