

Land Report

Number 106, Summer 2013 · The Land Institute



About 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.

OUR WORK

Thousands of new perennial grain plants live year-round at The Land Institute, prototypes we developed in pursuit of a new agriculture that mimics natural ecosystems. Grown in polycultures, perennial crops require less fertilizer, herbicide and pesticide. Their root systems are massive. They manage water better, exchange nutrients more efficiently and hold soil against the erosion of water and wind. This strengthens the plants' resilience to weather extremes, and restores the soil's capacity to hold carbon. Our aim is to make conservation a consequence, not a casualty, of agricultural production.

LAND REPORT

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ELECTRONIC MEDIA

For e-mail news about The Land Institute, write to Carrie Carpenter at carpenter@landinstitute.org, or call. Web site: landinstitute.org.

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The serious challenge of our time

WES JACKSON



From the 2013 commencement address at the University of Kansas.

A century and a half ago, only nine years before the first graduation at the University of Kansas,

our nation was in the midst of a great civil war. The Declaration of Independence had declared that we are all created equal. That assertion has been called a high law of morality. But our Constitution had one perilous flaw. Slavery was legal. America was both the land of the free and the land of the slave. To complicate matters, as poet Robert Penn Warren said, each side “thought itself the legitimate heir of the American Revolution.” With the higher law of morality up against legality, “the war came.”

Now, 150 years later, another high law of morality confronts us, a moral law violated by all of us exercising a legal authority. That high law of morality in our time calls on us to protect our planet’s ecosphere, that miraculous skin surrounding the earth within which we are embedded: our soils, our waters, our forests, our prairies, our oceans, our agricultural fields, and now our atmosphere. Yes, there are too many of us, but our consumption is rapacious. And so, the high calling to protect our ecosphere has little legal standing. It is legal to rip the tops off mountains, get the coal, and burn

it. It is legal to drill for oil and natural gas, from the gulf to the arctic, and burn it. It is legal to engage in fracking that threatens groundwater to get natural gas and burn it. It is legal to buy unnecessary products made with extracted materials and fossil energy. It is legal to bring on climate change, erratic weather, and the loss of four-fifths of arctic sea ice volume since 1980. It is legal to erode and poison soils. It is legal to let our rural communities decline, and to watch so much of our cultural seed stock disappear.

We are now forced to address the legality of ecological exploitation if we are to achieve the high law of morality to protect our ecosphere.

The greatest challenge of our time is to reduce consumption of fossil energy and materials, but still meet the bona fide human needs. We have to develop a culture that provides rewarding, satisfying lives and free ourselves from moral/legal inconsistency. The challenge might be the greatest in human history.

Corporate leaders have a “fiduciary responsibility to stockholders.” Our retirement investments grow from the burning of fossil fuels. So, we are all in this together. This time, there is no North or South.

My hope comes from you, because I know where you come from. You come from the University of Kansas, in the heart of America. President Eisenhower, from Abilene, was proud that he came “from the heart of America.” His pride was about place and a way of thinking. When you carried

your books to classes over Mount Oread, you crossed the old California road. We were connected geographically, but divided on the moral versus legal. Our country was young then. If you celebrated a sports victory on and around Massachusetts Avenue, you did so where the town of Lawrence was burned and people were killed. The heart of America grew stronger on those streets. Kansas entered the Union as a free state. But it did so because of the spirited discussions in the territory called Kansas, countless discussions about the tragic paradox: the land of the free and the land of the slave. Our Kansas hearts grew stronger.

Now nature is being legally and increasingly enslaved, legally locked in an increasingly abusive and wasteful servitude. Our hearts are still strong, but ache because of our destructive ways. We need a course correction, and know that profound change comes hard. It has always been so – from the time of the Declaration to the constitutional amendments ending slavery and racial discrimination.

There is a source of hope: the high moral law can be advanced through the democratic processes that our ancestors drafted. We can overturn the legality of destruction. This requires organizing.



Hoeing in a sunflower plot at The Land Institute. To live within ecological means and cut fossil fuel use, we will need to weed out the superfluous in favor of what is truly needed. Scott Seirer photo.

Also becoming more important are individual efforts. Here is an example from my own life.

