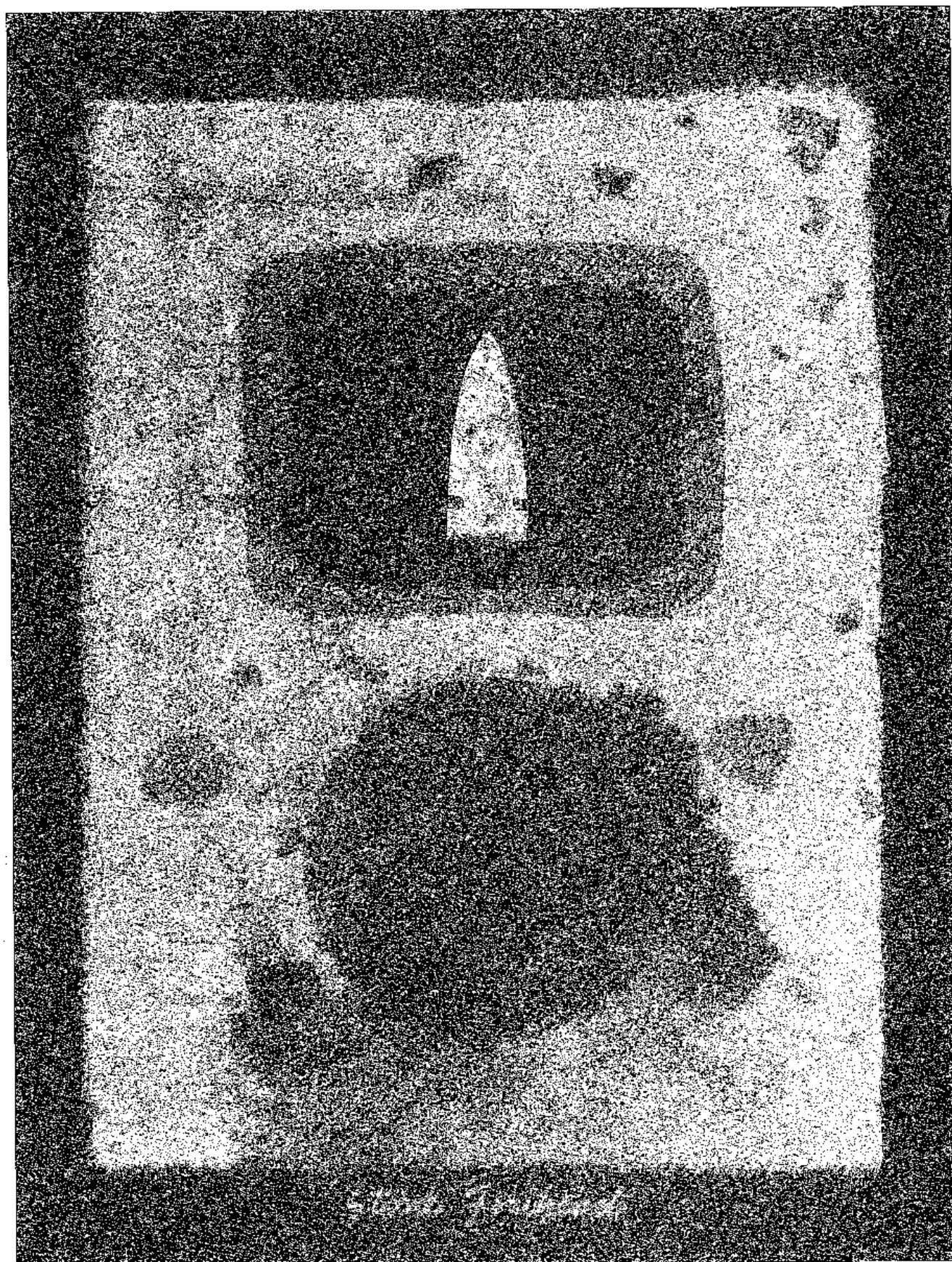


THE LAND REPORT

Spring 1993
Number 46



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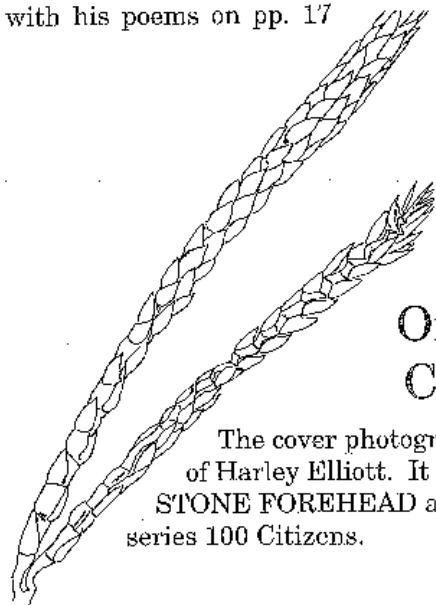
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Photographs: Thanks to Terry Evans for the photographs on pp. 29-31. The rest in this issue were taken by James MacNeil, Jeff Shields, and Jennifer Tressler. Jeff Shields made the prints in The Land's darkroom.

Sketches: Harley Elliott's artwork appears along with his poems on pp. 17 and 18.



On the Cover

The cover photograph is the work of Harley Elliott. It is entitled: **STONE FOREHEAD** and is from the series 100 Citizens.

In This Issue

As editor of Land Report No. 46 I welcome you to this issue. I have followed Dana Jackson's format for the most part but you will notice differences too. The staff has held preliminary discussions this spring regarding what the Land Report should be/become. Ideas ranged from keeping it more or less as it is to changing it radically, making it a venue for invited scholarly articles centered on perennial polyculture research. Other questions included whether to keep it the same length and the same number of issues per year or to make it a more frequent but shorter length newsletter format. Other alternatives included putting out a single full length issue plus a few much smaller newsletters each year.

We here at The Land sincerely ask for your suggestions on these questions. Thank you in advance for your help.

THE LAND REPORT

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2440 E. Water Well Rd.
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Editor: John Ellefson
Arts Associate: Terry Evans
Circulation Manager: Sharon Thelander
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Contributing to #46: Kirsten Bergman, Abigail Brenner,
Jennifer Katcher, James MacNeil, Corey Samuels,
Jeff Shields, and Jennifer Tressler.

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DEVOTED TO SUSTAINABLE AGRICULTURE AND
GOOD STEWARDSHIP OF THE EARTH

STAFF: Stan Amick, Marty Bender, John Ellefson,
Jim Huskins, Wes Jackson, John Jilka, Peter Kulakow,
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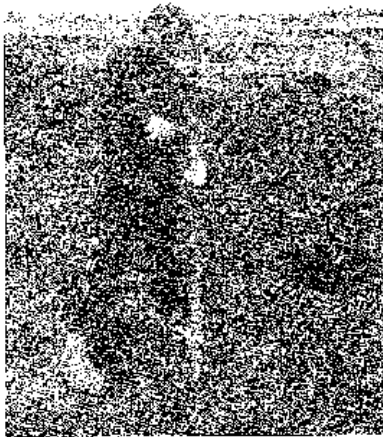
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At The Land

Harbingers of Spring: Interns, Visitors, and Migratory Birds

Corey Samuels

Like many who work with plants, Land Institute staff members look forward to the winter as catch-up time. The quiet months when perennial plants lie



Intern, Christian Petrovich, at work in gamagrass plot.

dormant and interns have yet to arrive easily promote idealism: dreams of papers ready for the hands of publishers, sparkling clean desks, and research areas perfectly organized and free from clutter are quick to surface during the two quiet months preceding the arrival of the new intern class and along with it, spring.

As often happens with such ambitions, this reality was quite a variation from the dream... especially the part about spring coming with the interns. Most activities this winter were in some way colored (mostly white colored) by a seemingly endless series of icy snowfalls. But, in contrast with the notion that adverse weather slows the pace, it was a time full of activities.

Early January found two new staff members and several special visitors braving ice and snow to make their way here. John Ellefson arrived from Nebraska to serve as the interim Director of Education. Jim Huskins, the new Sunshine Farm manager, made his way across the country from Pennsylvania with a convoy of family members, horses and farm equipment.

John and Jim were spared no time in getting acquainted with this winter's quick pace. They both arrived just in time for a three day seminar with Charlie Sing and members of his research staff from the University of Michigan Medical School. The first week of January was devoted to sharing and comparing ideas about research problems that ranged from designing experiments to exploring new statistical methods. It was an exciting few days of finding out that medical and agricultural research share many common challenges. John Ellefson writes more about this on pages 14-16.

January also found work progressing in The Land's newest project. The Sunshine Farm Research Advisory Committee met here over the weekend of January 16-17 offering ideas and suggestions in response to Sunshine Farm project designer Marty Bender's proposed plans and questions. The next week, Marty and Jim met with Don Austin and Sally Cole of the Austin Foundation to share the results of this meeting.

Snow was still falling in mid-February as the new interns made their various ways to Salina. This event, often regarded by Land staff to be a harbinger of spring, proved to have no significant impact on the weather. The interns' first view of their new place was snow-covered fields seen from under fuzzy hats and chunky boots. However, it

The 1993 Interns

— **Audrey Barker** B.A., Biology, Carleton College (MN).
— **Kirsten Bergman** B.A., English, Guilford College (NC).
— **Abigail Breuer** B.A., Biology and Economics, Pomona College (CA).
— **Jennifer Katcher** B.S., Molecular and Cellular Biology, University of Arizona.
— **James MacNeil** B.A., Philosophy, University of Massachusetts.

— **Alan Page** B.A., Cultural Anthropology, University of California at Santa Barbara.
— **Christian Petrovich** B.A., Ecological Conservation, Prescott College (AZ).
— **Jeff Shields** B.S., Plant Science, Rutgers University (NJ).
— **Jennifer Tressler** B.S., Zoology, Ohio State University.
Corey Samuels, an intern in 1992, is our research fellow this year.

would take more than a little snow to put a damper on the excitement of beginning a new year. The staff and interns took advantage of the incentive to stay indoors with a three day symposium inspired by the January meeting between Land Staff and Charlie Sing's group. The symposium was designed to acquaint the interns with The Land's work including the ideas about agriculture that led to the research program.

