# Land Report

*Number 121, Summer 2018 · 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 info@landinstitute.org, or call. Web site: landinstitute.org.

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# Land Report

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## Cover

*It's called potato leafhopper, but it also damages apples, grapes, and clover, to name a few plants in a broad menu. Land Institute legume breeder Brandon Schlautman wants to stay on top of Empoasca fabae in his alfalfa and clover. Here our new crop protection ecology technician, Edy Cheremond, makes a weekly sweep to count leafhoppers. This day there are only a few. But the insect's size – the adult about one-eighth of an inch – and speed make it hard to find, and "hopperburn" builds quickly. Cheremond's strides and swings were vigorous. Cover photo by Scott Bontz.*

*Wylie Harris, above, and Özlem Altıok, right, at The Land Institute's Prairie Festival. They care for family land, want city schooling for their girl, and are ready for an agrarianism with hybrid vigor. Scott Bontz photos.*

# Wanted: native outsiders

*Full-time agrarians on part-time farming and the authenticity of coming home*

SCOTT BONTZ

Wylie Harris is a fifth-generation rancher whose belt buckle circles a lone star with the words "The State of Texas." He wears jeans and boots. Salt-and-pepper hair and short beard frame a lean face with a strong nose and large, brown eyes. His talk is gentle, often wry, and short of drawl. Özlem Altıok's accent is Turkish. Her hair is just shy of black, and she stands just shy of Harris's chin. Her own, pointed up at a microphone, hints a dimple. She wears black drapery of a skirt, a thin gold bracelet on one arm, a wide, deeply textured silver watchband on the other. She looks native to the city. Now she is in a dirt-floored barn, at The Land Institute's 2017 Prairie Festival. And when at home in northern Texas, she and Harris, wife and husband, shepherd cattle between two fields.

One day while they moved animals over asphalt, a driver stopped and twanged to a companion, "Is that the farmer?" Harris asked the festival audience, "What is a real farmer?" And what is "agrarian"? "I don't want to even attempt to define that," he said. But agrarian he counts himself to be. And he said you don't have to be rural to be agrarian.

The USDA defines farmer as someone making over $1,000 a year from agriculture.

> "You don't have to be born in a place to be native to that place."
>
> *Özlem Altıok*

Altıok and Harris qualify. "But we're certainly not making a living on it," he said. They consider themselves full-time agrarians, part-time farmers. And now they are only weekend rural dwellers. Recently they moved to town – Denton, where Altıok teaches international studies and women's and gender studies at the University of Northern Texas – so their daughter can be nearer friends and receive better schooling than the sort that bored young Harris.

Even then, farming couldn't support his family. His father supplemented income as a highway engineer. And Harris didn't grow up feeling connected to the land and farming. Travel in Latin America is what made him appreciate the stability that comes with having land, and to want to care for it. He studied biology, and while earning a doctorate at Texas A&M, served as a Land Institute fellow. At home he explained his studies to an uncle, and later returned to hear among family this description: "He's down there and they're studying *him*."

This plays to a dynamic combination proposed by Altıok, that of the "native outsider." "You don't have to be born in a place to be native to that place," she said. What matters is if you *feel* native. You feel it through social engagement – you can't simply shop. A native knows local ideals, history, and what certain words mean.

But you don't necessarily *want* these things. You need to be able to stand outside the social relation, to see that the form is not "natural," but instead results from a long history of people making particular choices, and that new choices can be made, to win new results. Wendell Berry and Wes Jackson took experience from outside their native places, then came home. Altıok sees this giving them authority and authenticity.

We need community to effect change, and to boost morale when we are down. But we must keep pounding on our ideas for change, she said, because a time will come when they are needed, and we must be ready to roll them out. At this her chin and volume rose, and so did her festival audience, to its feet, in applause.

Harris said the machine that has so damaged the world is bound to falter. He has stopped trying to stop the machine, and instead readies for its demise. His seeking to balance the agrarian and things like good schools and high-speed internet make his life a "serial of compromise." Through luck he enjoys land, and choices that others lack. But he still can't make it farming. The income parity sought for farmers a century ago has largely failed.

What will the machine's demise mean for this? How will a new agrarianism look? Harris said it will be unfamiliar to everyone. But, playing on how The Land Institute gave him a fellowship without seeing eye to eye with Texas A&M, he thinks we must have the courage, graciousness, and kindness to say, "That's all right. Come on ahead. We'll work it out."

# Prairie Festival

*Changing our system to attain stable, lasting societies*

Economic transformations for an ecological civilization is the theme of this year's Prairie Festival, September 28-30 at The Land Institute. Some of the speakers:

· Loka Ashwood grew up on an Illinois farm, worked as a journalist, and now helps communities through her research in agricultural economics and rural sociology at Auburn University. She wrote the book "For-Profit Democracy: Why the Government is Losing the Trust of Rural America."

· Mary Berry is founder and executive director of The Berry Center, which advocates for land conservation, small farmers, and rural community, as has her father, writer Wendell Berry.

· David Bollier, as an activist, scholar, and blogger, focuses on commons as the basis for economics, politics, and culture. He works at the Schumacher Center for a New Economics. His books about the commons include "Think Like a Commoner."