I could not tell it without the Kansas spirit or KU. My passion is agriculture, natural for one reared on a Kaw Valley farm, just 30 miles west of here. Our nonprofit at Salina, The Land Institute, started in 1976. My family and I had returned home from California, and soon after there was a convergence of two ideas. One, it appeared to me from a government study that soil, the stuff of which we are made, was eroding about as badly as when the Soil Conservation Service was formed in the Dust Bowl years of the 1930's, despite thousands of miles of terraces, grass waterways, and millions of dollars invested. This was shocking. Also, about that time I took students on a field trip to visit nature's Konza Prairie near Manhattan. No soil erosion was apparent, no applied fertilizer, no sprays, no fossil fuel needed. Elsewhere in our grain fields of wheat, corn, soybeans, and sorghum, it was the opposite. Soil erosion was visible. Those fields were fossil-fuel dependent for fertility, pest management, and traction. The contrast between nature's way and agriculture was striking. What explained it? Our grain fields feature annuals, which must be replanted each year from seed on disturbed ground. The prairie, like most other land ecosystems, features perennials, plant mixtures that keep coming up every year from deep roots that hold soil.

Clearly, agriculture had taken a far turn away from nature's way. Grains are responsible for some 70 percent of humanity's calories and are grown on around 70 percent of farm acreage worldwide. So I asked, Why no perennial corn or wheat? Why not farm like prairie? This sounded crazy then. But my former KU professors encouraged me. So we set out to perennialize major crops and

domesticate some promising wild species. We now see results from our geneticists at work on several perennial grains and our ecologist at work to integrate them. Kernza is a relative of wheat and other grasses. In addition to the Salina fields, 80 acres will be planted in Minnesota this fall. Wheat hybrids are in field trials in 20 locations in eight countries. We support the perennialization of upland rice in China. Other perennial species and hybrids are in the research plots. KU faculty and Land Institute scientists have joined hands recently to help ensure that farming, like a prairie, can have a life of its own, yielding agricultural landscapes that absorb greenhouse gases, protect soil, water, and air, and feeds us.

This one example illustrates what a few individuals can start without permission. It does not require society at large.

In summary: the moral versus legal was on the line before the Civil War. Results were the 13th, 14th, and 15th amendments. Kansas was a key player then, right here in Lawrence. The moral versus legal is on the line now. Both political and independent action are required again, this time to protect the ecosphere.

You come from KU. You come from the heart of America, which from its early history has displayed a great sense of oughtness. You are inheritors of that cultural seed and therefore expected to exercise your collective and individual power to merge the moral and the legal. You have an education from KU. You have the energy. I know that. I have seen and heard some of you in the classroom. I have seen and heard thousands of you in the Phog.*

Congratulations, class of 2013.

*Nickname of KU's Allen Fieldhouse, after pioneering basketball coach F. C. "Phog" Allen.

Meeting needs with no growth

All of us have lived through at least one economic shrinkage, and many of us have done so with some hardship. But we've always seen the economy bounce back. On a chart the downturns draw brief dips in two centuries of grand ascent. So at least for the long haul we take growth as a given. To judge by news stories, which cover job woes and oil and stock price swings, but never question faith in continued growth, we can't see it any other way. Since the US technically left the most recent recession in 2009, gross domestic product has averaged an annual climb of roughly 2 percent. Inadequate, say politicians, business people, and media commentators. So also can say the nearly 8 percent of Americans who are still counted as unemployed, and the much higher number of Europeans.

But what if unemployment remains high, or later grows, because real, physical wealth, not the financial sleight of hand included in the GDP, can grow no more? What happens when the food, fiber, metals, and, above all, the energy behind them – the energy that gives each North American the equivalent of 89 slaves – can no longer be extracted and exploited at higher rates, and the resources that aren't renewable by sunlight take permanent falls? What will we, with growth in our blood, make of a world when the economy doesn't bounce back more than to draw blips in a long descent?

Speakers at The Land Institute's Prairie Festival, September 27-29, have been asked not just to play Cassandra, but also tell how to meet needs in that smaller economy. The

speakers include Peter G. Brown, who co-wrote "Right Relationship: Building a Whole Earth Economy," John Fullerton, a former JPMorgan executive who founded Capital Institute to work on a more sustainable economic system, Land Institute scientists Tim Crews and Wes Jackson, and food writer Mark Bittman. In the following pages are stories about the ideas of three more speakers. Economist Lisi Krall wants to help people understand how capitalism evolved, while our thinking about it has not. Institute plant breeder Stan Cox makes a case for something that people dread but that has worked in hard times: rationing. Sandra B. Lubarsky looks beyond economics, arguing that to conduct ourselves ecologically with the world, we must first reclaim a greater sense of its beauty.