Presentations from special visitors often enhance the regular class curriculum. On the first day of the 1993 intern term, Chris Penfold, from the University of Adelaide Agricultural Research Station in Southern Australia informed us of his work there. He talked about and showed slides of his project comparing the performance of four types of farming: organic, biodynamic, transitional and conventional.

The following week the interns traveled to Kansas State University in Manhattan where they were hosted by long-time Land Institute Board of Directors member Orville Bidwell. Orville is professor emeritus of soil science. Three years ago he led a legislative fight to have Harney silt-loam named Kansas' state soil. Orville told entertaining anecdotes from that campaign and presented the basics about the soils of Kansas with special emphasis on the soils around The Land Institute.

Several agronomy department staff members also attended the session. They were excited at the prospect of looking at the soils on our Sunshine Farm.

In early March flocks of geese were seen heading north despite the weather and we breathed a sigh of relief: spring is here at last. However, the snowstorm of the next day was punctuated by the sight of geese turning their V's back southward. Meanwhile the class schedule began in earnest. Discussion about sustainable community was a theme of many early classes. Doug Dittman, who was an intern in 1987 and is now farming in Nebraska, hosted a class and warm-up. He discussed his own experiences with life in rural Nebraska, the challenges of making ends meet as a beginning farmer and becoming part of the community there. He suggested ways of using "hidden economies" of the farm; basically, living from the gleanings of a modern industrialized farm. Elaine Morgan took time out from one of her several weekend stays here with her husband (and our Director of Education) John Ellefson to visit a class. She and John contributed ideas from their own experiences building their home in Nebraska using recycled materials and attempting to live sustainably.

Further fuel was added to the discussion of community and lifestyles when the interns toured Matfield Green in Chase County, Kansas on March



Kneeling: Kirsten Bergman. Middle row: Christian Petrowich, Jennifer Katcher, James MacNeil, Audrey Barker, Jennifer Tressler, Abigail Breuer. Back row: Alan Page, Jeff Shields.

9th. Matfield Green is the site of Wes Jackson's own foray into these questions. The interns' study of building community was stimulated by the challenge of imagining possible ways to induce a community to grow in this nearly depopulated town. Wes owns several houses and other buildings in Matfield Green and has two 1992 Land interns, Darryl Short and Sara Wilson, who began work with him there in mid-April.

Early classes are primarily geared to inform the interns about The Land's research. Staff ecologist Jon Piper led discussions of *Farming in Nature's Image*, the book he co-authored with Judith Soule, a former Land Institute ecologist. The book gives the rationale for our research using nature as a standard and describes the scope of The Land's current research program. Armed with details from these classes the interns chose on March 15th the experiments they will be responsible for through the end of the term in mid-December. Read more about this year's research projects on pages 5-7.

The weather hampered the early research field work as snow made impossible much of what was planned. For the Sunshine Farm, Jim Huskins' arrival was to have signaled the beginning of the season, but the farm site lay beneath a thick white blanket with generous amounts of mud below.

In mid-March the geese finally, resolutely headed north and the temperature rose. With that, we began the year's field season in earnest, if a little later than usual. We burned the research fields and measured last year's growth of the eastern gamagrass plants. Sunshine Farm work added a new twist to the typical spring work. Interns helped by transforming part of a storage building into three stalls for the draft horses and learned about the care of the animals and the elaborate equipment involved in draft horse farming.

Late March was marked by the arrival of the wind, a sure sign of spring for Kansas. The monthly morning prairie walk enticed interns to their hands and knees searching out tiny wild prairie onions and poppy mallow plants that have managed to surface despite the unpredictable circumstances. The bluebirds have arrived and a cardinal can often be spotted outside the window during class. The Smoky Hill River rushes by, running higher than many of us can remember, beckoning to those who might sit at its edge to relax after a day's work.

Perennial Plants — Annual Interns

Corey Samuels

The Land Institute's research goals are often described as achievable in 50 to 100 years. Much of the work involves careful observation and record-keeping of individuals or populations of plants over several growing seasons. So it is intrinsic that many aspects of The Land's research program are open-ended.

In contrast with the perennial nature of the work, one thing that changes each year is the people undertaking it. Each mid-February a new

group of interns arrives at The Land, each intern eager to delve into the work by overseeing a particular experiment for the year, the results for that year being published in The Land Institute Research Report. To this end, the long-term aim of the research, to develop a perennial polyculture or measure the



Corey Samuels, research associate and intern coordinator.

energy and nutrient flow of an operating farm, is divided. The result is several individual increments encompassing one annual cycle that moves the research along toward its ultimate goal.

Land Institute research staff members Jon Piper, Peter Kulakow, and Marty Bender provide continuity for the long term, while incorporating the intern-coordinated experiments. Each year presents an opportunity for the researchers to rethink the design of their experiments and the practical work.

The recent visit of Charlie Sing and staff impacted this season's research plans by contributing views of complex adaptive systems and possible new statistical methods for analyzing several variables at one time, whereas in traditional statistics this is difficult. The three day symposium increased our motivation to study systems by ways other than taking them apart and examining the pieces, the usual method in

"reductionist science." Instead, wherever possible we strive to look at the pieces, in our case several different plant species, as they occur in a complex system and in the environmental context we want to use them in. The symposium challenged Land Institute researchers to think of ways of increasing the role of these ideas in designing our latest experiments. Because this growing season marks the beginning of several new aspects of the research program, the suggestions are useful immediately.

The possibilities for using these concepts are particularly exciting to Peter Kulakow, The Land's plant breeder. One of his projects is a study of eastern gamagrass (*Tripsacum dactyloides*), the warm season grass we are examining for use in perennial polycultures. For several years he has been growing out collections of eastern gamagrass from 150 natural populations collected in ten states. These specimens are grown in a common garden at The Land Institute. The collection will provide the genetic base from which to begin selecting for domestication as a perennial grain. Intern Jeff Shields will be assisting in this year's effort to describe genetic diversity and identify useful varieties for domestication.

Concurrently with the germplasm study, Peter is applying the information from the common garden in selecting plants to save, grow out, and examine in several different environments. Plants are selected on the basis of high seed yield, compactness, or some other particular trait. The plants chosen for a single trait are cloned and transplanted in an "isolation block", a plot spaced far enough away from other eastern gamagrass plantings that the plants will breed only with other plants in the same block. This project will thus provide another setting to evaluate the performance of the plants as well as another year's round of breeding. Intern Kirsten Bergman will be devoting her research efforts to helping with these tasks of selecting plants, and establishing the isolation plots.

Some of the selected plants will also be evaluated in a set of polyculture plots. plots combine eastern Illinois bundleflower, wildrye, and sunflower to determine how selected types react in different mixtures of species. Jennifer Katcher is the intern who will focus on this study. She may also subject the plots to grazing to determine its effects on polycultures. This project

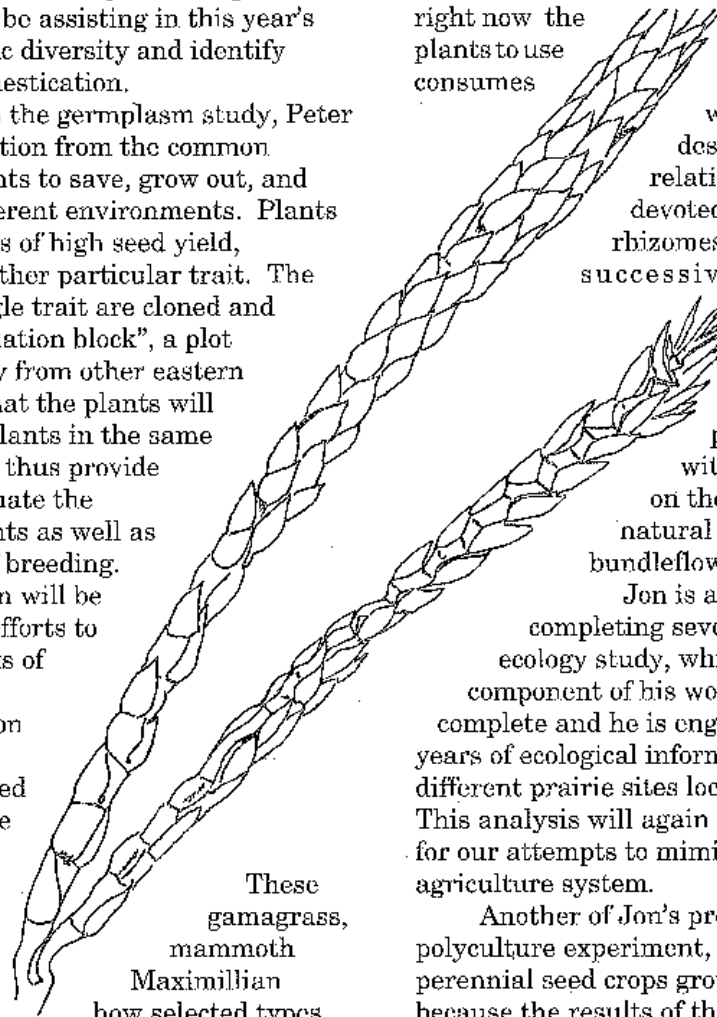
will explore how management strategies interact with genotype.

One new research project is of special interest to both Peter and staff ecologist Jon Piper. They will be conducting a survey, with the help of intern Christian Petrovich, of the natural populations from which some of The Land's most promising plant collections originated. It will focus on natural populations of eastern gamagrass and Illinois bundleflower. Researchers will return to the sites where they originally collected seed for the plants we have been using in The Land Institute's studies. They will record more information about the natural context including interactions among different species in wild populations to refine our attempts to create a mimic of the prairie. The study promises to add important new information to Jon's work that focuses on creating an agricultural model based on mixtures of perennial grains as well as informing Peter's search for the best plant varieties to grow in such a setting.

