

The Land Report

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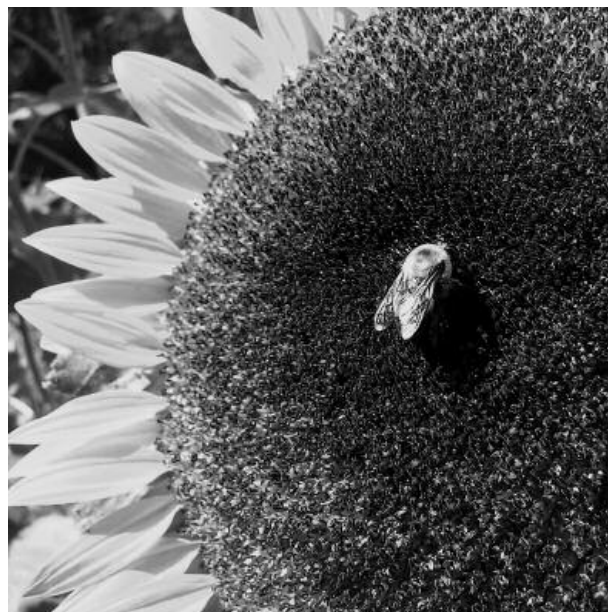


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Cover: Jin Lee. From Prairie (Four Seasons). There are other pictures of the winter segment of this series scattered among The Land Report, and an introduction from the photographer on page 7.

Above: Patty Melander. Bee on sunflower.



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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Clothing the Rocky Framework of the Globe

Jeff Walker

About all we have in mind when we think of this earth is this thin pellicle of soil with which the granite framework is clothed — a red and brown film of pulverized and oxidized rock ... but it is the main thing to us. Out of it we came and unto it we return. — John Burroughs

Farmers have long understood that sandy soils do not hold water, that clay soils are prone to waterlogging, and that compost improves fertility. But appreciation that the physical character of soil is important for understanding its fertility came relatively late in the history of soil study. In the main, soils were viewed as relatively inert substrates providing support, water and nutrients for growing plants. By the middle of the 19th century, this “nutrient bin” notion led the German chemist Justus Leibig to propose that essential plant nutrients removed in the harvest could simply be replaced by chemical fertilizers.

The limited variety of soil types and the long history of cultivation in Leibig’s Europe gave credence to this view. But in Asia there is a larger variety of soils, many of them never farmed, and Russian scientists in the late 19th century developed the study of soil geology, which classifies diverse types based on their physical characteristics and origins. About the same time, work such as German biologist A.B. Frank’s on the interdependence of plant roots and fungi showed that organisms living in soil played an important role in its fertility. To understand the health of soils and their ecosystems, people realized that they must understand the geology, chemistry and biology at work. The study of soils became a multidisciplinary science.

John Burroughs, a popular early 20th century literary naturalist from New York’s Hudson River Valley, appreciated this when he wrote: “The soil, as we know it, is the product of three great processes — mechanical, chemical, and vital [biological] — which have been going on for untold ages.”

From 1860 to 1921, with essays in *The Atlantic Monthly*, *Harper’s* and *Scribner’s*, Burroughs distilled scientific information for general audiences while maintaining awe for the unknowns permeating nature. He is best known for his essays on birds and wildlife. But his farming background, and his conviction that home was where people should focus their attention, inspired him to look not at the mountains of faraway places but at the earth beneath his feet.

This perspective moved him to write an extended meditation on soil called “The Grist of the Gods,” first published in his 1908 anthology *Leaf and Tendril*. There he said that soil is the basis of not only life, but the human mind and spirit. His view was comprehensive, his writing careful, thorough and reverent:

The trembling gold of a pond-lily’s heart, and its petals like carved snow, are no more a transformation of a little black mud and ooze by the chemistry of the sunbeam than our bodies and minds, too, are transformations of the soil underfoot.

Modern soil geology owes much to Hans Jenny, who proposed that five things combine to make soil: parent material, climate, plants and animals, position on the landscape, and time. Jenny’s ideas help us appreciate soil as a three-dimensional body continuously variable in time and space. Nowhere is it exactly the same.

Parent material

The mineral particles in soil originate from bedrock, the solid rock that extends from Earth’s surface to its depths. Where bedrock is not at the surface, parent material is sediment, rock grains that have been loosened and then carried and deposited by water, wind or glacial ice. Sediment can be as localized as a river floodplain or be vastly dispersed. When glaciers retreated north from the Missouri and Ohio rivers 10,000 years ago, they left behind thick sediments, parent material for the Midwest’s fertile farmland.

A soil reflects the chemical composition of the parent material it came from. Burroughs wrote that in the making of soil, “the leanness of granite ... has become the fat of the land.” He used the common convention of referring to any bedrock as “granite,” but his statement is accurate since the average composition of bedrock and sediments at the earth’s surface is granitic.