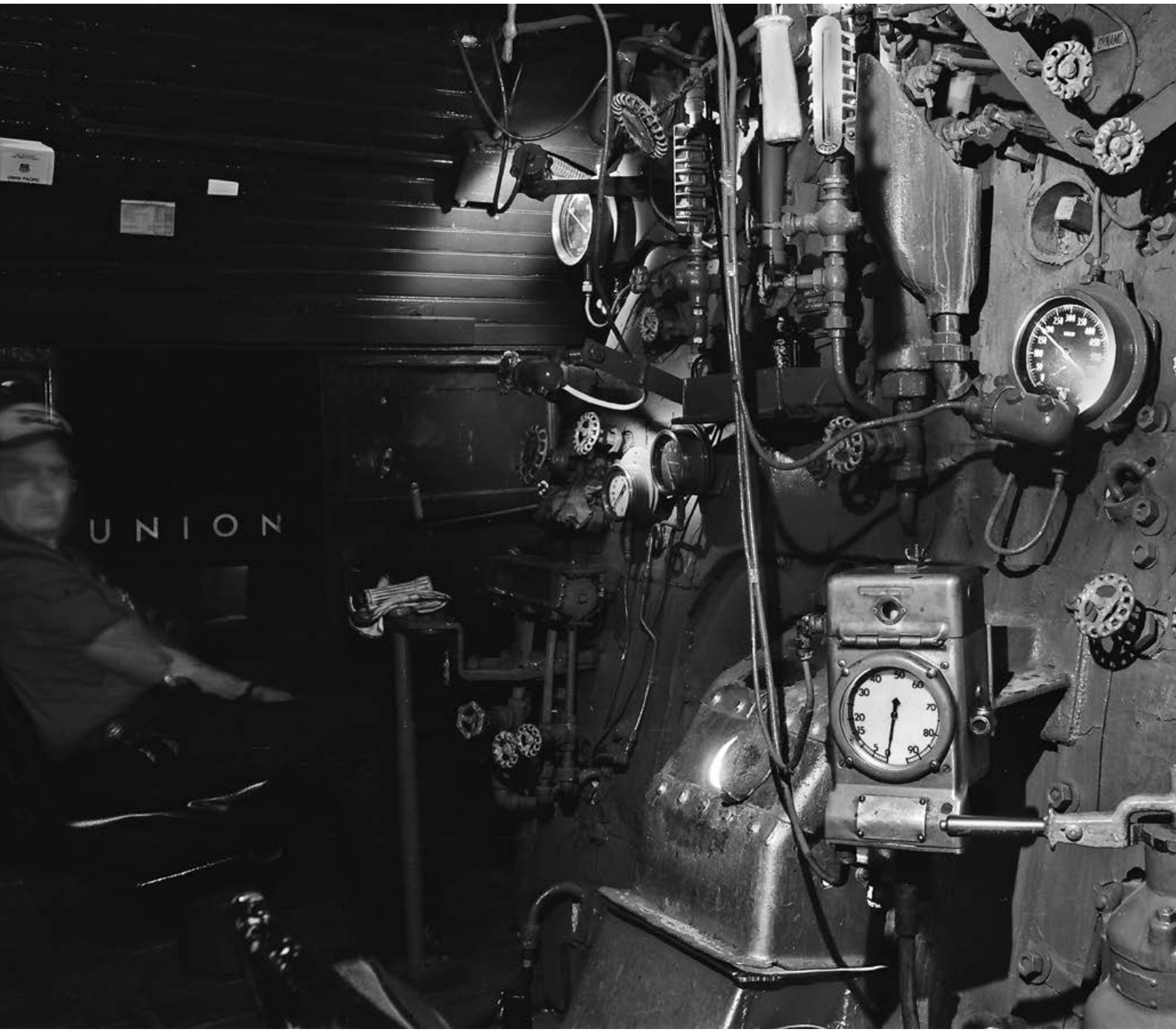
· Liz Carlisle teaches at Stanford University about food and agriculture, transition to sustainable living, and environmental communication. She wrote the book "Lentil Underground: Renegade Farmers and the Future of Food in America."

The book "Frog Pond Philosophy," by Strachan Donnelley, will be discussed by his daughter, Ceara Donnelley, his mentee, Brooke Hecht, and The Land Institute's Aubrey Streit Krug. Donnelly asks, What if "nature alive" were taken as our bottom line?

Friday night features a barn dance and, weather permitting, a bonfire. There is free tent camping, but no RVs.

For more, or to register, click the News & Events tab at landinsitute.org, or call 785-823-5376.

*A piece by artist Claire Pentecost, who will show at the Prairie Festival.*




*Who's doing most of the work in this locomotive? How much of the conductor's wage is supported by the fuel oil? In a course called Reality* 101, *Nate Hagens says Gross Domestic Product now is primarily made by fossil energy, replacing most work with jobs, which don't create wealth, but distribute it – and distract us from the distribution's gross unevenness. Hagens also predicts more work, soon. Scott Bontz photo.*


# GDP, jobs, and fossil largesse

*Former financier Nate Hagens studies energy and psychology to get at what wealth and work really mean*

With a master's in business administration from the University of Chicago, which boasts 12 Nobel Prize winners in economics and has spread corporate capitalism across the planet, Nate Hagens set to work on Wall Street. He first served Salomon Brothers, then managed Pension Research Institute, and then founded Sanctuary Asset Management. At his Web site, The Monkey Trap, he says, "I made (and spent) a lot of money."

By his early thirties, he also had begun nosing beyond the Chicago school's neoclassical focus on capital and labor, to trace how the modern holy grail, Gross Domestic Product – and everything else – is about energy. And, he said, "I intuited that in my lifetime, and possibly quite soon, global energy production (and therefore consumption) would peak and decline." Daniel Quinn's novel "Ishmael" showed Hagens how agriculture – as one possible path, not destiny – changed everything. "Valuing the Earth," co-edited by economist Herman E. Daly, pushed his perspective beyond seeing humanity as the end all. He saw that our chapter in world history has been short. And Wall Street co-workers high-fiving over $10,000 commissions is something he learned to see in terms of brain chemistry. He quit his job to study how all of it – biology, ecol-

ogy, energy – explains the human ecosystem. Cutting through the veil of "the carbon pulse" and its comforting gadgets, he said in email, "I started to look at my own behaviors differently, and ultimately changed my values from frivolous consumption, more to knowledge, understanding, and social capital." He earned a doctorate in natural resources from the University of Vermont. He edited The Oil Drum, an Internet portal for analysis of energy and society. He served on the board of the Post Carbon Institute. "I still engage in frivolous consumption, but it's now a fraction of my (small) income instead of majority of my (once large) income."

The undergraduate course he teaches at the University of Minnesota is called Reality 101. He wants young people ready for major change as fossil energy that built our world peaks and then peters. What will come with this he calls The Great Simplification, and he, at 51, expects to see it.

We'll start this dramatic powering down with great slack. Cutting consumption in half will take Americans only to the economic level of 1977. But US lifestyle then, with 4.3 billion people in the world, already demanded more than Earth can give the 7.6 billion in it now. And though the energy from solar panels and wind turbines can maintain a civilization, Hagens says it won't be this one: alternative energy can't come close to matching fossil fuel. At an April presentation in Salina, he said, "How we respond to this energy descent as individuals and as a culture will be a deciding moment in our history."