As for his current projects, Peter reports that right now the tough process of choosing the plants to use in the isolation plots consumes much of his time. He is also working with Jon on a paper describing changes in the relative proportion of energy devoted to producing roots, rhizomes, stems, and seed in successive generations of crosses between annual grain sorghum and perennial Johnsongrass plants. Additionally he is polishing up a paper written with Mary Handley reporting on their study of variability in natural populations of Illinois bundleflower.

Jon is also in the throes of completing several projects. The prairie ecology study, which made up a large component of his work in past years, is now complete and he is engaged in interpreting several years of ecological information collected from four different prairie sites located at The Land Institute. This analysis will again provide further information for our attempts to mimic the prairie in our agriculture system.

Another of Jon's projects, the perennial polyculture experiment, looks at interactions of perennial seed crops grown in mixtures. It is exciting because the results of this year will be added to the data from the previous three years, and used to identify changes resulting from interactions between plants on different planting sites over time. It examines interactions among three perennial seed



These gamagrass, mammoth Maximilian

how selected types

crops, insects, and diseases on two soil types over four years. Three interns will be assisting on this project, each focusing her attention on one of the three species within these mixed plots. Audrey Barker will describe the effects of these mixtures on eastern gamagrass. Jennifer Tressler will concentrate on the cool-season grass, mammoth wildrye, as well as recording soil conditions. The reaction of Illinois bundleflower to polyculture conditions will be the subject of Abigail Breuer's study.

Jon has recently spent considerable time on the road telling others about his work and The Land Institute's research program. He spoke to the environmental studies and biology departments at the University of Nebraska in both Lincoln and Omaha. On April 14th, he will travel to Emporia State University in Emporia, Kansas to give a talk, and in early May, he has been invited to Carleton College in Northfield, Minnesota to speak to the Farm Club, a group of students interested in sustainable agriculture. He will give a seminar in Carleton's biology department as well. This summer Jon will attend the Ecological Society of America's annual meeting in Madison, Wisconsin. There he will report on his recent experiment done with Peter that examined the differences in how much energy is devoted to seed production in different generations of hybrids between grain sorghum and Johnsongrass.

The Sunshine Farm, designed by Marty Bender, will someday be a farm setting for perennial polycultures, thus broadening The Land's study of problems in agriculture. It is a ten year project exploring to what extent a modern farm can provide its own energy and fertility and produce food. Marty plans to monitor the energy expended by human labor, machinery, and draft horses, comparing that with the energy produced by the farm. Intern Alan Page will be helping with this energy accounting portion of the project. A second intern, James MacNeil will be involved with the assessment of nutrient cycling. He will focus on soil quality, measuring inputs such as fertilizer and other soil amendments. From the outline of the project, it is easy to imagine the large array of questions Marty has to sort through in defining which variables to measure. One source of help in this choice of what to study is the Sunshine Farm Advisory committee, a group of scientists that periodically reviews the project design, makes suggestions, and asks further questions. The committee met January 16th and 17th to grapple with some of the toughest questions that will arise in this first season of actual farm work. One key to the project is collecting information about the soil characteristics at the beginning of the project so that we can monitor changes in mineral content, density, and water holding capacity. Finding stable sources of phosphorus and potassium poses another challenge. These minerals are not replaced at the

rate they are used by the plants in any current on-farm methods or cropping system. Thus they represent non-renewable nutrient inputs.

The power for traction will be supplied in two ways, by draft horses, and eventually by a vegetable oil powered tractor, fueled from oil crops grown on the farm. Marty will be measuring the energy used in each method. How to calculate the energy involved in human labor is another tough problem because it is difficult to estimate the amount of energy used by a person working without analyzing each worker on each day and for each task individually. Concurrently with the project, Marty is writing a book describing the operations of the Sunshine Farm and the assumptions that underly its design.

The Land's work covers a range of subjects that grows with time. This continually poses new challenges to the research staff and interns. Perhaps the challenge of the research, and sharing the excitement of it with each year's interns, is what keeps us motivated even though concrete results may be 50-100 years away.

Carrying Capacity Network is pleased to announce that we will be holding a second **National Carrying Capacity Issues Conference June 4-6, 1993**. We look forward to building on the 1992 conference by focusing on policy development and cooperative action. Key carrying capacity issues such as environmental protection, population stabilization, immigration, ecological economics, resource conservation, growth control and cultural carrying capacity will be discussed. CCN invites proposals for papers. Contact Carrying Capacity Network, J325 St., NW Suite 1003. Washington, DC 20005. Call (800) 466-4866 or (202) 879-3044 for further information.

Director of Education Position

The Land Institute has an opening for an education director starting in July. This is a one year appointment that could lead to a permanent position.

We are looking for someone to manage the intern program, coordinate public education events, and produce The Land Report. We prefer someone with a post-graduate degree and a broad based background who is a dynamic teacher and skilled writer.

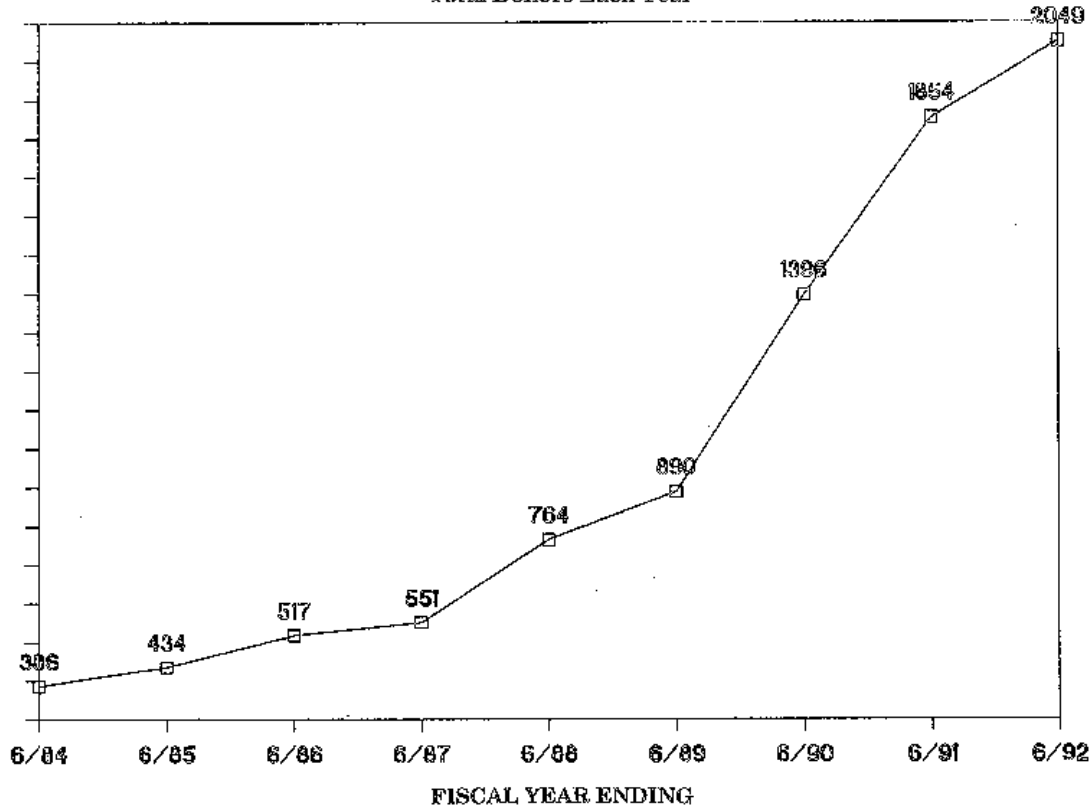
In addition we are also looking for a full time assistant to the education director.

We are also starting a search for a managing director of The Land Institute.

For full job descriptions, call The Land Institute offices at 913-823-5376. Send applications to Dr. Donald Worster, chairman of the board of directors of The Land Institute.

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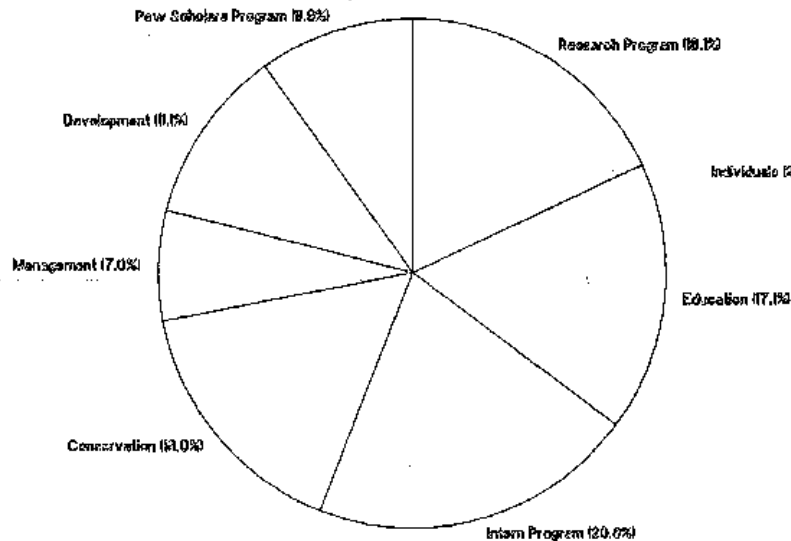


Friends of The Land are those who contribute their money, their goods, or their services to support the work of The Land Institute. During the fiscal year that ended June 30, 1992, there were more than 2,000 *Friends of The Land* from all 50 American states and 15 nations around the world. States with the greatest number of *Friends of The Land* were: Kansas (481), California (190), Minnesota (103), Colorado (97), and New York (87).