'... the grist out of which



U.S. Geological Survey. A limestone quarry in Gaffney, South Carolina, 1904, shows soil on bedrock.

our bread of life is made ...'

Climate

Weathering breaks the parent material into parts to form soil, and two types of weathering, mechanical and chemical, are at soil formation's heart. Mechanical weathering physically breaks the rock into smaller and smaller particles, exposing more surfaces to chemical weathering. Chemical weathering by water dissolves the particle surfaces, releasing atoms that either form new chemical compounds, or are carried away by the soil solution. Chemical weathering by air oxidizes the soil to make it different colors, such as red and brown for iron, and black for manganese.

Climate determines the intensity of the various weathering agents and profoundly affects soil character. The two major climate variables are moisture and temperature. Precipitation is slightly acidic and helps dissolve bedrock. Runoff carries away particles and soluble ions.

Most weathering happens faster at warmer temperatures, especially with abundant moisture, yet cold temperatures can freeze water in cracks and fracture rocks.

Weathering is virtually imperceptible over our lives, but the cumulative effects are significant. Burroughs wrote of this:

What adds to the wonder of the earth's grist is that the millstones that did the work and are still doing it are the gentle forces that career above our heads — the sunbeam, the cloud, the air, the frost. The rain's gentle fall, the air's velvet touch, the sun's noiseless rays, the frost's exquisite crystals, these combined are the agents that crush the rocks and pulverize the mountains, and transform continents of sterile granite into worlds of fertile soil.

A relatively quick kind of weathering occurred about 15,000 years ago when glaciers covered much of the Northern Hemisphere. Their great moving mass ground down rock, and upon melting left thick deposits of sediment ranging from coarse gravels to particles fine enough to be carried by the wind. This loess blew away to become the parent material for some of the country's most fertile soils, in the Palouse hills of Washington state and prairie from eastern Colorado into Illinois.

Biota

Plants and animals are also important in determining a soil's nature. Roots protect soil from erosion by anchoring it, but at the same time break down particles as they grow and expand. Plants modify soil chemistry and exude acids that weather parent material. Earthworms and other burrowing fauna make soil loose and porous for the flow of air and water, while their digestion breaks down soil compounds to make nutrients available.

Decomposing plants and animals further transform the soil. Burroughs wrote that decomposition

gives humus to the soil, in fact, almost humanizes it, making it tender and full of sentiment and memories, as it were, so that it responds more quickly to our needs and to our culture. The elements of the soil remember all those forms of animal and vegetable life of which they were once a part, and they take them again the more readily.

In Burroughs's time humus was characterized by one textbook as "a mixture of ill-defined bodies." Today another says that "the identification of the chemical structure of [humic] compounds has proven difficult." Humus has defied more than a century of attempts to unravel its structure, and remains one of the great mysteries of soil. We can separate humus into its parts, but we don't really know their significance in the soil.

Still, Burroughs gets to the heart of the importance of organic matter by noting that the value of many nutrients is enhanced if they come from plants or animals. Most farmers know intuitively that compost is a better fertilizer than artificial chemical compounds.

Relief

Relief is a measure of land's steepness. Steep slopes tend to have thin soils because gravity pulls loose material away. This piles parent material thickly on gentle slopes and flats.

Large geologic upheavals create relief and bring bedrock to the surface to be weathered. In geologically quiet places such as Australia, which lack the volume of sediment contributed by young mountains to replace nutrients drained over time, soils can become depleted

no matter how careful the husbandry. The Great Plains, on the other hand, owe a measure of their fertility to fresh parent material weathered constantly from the young Rocky Mountains to the west.

Burroughs wrote, “What transformations and promotion! — the decrepitude of the hills becoming the strength of the plains, the decay of the heights resulting in the renewal of the valleys!

Sometimes, geologic upheaval appears catastrophic in the short run when the long-term results are actually beneficial. A volcanic eruption seems to devastate the countryside while it shoots material high into the atmosphere, yet the falling ash leaves a blanket of fine-grained particles that quickly convert to fertile soil.

Time

Before recognition of geologic time’s immensity, the landscape was thought to have been created as we see it today. Debates about the age of Earth raged for several hundred years, until accurate dating methods at the turn of the 20th century allowed geologists to determine that the world was about 4.6 billion years old. This almost unimaginably long period leaves plenty of time to do things slowly but to accomplish a lot:

[Soil] is the grist out of which our bread of life is made, the grist which the mills of the gods, the slow patient gods of Erosion, have been so long grinding — grinding probably more millions of years than we have any idea of. The original stuff, the pulverized granite, was probably not very nourishing, but the fruitful hand of time has made it so. It is the kind of grist that improves with the keeping, and the more the meal worms have worked on it, the better the bread.

The Canadian songwriter Alex Sinclair put it succinctly in *The Elora Mill*:

The mills of the gods grind slowly but they grind
exceeding fine.
I’d like to have such work to show but we ain’t got
the time.