In a synthesis of energy, raw resources, finance, and psychology, he argues that once we have basic needs comfortably met – and with extra stuff spread equitably – goodies don't really make us happier. Following is a digest of the case he makes.

People talk about job growth like it's a good thing. But kick apart an anthill or a beehive to create jobs for the insects. They will not be grateful, and they will say so in the cross-species language of bites and stings. From this we may infer that insects don't understand economics. But consider that, having honed behavior for 130 million years and attained a total biomass only recently matched by we humans, the ant colony, a superorganism, might be deeply in tune with jobs, energy, and building complexity. We might go on to ask this: What are jobs, really? How do they relate to energy and wealth? How do we keep track of whether we're richer or poorer? First, some basics about how we now get work done – or, rather, get work done for us. Fossil carbon, formed by geologic forces over deep time, packs far more energy than does living tissue. A 42-gallon barrel of oil can do what would require of a human laborer four and a half years. If that's hard to believe, hire a bunch of people to push you and your car hundreds of miles per week and see what it costs. This energy that we enjoy for thousands of times less than what labor costs is essentially fossil slavery. A pejorative label, but right on. Energy slaves do what human slaves and domestic animals once did: they fulfill their masters' needs and whims. Only faster and cheaper. It probably wasn't coincidence that the world got around to freeing most of its human slaves as industrialization offered cheaper fossil replacements.

*Hagens*

A gargantuan invisible labor force built the scale and complexity of our industry, population, wages, and profits. Almost 90

percent of the energy we use comes from oil, coal, and natural gas. Along with nuclear and hydro power, they do more than 98 percent of our physical work. The average human being enjoys 14 times the goods and services as in 1800, when we were already harnessing plenty of wood energy. For the average American it's 49 times the 1800 average, with about 250 energy equivalent slaves working around the clock.

Strongly correlated with energy use is gross domestic product, a measure of finished goods and services, and the figure that nations aspire to relentlessly raise. From 1965 to 2016, world GDP and energy use both increased fivefold, keeping almost lockstep. Reasonable approximation for GDP can come from measuring what we burn. No matter which technology, every good and service demands, somewhere, a fire.

Material things we value combine human and energy-slave work with natural capital such as minerals and ores, soils and forests. It took huge amounts of energy to occupy our hands with iPads. When we tap the screen to view a kitty, the image might be pulled halfway around the planet from a hard drive furiously propelled by coal or natural gas, and routed through data centers likewise fueled. Just building the infrastructure for this took decades. Now the Internet's share of electricity use is more than 13 percent, and rising.

If, like the anthill, the Internet were wrecked, rebuilding it would certainly create jobs. But it would also require prodigious energy and raw material. Ants don't have energy slaves, so they don't want more work. Rebuilding the anthill leaves less of precious energy for tending larvae, foraging, and defending the homeland. Energy slaves are zombies; about job creation they don't care either way. Why do we?

If you give a capuchin monkey a nonsense job, it will happily work as long as it is rewarded with a cucumber slice. But if the capuchin sees the monkey in the next cage get a grape, the better perk, it will throw the cucumber slice in the researcher's face. This capuchin sense of fairness similarly underlies a great deal of human behavior. We're outraged at the notion of somebody getting more reward than we for doing the same thing. To minds both monkey and human, relative reward is more important than absolute reward.

Our brains are seeking the best from conflicting pursuits with deep roots in our social species. One is energy gathering and wealth creation: getting food, clothes, shelter, and other necessities. The second is transparent and equitable social distribution of the goods. A tribe of hunter-gatherers must cooperate as a mini-superorganism to compete with other groups for land and food. But within the tribe, an individual's success depends on getting a fair share of the tribe's take. We're descended from tribe members who, as will every capuchin, each strongly insist on their due.

But a funny thing happened on the way to the Anthropocene. While wealth creation over the past 200 years shifted from human and animal labor almost entirely to fossil slaves, much of the riches went beyond meeting needs and providing simple comforts. Plastic toys. Salad shooters. Smartphones. And vegetables we might need, but grown 5,000 miles away with the remaining cheap human labor and shipped on the backs of fossil slaves. On top of this, things we didn't need before, but now think we do, increasingly grew disposable. A whole dishwasher is thrown away because the controls are integrated, cheap electronics. Because planned obsolescence is good for GDP.

*Apollo 13: with an oxygen tank explosion, lunar landing was aborted. The three astronauts went farther from Earth than any other human has been. But they safely came home, splashing down where life began. NASA photo.*

Do we distribute the fossil largesse with capuchin fairness? No, we don't even acknowledge the energy slaves. We tolerate the distribution gap because it *feels* like others are doing something qualitatively different. This evolved from when a blacksmith's skills could earn him more than a ditch digger's. Now a Wall Street vice president's take dwarfs that of a college professor, whose salary trumps that of an environmental campaigner. But is a teacher, farmer, or fireman really of less value to society than a real-estate flipper? The gap has little to do with the relative worth of each job to society. It's about how well connected each is to the flow of wealth from energy slaves.

If higher pay goes to someone in another "tribe," we don't scream and throw our paycheck, although we might wish for a better job. More important to us now is "the equality of inconvenience." The 40-hour week is a social threshold of inconvenience endured. John Maynard Keynes predicted in 1930 that by 2030 the world would be six times richer and we'd only work 15-hour weeks. About the wealth he appears remarkably prescient. But any segment of society that now only worked 15-hour weeks would be seen as freeloading, and pelted with cucumber slices or worse.

When it comes down to it, however, most of us are freeloaders, idle royalty be-

# Committed

Though it ended several years before I was born, through my life I've frequently heard audio snippets from the Apollo program. It has caught my attention that in every launch, after the countdown reached zero and the engines started, one of the first phrases uttered over the radio link was, "We have commit." It's been explained to me that even though the long trip had only been under way for one or two seconds, even though no motion was yet perceptible, the rocket had in fact risen minutely. And that inch or two of upward motion was already enough to alter the physical relationships such that the rocket could never again settle back intact to the launch pad. The astronauts could still opt out of going to the moon, but at that point there was no hitting a shutdown button and walking away. Lowering the trajectory and then floating down safely on a parachute could be done, theoretically, but only if everyone involved worked for their lives to implement the necessary procedures.