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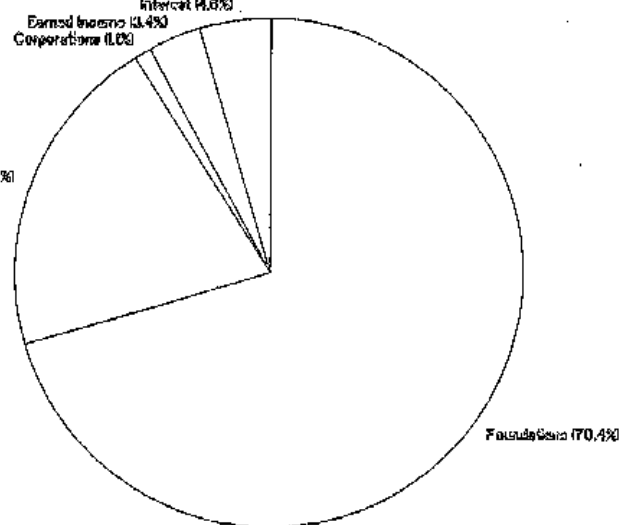
THE LAND INSTITUTE OPERATING EXPENSES

July 1, 1991-June 30, 1992



THE LAND INSTITUTE OPERATING INCOME

July 1, 1991-June 30, 1992



During the fiscal year that ended June 30, 1992, total operating income at The Land Institute was \$612,314, a 12 percent increase over the previous year. Total operating expenses were \$609,193. 91 percent of all operating income came in the form of charitable contributions from foundations and individual *Friends of The Land*. To receive a copy of our complete audited financial statement, please contact Tom Mulhern or Linda Okeson at The Land Institute.



Prairie Festival 1993: A Preview John Ellefson

Something happened to the balance of nature around the time humankind began to engage in till agriculture. Wes Jackson put the notion this way in *New Roots for Agriculture*, paraphrasing: it is not so much a question of the problems in agriculture as it is one of the problem of agriculture. The something that was occurring was the shift from a predominantly gathering/hunting/horticultural epoch to a time of early agriculture utilizing primitive tillage devices powered by draft animals. It was a time, also, of the emergence of relatively sharply demarcated divisions in social class in human social organization.

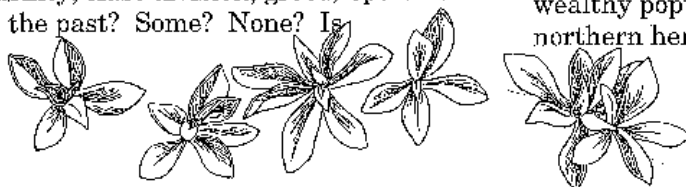
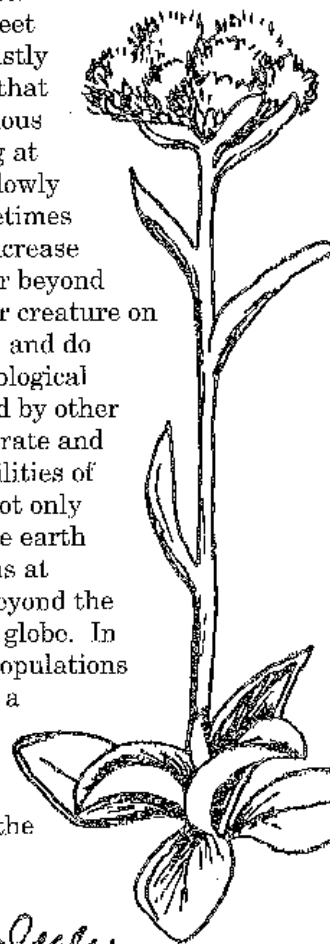
Was this shift a case of "necessity being the mother of invention" in the sense that expanding human populations required the channeling of the available energy from sunlight more and more into plants with a human utility through the process of human selection for plant varieties yielding more abundant food for humans? Was it a path of lesser resistance; i.e., was grain farming an easier, more reliable way to put food on the table regardless of population concentrations? Had class divisions arisen for some reason not related to agriculture such as warfare/subjugation among pastoral peoples prior to the advent of agriculture? Since annual grains are harvested during a sharply delineated season, the grain must be stored if it has become a year round staple leading to at least temporary surpluses. Do such surpluses necessarily lead to increasing greed, envy, and struggling over who controls the storage and parceling out of the surplus food?

Are humans as a species most inventive and most reproductively prolific during times of leisure or times when we are under duress? Can it simply be agriculture beginning in the Fertile Crescent of the Middle East that is responsible for the serious, perhaps irreversible, degradation of the living and material base of our existence? We here at the Land Institute try to conceive of an agriculture that would not take more away from the soil, from the farm or garden, than is being renewed each year via natural processes that occur on the farm. Were all of the above mentioned factors (necessity, path of lesser resistance, reliability, class division, greed) operative at some time in the past? Some? None? Is

it likely that we can never recapture the story? In what detail need we reconstruct past events to advance in our attempts toward an agriculture in community that we can sustain?

Well, come to this year's Prairie Festival, May 29-30, and hear some of these questions as well as many others addressed in workshops and presentations by many persons who have pondered them for decades.

One thing is clear from the fossil and archaeological record: *Homo sapiens*, a single species, our species, had occupied most of the earth's land surface including such diverse bioregions as tropical rain forest, savannah woodlands, temperate forests, grasslands, periglacial areas, and even the Arctic 20,000 years B.P. (before the present). Geographical distribution on that scale is unprecedented in the history of life on earth. How was this made possible? Tools of stone, bone, leather, wood, and fiber and certain kinds of enhanced intelligence including the ability to bind time, i.e., the ability to remember our past and imagine, intend, our future must have been primary factors. We became so proficient at extracting a livelihood through modifying our behavior including our social organization and our artifacts (tools and shelter including clothing) to meet the demands of these vastly different environments that we gained (through various cultural changes coming at varying rates, usually slowly and gradually, but sometimes quickly) the ability to increase and multiply at rates far beyond the capacity of any other creature on the planet. We now can and do preempt many of the ecological niches formerly occupied by other species and do this at a rate and scope far beyond the abilities of other species. We are not only dispersed over the entire earth but also populate regions at densities that may be beyond the carrying capacity of the globe. In addition those human populations that are moving toward a steady state, zero population growth, namely the materially wealthy populations of the northern hemisphere,



consume materials/energy and produce waste (some of it highly toxic to other life forms as well as to ourselves) at rates from 20-100 times that of the poorer populations of the southern hemisphere. We approach the point of being able to swamp out much of the rest of the biotic as well as some of the physical world with human protoplasm and our associated wastes. There appear to be no built in checks and balances to this trend save natural disasters. And those alone appear to be insufficient to forestall the trend. The great plagues of Medieval times cut the human population at that time by about one third but that downturn appears as an insignificant and aberrant blip in the over-all growth curve of the human population, a growth rate that is approaching infinity. Whatever occurred during the evolution of hominids from *Australopithecus* through *Homo erectus* to *Homo sapiens*, some constellation of factors came into play at the gatherer/hunter-agriculture boundary that greatly enhanced our abilities to "bend nature to our will" (and hence significantly increase our reproductive rate) in Sir Francis Bacon's sense; but I believe that the incipient capacity to do so long predates the agricultural revolution of 12,000 years B.P. Although of nature *Homo sapiens* somehow through the accumulation of cultural changes, cultural adaptations, was able to step away from the usual environmental constraints and other population limiting factors experienced by all other living creatures. The first steps must have been tiny, imperceptible steps, but we have come to the point where we have all but stepped out of nature and find ourselves in the late 20th century at the point of ultimate paradox: Some of our peculiarly human adaptations that arose by the same biological evolutionary mechanisms that gave rise to the adaptations of all living things now and ever on earth, like those that gave us the capacity to manipulate nature (only different in rate and magnitude from similar abilities in myriad nonhuman species) to the degree that we have now stepped out of and manipulated nature to the point of destroying the biotic and physical wherewithal for our survival.

Even the most optimistic projections of energy supplies and a slowdown in human population growth point toward a collision course between humankind and the rest of the ecosphere (biosphere plus physical matter) in the not too distant future. I hope this year's Prairie Festival will give us glimpses of times when and where we had at least

stepped away from nature less far, stepped away more gently and perhaps in ways more sustainable, and suggest ways for us to begin stopping back in. We need models of sustainable ecosystems that include human beings living in sustainable relationships with each other that are the fabric of sustainable communities. While solutions to these problems may not come easily, each presenter will offer some positive ideas for all participants to ponder.

The Prairie Festival 15 format contains more keynotes speakers and somewhat fewer workshops than usual. An over-arching goal for the next several years is to present major issues in the historical transition of our species from that of enmeshed member of an ecosystem (several ecosystems dating back over the past 40,000 years) living sustainable lifestyles to that of our modern estranged and alienated position *vis a vis* nature, i.e., the transitions from gathering/hunting to agriculture through the industrial revolution until the postmodern present.

The theme for the first year in the series is "Becoming Native: Our Paleolithic Past, Modern Gatherer/Hunters, and Subsistence Farmers." Key-noters include: Dave Foreman, founder of Earth First!; University of Toronto Professor Richard Lee, a leading figure for three decades in the study of the !Kung of the Kalahari (now known as Ju/'hoansi, the name the people use to refer to themselves); Helena Norberg-Hodge, Director of the Ladakh Project, the leading authority on the Ladakh subsistence farming system; Doug Peacock, writer and active advocate for the wild; and our own Wes Jackson.

Paul Winter and Friends (Paul and two of the other four Paul Winter Consort members, Paul Halley and Eugene Friesen) will present a Sunday afternoon concert featuring prairie music.

For those attending we will also offer the usual opportunities to tour The Land Institute, our tall grass prairie and herbary, and research plots as well as to experience a new tour: the Sunshine Farm featuring horse-drawn wagon rides behind farm manager Jim Huskins' matched team of Belgian draft horses. There are also other activities especially planned for children.

We'll again have a Saturday night barn dance and an early Sunday morning bird walk. The Sunday noon catered meal will feature barbecued buffalo on Thom Leonard's French bread plus there'll be an alternative vegetarian choice. Make plans to participate. The dates are Friday evening, May 28 through Sunday afternoon, May 30, traditional Memorial Day weekend.