Besides appreciating how long it takes for a soil to form, the soil geologist must allow for swings in the major influences’ intensity. For instance, since the latest ice age peaked, global temperatures have increased and presumably changed soil weathering rates. Also, over the past several thousand years, humans have become increasingly important users and misusers of resources, including soil. At our industrious pace the future can look bleak, as Burroughs recognized when he wrote that “one cannot but reflect what a sucked orange the earth will be in the course of a few more centuries”:

Our civilization is terribly expensive to all its natural resources; one hundred years of modern life doubtless exhausts its stores more than a millennium of the life of antiquity. Its coal and oil will be about used up, all its mineral wealth greatly depleted, the fertility of the soil will have been washed to the sea through the drainage of its cities, its wild game will be nearly extinct, its primitive forests gone, and soon how nearly bankrupt the planet will be!

Conclusion

Hans Jenny’s original hope was that the five major soil formation factors could somehow be measured and studied mathematically. That goal has proven elusive. It is difficult to balance those combined variables’ effects along with local influences such as fire or human disturbance. But his idea helps us fathom soil formation’s complexity. Appreciation of soils inspires a reverence for their continued mysteries, and can make us better stewards of this life-giving resource.

Celestial dirt we may truly call it, star dust in which we plant our potatoes and grain and out of which Adam was made and every son of man since Adam — the divine soil in very fact, the garden of the Eternal, contributed to by the heavens above and all the vital forces below, incorruptible, forever purifying itself, clothing the rocky framework of the globe as with flesh and blood, making the earth truly a mother with a teeming fruitful womb ...



Effects of Place

Jin Lee

For the past eight years I have been photographing the landscapes of Illinois to explore how we experience a place and the way it structures our thoughts and sense of belonging. Whether using a panoramic format, a sequence of related images or landscapes that also include the female human presence, my work also seeks to reference and expand upon the traditions of landscape art including Chinese scroll paintings, documentary pho-

tographs and botanical drawings. Two years ago I began a study of prairie plants in different stages of their seasonal cycles, recording the rich diversity of this plant community. Concurrently I started a series of photographs of the wind, using the camera's ability to stop motion and make the invisible visible. Both series explore the particularities of a specific place: its native plants, its weather, its seasons.

Festival-goers Speak

It was open mike night in the Big Barn. Hundreds again filled the place for our Prairie Festival's Saturday night feature, but this time the question of where to take the world was turned to the audience. We called it town meeting on the prairie.

About 500 people from 36 states and Canada — nearly one-fourth of them students, possibly a record — attended the festival October 1-3. They ate Kansas-grown food prepared under the direction of chef Donna Prizgintas, who will volunteer her time again for the event next year, September 23-25. They also came to hear talks by Land Institute President Wes Jackson, local-economies entrepreneur Judy Wicks, activist farmer Percy Schmeiser, and writers Michael Pollan and William MacLeish.

For a sampling of what festival-goers said at the town meeting, and for responses from speakers mentioned above, read on.

The moderator, institute board Chairman Conn Nugent, invited participants to consider three questions: What do you hope to accomplish in your personal life before you die? What major changes in society do you hope to see in your lifetime or in that of your children? And what role does The Land Institute play in either of those hopes?

David Matthew, of Silver Spring, Maryland, said the connection of food and the environment deserves more attention in the news. "I want to see it become a part of our skin."

The time has never been better for realizing this, said Pollan, who teaches journalism for the University of California at Berkeley and has written to connect the obesity crisis with food policy and agriculture. Even "fluffy" Wednesday food sections in newspapers are improving to something more than cooking promotion and recipes, he said, and interest will rise as the United States approaches another multibillion-dollar farm bill and international challenges of its food trade policies. Pollan said the key for appeal to the media is to not speak of Midwestern agriculture, which New York editors will find parochial, but of food, for which their interest is intense.

"To know who owns our food" was the interest of Damon Vold, a student at St. Olaf College in Northfield, Minnesota. He asked for advice on how to buy tactically.

This can be researched through the Internet, Pollan said, but the simplest thing to do is shop locally, at farm markets and through the contract operations called community supported agriculture. He liked a bumper sticker in Europe that said, "Eat your view." "Buying local supports a whole lot of other values," Pollan said, such as

community. He also urged awareness that many farmers have given up organic certification because of paperwork and cost, but remain essentially organic.

Former institute intern John Curtis, of Macomb, Illinois, sought training for people to run small farms, and to bring food growing to cities.

There is a dearth of farmers selling directly in urban markets even though it is more profitable, said Wicks, founder of the White Dog Cafe in Philadelphia. That city has an urban garden, and it contracts with outside farmers to supply what can't be grown in town. "We're kind of opening all the old trade routes that used to be there," she said.

Pollan noted that chefs have attached glamour to certain farmers, and that in this nation, glamour and celebrity count. "You shouldn't ignore it."