A lot of people still don't realize we're riding a rocket, but arguably we reached "launch commit" as a civilization at or before the rise of agriculture – it was at that point, one could perhaps say, that the ecospheric relationships that came before were drastically and irreversibly altered. And certainly at this point, if we want to return to earth safely, we need to work for our lives. If we're fortunate enough to float down safely, then we can try to recreate relationships as best we can, and to find a new destination and a more congenial way of getting there.

– *Fred Iutzi, president of The Land Institute.*

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ing catered to by fossil slaves. Jobs now are mostly a co-opted, socially evolved mechanism for wealth distribution – along with busy distraction from the distribution's gross disparity. Jobs are very little about wealth creation, and of no interest to ants.

*Real* wealth we enjoy but mostly don't measure. Clean air and water, hummingbirds and dolphins, pleasure and satisfaction: our market system considers the value of such things essentially zero. Instead it tracks success by the sum of monetary transactions for *finished* goods and services provided. Anything without a money value isn't part of GDP. So a nation that cuts all its trees to sell them abroad as firewood has higher GDP than one that leaves its trees standing. It's a funny metric, but one on which we bet everything.

Because modern GDP depends almost entirely on fossil energy and, so, on producing carbon dioxide, our society can be considered a giant heat engine, converting thermal and chemical energy into mechanical energy. Or like an ever expanding hungry amoeba. Over the past half-century, this GDP-from-burning has grown exponentially, and has brought proportional species extinction, fisheries gutting, and ecosystem mangling. Still on it goes, pinned to dollars and jobs.

We are using trillions of watts of fossil energy so each of us can enjoy a few milliwatts of pleasing stimulation to our brains from entertainment and possessing at least as many things as our neighbors. Consumerism is much about social competition. With capuchin sensibility, most of us would prefer a house bigger than those around us, rather than an even bigger one in a place where it's the smallest house. But most of happiness is not correlated with wealth per se, beyond that to cover basic needs. Most fulfillment comes not from physical stuff, but from how we interpret our world. With a small fraction of America's energy slavery, Filipinos report themselves just as happy.

So don't be sad to lose your fossil slaves, but be prepared. In the past half-century, *Homo sapiens* has used more energy than during the rest for its quarter million-year history. We're now passing the all-time peak of available liquid hydrocarbon, whose punch and portability make it our economy's chief driver. The descent might begin imperceptibly, but it will be unstoppable, and we'll never get so high again. Oil and ores will remain, but increasingly hard and costly to get, with fewer fossil slaves. Then we will learn the difference between jobs and work.

We could free the slaves *now*, and cut our losses of natural capital. This would fly in the face of our capuchin sense of entitlement, of our mechanisms for brain chemistry rewards. Consider Easter Island. Its people attributed all goods to their ancestors, and in propitiation, with stone-age technology they sculpted, hauled, and erected immense stone heads. This took cutting the island's trees, which brought more erosion of farms, which along with invasive rats brought the economy to ruin, and the islanders to starvation and war. What they had done was not too different from our devotion above all to GDP: both show nearly hallucinatory obliviousness to how living systems work by complex interconnection. To keep GDP rising, nations create more money, out of thin air, and pay couples to make more buyers – to have children. But money is essentially a claim on future energy, and future energy won't meet the debt we're accumulating now. And stone heads don't suffer, reproduce, or further degrade the ecology.

Hagens says, "Learn to see the giant stone heads around you, and think about them." Because it's not that we're powerless. We are capable of much more, and even if we don't stop the machine, we can prepare for it to run down. Among the simplest changes: become a "sleeper" leader, an anchor, ready when needed, not abandoning normal life, but knowing it will change. Or simplify now and beat the rush. Don't become too reliant on high energy. Learn physical skills. Design and organize for meeting basic human needs rather than for getting hits of dopamine – and get to know your own brain chemistry. Organize in small groups of dedicated people, which works better than acting alone, and, contrary to common assumption, far better than can a whole nation or the world. Be happy with absolute wealth rather than your wealth relative to that of others. Consider a paleo behavior diet: take breaks from electricity and technology, and reset your brain to nature. Ask yourself: In these times, who am I? For what do I stand? And tell yourself: We are complex creatures capable of great things, both terrible and wonderful. I am part of a superorganism. And I am not.

*For the complete essay used for much of this story, look for the title at resilience.org. The talk made by Hagens at Kansas Wesleyan University is at his Web site, themonkeytrap.us.*

# Extracts

WE MISS THE PROGRESS that's happening right in front of us when we look for heroes instead of systems. If you want to improve something, look for ways to build better systems. – Bill Gates, in Time, April 16.

GRATITUDE IS NOT ONLY the greatest of virtues, but the parent of all others. – Cicero, as quoted by Janice Kaplan in "The Gratitude Diaries"

RANDOMIZATION IS THE ENGINE of diversity, and diversity turns out to be the mother of invention, not necessity, as mechanists had thought. – James Ogilvy, "Living Without a Goal"

THE WORLD OF HIGH FINANCE can be understood only when it is recognized that the greatest admiration is accorded those who are paving the way for the greatest catastrophe.
– J. K. Galbraith, "A Journey Through Economic Time"

MOST JEWISH FAMILIES in the Diaspora sent a regular contribution to the Temple and made a pilgrimage to Jerusalem for at least one of the three major yearly festivals. They reported a mood of relaxation and rejoiced to be among like-minded people, at their own temple, celebrating their mutual support. – Jennifer Michael Hecht, "Doubt"

THE YOUNG CORN waved and was silken, and the lustre slid along the limbs of the men who saw it. – D. H. Lawrence, "The Rainbow"

THE ROOTS OF A THING always go deeper into the soil than our vision of the plant above the surface would lead us to imagine.
– William Barrett, "Irrational Man"

IT MIGHT SEEM SILLY to care about the well-being of citizens thousands of years from now, but we still commune with the inner lives of people of antiquity. We read their poetry and oratory, marvel at their architectures, and identify with their humanity.
– Peter Brannen, "The Ends of the World"

BASICALLY THE ENTIRE global economy rests on how quickly we can get carbon out of the ground and put it in the atmosphere. … Geologically, it's a really impressive effort.
– Geoscientist and climate modeler Andy Ridgwell, to Brannen