New Roots for Agriculture

A New Perspective on the Family Farm Dilemma

Dick Austin

Stewart Smith recalls that when he served as Maine's Secretary of Agriculture in the late 1970's and early 1980's, he noticed that several groups of unconventional farmers were doing something in common:

The organic farming group, the direct marketing group, those involved in home food processing, and others, were recapturing some of the activities that conventional farmers like myself had spun off to the non-farm sector.

As I had once expanded my own farm, I did it by heavy use of purchased inputs, and with larger equipment. I used these farming techniques because they simplified farming from the management standpoint and allowed me to produce more output with my labor. But they also resulted in less return to myself per unit of production, because I myself contributed less input per unit of output. That's the way the market is going to sort things out.

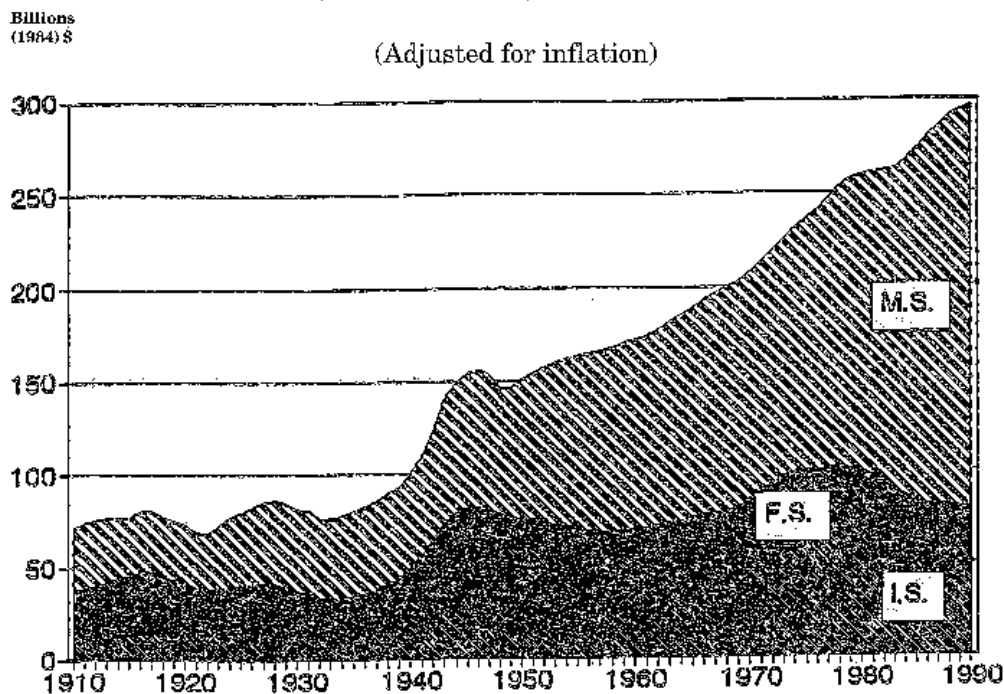
In every case, the organic farmer, the direct marketer, and the home processor were recapturing some of those activities that conventional people like myself had thrown off.

I heard Smith at a meeting of the Scientific Advisory Committee to the Sunshine Farm Project at The Land Institute in Salina, Kansas, in January 1993. The Sunshine Farm will experiment with organic cropping techniques, with draft horse utilization, and with a tractor powered by vegetable oil grown on the farm, in order to explore whether a modern farm might sponsor its own fertility - without petroleum inputs for traction and fertilizer - while producing food for human consumption.

Smith has just joined the faculty of the University of Maine after completing a term as senior economist with the Joint Economic Committee of the U. S. Congress. He plans continuing research on an economic thesis showing that (1) the decline in the number of American farmers relates to the displacement of activities from farms to other sectors of the agricultural economy, (2) the agricultural research and extension system has encouraged such displacement even when its economic utility was uncertain, and (3) any renewal of family farming will require techniques to recapture activities for the farm.

On the graph, Smith divides the agricultural

AMERICAN AGRICULTURE DIVIDED INTO MARKETING, FARMING, AND INPUT SECTORS



economy into three sectors: inputs (I.S.) such as machinery, fertilizers, and expertise provided by off-farm institutions; economic activities on farms themselves (F. S.); and activities performed by the marketing sector (M. S.) such as slaughter, transportation, packaging, *etc.*¹ The input and marketing sectors have both grown rapidly since 1910 while the on-farm sector of agriculture has actually declined as farmers substituted tractors for horses, purchased fertilizers for crop rotations, bought in bulk for neighborhood marketing, *etc.* The exceptions to this trend were the World War II years when farmers were challenged to produce more with fewer inputs and, interestingly, the farm recession years in the 1980's when distressed farmers cut back on the purchase of new machinery and fertilizers and still did not find ways to significantly increase their economic output.

The dominant trend has been interpreted by the agriculture establishment as an increase in efficiency: 2 million farmers today produce far more food than 32 million farmers grew in 1910. Smith argues that a significant portion of this gain in efficiency is illusory. Pointing out that 21 million additional people work in the input and marketing sectors of the modern agricultural system, Smith observes that "the whole truth" is that much of the activity performed by millions who were once farmers "has been assumed by nonfarm firms and not passed on as system efficiencies."²

Smith argues that the agricultural research and extension establishment encourages this trend, often uncritically. Much research is financed by companies that stand to benefit from off-farm technologies that replace on-farm management, and many people in university research faculties are more comfortable with industrial scientists and engineers than they are in the company of farmers. The agriculture research establishment generally fails to offer farmers techniques that might increase the farmer's share in the agricultural process.

For example, millions of dollars have been spent to develop a bovine growth hormone that promises to increase milk production up to 25% per cow, even though milk is in surplus in our society and the competition resulting from use of this expensive purchased drug would drive thousands of smaller dairy farmers out of business. On the other hand, relatively little research investment has gone into new techniques of rotational grazing that promise to save dairy farmers 25% in feed costs - reducing off-farm inputs, increasing farmer's profits, and stabilizing production. The biases of the agriculture research establishment are clear.

Smith's analysis is hopeful, however, in that it directs attention to an aspect of the family farming crisis that has not been so clearly identified before, and that could respond to new research priorities. "If we want to maintain farming we must maintain publicly funded applied research directed at



Sunshine Farm manager, Jim Hushins, and his matched team of Belgian draft horses, Platt and Scruggs.

technologies that enhance farmers' valued added activities...

Sustainable agriculture... necessarily involves more farming activity. Farmers practicing sustainable agriculture must develop systems that allow farming activity to displace purchased inputs. Pesticides will be displaced with crop rotations and other integrated pest management techniques. Purchased fertilizers will be replaced by rotations or locally produced nutrients, from both animals and plants. Many sustainable farmers will be diversified vertically as well as horizontally, providing marketing services as well as production services of a wider variety of output products. Economics of scope will offset economics of scale.³

Garth Youngberg, Director of the Institute for Alternative Agriculture, attended the same meeting where I met Stewart Smith. Youngberg advocated a "new Morrill Act." The original Morrill Act of 1862 established the land-grant college system for "liberal and practical education" in "agriculture and the mechanic arts" which has now evolved into an agriculture research establishment removed from farmers and their needs. Youngberg would require that a significant portion of agricultural research be conducted directly on America's farms with the participation of our most imaginative farmers. This research would help farmers to develop the techniques that might improve the quality of our food, protect our natural environment, and restore healthy communities to the rural landscape as farmers and rural communities recapture a larger portion of agricultural activity.

We had gathered together to evaluate The Land Institute's Sunshine Farm, a bold experiment to replace petroleum - agriculture's most pervasive and precarious off-farm input - with sunlight and the farmer's ingenuity. The research begun in this project, if followed by many other such efforts, might indeed develop techniques for the revival of American agriculture as thriving human communities embedded in vital ecosystems.

³Stewart Smith, "Is There Farming in Agriculture's Future?," presentation to the College of Agriculture and Life Sciences, University of Vermont, Nov. 14, 1991; revised Nov. 21, 1992, available from the author.

⁴Ibid.

⁵Ibid.

Contacts:

Stewart Smith, Department of Agriculture and Resource Economics, University of Maine, Orono, ME 04469; (207) 581-3174
Garth Youngberg, Executive Director, Institute for Alternative Agriculture, 9200 Edmonston Rd., Greenbelt, MD 20770; (301) 441-8777

Richard Cartwright Austin, Environmental Theologian with Appalachian Ministries Educational Resource Center, Chestnut Ridge Farm, Route 1, Box 318, Dunganmon, VA 24245; (703) 467-2437

For information on the Sunshine Farm Project contact The Land Institute, 2440 East Water Well Rd., Salina, KS 67401 (913) 823-5376

Announcements

Sam Evans, former member of the board of directors of The Land Institute from its inception in 1977 until 1981, has recently been appointed as the director of the international division of the YMCA. Sam will be working out of the YMCA's national office in Chicago. He has been involved with several public service organizations over the years including a 30 year span with the YMCA.

Sam's wife, Terry Evans, is a current Land Institute board member, a member of the board's executive committee, and is The Land Institute's arts associate.

From all of us here at The Land Institute, congratulations and good luck, Sam, in your new venture.

The Center for Rural Affairs celebrates its twentieth anniversary on June 12 and 13, 1993 at Walthill, Nebraska. The program includes music, speakers, historical portrayals, teach-ins and much more. Keynote addresses by North Dakota farmer Fred Kirschenmann and Center Program Director Marty Strange. The music program includes bluegrass, traditional and original folk, barber shop quartet, brass quintet, Native American drum and singers, and blues harmonica. Stage performances will be highlighted by Clay Jenkinson's award winning portrayal of Thomas Jefferson. All events free and open to the public.