Buying local food is good but largely not an option, said Jim Scharplaz, who ranches cattle near Minneapolis, Kansas: Most people who grow food do so in relative isolation, and most people live where food isn't raised. A few places enjoy the connection, but he said, "What about the rest of us?"

Pollan responded by telling how a distinctive variety of wheat grown in a particular part of Italy was connected through the European "slow food" movement with the American kitchen retailer Williams-Sonoma — an example of how the global economy can protect the local.

Jackson supports CSAs and the like, but said that they can anesthetize one to the larger problem. He told of a Barry Commoner essay that describes a woman copying a painted interpretation of a Roman myth, *The Rape of the Sabine Woman*. From this horror scene the woman selected only a corner image of a little bird. With two-thirds of the world's cropland dangerously devoted to just three grains, all annuals, Jackson said, we must keep asking, "Are we painting the little bird?"

Pollan wondered about fighting erosion and pollution by converting America's cropland to pasture and feeding livestock directly.

This won't work on the whole, Jackson said: Though the dry High Plains will be grazed again sure enough when the Ogallala aquifer can no longer be pumped, grain will remain needed to feed humanity. "I think we've got great hope, but our eye is on the wrong ball."

Taxpayers are dismissive of the need for complex solutions to complex problems even in the face of catastrophe, said Andres Ferreyra, a crop modeler from Murray, Kentucky. Children need a head start in education about our dilemma, he said, pointing to the example of the National Park Service's junior ranger program. "Where's the junior Natural Systems Agriculture farmer program?"

Bruce Hirsch of San Francisco told of overhearing a young festival-goer say the bleak picture depressed her. Depression shows something is wrong, Hirsch said, but is also an opportunity.

He said that progress will require presentation of not only truth, but values. "The facts do not matter unless people are predisposed to hear you," he said, so The Land Institute must convey a strong set of values for context or, even with a big budget, it will fail. Hirsch urged collaboration with people sharing core values even if not details. Unity is needed, he said, but now, "We don't have a we."

Sheri Breen, who teaches political science and environmental studies at St. Olaf College, said students at small liberal arts schools are interested in agroecology but do not enjoy enough communication with The Land Institute. She said these schools' faculties are too unaware of the organization and the big picture of environmental studies.

The former journalist also said people get much of their news from small local newspapers that, like the

small schools, can be ill-informed: "They can't tell the difference between a Hereford and a heifer." Breen suggested a workshop to educate small papers about the institute and its argument.

Here moderator Nugent had his say. One of the institute's great attractions is the acuity of Jackson's vision, he said, and those who feel they share that mission should promote it. "I think we should talk it up."

Jackson concluded by asking, Have you joined the fight? He told listeners that the institute wants them to work in the area of their passions as part of that fight. He also asked them to recognize something that he didn't for a long time: the need to organize.

"I don't know how to do that," he said. "It's not my line of work — and I'm not sure I wanna know."

The crowd filled the barn with laughter.

But in the interest of ecological security, Jackson said, those interested must work together while pursuing their personal passions — to paint the little bird, but keep in mind that there is a bigger picture.

Prairie Festival Tapes

October 1-3, 2004, The Land Institute

- ☐ S1 *Election Year 2052: A Secretary of Agriculture Runs for President* — Wes Jackson
- ☐ S2 *The High Cost of Cheap Food* — Michael Pollan
- ☐ S3 *Corporations vs. Farmers: Whose Plants Are These, Anyway?* — Percy Schmeiser
- ☐ S4 *Building an Alternative to Corporate Globalization* — Judy Wicks
- ☐ SU1 *The Long Arm of the Land* — Land Institute graduate research fellows
- ☐ SU2 *Where in the World We Are Going?* — William MacLeish
- ☐ SU3 *An Ignorance-based Worldview* — Wes Jackson

Total individual tapes _____ x \$8 = _____

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Subtotal _____

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A River Ran Through It

Jake Vail

Kansas, scholars proved last year, is in fact flatter than a pancake. Syrup drains off undramatically, west to east, like someone stuck a knife under the left side of your breakfast plate. If you were to drop, say, a big strawberry onto your Kansas pancake, aiming for the middle, the 41,000-acre dimple it made would be Cheyenne Bottoms basin.

Cheyenne Bottoms proper, the low and usually soggy half of that basin, is the main stopover on the central flyway, and probably the most important shorebird migration point in the Western Hemisphere. In 1988 it was designated a Wetland of International Importance. Every year hundreds of thousands of migrating birds funnel down into the navel of Kansas to eat and rest.

Cheyenne Bottoms sits just north of Great Bend, named for an elbow in the Arkansas — that's Arkansas, or Ark — River where the water's northeast course feels the tug of the Gulf of Mexico and turns southeast. With a little imagination you can peel back Jefferson's grid and feel for the energy meridians of this land. Follow the Ark as it flows down from the heavy mountains of Leadville, Colorado, and out onto the open prairie. In Chinese medicine, energy runs deep and strong near the elbows and knees. At the great bend of the Ark you can feel it too.