Citing President Kennedy's call not to ask what your country can do for you, but what you can do for your country, "Charity Case" author Dan Pallotta said this on the TED Radio Hour: "I think people have been asking and nobody's given them anything big to do. We underestimate people all the time. People want to make a difference, and they want to make a big difference, and they want to do something epic and heroic in this lifetime. Sometimes they don't even know it until you show it to them." Following are thoughts about what to do.

Capital error

An economist says our system needs radical, foundational change

SCOTT BONTZ

Like a natural ecosystem, a human economic system evolves, and that evolution builds complexity. But even while it becomes a different animal, ideas about it can remain dangerously fixed. Lisi Krall has spent more than two decades studying how capitalism evolved, including its relation to natural systems. In conversation with her about this economic system, the word she repeats is “untenable.” Capitalism is not what it was in 1776, when Adam Smith championed the “invisible hand” for a nation of craftspeople, shopkeepers, and 10-employee factories, and when Thomas Jefferson imagined a land of yeoman farmers. Capitalism’s requirement of growth now faces biophysical limits. There is no way around this, not even with so-called green or renewable energy, said Krall, a professor of economics at State University of New York at Cortland. She said we need something foundationally, radically different from capitalism.

She calls for the best minds gathered in something like the World War 2 Manhattan Project, this time to map a plan for ending economic growth in the least disruptive way. “People shouldn’t underestimate the magnitude of the problem,” she said. “We’re a long way from a no-growth economy.” She

will share her thinking about the problem at The Land Institute’s Prairie Festival.

Krall’s grandfather was killed in a water dispute with another Wyoming homesteader. This battle over a finite resource opens “Proving Up: Domesticating Land in US History.” She called her book an examination of a slice of a larger economic picture she wants people to appreciate: capitalism’s foundational institutions and the fact that the system keeps evolving. She also questions how much agency this has left people. “Jefferson lived before the industrial revolution in the United States and before the institutional foundation of capitalism was fully erected,” Krall said. But he helped to establish “fee-simple ownership” of land, which made it easy to trade and use as a com-



Lisi Krall

modity. He did this expecting a society of small farmers. That’s not what happened. Across the Atlantic the evolution of capitalism was further along. But when Adam Smith stood on the streets of Edinburgh while writing “The Wealth of Nations” and observed butchers, brewers, and bakers on each corner, in competition, he could still see self-interest benefiting social welfare. What Smith and Jefferson couldn’t foresee was what fossil fuels would do with the evolution of capitalism. It already was a system predicated on private property and pursuit



Capitalism's early pioneers could not foresee how industrial expansion would bring endeavors and damage on the scale of a modern steel mill. Lisi Krall says the system's "entire metabolism" changed, and now, unlike what Adam Smith championed, "It's quite likely that private interest does not lead to social welfare." Scott Bontz photo.

“We must move away from the belief that planning is a four-letter word that will lead to totalitarianism.”

Lisi Krall

of profit. And the social dynamic brought by surplus production and attendant expansion had been at play since the agricultural revolution. But the industrial revolution changed the human economy’s “entire metabolism.” Now, she said, “It’s quite likely that private interest does not lead to social welfare,” though people do not understand the change and have not shaken pre-industrial ideology.

How a post-capitalist, no-growth economy meets human needs will depend on how growth ends, Krall said. “Because that will determine what possibilities we are left with.” She stresses facing up to growth reaching limits of what the earth and its life can deliver. She thinks we already are in ecological collapse.

In no scenario can she imagine that we will keep traditional labor-market employment or unplanned economic production. “Employment today is dependent on the rate of growth of the economy,” Krall said, “and if you think about the high rates of unemployment we now have, and imagine the rates of growth we will need to lower these rates, you start to understand the challenge we are faced with just in terms of employment if we want a no-growth system.” She said the market economy must change to a mixed economy, with large segments such as energy not left to the “willy-nilly” vagaries of market forces, but taken out of private enterprise and planned on a scale to match the problem. “We must move away from the be-

lief that planning is a four-letter word that will lead to totalitarianism,” she said.