Schrankia uncinata

Research Considerations Common to Medicine and Agriculture

John Ellefson

The Land Institute hosted a three day symposium January 6,7,8 designed to address problems common to research in medicine and agriculture. A working group of scientists headed by Dr. Charles Sing, Professor of Human Genetics in the University of Michigan School of Medicine, met at The Land with the research staff and management team of The Land Institute. The interdisciplinary group of co-investigators from Michigan has been working on causes of coronary artery disease (CAD) for several years and includes Dr. Brian Athey, Department of Anatomy and Cell Biology, Digital Microscopy and Scientific Visualization Laboratory at the Medical School, Clare Congdon, Ph.D candidate, Department of Computer science, Dr. Sharon Reilly, Research Associate II, microbiology Ph.D., Dave Sing, Programmer II, English major, and Dr. Kim Zerba, Assistant Research Scientist, ecology Ph.D. Participants from the Land Institute were Marty Bender, Ph.D. ecology, John Ellefson, Ph.D. anthropology, Mary Handley, Ph.D. plant pathology, Wes Jackson, Ph.D. plant genetics, Peter Kulakow, Ph.D. plant breeding, Jon Piper, Ph.D. ecology, and Corey Samuels, B.A. political science.

The symposium was designed to ask questions about how we, as scientists, can conceptualize and formulate new ways of designing research enabling us to move forward in our understanding of the complex interactions within prairie ecosystems, within our perennial polyculture prairie mimics, and within the etiology (causal history) of CAD. A central query was: How can we plan our research to encompass the complexities inherent in biological systems, *i.e.*, the fact that the things we are trying to examine are processes that are multi-factored, that the factors themselves are multi-variate, that all of the above are constantly changing, and that it is the interactions between and among all of them that should be the subjects of our inquiry?

We came together with concerns about the efficacy of continuing in the reductionist paradigm, the oft referred to Baconian/Cartesian one, that has characterized Western science since the Renaissance. Both research teams are experiencing a growing awareness and unease that we have gone about as far as we can using the models from that way of knowing, from that reductionist research paradigm and, by extension, that view of the cosmos.

On the first day Charlie Sing critiqued Peter Kulakow's paper on Illinois bundleflower (in progress toward press) and Jon Piper's perennial polyculture paper (also in progress toward press). Charlie made several minor but helpful suggestions regarding the papers themselves, but his main suggestion was that The Land Institute needs to develop an over-arching research program that incorporates selective breeding programs within a complex polyculture background.

After the usual round of Land Institute introductions on Thursday morning, Wes began the discussions with an overview of the legacy of the reductionist paradigm in science and in the modern world view generally. Charlie then began his group's presentations with a discussion of the role values systems play in science including those values influencing different styles of leadership in a working research group. He then raised questions about the nature of training scientists, whom science should serve, and from whom science should solicit input for the purpose of developing an ethical framework for informing science. He moved next to the problems inherent in studying interactions among complex adaptive systems (CAS's), focusing on the failure in medicine to be able to predict whether or not a particular drug will have the desired affect when given to any person evidencing the same clinical profile for a given disease, *e.g.*, a person experiencing high blood pressure, one of several symptoms often associated with coronary artery disease. Despite myriad data having been collected over decades on the many complex adaptive systems known to affect CAD (among them the heart's vascular system, plasma lipid metabolism, and clotting factors) the best single diagnostic tool for predicting the likelihood of a heart attack remains whether the person tends to accumulate fat around the middle or on the upper thigh; and the diagnostician can detect that by simply pinching a person's flesh in those two places.



Charlie emphasized that there are unpredictable events and outcomes, emergent properties, because of the interactions within, between, and among these complex adaptive systems. How do we study these interactions in the etiology of a disease during the course of an individual's over-all development from genotype to phenotype? How do we deal with the fact that except for identical twins every individual is precisely that, a genetically unique individual? We are confronted by that fact both clinically and experimentally. Individuals are not replications, clones, of one another. In reductionist science we have collected and stored vast quantities of data on the interactions of pairs of variables and even some on the covariation of three variables, rarely more; and we could conceivably



Dr. Charlie Sing at The Land Institute.

collect even more data on all possible pairings of variables and collate all of those data and still we not have furthered our understanding of cause and effect because such systems almost never interact simply as pairs and triplets of discrete variables. We have arrived at a reductionistic dead end in our quest for silver bullet cures in medicine. We are stone-walled.

Sharon Reilly stated that complex adaptive systems (CAS's) are everywhere. That's what all biological systems are; that's what organic evolution is and always has been whether we are talking about the coadapted genome within each of our own bodies, a population's shared gene pool, an ecosystem, or the entire ecosphere. We know that all are comprised of CAS's in constant interaction. It is time to move on from the study of quantity and quality of particles

and waves to a science of relationships, a scientific endeavor to understand interactions whose ephemeral nature renders them extremely difficult to scrutinize, *e.g.*, when we try to tease apart cells, organs, different species in an ecosystem, we either destroy them or we significantly change the quality of the interactions we wanted to describe in the first place. Rather than continuing research as usual on particles and waves, quantities and qualities, we have to find new ways to conceptualize and investigate such phenomena as balance, pattern, and organization because these phenomena are not simply the sum of their parts.

Dave Sing presented his notions on what he called the *parallax view*, the focus on an object from two or more points of view. He used that metaphor to distinguish between interdisciplinary research that attempts to bring together narrowly trained specialists from several fields with that which attempts to bring together persons from different disciplines each having the ability to view the world in two or more ways. This new approach in science requires that persons come together as a team not only from several disciplines but also that each of them has a parallax view. The distinction is more than a simple shift in scientific methodology; it is a major shift in the philosophy of science.

Kim Zerba discussed differences between observational science, the core of ecological field research, and experimental science which is usually undertaken in a controlled laboratory setting. The salient variables that come to our attention in the field, in nature, are on the order of magnitude of 50 or 100 not just the two or three variables that reductionist science has traditionally focused on hoping that or assuming that the other factors would somehow have no effect or random effects regarding the outcomes of the experiments. The classic rationale for taking this position in science is one of convenience: For the purposes of this experiment we will assume that individual genetic differences, *e.g.*, will not affect the outcomes of our experimental trials or clinical observations. That position has always been theoretically suspect, if not often explicitly acknowledged, and during the early days of behavioral genetics was demonstrated to be untenable.

The chance that two human beings born to the same parents except for identical twins will be the same genotype is $1/64,000,000,000,000$, *i.e.*, one chance in 64 trillion (64 trillion is far in excess of the total number of human beings who have ever existed, the sum total from the earliest hominids, *Australopithecus*, to modern day *Homo sapiens*, a period of some 5,000,000 years). That

minuscule figure is large considering possible occurrences of other meiotic phenomena such as chromosomal linkage, crossing over, breakage, *etc.* Mathematically: humans have 46 chromatids, (23 pairs of chromosomes); they segregate independently (mix up randomly) during meiosis and recombine to form the sex cells, eggs and sperm. Each parent potentially produces 2 to the 23rd power different kinds of sex cells; assuming that the parents are not close relatives the probability of the same sex cell coming from each parent in two separate pregnancies is the reciprocal of the product of 2 to the 23rd times 2 to the 23rd. This fact seriously calls into question the notion of repeatability from one person to the next, one observation period to the next, and one experiment to the next. Repeatability of observations and experiments is a major pillar on which reductionist science rests. Plato presaged this condition when he said that we never step twice into the same river.

It seems amazing and at the same time reassuring that we have come as far as we have in understanding the world using our reductionist methods. The distance we have traveled in medicine of course also relates to the fact that we massively support that research which purports to deal with matters of life and death, *our* lives and our deaths.

Clare Congdon spoke of new statistical techniques that may help analyze the causal relationships within and between complex adaptive systems. One analytic tool is a program designated, "genetic algorithms", being analogous to evolutionary biology's ideas of natural selection, differential fitness, *etc.* In statistical terms such computer programs are necessary when the *search space* becomes so large that other models such as the analysis of variance, covariance, and regression equations are no longer adequate. This technique projects a pool of solutions to a given problem and continually refines the parameters of that pool as newly incoming data are entered, but it does not necessarily reduce the solutions to a single one. The answer may remain in the category *all of the above*. The cluster of solutions could in fact increase in size in light of new evidence. This technique leads us to promising regions within the search space. And the promising regions may be irreducible and may indeed be the answer.

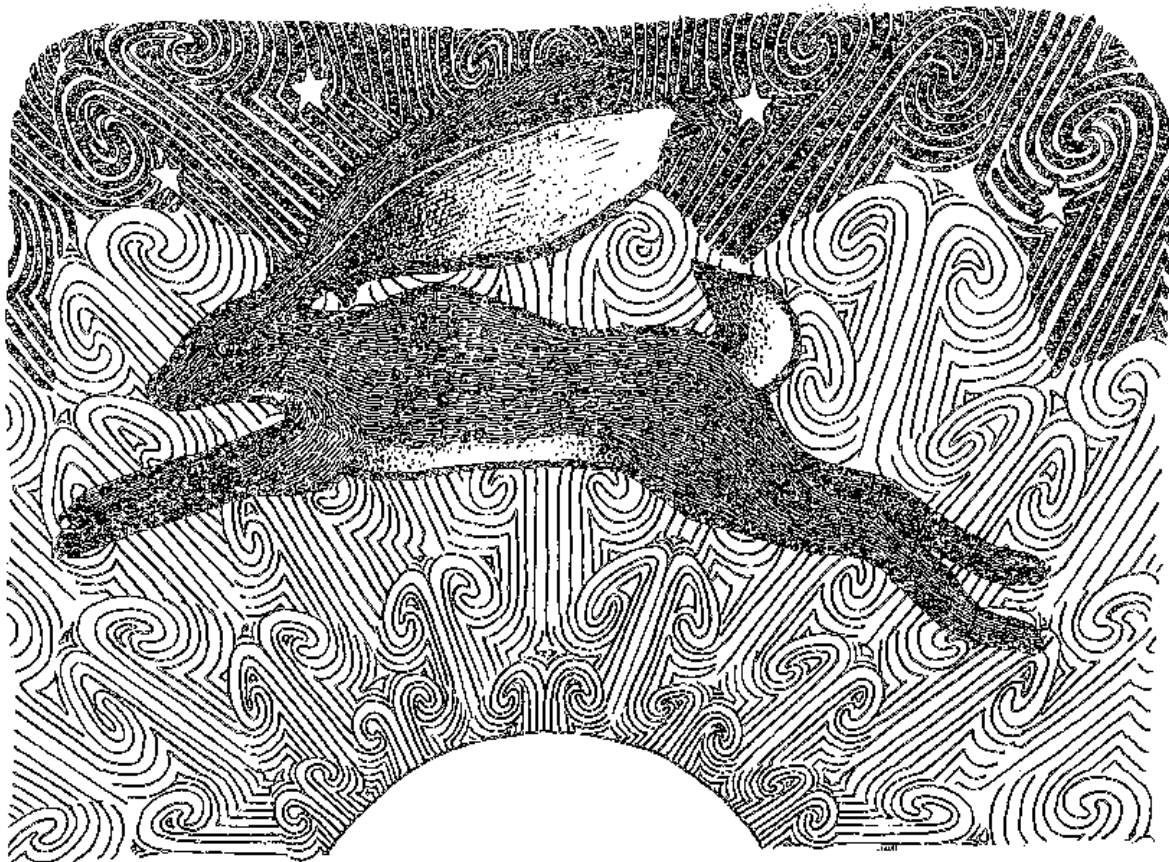
Brian Athey stated our general conundrum succinctly: Real biological questions do not lend themselves to the Baconian/Cartesian reductionist model for their understanding, their *solution*. Brian writes, *Using the research and theoretical tools of this era, simple and woefully inadequate*