I try to visit Cheyenne Bottoms often. It draws me as it does a duck, I suppose, or a phalarope, hunger spinning her around in the water, a different sort of hunger driving me around the circular dike. It was here that these eyes first saw white pelicans — pelicans! White ones! In Kansas, for crying out loud! Of course the innumerable birds are the main and most obvious attraction. But there is more at play, and the pulses of the river, birds and history are changing.

Last fall, chased by a quintessential Kansas storm that put one end of a very confused rainbow in the massive feedlot landscape east of Dodge City, I found Cheyenne Bottoms dry. Again. This was just a few days after I visited Bear River Migratory Bird Refuge in Utah, near Great Salt Lake. I'd wanted to see Bear River ever since I read of it in Terry Tempest Williams' marvelous book *Refuge*. I entered with visions of avocets and burrowing owls, curlews and pelicans. I found miles of washboard gravel road, a few swallows, a dove. The refuge, drowning before Terry's eyes a decade earlier, was dry.

In Nebraska I watched a line of deer saunter across the reservoir called Lake McConaughy. Or, what used to be Lake McConaughy. These days, the Platte River is pretty dry on both sides of the dam at "Big Mac."

Critters are cavorting and banks are collapsing in a ghost lake to the west, cottonwoods are moving into the riverbed to the east. Once "a mile wide and a foot deep" from Wyoming to the Missouri, the greatest prairie river is becoming a 400-mile-long tree nursery. In wetter parts of the country, dams are being torn out in noble restoration efforts. Atop the Ogallala aquifer of the High Plains — where engineers propose up to forty new dams on the Platte — dams are not so much an obstacle as they are becoming entirely moot.

Unlike the folks along the Platte, I have the great fortune to live by a wet river. A stone's skip from the Kaw (Kansas) River, I waded through the magazines in the Lawrence Public Library and find this in the March *BioScience*: "Since the 1970s, water use has led to a mostly dry channel as the (Arkansas) river passes through watersheds that lie above the Ogallala-High Plains aquifer. This leads to a situation in which the sewage effluent from the small city of Great Bend, Kansas, often forms the headwaters of the Lower Arkansas." Yikes. Wichita, your feng shui is in deep ... trouble.

Due to large-scale agricultural irrigation, several rivers on the Plains now dry up midcourse. How is it that throughout 10,000 years of agriculture, utterly dependent on soil and water, the processes below the surface have been ignored? Soil building and aquifer filling take time and nonhuman labors beyond our ken. Kicking up dust in a dry wetland like Cheyenne Bottoms, I can't help but wonder why we're doing this to ourselves and our places, and what might come next. Natural fluctuations such as that at Bear River, based largely on snowfall in the surrounding mountains, are exacerbated to a relatively small degree — so far — by irrigation and global climate change. But the desiccation of the High Plains is a direct result of our actions. I suppose there's small consolation in that after a couple hundred years here we have grown somewhat aware of everything's interconnectedness. We came, we conquered, we saw. Still, irrigation is drought. It sounds like a zen koan — or a Big Brotherly decree from 1984.

Such are the thoughts I try to push to the back of my mind as I stand shivering on a wooden walkway above the Platte River on the first day of spring. With the help of a few hundred thousand raucous sandhill cranes, I find that I can, easily. How can one not walk around with an idiotic grin in the midst of spring crane migration?

The most ancient of birds, these modern flying dinosaurs have known this place and its changes for 9 million years. They know what subtle dynamics changed when the horse returned from its long stay in Eurasia, when cows replaced bison. For eons the cranes watched the news on a vast sea of grass as they flew to the braided Platte and beyond. Now they look down on The Grid and the round-peg-in-a-square-hole landscape of center-pivot irrigation, shimmering ribbons of rivers in tatters. In the blink of a crane's eye, human gathering and hunting became farming, and the land changed. Farming became industry, and the land was again transformed, to something entirely new under the sun.

The cranes, I've realized, are a gift. Hundreds of thousands of gifts, falling out of the sky like a shower of parasoled Mary Poppinses, feet akimbo. They come dependably yet remain untamed and aloof, bringing spring with them, making a hell of a joyful noise. It's a paludal party, a veritable vernal birthday bash. After stuffing themselves with corn for a few weeks they take

the red-eye and move on to cold and quiet lands, to bring forth more gray gifts.

This is the gift of nature, which, as Lewis Hyde reminds us in his book *The Gift*, must always move. Indeed, a gift of wildness *will* always move, or cease entirely to be wild — and certainly deserves something in return besides genetically modified corn and parched river beds cloaked in cottonwoods.

The cranes' gift is a lesson, a happy, noisy, yet serious discourse on the long view. We might continue to ignore it until the oil gets scarce and so expensive that it's no longer cost-effective to mine water to grow grains to feed cows at waterless feedlots. By then, a time not so far away, the cattle and oil economies that seemed to belong on the High Plains won't be all that we hanker for.