THE DECISIONS WE MAKE as a civilization in the next several decades might influence the climate twice as far into the future as our species has existed in the past. – Brannen

MY IDEAL is frugality of body and opulence of mind. – Robert Blatchford, "Merrie England"

IF WE DEFINE WORK mathematically, as force over distance, day in and day out the work of photosynthesis exceeds the total of the world's industry by a factor of nine. – Judith D. Schwartz, "Cows Save the Planet"

SITTIN' IN THE TRACTOR so long, you start wonderin' about shit. – Ron Kinkelaar, Land Institute technician


*In a class called farrier science, Rick Thomas teaches Carly Wile and Walker Hartt to shape horseshoes at Sterling College's Alfond Forge. Sterling is all about stewardship of the ecosphere. College President Matthew Derr said, "We would be a terrible place to study French literature." Sterling College photo.*

# The school that majors in homecoming

*Sterling College in Vermont wants its students to experience living without economic growth, and with nature as measure*

SCOTT BONTZ

On May 5, Wes Jackson gave the commencement address at Sterling College, student population 125, in unincorporated Craftsbury Common, Vermont. Jackson, 82, has spoken at dozens of institutions of higher education. Here he reported seeing "the most different kind." The walk to the podium was led by a bagpiper. They passed a horse barn, which included a shop for crafting horseshoes. Then there was a pair of oxen, two tons of draft power. The Sterling graduates, who could have fit in a small classroom, did not wear caps or gowns. Corsages adorned men and women alike. One of only two men to don a tie also wore a crown of flowers. The graduates walked a gauntlet of congratulatory hand slaps. At the podium, outdoors, stood six woodcut-style banners, each bearing one word: Ah! Simple. Listen. Shine. Hallelujah. Good.

Six – counting "design your own" – was also the number of majors available for the diplomas: Ecology. Environmental humanities. Outdoor education. Sustainable agriculture. Sustainable food systems. During a June visit to The Land Institute, Sterling President Matthew Derr said the whole curriculum could fit in one interdisciplinary studies major at Kansas State University. "We would be a terrible place to study French literature," he said.

During the course of their education, all students work on Sterling's farm, which raises 30 percent of the school's food. Oxen and draft horses provide field traction, and students take the reins – there is a draft horse minor. The school also raises hogs, sheep, steers, laying hens, and turkeys. It grows 60 annual vegetable crops, and perennial small fruits, nuts, apples, and other tree fruits. It makes maple syrup. It teaches how to use a chainsaw and manage a woodlot. It has blacksmith and woodwork shops. It also uses microscopes. The unifying aim is stewardship for the ecosphere "in all areas of your life," as Sterling's Web site says. Derr, using a phrase from Jackson, said, "We're using nature as measure."

Jackson puts this all under one major he thinks sorely needed, and which he calls homecoming. Derr said, "We have to create a homecoming for people who've never come home." What both men mean is not just getting more people back on the land, but bringing them to deeply know and love its nature.

Higher education now serves a different master. It has failed to value how we fit in the natural world, Derr said, and the kinds of communities that would make us happy. Almost everything about the schooling enterprise follows faith in the endless accumulation of wealth through endless economic growth. Derr repeatedly says that liberal arts colleges fail to be *pertinent*. Your diploma prepares you to make money, but not for what the world needs. Nineteenth century colleges – then established by religious denominations – led the fight against slavery. For our own century the most important fight is climate change, Derr said, including how it will affect the most vulnerable communities. Many colleges address climate change. But at the same time they teach manipulation of financial derivatives. Which goes with fossil fuels supplying a wealth that Derr called surreal. It cannot last. So supporting economic growth is not pertinent.

*Derr*

If in education you accept that growth cannot last, he said, a good place to start looking at what to do is on your plate. In Sterling's dining hall, students don't enjoy "rivers of food choices," as if Vermont knew no seasons, nor distance from Chile's grapevines. At dinner is one entree, with a vegetarian option. Derr thinks that restaurant variety would make unrealistic demands of local farmers. But he said that Sterling meals aren't spartan. Included are several salads. And last year Bon Appetit magazine called Sterling's dining hall the most healthful in the nation.

Another reason for everyone to share the same food: it makes the meal a communal experience. Connecting with the natural world and with the land demands also connecting with each other. And vice versa. "You have to see yourself as part of all kinds of communities," Derr said. Sterling's dining hall serves not just students, but students' children, and staff members, and staff members' parents.

This family atmosphere affects behavior. "You're accountable to people you live with," Derr said. "I've never picked up a beer can on campus." And part of the deal is that students are employees. They help mop up after each breakfast, which begins after everyone has done chores. "There are no cleaners at Sterling," Derr said. "The division between thinking and doing is not a very long journey."

He does not want to paint a Utopia. But it is a very small, tight college, with students and faculty together near the number of stable relationships – 150 – that British anthropologist Robin Dunbar figured a human could comfortably maintain.

That is not why Derr wants to limit the number of students in Craftsbury Common to about 125. He thinks it the right size for the place.

The common is one of several villages making the town of Craftsbury, with about 1,100 people on about 40 square miles. The town was built on a plateau – rather than the usual New England valley – by Ebenezer Crafts and associates shortly after the Revolution. Around it lie rolling hills, and five ponds and lakes. The school's sports teams are trail running, trail cycling, and cross-country skiing – forms of play that one can continue through life, Derr said. Each year instructors and students live four days and three nights in the woods, carrying tarps, but not tents or stoves. This is to be part of the education of deepening one's sense of nature and place, and of taking risk.

Sterling occupies about 180 acres, with about 300 more for a nature preserve. About 20 acres go to crops and livestock, with about 5 acres tilled. There are 24 buildings, and Derr said that between them and town appears no architectural separation. "There's a kind of porousness between the college and the community," he said. "We are served by our community, and we are a member of the community." He thinks that schools set apart from the world like monasteries will, and should, die.