We also must know the difference between what merely reforms the system, and what revolutionizes it. The US Forest Service and labor unions were reforms to capitalism. The Forest Service functions on a mandate to allow for multiple uses of its land. This might have once worked, but Krall said that demands now are so great, “There’s no pie big enough to accommodate everybody.” The institution is stretched to limits, and solution requires change at its economic foundation. Krall wants to help people see critically how the structure and drive of the economy plague us with problems that it can’t cure, such as eliminating poverty and unemployment while recognizing and dealing with biophysical limits.

She also wants to impress that revolutionary change involves more than personal virtue in how one lives. It takes large-scale institutional change. And she said it begins with an ability to question the things we have come to believe, and to think about the “unfathomable economic truths” that we now face. She said that looking at the system as evolutionary is important for understanding both how it works and how our ideas about it might be outdated. She said, “We need to ask more probing questions about the nature of our economic system if we are to understand how we got to this historical moment.”

Prairie Festival 2013

How to live when material or institutional limits reverse economic growth is the main focus of this year's Prairie Festival, to be held September 27-29 at The Land Institute, Salina, Kansas. A treat speaker will be New York Times food writer Mark Bittman. Speakers on theme are economist Lisi Krall (see page 8), Land Institute scientist Stan Cox (page 12), sustainable development educator Sandra B. Lubarsky (page 16), environmental educator Peter G. Brown, Capital Institute founder John Fullerton, and Land Institute scientists Tim Crews and Wes Jackson. The artist is photographer Philip Heying (see back cover). The festival features a barn dance Friday night. Singer Susan Werner will perform Saturday night, singer Ann Zimmerman on Sunday morning. Primitive camping is available. For more, click the Visit tab at landinstitute.org or call 785-823-5376. Schedule and updates appear on the Web site Calendar.

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Rationing: Not whether but how

A call to act before the economy inevitably becomes like in wartime

SCOTT BONTZ

Through the decade of the Great Depression, the United States stocked goods, or at least harbored resources, but people lacked the means to buy them and drive a growth economy. In World War 2 factories steamed full ahead, wages rose, and almost everyone able found work. Still Americans scrimped. Now the frugality was by fiat. Goods were diverted to feed soldiers and fuel battle in Europe and the Pacific. At home government allowed each citizen to buy only so much gasoline, meat, and sugar, and only so many shoes. It curbed fashion cycles, restricted the amount of material for collars and pockets, and promoted two-piece swimsuits. It applied this rationing equally across rich and poor, and polls showed broad support. They showed support again during the oil embargo and crisis of 1979, though flow resumed and the government never distributed the ration coupons it had printed.

Both times rationing was seen as a necessary evil, imposed as last resort. “Most people stoically tolerated limits on consumption in the hope that better times were on the way,” Stan Cox writes in his new book, “Any Way You Slice It: The Past, Present, and Future of Rationing.” In both cases materially plentiful times came. But the material and its days are numbered, Cox says, and the best times to come now depend on radical reform both of how we

see the world’s resources, and our economic relations. “It is not a matter of whether we ration but how,” he says in a chapter called “Slowing Down with the Joneses.” The Land Institute plant breeder, who also has written books about the ecological costs of medicine and air conditioning, opens his essay about rationing’s many forms with a summation of why it’s needed: the human economy, or at least that of the industrialized nations, is living beyond the world’s ecological means, and people will have to live with less. The word ration goes back to the Latin *ratio*, meaning “reason” or “calculation.” Better to plan and implement now, to conserve water, energy, soil, and climate, Cox says, than to wait for losses more painful, and then react in emergency.

An economy based first on profit cannot stop itself from exhausting natural capital, and even the best-tested rationing system cannot by itself solve that problem, Cox says. First must come a ceiling imposed on consumption across resources and society, to make the economy smaller. If we simply limit each driver to 5 gallons of gasoline per week, or even impose a carbon tax, without stemming the overall flow of materials that are irreplaceable or destructive to extract, then money and energy no longer exchanged at the pump will find different outlets. “Carbon emissions may be the biggest problem, but that money can get into all kinds of other trouble,” such as soil-exhausting bio-

fuels, Cox said in an interview. He said the goal should be not “We want rationing,” but “We want a long-term, sustainable society.” That will entail rationing. Then we should ask, “What’s the best way to do it?”