2- and 3-body (two and three variables) problems can be solved analytically. To move to the real biological (and even physical) world requires that we formulate models that encompass the enormous body of information that are requisite to our understanding of the properties that emerge and are continually emerging from the interactions of complex adaptive systems at all levels of organization from ecosphere to element. We wrestle to understand thingness, not-thingness, and their dynamic interactions at one and the same time. It might be comforting to simply say that this is the way of Zen or the way of the Tao but I think it is beyond even that.

Whether or not we shifted the reductionist paradigm during our time together, the symposium was collegial and everyone was stimulated, challenged, and given enough in the world of ideas to think about for at least one human lifetime. For that alone I consider it a resounding success.



Asclepias tuberosa



Poems by Harley Elliott

THE SMOKY HILLS

The rising sun's grey mask
hangs in the rear window;
valleys flow
with rivers of fog.

Smoky Hill they named
the region and the river.
Now my friend sees a heron
great blue lifting the air full of water

filling its wings
and throwing fog
into waves as it climbs.

We are here through
waitresses and farmers;
the first crop of corn
rubbing leaves on a
blue eyed Viking's new
black Kansas land.

In passing fields the stones
of other farmers lie;
blue-grey flint knife
formed and lost
fossils printed on its blade.

We ask for deer
and one deer comes
grey on grey obsidian light
ready to leap in this
smoke on the hills

this shifting memory of
ocean time where big eyed fish
wait quietly in stone.

We make passage through this light
and the river's backbone
shining like a new
found arrow in the earth.



BLUE WIND

Miyazawa dead seven years
before my birth
I still sometimes see
you in a shimmering landscape
eyes down black coat
and serious Japanese bowler

lamenting the delicate rice stalks
fallen under water

And the pine trees are
different to me now
knowing you gathered snow from
their needles for a dying sister
How right you were shouting
"Superficial Traveler!"
to those who would comfort
you with words

Yet your own words
comfort me:
I look back in the dark
and see you examining pebbles
on the grey terrain
each turn of your fingers
a separate work

Lost in your love of stones
and the names of stone
what you loved you have now become
Not only the chemical glow
of soil and rock

I mean also the blue wind
that circles the earth.

STRUCK IN THE FOREHEAD BY A SPARROW I BEGIN TO GET A CLUE

The sparrow losing his
way in the boiling air
skittering sideways
a flapping feathery molecule
meeting my hairline head on

glancing up through the alien hair
and finding his wings
at last in the space above.
He disappears in a rush of alarm
while I stand reverberating

in the parking lot
arms loaded with cabbages
catsup and birdseed
and the world opens up
like a fat man's laughter.

There is nowhere to go but on
forever right to the
fragile blue rim of the earth
with a glowing bird print on my skull.
I move and the cabbages

fly away over the fields.
The catsup turns a warm sky blue.
The birdseed explodes into
a million tiny plants
'dancing up my arms.



Traditional Roots

What Comes of Counting Caribou Instead of Sheep

Burns Ellison

They call themselves the Caribou People. They are the 7,000 member Gwich'in Athabascan Indians of the Alaskan interior and northwestern Canada. They call themselves the Caribou People because they are dependent upon the caribou in the same way the plains tribes of the American West were once dependent upon the buffalo. For thousands of years the Gwich'in were nomads who followed the annual migrations of caribou on foot and by dogteam. Living in caribou hide tents, they shot and speared caribou crossing rivers, and drove the animals over cliffs. Up until the turn of the century, they also used caribou fences. With tripods lashed together with willows and spruce poles for railings, the fences were sometimes two to three miles long. Elders and children would surround a herd of caribou and block off the exits while the younger men and women, armed with bows and arrows or muzzle loaders, drove the animals into snares made from strips of braided caribou hide.

No longer nomadic, the Gwich'in now live in seventeen small isolated villages, nine in Alaska, and eight in Canada. One of those in Alaska is Arctic Village. Located 110 miles north of the Arctic Circle, on the southern edge of the Arctic National Wildlife Refuge, Arctic Village can't be reached by road. That's not to suggest, however, that it hasn't been reached by the outside world. The village has an airport, a post office, a coffee shop, and two general stores. It has a community hall, a community freezer, a 100,000 gallon water tank, and a big, modern schoolhouse with a gymnasium. Sled dogs can still be found tethered to their stakes, but all-terrain vehicles and snowmobiles are more often used for transportation. The people now live in log cabins, and they have television sets, VCR's, and telephones.

In 1987, I spent several days in the Arctic Refuge with a bush pilot named Don Ross. Traipsing across the tundra beneath a pale blue sky, we observed through his binoculars a sow grizzly and her cub, sleeping. There not being any trees to climb, the two of us beat a hasty retreat. On our flight back to Fairbanks we made a brief stop in Arctic Village,

landing in his float plane on the Chandalar River, a major tributary of the Yukon. Walking over the old wooden bridge into the village — the wild and desolate peaks of the Brooks Range to the north — I vowed then I would return.

In the spring of 1991, I called up Trimble Gilbert, the village chief and Episcopalian priest, to ask how he and his people would feel if I were to come up and pitch my tent and just hang out for awhile. Trimble didn't ask why I wanted to do this. Had he asked, I might have told him I knew his people were opposed to the Arctic Refuge being opened up to oil drilling, and that I was on their side. I might have told him that what with 1992 being the 500th anniversary of the so-called "Discovery of the Americas," I had decided that living in a Native American community for a period of time was the appropriate thing to do. I might have shared with him my abiding sense of being uprooted. I might have even brought D. H. Lawrence and his "Spirit of Place" into it, and how I was still looking for a place or home somewhere I could call my own.

But Trimble didn't ask me about any of that, and so I didn't have the chance to tell him. He simply said, in reply to my question: "Fine, come ahead."

Don Ross had told me that when I got to Arctic Village I should introduce myself to a woman there named Margaret Tritt. When I stopped by her cabin to do that, she invited me in, sat me down to a cup of coffee, then began frying me a salmon steak for dinner. Three of her eighteen grandchildren were riding together on a small swing inside the cabin. The television set was on, and the Secretary of the Interior, Manuel Lujan, was being interviewed on the rural Alaskan Television Network. Margaret's grandchildren were laughing and shouting, making it difficult to hear much of what he was saying. Then I began catching words like "energy needs" and "national security," and, realizing he was talking about the Arctic Refuge, I made an effort to listen more closely.

Secretary Lujan was saying that geologists now believe there is a 46 percent chance of finding anywhere up to 14 billion barrels of oil beneath the 1.5 million-acre coastal plain of the Arctic Refuge. (Governmental reports and environmental impact



statements refer to the coastal plain as the "1002 area"; Gwich'in Indians refer to it as the 'Birthing Place' — the place where each spring the 186,000 Porcupine Caribou Herd migrates to, and where the cows give birth to their calves.)

Four or five years ago, proponents of drilling in the refuge were saying there was a 19 percent chance of finding up to 3.2 billion barrels of oil. Later that figure was upped to 9.6 billion barrels. Now the figure has jumped to 14 billion barrels, and the odds of finding oil close to even money. At this rate, in a few years it wouldn't even be necessary to drill — the stuff would be bubbling to the surface of its own volition, spouting up like geysers of black gold!

Finishing my dinner, I thanked Margaret and hiked back to where I had pitched my tent on a small knoll west of the village. Before I left for Alaska, a friend gave me a tiny little bear, carved out of pipestone by a seven-year-old Zuni boy. My friend told me this was to be my power animal. She also told me that after I put up my tent, I should face the four directions from each side of it and pay my respects to the "Above Ones."

As I went to do this, I found myself feeling self-conscious about it. I imagined villagers peering out from their cabin windows at me. "Hey, what's that guy up to now?" "I don't know. He must be another one of those New Agers." "Yeah, probably getting himself ready to go on one of those, uh, what do you call 'em? — Oh yeah, vision quests."

I stood to the east, facing the village. A raven flapped over a couple of tin-roofed cabins to light on top of a telephone pole. A propitious sign, I thought to myself. Raven — creator of the universe, of human beings and all of their fellow creatures; then I

remembered earlier that day overhearing a woman in the village crying out to her son: "Get rid of that dirty water! We're drinking ravens' droppings!"

I stood to the south, staring down through the trees at the lake below the knoll where I was camped. A chorus of sled dogs began to howl from the other side of the lake. I stood to the west, my eyes averting the bright sun and focusing on the bleached white antlers of a caribou. After that I stood to the north and watched a leaden curtain of rain move down the knife-edged mountain of exposed rock that the people of Arctic Village call Keevetonlee. Sun and blue skies, black clouds, a curtain of rain — I looked around me, hoping to see a rain bow. Then I crawled into my tent.