Derr's parents built cars, his mother on the assembly line, his father as a foreman, in Flint, Michigan. But their home was about 15 miles from Flint, in Holly, population 6,000, and they loved the outdoors. His mother gardened. He canoed on Bush Lake. The family also had a cottage on Lake Huron. Matthew fished for trout, skied across country, hiked, and camped. And he read books such as "The Wind in the Willows" – one doesn't have to live in the country to appreciate it, he said. As a teenager he visited Point Pelee, where mainland Canada juts farthest south, and found himself at arm's length from warblers exhausted by their crossing of Lake Erie. It was a transformative moment. A birder the 51-year-old remains. On his visit to central Kansas he set out one morn with binoculars, hoping – in vain – to see a scissortail flycatcher.

For his bachelor's degree Derr went to Antioch College, in Yellow Springs, Ohio, population a bit under 4,000. This small school accepted black women before the Civil War, and included in its original faculty Rebecca Pennell, the first female professor with the same rank and pay as her male colleagues. She was niece of Antioch President Horace Mann, whose final commencement speech included a line that became the school's motto: "Be ashamed to die until you have won some victory for humanity." In the 1960s and '70s Antioch was a core of student radicalism. Derr studied history, focused on social movements, and wrote his senior thesis about Irish priest Theobald Mathew, who led a 19th century abstinence movement estimated to have enrolled more than

4 million and cut his nation's spirits consumption by half. Derr wants people with different aims to find common ground and work together. He earned his master's degree at the University of Michigan, in social work. When Antioch went under in 2008, it brought him back to help devise a new path, first as a volunteer, then as interim president. It reopened in 2011.

Sterling College is 60 years old. Derr has led it for six years. The year he arrived, the school raised $300,000 in donations, and 90 percent of its costs were covered by tuition. Last fiscal year it raised $1.8 million and tuition was needed for 75 percent of costs. Tuition, room and board, and other fees add up to $48,000 a year. Sterling says this is about 20 percent less than most other private colleges in New England. Sixty percent of its students have federal Pell grants, and the school's Web site says 98 percent receive scholarships or some other kind of financial aid. It says the average debt upon graduation is $18,000, compared with the national average of $28,000.

Even if free of debt, a 22-year-old with neither land nor agricultural upbringing will find becoming a farmer a very hard row. Yet Sterling aims to get young people on and caring for the land. This is not about persuasion. As Derr said, "You don't stumble into Sterling College. You know something about yourself. You know not just what you want to do, but who you want to be." But there are plenty of bucolic colleges that see students go to businesses like Goldman-Sachs. Sterling wants its graduates living for rural community, in what Derr called a "diverse, intentional, creative way."

Rural America emptied because fossil fuels undercut labor by humans and other animals. How can we get people back to the land when the place has no jobs? Derr was asked this when he visited Kansas. Answer: You bring enough people back to make the jobs. You invest in resources to create the economy. Admittedly, he said, "It's alchemy, at one level." There is rural poverty in the "Northeast Kingdom" of Craftsbury in Vermont's far corner. It's said that you have three homes or three jobs. Those with "three homes" are often Bostonians or New Yorkers on vacation. Their visits help Craftsbury and Sterling. They likely helped save the town's beloved general store.

To compare there is Henry County, Kentucky, formed in the same, last decade of the 18th century as was Orleans County, Vermont, home of Craftsbury, and now populated at similar density. Henry County doesn't get many vacationers from nearby Louisville. But the city is a much closer big market than any enjoyed by Northeast Kingdom farmers. Derr and Sterling want to invest their resources to help revive Henry County's rural community.

Henry County is home to agrarian writer Wendell Berry, and to The Berry Center, founded and directed by Berry's daughter, Mary Berry. The center's mission is "putting Wendell Berry's writings to work by advocating for farmers, land conserving communities, and healthy regional economies." (You may compare that with Berry's interpretation of The Land Institute's mission, in the statement on page 2.) In September, 12 students and a teacher from Sterling will spend two weeks at the Berry Center to learn about Henry County's food system, and about Berry and his writing. In January a second Sterling course at the Berry Center will teach woodlot management. It will give draft animal workshops for Henry County residents. Derr also wants his school's teachers and students to learn from Kentucky – to expose them to life beyond the "preciousness" of New England and its

quaint small towns. This project has been funded, anonymously, for three years. Derr hopes to expand to semester-long courses, and then to a sustainable agriculture degree in Kentucky. He doesn't want to increase the size of Sterling's enrollment in Craftsbury, but he thinks the mission of farming in the context of liberal arts is crucial, and for this Sterling has developed the knowhow. How it is shared – not imposed – in Kentucky, a different place, also is crucial. What happens in Kentucky should be Kentucky-based, he said, in Kansas, Kansas-based. But the conversation should spread.

This is all about the knowhow. There remains the wherewithal. For that Derr wants to build an endowment to cover tuition, so graduation comes without debt. He also wants schools to help graduates find openings. Part of a conservatory professor's job is using connections with professional ensembles to get auditions for music students. Agriculture students have enjoyed no such help, but Derr said their success takes that much connection and care.

This isn't just to win a job, it's also to enjoy support and enrichment that comes with a culture. Derr said Sterling doesn't teach rugged-individualism homesteading. For that the stars must align. "We're about building community," he said. Engrained in Sterling life is a weekly community meeting. "I don't think you should farm from a textbook. Or without a community. You have to experience it deeply."

The word "agriculture" appears in the name of only one Sterling major. And even among young people with that degree, a substantial number go on to graduate school or to value-added industry rather than buy land, a tractor – or draft animals – and get to farming. But Derr said there are alumni, and parents of alumni, who have land, or access to farmland. And established farmers, with an average age near 60 – higher than almost all other occupations in the US – need educated workers. And a small number of Sterling graduates do set up small farms.

Henry County, as elsewhere, has seen the number of farmers and eyes on the land plummet – as Berry critically describes in "The Unsettling of America." With fossil fuel still cheap, Sterling can't close the gap, even in one county. But it wants to raise an endowment that, with local lenders and The Berry Center, brings Henry County 12 new farmers. Derr hopes that this "scalpel" approach can grow, and change agriculture as much as did the Morrill Act and land-grant colleges beginning in the latter half of the 19th century.

Derr also argues for other schools to radically change. He said small liberal arts colleges are in a crisis of pertinence. They have in large part merely survived, by doing what everyone wants, by clinging to service of the growth economy. He thinks that schools could distinguish themselves by doing what society will need, by reorienting from growth to sustainability. And for taking this more inspired mission, he said small schools are more nimble.