As the wheaty pancake of Kansas gets ever drier, will the next generation to inhabit this beautiful open country be able to satisfy their hunger for cranes, for pelicans, for the sweet meaning of "river"?



Bob Gress. Sandhill cranes.

Consumers Need to Know Food's True Cost

Charles Francis

Our short-term economics is driving to ruin the source of our riches, the Earth. Investors and corporate boardrooms focus myopically on the next quarterly report, ignoring the long term.

Putting a price tag on the gross domestic product or the stock market is relatively easy. But these indicators ignore our need to sustain natural resources, which are vital. We must bring security of our planet's ecological capital into the marketplace's calculations.

We should start with agriculture, whose footprint is huge. It uses 40 percent of the world's land to make our food, feed and fiber. As agriculture goes, so goes the planet's health.

Farming and forestry prices reflect the immediate costs of labor and capital, but do not include long-run ecological costs. Paying \$1.25 per pound for supermarket chicken does not cover cleaning up rivers polluted by poultry factories. That charge goes to society at large.

Rivers can clean themselves given time. But the soil loss that results from the way we farm today is essentially irreversible. This erosion washes about the thickness of a business card from our topsoil each year, an estimated 5 tons per acre, exceeding the soil's natural rate of formation. Large areas of the Midwest have lost half of their productive topsoil in just 150 years of farming.

This earthy gold mine helped build our nation. Other powers — Greece, Carthage — gutted their soils and fell. We can mask this erosion by mining other ecological capital — fossil fuels used to make fertilizer, for example — but not for the long run.

Meanwhile, also washing away are pesticides and fertilizer that poison groundwater. Taken by the Mississippi River to the Gulf of Mexico, the fertilizer drives life from 8,000 square miles of the sea, costing millions of dollars in lost fishing.

Future generations will foot the bill for fouled water, ravaged soil, lost wildlife and global warming.

That is, unless something replaces our shortsighted, narrowly defined accounting so that we pay for the total cost of our food consumption.

And something is emerging: ecological economics. It's a field of study that does account for long-term costs. We can now calculate the environmental costs of different types of food production, and compare in monetary terms the long-term impact of global versus local food production. If we can devise a way to include these



ecological costs in the prices we pay at the supermarket, we can show consumers the true costs of their food-buying decisions — that it makes more sense, for example, to buy local apples in season rather than similar products imported from New Zealand or China.

Any corporation, government or family that spends its economic capital eventually will go bankrupt. Our spending of ecological capital is no different.

Our human-centered approach to nature assumes Earth's resources are here for our exploitation. It is essential that we recognize ourselves as only one species in a complex web of relationships, and that ultimately we are just as threatened by ecological losses as are our co-inhabitants.

We must learn to see our true vested interest. We must reform our markets so we don't keep cooking the ecological books. We must learn to pay a fair price to Earth.

With the Prairie Writers Circle, The Land Institute invites and distributes essays to more than 200 newspapers and web services. For more, see page 17 of At The Land, and www.landinstitute.org, which has all of the essays.



Jin Lee

Going, Going, Gone

Maurice Telleen

'Tis the season for the closing out farm sale. Or it used to be. When grandpa and grandma had finally decided to hang it up, move to town and let the young folks do the heavy lifting. This was almost always “when the frost is on the punkin and the fodder’s in the shock.” The farm was between seasons — you might say dormant. Fall was the right time for such a sale.

This marked a rite of passage, as surely as confirmation, graduation, marriage, parenthood and grandparenting. Just one darn thing after another, and almost before you know it, you are old. That is the way it goes.

You could tell when a farm sale was imminent because the place had been picked up and the machinery lined up. The whole place said, “Something significant is about to happen here.”

Sale bills took up a good bit of space in the local papers and at gathering places such as banks, elevators, coffee shops and taverns. I don’t think anyone ever had quite enough brass to hang one in the men’s room at church.

What a neat institution they were! You didn’t need to load all your stuff, including livestock, and haul it or them to a “marketplace.” Your farm was the marketplace for that day. Your friends and neighbors would be there, some to help and some to bid and others just to visit. And, of course, there were also plenty of strangers, if those sale bills and the grapevine had done their jobs. It served both a social and a commercial end. And at the end of the day, those people would own all that stuff that used to be yours.

A farm community auctioneer was a man to reckon with. His work was quite an art and still is. He had to have a very good handle on both the price and the value — and sometimes the function — of just about everything. He had to have a strong voice and a quick wit. And he had to make decisions quickly.

Auctioneers since the Civil War have enjoyed the honorary title “Colonel,” and more farm-reared boys wanted to become auctioneers than to be astronauts. That is based on a recent study, but I’ve forgotten where it was done. Some university, I suppose. You can see so much more from atop the hayrack, where the auctioneer and his trusty clerk work.

This reminds me of a story.