From his look at the history of rationing in wartime American and Britain, and as a constant in countries including Egypt and India, where he lived for years, Cox concludes that for acceptance such controls

must be administered fairly. Even then there will be cheats. But a program of prevailing fairness wins prevailing support and can work. Cox sees “extreme unfairness” in rationing by price, which like coupons and points is a means of divvying scarcity. He tells of quinoa, which has become a popular grain substitute in the West. This drives up the price, and takes the food away from feeding the South Americans who grow it.



At last year’s Prairie Festival, Stan Cox explained his sorghum plots, where plants are spaced evenly to help ensure equal shares of sun, water, and nutrients – rationing. Scott Bontz photo.

They now eat cheaper stuff and their nourishment suffers. Another example is the drug eflornithine, whose manufacturer used it to treat unwanted facial hair among women in industrialized nations, but, until yielding to pressure, chose not to use it to save lives of Africans with sleeping sickness. “These are consequences of the market working just as it’s designed to work,” Cox said.

But he counts himself among conservatives when environmentalists seek to keep the Western life of plenty with green energy solutions and efficiency improvements. The new technology can’t come near matching the power of fossil fuels, and through history, efficiency gains paradoxically beget greater consumption. He wants environmentalists to consider, “What if we can’t get around the problem?” Treat new natural gas reserves as if they weren’t there, because of their environmental cost. Don’t deplete soil by growing crops to fuel cars. Don’t build wind turbines unless the kilowatts they bring to the grid are met with an equal reduction of kilowatts from fossil fuel. He is convinced, and wants to hammer home, that if we are really serious about making things work green, “The economy will be similar in some respects to a wartime economy.” Life will require thrift. Like conservatives, he sees environmental regulation leading to rationing. But they react with dread, while Cox supports safeguards, and said, “Rationing: is that really the worst thing that could happen? Would it be so bad to consider sharing by what is equitable, rather than by how much money we have?”

Even if we approach economic equality and return to life within ecological limits, rationing will be necessary, he said. Because once you limit what’s available, inflation is almost inevitable, and then come price controls, long lines, and “fist fights at gas stations.”

His last chapter about slowing down includes these summaries:

- Wartime experience shows that consumption is more easily limited if there are firm limits on the number of grades, models, or styles of products.

- Experience with rationing, price controls, and subsidies shows that a universal policy is more politically acceptable than targeting only poor families. “Any time a system evolves into two (or more) distinct tiers, it accommodates the desire for higher consumption by those who can afford it but weakens the fair-shares principle, and that tends to undermine broader acceptance,” Cox writes. “When rules apply equally to everyone, even the most powerful, they draw far stronger public support.” This not only seems more fair to people, but cuts deeper into consumption by the wealthy Joneses, whom others try to follow, and so reduces envious “cascades” of buying.

- History shows that ensuring fair shares on national or world scales requires clear, consistent, and firm allocation methods. “Rationing would probably always fail were it not for the high value we place on fairness; the ‘carrot’ of fairness compensates for the ‘stick’ of consumption controls,” Cox writes. Consumer rationing draws stronger support with decisions made locally within overall limits, as was done in wartime America. Cox cites Harvard Law School’s Yochai Benkler, who studied fairness and cooperation, and found that most people, though far from all, dependably want to cooperate, some even at immediate cost to themselves. But the behavior of whole societies is unpredictable, and Benkler urges building public institutions for democratically adopted goals to advance fairness.

Cox does not favor limiting consumption through taxation, which he says is indirect, unpredictable, and, if levied on

something craved like gasoline, much more unpopular than simple rationing. He prefers economist Josh Farley's proposal, in which companies using the commons – water, air, soil – buy rights to it. Proceeds go to building green infrastructure, to make the state more capable of living on fewer resources.

Cox says questioning growth or suggesting rationing has been compared to shouting an obscenity in church. Because if prices were controlled and demand for goods intentionally suppressed in the current economy, businesses would make less, breeding stagnation and unemployment. But stagnation and unemployment already plague economies worldwide, and Cox says this isn't from failure of consumers to consume, but from economies' inherent tendency to overproduce. A sustainable economy can only be one in which Westerners, at least, work and produce less, Cox and Harvard economist Juliet Schor say. This will require overcoming the market's inherent pressure for employers to get more hours from employees.

In existing economies, the pie must keep growing to ensure that the narrow slice going to poorer households will keep them above subsistence level. But if overall consumption is suppressed while reducing inequality, Cox says, overall wellbeing can rise.