They may also be more together. Citing David Fleming, who wrote "Surviving the Future," Derr said change can happen when people share purpose and ritual. Sterling's students and staff share a sense of stewardship, and they share meals. And Derr said, "There's a way of coming to dinner at Sterling, and a way of not coming to dinner at Sterling." There is no stated rule, but at mealtime no one uses a cell phone.


*Bryce Hostetler's internship included helping make the perennial silphium into an oilseed crop. Scott Bontz photo.*

# For the love of nature

SCOTT BONTZ

In his youth Bryce Hostetler repeatedly got out of Dodge. His talk today about home, a city of Wild West notoriety turned meat packer and farm tool maker, is not disparaging. But he loved traveling with his parents and sisters from Dodge City, Kansas, to hike and ski in Colorado. The imperceptible ascent of the High Plains bisected vast fields of wheat and sorghum. At the time, Hostetler didn't appreciate how that grass seed and its likes around the world had developed from wild plants to feed him and the rest of humanity. But from early on he related to something in, though not confined to, the Rocky Mountain wilds. "Earth has always been very important to me," he said. "The feeling you get when you're outdoors, the mental health."

Hostetler's father is a retired family physician who gardens and crafts with wood. His mother taught elementary schoolchildren, and volunteers at a food bank and the library. His sisters are a nurse and a Spanish teacher. When he left Dodge City for Bethel College in North Newton, Kansas, Hostetler started in chemistry but gravitated toward biology. "I felt drawn to the environmental, ecological side," he said. One teacher was Jon Piper, formerly a researcher for The Land Institute, about 60 miles to the north.

Before graduating in 2016, Hostetler studied how damselfish deal with intruding sea urchins in the Galapagos Islands. In Panama he studied insect-plant food webs. After Bethel he helped would-be vegetable farmers who lacked capital. This was as a volunteer for Rio Grande Farm Park in Alamosa, on Colorado's south-central plain. There soil loosed by tillage blew to "almost Dust Bowl-esque" density, he said, "a very in-your-face visual of soil erosion." That is among human workings on the world – fracking is another – that pain Hostetler.

In September he came to The Land Institute, living with other interns in one of our rural houses. He helped researchers thresh and measure thousands of plants. He learned how big a job it is to turn humanity's food from the grain of annual crops, with erosion like that in Alamosa, to the grain of perennials, more like the plants that dominate nature. It's a job that couldn't be done without a great deal of help from interns.

Hostetler said goodbye in April, and, with a friend and a 50-pound backpack, began hiking north over the Sierra Nevada from Mexico to Canada. Three weeks into July he was at 1,331 miles, halfway, at Chester, California, thinking much about food and foot pain. He wants to identify plants, and to soak in the shifts and contrasts of desert, forest, and ecology above the tree line. He also wants to learn constellations beyond Orion and the Big Dipper. But while other people love the idea of riding a rocket to explore far from Earth, he will be content on the land. "The idea of leaving our planet seems very repulsive to me," he said. "I feel rooted here."

# Land Institute shorts

## Five brewers use Kernza

Three more commercial brewers – for a total of five – have used our perennial grain crop intermediate wheatgrass. Our trademark for this as a food product is Kernza®. All three brewers are in the upper Midwest, the leading area for wheatgrass production, partly because of climate, partly because of our collaboration with the University of Minnesota. General Mills, the Twin Cities-based food giant, hopes to release next year a cereal that includes Kernza, said the company's senior principal scientist, Laura Hansen.

The University of Minnesota was a Kernza source for Bang Brewing in St. Paul. Sandy and Jay Boss Febbo, Bang's owners and brewers, called their first Kernza beer Gold. Sandy Boss Febbo said, "It's kind of a cheeky reference that they struck gold with this grain." The blonde ale, about 15 percent Kernza, was first tapped last summer. In July, Bang released Kipa, an acronym for Kernza India pale ale. August 5 was the opening date for Snap, an ale named with slang for a quick sip of spirits. Snap is all beer, but Bang collaborated with Tattersall Distilling in Minneapolis for a recipe using botanical ingredients.

Another new ale is Keep the North Cold, made by Fair State Brewing Cooperative for another Minneapolis business, Askov Finlayson. North Cold – the words that appear large on the cans – appears on other Askov Finlayson products, as a catch phrase for the company's vow to invest more in fighting climate change than their business costs the planet. All of the beer's Kernza, barley, and hops come from Minnesota.

Driftless Brewing, in Soldiers Grove, Wisconsin, recently made a pilot batch of one barrel – 31 gallons – that used Kernza and maple syrup. In honor of both perennials the ale is called Deep Roots. Brewer Chris Balistreri said it used a minimum of hops, to "let the grain do the speaking," and was well liked, for both its flavor and what wheatgrass could mean to local farmers and the steep, erosion-prone topography of an area that glaciers didn't reach to leave behind the rocky detritus called drift. On July 4 Balistreri brewed a second Kernza beer. It is "saison" style, he said, "spicy and floral, easy drinking beer with a crisp, dry finish."

Wheatgrass also goes to a Portland, Oregon, brewer for use in Long Root Ale, sold in West Coast states by Patagonia Provisions. And Blue Skye Brewery & Eats, here in Salina, uses Kernza.

## Administration reconfigured

Rachel Stroer, who had been The Land Institute's chief operating officer, handed off administrative duties and took the role of chief strategy officer. Chris Pembleton, who had been facilities and special projects manager, is our new director of administration. Stroer coordinates our work with partner organizations such as Patagonia Provisions and General Mills, as well as continuing to manage communications and serve as senior development officer, for fund raising. Pembleton had applied skills including car-

*By mid-July our second greenhouse was walled, roofed, and scheduled for occupancy by early fall. The complex has two greenhouse buildings totaling almost 6,500 square feet, about twice the size of our current greenhouse, which will remain in use. A head house of almost 4,000 square feet includes a pathology lab, summer growth chamber, office, pot washer, and equipment to run the buildings. Here Rob Ewing, of Jamison Construction, near St. Joseph, Missouri, caulks the main greenhouse roof. Scott Bontz photo.*

pentry, computing, and a master's in business administration to manage our growing facilities. Meanwhile, he finished a doctorate in business administration, including a study on nonprofit revenue management.