William Jennings Bryan was campaigning for office — he generally was — in his home state of Nebraska. Maybe running for Congress — or even the presidency. Anyhow, he happened onto a large gathering of voters at

a farm sale, and, naturally, he couldn’t resist stopping in. In due course the auctioneer cleverly decided that the way to refocus on the business of selling stuff was to give this man a chance to speak and get the distraction over with. He also noted that the politician was holding court right by the manure spreader. So he announced that the sale would recess for a few minutes to hear from the distinguished Mr. Bryan. And with just a hint of wickedness, the auctioneer, who happened to be a Republican, deftly suggested to his guest that he hop up on the spreader’s footboard so the entire crowd could see as well as hear him.

Bryan didn’t miss a lick. He flipped the seat back, climbed up on the footboard and began, “Unaccustomed as I am to speaking from the Republican platform ...” The auctioneer was heard to mutter something under his breath. The manure spreader had outfoxed the hayrack.

Farming has become such a specialized, remote control thing that the old-fashioned closing out farm sale has gone the way of the passenger pigeon. It would be really hard to hold a farm sale with 1,000 dairy cows, and little else, or 2,000 brood sows, and little else, or 15,000 laying hens, and little else.

The exception to this demise is our great Amish communities. There you can still find a crowd of neighbors there to socialize as well as bid — some there only to socialize — and a full line of machinery, cattle, hogs, horses and harness, laying hens, chicken coops, etc. And there on the hayrack is the Colonel.

If I had my choice between two tickets to the annual Michigan-Ohio State football game or a ripping good big Amish farm sale, I’d take the tickets, sell them for \$50 apiece, and then go to the sale. How about you?



Pete Wettach, from the A.M. Wettach Collection of the State Historical Society of Iowa. Farm sale, Henry County, Iowa, about 1950. The auctioneer is Dan Roth.

At the Land

Natural Systems Agriculture

A new cycle of winter breeding is well under way in the greenhouse.

Because the offspring have flowered, we know that last winter's crossing successfully produced hybrids from wheat and a perennial called quackgrass. The most successful wheat parent was an old variety that does not yield well in Kansas. This winter we will use an improved variety touted as having similar crossing ease.

Nearly all of the small-grain hybrids that we moved to the field made it through summer with no difficulty.

As for several years now, we made hundreds of new pollinations with old and new perennial sorghum lines that are proven or potentially winter-hardy.

We are pollinating new species, two locally occurring wild perennial sunflowers, Jerusalem artichoke and *Helianthus rigidus*. They are crossed with pollen from crop sunflower. The two are reported to be easier to hybridize with crop sunflower than is the wild perennial we have focused on, Maximilian sunflower.

We also are crossing the crop plant pearl millet with several wild, perennial relatives. Whether these wild relatives would survive Kansas winters was unknown. But last year's plants vigorously re-grew this spring and look robust. We wait to see if hybrid seeds develop.

Honor for Marty Bender

At the Prairie Festival we dedicated the Marty Bender Nature Area, in honor of our energetic energy scientist, who is also a self-made naturalist. This will be developed on the part of our northern 206 acres, the western half of which includes rugged slope to the Smoky Hill River.

In accepting this honor, Bender encouraged deepening human appreciation of the rich, diverse natural world. He told of beginning to develop his interest when he was a 25-year-old Scout leader frustrated at knowing few tree names. His indefatigable curiosity built a command of local plants, animals and insects, seasoned with geology and ecology of the Great Plains, that is now nearly encyclopedic.

Though not in his job description, this fount is a gift to us. We honor him for inspiring us to know more about our place.

Bender was Land Institute intern in 1978 and stayed on as a staff member, went off to get a doctorate, and returned as a scientist in 1991. He headed the 10-year Sunshine Farm study of the energy going in and out of the farm gate, on which he is writing a book.

Presentations Made

Cross-fertilization of ideas comes out of travel and visitors. Our recent travel is more exotic than usual.

Plant breeder Lee DeHaan was an invited speaker at the International Ecoagriculture Conference and Practitioners' Fair in Nairobi, Kenya. The objective was to develop strategies for melding farming and forestry with ecosystems. Details about the conference are at www.ecoagriculturepartners.org/home.htm. DeHaan's paper on developing perennial grains will be in a book about ecoagriculture.

Senior scientist Stan Cox visited the state of Western Australia to talk with university and government scientists interested in breeding perennial grains. Removal of native, deep-rooted trees and shrubs and their replacement with annual crops and pasture created a serious and growing problem of soil salinity across much of the state. To slow and eventually halt this, farmers and scientists agree that more trees and shrubs must be returned to the landscape. Perennial forages such as alfalfa are also proving effective. But Western Australia is a major grain producer, and perennial grains would help with sustainability.

Cox also explained our work to the Ecological Society of America's annual meeting in Portland, Oregon.

Presentations Coming

January 28, South Padre Island, Texas.

February 5, San Francisco.

February 26, Hesston, Kansas.