An economy that contracts in a fair and orderly way will be very different from a traditional economy that has old-fashioned recession. This broad downsizing faces rejection not just from corporations, but from societies that have had the enjoyment of material abundance instilled in their psyches over three generations. Cox cites Maurie Cohen, who calls commitment to consumerism "powerfully resolute," and David Orr, who says that "we had a collision with affluence, and it changed us as a people."

Cox thinks that addiction to overconsumption is not irreversible. People can quickly respond when presented with limits. For three decades after the war prosperity rose. Then came the oil embargo, the Iranian revolution, and a tighter ceiling. People panicked in gas lines only as long as government wasn't clear about what to do. Then came broad support for coupon rationing, even from conservatives including columnist George Will. President Nixon had the stamps printed, and President Carter got a stand-by rationing plan passed. Within a decade the nation went from finding the idea of gas rationing entirely unacceptable to enjoying serious consideration. Then, Cox said, "Mideast oil began flowing, Alaska oil began flowing, and everybody forgot about it." Affluence increases resistance. "But I don't think that's a permanent condition," he said.

In 1906, philosopher William James wrote an essay called "The Moral Equivalent of War," in which he saw humans' moral need for a cause like battle, if not its blood. Cox calls the first chapter of his book "The Material Equivalent of War," and he opens with a quote from Interior Secretary Harold Ickes explaining the government gasoline ration plan in 1942: "No patriotic American can or will ask men to risk their lives to preserve motoring-as-usual." Americans have indeed been asking for this risk with wars in the Middle East. But Cox is hopeful, and argues for a more equitable and resilient rationale for prosperity on the home front.

He told of his aunt being so excited to welcome her brother back from fighting in World War 2 that she used her entire sugar ration to make him a cake. What the wounded soldier had longed for was to again having sugar in his coffee. "But he didn't complain," Cox said, "he made the best of it."

Food, clothing, shelter, beauty

A prescription for right living includes esthetic sense and sensibility

SCOTT BONTZ

Wes Jackson says we won't reach living sustainably if we don't reach sustainability in agriculture first.

Sandra B. Lubarsky says there's another prerequisite: a culture that more highly values beauty, especially that of the natural world. If we see something as beautiful, it isn't only something to use, as in the current market, but to love and care for.

"Until beauty returns again to the foreground of our cultural life, I do not think that we will see a successful shift to an ecological paradigm," Lubarsky writes in an essay called "On Beauty and Sustainability." Unlike agriculture, which from the start depended on annual grains and is not truly sustainable beyond places like the Nile River valley, what Lubarsky prescribes will last as long as we pay attention. She said it will be important for when society no longer has fossil-carbon gadgets. Beauty does not depend on consumption.

She is writing a book about the importance of beauty as a public value, with one chapter called "Practicing Beauty," and it is what she will speak about at The Land Institute's Prairie Festival.

Lubarsky will travel from Appalachian State University in Boone, North Carolina, where she is chair of the school's

Sustainable Development Department.

Earlier she created one of the nation's first graduate programs in sustainability, a master of arts in sustainable communities, at Northern Arizona University. Her interests include higher education, community, religious pluralism, and process philosophy and theology, after British mathematician and philosopher Alfred North Whitehead.

She called that philosophy an ecologically sound one in her case for beauty. In an interview, she explained. All living things are feeling beings. This doesn't mean they are conscious of other living beings, but that they have some kind of feeling of the world, and of others around them. This is the basis for esthetic understanding: at the base of reality is not just material, but feelings. The word

esthetics is associated with "to feel," as opposed to anesthetic. The Cartesian mindset of the scientific revolution sees the world as a mechanism, and that leads to instrumentalism, where the world is only something to use. A feeling-based metaphysics makes beings intrinsically valuable, and the world understandable esthetically.

Lubarsky doesn't think this should be the only way to understanding. But beauty has come to be seen as subjective, and to be disregarded as a fundamental to living well. This diminishes the value of life and



Sandra Lubarsky

our enjoyment of it, she said. “We’ve lost the connection.” Meanwhile, industrialization sacrifices natural beauty to “short-lived efficiencies of production.”