## Write to life

Aubrey Streit Krug, The Land Institute's director of ecosphere studies, taught a Kansas Wesleyan University course called eco-writing. About 20 students took the class. Streit Krug said the subject was not just writing about ecology and its crises, but the crises themselves, of which many students knew little. Only one was working for a major in ecospheric studies and community resilience; other majors included criminal justice, history education, and music. Among readings were Jeff VanderMeer's novel about a dark expedition, "Annihilation," and plant ecologist Robin Wall Kimmerer's essay collection about nature and gratitude, "Braiding Sweetgrass." "Radically remaking one's worldview or learning to be a good writer are long-term efforts, beyond a single semester," Streit Krug said. But she wanted students to learn what language is helpful and appropriate to express emotions about such matters, and how writing and stories can be used to effect change. Some of the final projects: how to educate other students about climate change and planetary limits; a letter to the school arguing for a course in environmental justice; a brochure detailing water use at the college. At the start of each day Streit Krug gave students an experience: a plant, a poem, a prairie chicken video, handling and smelling braided sweetgrass. "That for me was full of joy," she said. She's writing a book about American literature and how both Euro-American and Native American cultures engage with plants.

## Simpson, 2 others leave board

Three members have left The Land Institute Board of Directors, including John Simpson, the only director who had served continuously since the organization was founded in 1976. The other departing directors are Michelle Mack, an ecologist at Northern Arizona University and a former Land Institute intern, and Pat McLarney, a retired lawyer in Kansas City, Missouri. Simpson and McLarney were named directors emeritus; they may attend board meetings as nonvoting members.

## New staff members

Edy Cheremond fills a new role at The Land Institute, crop protection technician. We want to manage both beneficial insects and pests. In addition to catching and identifying pests for our plant breeders – see the cover photo – Cheremond is helping raise in the lab a harmful moth species for controlled study. Next year he'll survey plots of different plant species for pollinators and natural enemies of pests, with the aim of helping improve crop yields. Cheremond grew up in Haiti, earned a bachelor's degree in biology at Utica College in upstate New York, and a master's degree in biology, with a concentration in ecology, at Shippensburg University in southern Pennsylvania. At school he worked with wildflowers and bees. At home he keeps another eusocial insect, ants. "Ants are fascinating because they essentially do

*Cheremond*

everything that we do – farm, build, wage war, enslave each other, protect each other – with a fraction of our brain size," he says in his profile on our Web page. "From my perspective we are essentially bigger versions of ants."

Carl Bowden joined us as an intern in October. On July 1, he became an ecosphere studies associate, joining Aubrey Streit Krug, who became the young program's director in April. They work for people to see themselves not apart from "environment," but as members of an intricate whole, without which the parts can't exist. At Kansas State University, Bowden earned bachelor's degrees in wildlife conservation biology and in natural resources and environmental science. He wants a master's degree in ecology. He also wants to compile books of quotations about life, leadership, Christianity, and environmental studies. His brother, James, is The Land Institute's research technician in ecology. They both grew up in Salina, and share a century-old house in nearby Gypsum.

*Bowden*

## Bee haven

In April, The Land Institute added to its insect populations three hives of honeybees. One reason was to draw attention to bee conservation. "Bees are in trouble in a lot of places because of insecticides," said Ebony Murrell, our insect specialist. Neonicotinoids, insecticides chemically similar to nicotine, and which fatally paralyze pests, now also are blamed for contributing to dismembering honeybee colonies and for gutting native bee populations. Then there are fungicides that damage yeasts needed for turning the honeybees' pollen haul into "bee bread." Land Institute fields don't receive these synthetic biocides. So for bees, Murrell said, "This is a haven." Another reason for bees is to help pollinate our oilseed crop-in-the-making, silphium, and the candidate species for a perennial legume seed crop. We plan to install specific houses to encourage native, mostly solitary bees. First we must identify which species are at work here on which plants. Meanwhile we have the Old World honeybee, which pollinates many species, and through more of the year than some of the natives. A third reason is we'll harvest another crop: honey. An old crop, but maybe in a new flavor. Murrell said, "Who's tasted silphium honey?"

## Press and presentations

Over the past decade, many science papers have covered how perennials might be improved to make grain crops, and how this would help farming and the land. The online journal Sustainability now presents an issue devoted to what's actually been achieved with these plants. The guest editors are The Land Institute's research director, Tim Crews, and Douglas Cattani, of the University of Manitoba. Topics of some of the papers, involving Land Institute researchers and collaborators across four continents:

- Trials compared wheat and related wheatgrass species performance in nine nations.
- Perennial rice yields have matched annual rice in China so well that its developers propose commercial release.
- Among 17 perennial relatives of annual barley were several producers over four sea-

sons in Sweden, including a standout that is closely related to barley, and so a likely candidate for a perennial version of this important crop at high latitude.

- Certain silphium plants were found resistant to rust infection, which can greatly cut yields of this oilseed crop. The resistance is highly heritable, and Land Institute researchers have begun to select for the trait.

Also covered are progress with intermediate wheatgrass, buckwheat, sorghum, and legumes. If you're interested in these sometimes technical papers, see mdpi.com/journal/sustainability. Under Journal Menu click on Special Issues, and for Special Issue Editors type Crews.

The Ecological Citizen, an online journal, published in Volume 2 Issue 1 an essay headlined "Transforming human life on our home planet, perennially," by Wes Jackson and Aubrey Streit Krug of The Land Institute, and two of their ecosphere studies collaborators, philosopher Bill Vitek and journalist Robert Jensen.

BYU Radio's Marcus Smith interviewed Streit Krug for a half-hour program called Thinking Aloud. The episode is called Grounded – Our Future on the Land, and can be heard at byuradio.org.

Staff members made presentations in Iowa, New York, and Missouri.

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*Maya Lin, designer of the Vietnam Veterans Memorial, uses three live grass specimens from The Land Institute for a climate change display at the 500-acre sculpture park called Storm King Art Center, north of New York City. She wants to show how perennial grasses can take global-warming carbon from the atmosphere to build soil, as well as use less fossil fuel in farming. The species shown are two prairie natives, big bluestem and switchgrass, and one of our upcoming crops, intermediate wheatgrass. The display ends November 11. Jerry L. Thompson photo.*