For details, see our calendar at www.landinstitute.org.

NSA Short Course

Our weekend Natural Systems Agriculture course for undergraduate students will be May 27-28 in Salina. Call, write or see www.landinstitute.org for attendance qualifications and application.

Publications

A bibliography of Land Institute staff publications is at www.landinstitute.org, under "Publications" > "Science Articles." Papers appeared in *Agronomy Abstracts*, *Crop Science*, *Journal of Environmental Quality*, *Plant Disease* and *Washburn Law Journal*.

Visitors

Professor Peter Simonson of University of Pittsburgh, who had attended and critiqued our weeklong workshop for graduate student fellows, visited again to give generous suggestions on communication.

Rhodes Scholar Ben Champion of Oxford University, who is interested in rural community, stayed in one of our homes in Matfield Green, Kansas.

Prairie Writers Circle

We cultivate and distribute essays on ecology, farming and culture to more than 200 newspapers and about a dozen Web sites. The latest: Charles Francis on food's true cost (see page 12), Diane Dufva Quantic on life where buffalo might again roam, Robert Day on "The last tank of gasoline in America," Dennis Keeney on food supply fragility, Mark Ritchie on rural politicking, Wylie Harris on food choice and climate change, and Kristin Van Tassel on power and domesticity. All essays are at www.landinstitute.org, and free for use.

Staff

Darlene Wolf, who was our office secretary, became institute President Wes Jackson's administrative assistant and associate editor of *The Land Report*. Our new secretary is Patricia Johnson.

Annual Report

Our annual report is at www.landinstitute.org, under "About Us." For a print copy, e-mail olsen@landinstitute.org.

Cleanup

Indomitable staff members revamped and brightened outbuildings behind the office. They carried off material for use elsewhere or disposal, scraped, shoveled and cleaned until the buildings were tidy, extended a shed for greenhouse storage, insulated the shop and cold room spaces, and gave everything a coat of paint. Landscaping in the area is under way. You'll find a new look when you visit. Soon, we hope.

Electronic Newsletter

Scoop is a brief newsletter e-mailed every six weeks to tell about Land Institute activities. You may subscribe by e-mailing olsen@landinstitute.org.



Scott Bontz, Tiffany Stucky, Annie Kesler and Lee DeHaan lay out the result of crossing wheat with its perennial relative, intermediate wheatgrass. It grew in a 10-foot tube filled with a growth medium washed away after the plant's extraction. We have a variety of annual and

perennial plants growing in an array of tubes. This lets us compare roots and make a most compelling presentation of their importance: Perennial roots usually have more mass and reach deeper, and they live year-round, holding soil and not wasting water and nutrients.

Thanks to our contributors, July through October 2004

Thousands of tax-deductible gifts, from a few to thousands of dollars, are received each year from individuals and private organizations to make our work possible. Our other source of revenue is earned income from interest and event fees, recently about 6 percent of total. Large and small gifts in aggregate make a difference. They also represent a constituency and help

spread ideas as we work together toward greater ecological sustainability.

Thank you to you, our perennial friends.

The first section of contributors below lists Friends of The Land who have pledged periodic gifts. Most have arranged for us to deduct their gifts monthly from their bank account or credit card. They increase our financial stability, a trait valuable to any organization.

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Giving thanks ...

... in this season of Thanksgiving goes with harvest, haying, autumn colors, cooler nights, shorter days and feasts, family and friends. We wish you peaceful walks through your countryside, whether wetlands, woods, prairie or desert.

We thank you ...

... for the many ways in which you help — through your own work, and in your help for our work to move toward a more sustainable culture. Our recent Prairie Festival visitors remind us how many ways people express their concern and their willingness to sacrifice and give of themselves and their resources to try to leave the world a little better. Thank you from all of us at The Land Institute for your contributions to our work and for your ideas and encouragement.

Happy holidays and happy new year.

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Jin Lee teaches art at Illinois State University. Her *Wind and Prairie (Four Seasons)* series are showing at the Sioux City, Iowa, Art Center through February.

Patty Melander works in The Land Institute Development office.

Jake Vail is a librarian, arborist, field biologist and artist who lives in Lawrence, Kansas.

Maurice Telleen is co-founder of *The Draft Horse Journal*, and author of *A Century of Belgian Horses in America*. He lives in Waverly, Iowa.

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A.M. "Pete" Wettach, 1901-76, worked for the Farm Security Administration. His photographs are in *A Bountiful Harvest*.

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Scott Bontz. Tom Brown, of Hershey, Nebraska, honored Land Institute President Wes Jackson at our Prairie Festival with an iron wheel from an old rotary hoe. Brown said he has given these agricultural artifacts to honor two other agricultural pioneers, Robert Rodale and Allan Savory. The hoe is from the tillage agriculture that Jackson and The Land Institute are working to leave, but for Brown this wheel has sunlike artistic beauty. For more about the Prairie Festival, see page 8.



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