The West has artistic beauty, and that is important to Lubarsky. But it’s not what she means by beauty. “I mean something larger than artistic creation.” She also said, “The question that beauty asks us is deeper than the simple language of sustainability.” It asks, “How can we live in a life-affirming way?” Beautiful things are those with the “closest affinity with life.” They make us feel alive. “Beauty is sister to vitality.”

Lubarsky recommends developing a deep sense of dependence on the natural world, and making education center around beauty, rather than around technique for

control of resources for money. By making beauty a legitimate topic we can weaken the hold of thinking in terms of mastery, of knowing the world in order to manipulate it, rather than in order to love it. “We separate ourselves from the world in order to control it,” she said. “Once you are a companion of the world, you’re much more careful about the way you use it.” She said conservationist Aldo Leopold knew this well.

When someone does something remarkably good, we say they are a beautiful person. The Greeks had a word for the conflation of beauty and goodness: *kalokagathia*, from *kallos* for beauty, and *gotha* for goodness. Lubarsky said, “I think we need to resurrect that conflation.”



On The Land Institute prairie is catclaw sensitive briar, so named because the leaves can feel another organism and fold. Sandra Lubarsky says that at the base of reality is not just material, but feeling. She said a feeling-based metaphysic makes the world understandable esthetically, and not just something to use. Scott Seirer photo.

The haggard face of annual grains

Over April 17-18 storms dumped up to 8 inches of rain in the upper Midwest. Runoff took tons of soil. Fertilizer too. Later, Des Moines stopped tapping rivers for fear of violating nitrate standards for drinking water. Iowa farmers lost in two months \$93 million in nitrogen fertilizer. Loss like this comes

when cropping annuals, which for much of the year leave the earth bare. The Land Institute works to develop perennial grains to cover the ground year-round. Even everyday wind and rain can nickel and dime the land to death, unnoticed. Events like April's unmask the tragedy. Here, Land Institute supporters offer portraits.





At left, Story County, Iowa. Above, Boone County, Iowa. Both photos by Drake Larsen.

Barbara Stewart, agronomist for the Natural Resources Conservation Service in Iowa, said that last year brought a similar storm and worse damage, with lots of gullies, and terraces, which were built to slow flow and erosion, overtopped. This year the

damage was not nearly as bad. Stewart said the difference came as a result of drought: farmers tilled less and planted more cover crops that protect the ground. Perennial grains could provide not just cover, but also food.



Porter County, Indiana. By Fred McColly.

Since the achievement of our independence, he is the greatest Patriot, who stops the most gullies. – Patrick Henry



Hamilton County, Indiana. By Mike Habeck.

So direct is the relationship between soil erosion, the productivity of the land, and the prosperity of people, that the history of mankind, to a considerable degree at least,

may be interpreted in terms of the soil and what has happened to it as the result of human use. – Hugh Hammond Bennett and Walter Lowdermilk



Stark County, Illinois.



The USDA estimates that about half the fertilizer used each year in the United States simply replaces soil nutrients lost by topsoil erosion. This puts us in the odd position of consuming fossil fuels – geologically one of the rarest and most useful resources ever discovered – to provide a substitute for dirt – the cheapest and most widely available agricultural input imaginable.

– David R. Montgomery, in “Dirt: The Erosion of Civilizations”



Keokuk County, Iowa. By Sharon Rasmussen.

A study in the *Journal of Soil and Water Conservation* found vegetation type the most important factor governing soil loss. In a Missouri field monitored for over 100 years, perennial crops were more than 50 times more effective than annual crops in maintaining topsoil.



Land Institute shorts

Perennial beats annual crop sunflower during drought

During two years of drought, a perennial sunflower being developed as a grain crop at The Land Institute outproduced commercial annual sunflower in university test plots an hour away. The comparison was not a controlled scientific test, but it encouraged Land Institute plant breeder David Van Tassel.

His subject is *Silphium*, a prairie plant in the sunflower family. A random sampling from 10 plots produced seed at the equivalent of 278 pounds per acre in 2012. The plots were begun in 2011, and since *Silphium* doesn't produce the first year, yield then was zero. Kansas State University's experiment station near Hutchinson reported from its hybrid annual sunflower plots an average yield of 263 pounds in 2011. Next year the KSU plots were abandoned to drought. "So even our average, which included inferior plants and families, outyielded the most elite hybrid cultivars if you average 2011 and 2012," Van Tassel said.

In years with more rain, 2009 and 2010, KSU's annual sunflower yielded 1,632 and 908 pounds per acre. Van Tassel estimated the yield of his three best plants in the middle of plots – plants at the edge have less competition for moisture and can do better – at 1,055 pounds in 2012, still higher than the Hutchinson hybrid yields in 2010, before

the worst of the drought. *Silphium*'s genetic variation might make it a commercial contender.

A few plants at the edge of the field had estimated yields of 1,700-2,000 pounds per acre. "This suggests that average yields were strongly limited by competition for resources, not only by genetics," Van Tassel said. And it presents a conundrum. "Most plant breeders would attempt to ease the resource limitations in order to more strongly reveal plants' genetic potential to produce seeds," he said. But over time this could result in selecting for plants less good at foraging for water and nutrients. On the other hand, selecting plants that do better than their peers in a low-input experiment could yield counterproductive competitiveness rather than only the desired frugality.

Ultimately, some source of nitrogen will be needed in long-term *Silphium* production fields. The KSU plots received nitrogen and phosphorus fertilizer. The Land Institute plots had none. The yield limiter in the drought might have been water, not the normal key, nitrogen. But Van Tassel said there is evidence that more nitrogen can increase a plant's water efficiency. So *Silphium* might have benefited from fertilizer. If *Silphium* is getting moisture from its deep tap roots, he said, it might also be enjoying nutrients leached below the reach of previous crops. This ability would not be a long-term answer to its needs.

At left, a trench almost 6 feet deep shows the roots of Silphium, a sunflower family plant that The Land Institute is developing as a crop, and which looks better than annual crop sunflower at tapping resources. Steve Renich photo.

Van Tassel sent 2,000 select young *Silphium* plants to a research farm run by Organic Valley, to evaluate the crop candidate's potential in Wisconsin.

Former legislator Svaty joins institute as vice president

Josh Svaty, a former Kansas secretary of agriculture and state legislator, joined The Land Institute as vice president. The position is new. Svaty will address public policy and raise money. Since 2011 he had served as senior adviser to the administrator of the Environmental Protection Agency's office that covers Kansas, Nebraska, Iowa, Missouri, and nine tribal nations. His work primarily involved agriculture. He served as secretary of agriculture from 2009 to 2011, and from 2002 until then served in the Kansas House of Representatives. Svaty and his wife, Kimberly, run Free State Farms in Ellsworth County, just west of The Land Institute. He is part of the fifth generation of his family to farm in the county. Institute President Wes Jackson said Svaty, who has testified before Congress about water and energy policy, will help the organization globally expand development of perennial grain crops.

Water district supply supplants troublesome wells

The Land Institute tied into a rural water district system to lessen troubles in the greenhouse and for better drinking water. Until now, it used water from wells on its own property. The water from one well was high in salts, calcium, magnesium, sulfate, and alkalinity. The well also became unreliable in drought. Water from another well was high in a pipe-clogging bacteria. Greenhouse use also required cleaning by

costly reverse osmosis. For drinking water, the institute has paid for a bottle service. Beginning in June, taps began drawing from Ottawa County Rural Water District No. 2.

Remade farmhouse serves temporary staff, researchers

The Land Institute remodeled an old house on its 72-acre farm a mile and a half west of the office, for renting to temporary workers and researchers. Before, students interested in working a few weeks or all summer to learn about the institute faced the trouble of finding short rental terms in Salina, or expulsion from Kansas Wesleyan University dormitories when the school year approached. The house has three bedrooms and two bathrooms. Tenants will share the kitchen. Furniture for the remodeling was mostly donated.

Former classroom building remade for offices

The Land Institute also made over its original building, called the classroom building. This had served as make-do offices for its scientists before the science building opened in 2010. Now the offices have actual walls instead of bookcase partitions. President Wes Jackson makes his new office in the walkout basement that had included a make-do lab. His secretary, assistant, and the vice president have offices upstairs.

Breeders tell perennial grains story in American Scientist

Staff scientists David Van Tassel and Lee DeHaan explained The Land Institute's work in an eight-page, illustrated story for the May-June issue of the magazine *American Scientist*.

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is your last issue. Please renew your support.



Along Wolf Creek, by Philip Heying, who will show photographs at The Land Institute's Prairie Festival September 27-29. This issue features the thoughts of three festival speakers on achieving a smaller economy – before having it painfully thrust upon us.