Winter Landscape at The Land Institute

Nearing midnight, the sun was still shining, and I couldn't go to sleep. I climbed out of my tent to go for a hike. Walking along a gravel road into the village, I came to a large silver culvert. Some boys were fishing in the stream that flowed through it, and one of them had caught a big pike that he was dragging onto a sandbar. I walked to the boat landing, where the stream joined the river, going past





the new schoolhouse, some swings and a merry-go-round, and an outdoor cement court where four or five boys were playing basketball.

Dousing myself with mosquito repellent, I began hiking along a narrow trail up the river. I made my way through thickets of willow and dwarf birch, stopping now and again to pick blueberries. Then I was crossing over twenty-foot bluffs dropping down precipitously to where the river's deep-running channel swerved and sliced into the bank. Off to my right were open meadows, marshes and tundra ponds, and forests of black spruce. A few days before somebody had seen a moose swimming across the river, and a few days before that a grizzly had been seen.

A mile or so upriver, I came to a small bend where Tritt Creek enters the river. Here there was a cooling breeze, enough of one to escape the mosquitoes. I regretted not having brought my spinning outfit with me — that there was a concentration of fish at this place, of grayling and pike, I hadn't the slightest doubt.

I sat on a stump and watched, almost in a trance, all the ways in which light and color and air and water danced and merged before my eyes. I wanted to be *part* of all that light, color, air and water...I wished then I were an otter, or a water bug skipping buoyantly across those swirls and eddies.

Starting back to the village, I cut inland and came upon the deep splay-footed tracks of a moose. I tried to follow them but they went into a watery marsh that deepened into a pond. On the far side of the pond were water reeds and thickets of willow, the willows partially obscured by a low-lying white mist. Perhaps if only I had concentrated hard enough, I could *will* a moose to appear from out of that mist — or perhaps one would rear up from out of the depths of the pond, water streaming down its horse-sized flanks, pickerel weed dangling from its racks of antlers.

Suddenly three huge birds took off together not more than twenty yards in front of me — or rather they exploded, erupted from the ground with strident bugling cries. Long-necked with gangly long legs, black on the tips of their flapping wings, slate-gray bodied: sandhill cranes. Only months before those same huge birds had doubtlessly made a stopover along the Platte River in Nebraska, the same river I

had fished in as a child growing up in Nebraska. I watched the cranes glide over the pond, then bank down into the mist, their bugling cries sounding after them. I hadn't roused up a moose, nor had I sighted a grizzly; nonetheless, in that moment I was grateful — for what I *had* seen, and for being where I was.

Dark anvil-shaped clouds had piled over the peaks and gathered overhead as I returned to my tent. Lying in my sleeping bag, I listened to the first drops of rain pelting down. It was a lulling, comforting sound, and yet — I *still* couldn't make myself go to sleep!

I kicked myself for not having brought along a few sleeping pills — that was one of the items I *should* have had on my camper's checklist. I was no stranger to insomnia, but usually I had something on hand to deal with it. A pill or a nip of brandy — *something*.

I took a couple of Tylenols for the slight headache I had. The headache was probably the result of all the coffee I'd had to drink with my salmon dinner; and drinking all that coffee was undoubtedly a contributing factor to why I couldn't sleep. The Tylenols wouldn't help me for that, but maybe they'd make me less aware of the rocks and knobby roots I could feel poking at me from under my sleeping pad.

'Little wheel spin and spin... big wheel turn around and around...' go the words to that song Buffy Saint Marie used to sing. In similar fashion that was what my mind was doing, spinning and turning, around and around. Maybe if I tried visualization. I collected my thoughts, and stuffed them in a bag. I wiped the slate clean, applied an eraser to the blackboard of my mind.

But it was hopeless — more thoughts kept intruding. I stuffed them into the bag, but as fast as I did they burst right back out of it. I tried to erase the bag but that didn't work either. So what was I to do in order to sleep?

Well, given where I was, instead of sheep maybe I should try counting caribou. I remembered one of the Gwich'in hunters telling me what it was like seeing a herd of caribou migrating through here, along the ridge called Datchanee. He had described it as watching "a cloud shadow on the mountain." He'd also told me the "scouts of the

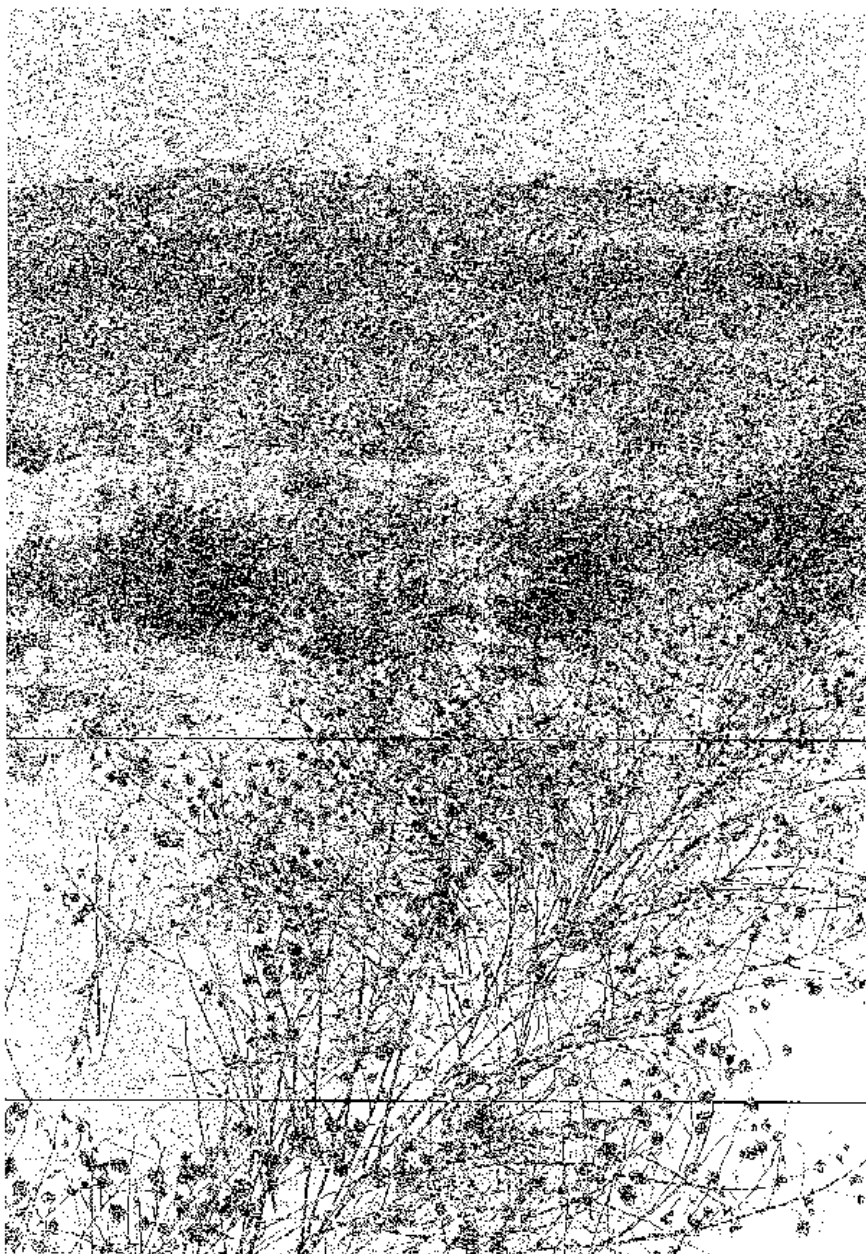


herd" often appeared first, and that the trick for a hunter was to position himself in their path, hiding behind rocks or brush, and allowing the "scouts" to pass by, taking care not to alarm them for fear the rest of the herd would veer its course and swing away from the village.

I visualized myself on that treeless, wind-swept ridge, the "scouts of the herd" moving toward me. I stood there frozen in place, as though I were an inanimate object—like a cairn. At first I had no problem counting the caribou as one by one the animals went by, lowering their heads to graze on lichen, then raising them up and peering about for signs of predators.

But then more and more caribou began appearing, and keeping count was out of the question. Their ranks grew and swelled into massed, heaving multitudes, and they were all around me, and I feared they were going to trample me under. The animals were close enough that I could reach out and touch the velvet on their antlers; I could stroke their backs. They had glowing bodies of rich chocolate, and their rumps, breasts and manes were a lustrous, snowy white. I could hear the castanet clickings caused by the snappings of their tendons, the clickings indistinguishable from the patterings of rain on a tent

Columns of mist rolled down the ridge and flowed up from the valleys below like a tide. I glimpsed shadowy, spectral gray figures of wolves drifting along like smoke on the flanks of the herd. Wolves on the periphery of the consciousness. To keep them at bay, we build fires and erect great walls. But what when the fires die and fences fall? The caribou were still all around me, but I could no longer see them. They had been swallowed up by the enveloping white mist. The mist washed over me like waves of sleep, and finally, at last, I did.



Winter Landscape at The Land Institute

Ruminations

(Editor's note.)

A year ago the article, "The Role of Livestock in Sustainable Agriculture," appeared in *The Land Report* (Spring '92). That article has since been reprinted in *Small Farm Today*, vol. 10, no. 1, 1993. We have had several responses to the original article, some positive, most negative. I am including one from the latter category written by Lynn Jacobs, author of *Waste of the West*, 1991.

To my mind both the first article and the response shed more heat than light on a broad spectrum of topics ranging from the natural human diet to the virtues, or lack thereof, of the so-called market driven economy.

While we do have historical and fossil data showing a correlation between post Pleistocene grasslands and large herbivores leading us to surmise that they evolved together, correlations do not prove causal connections, are not necessarily causal relationships. Furthermore, even if we had firmly established a causal linkage in the phylogeny (biological evolution) of bison and the tall grass prairie, that linkage, that relationship would not automatically fall into that special ecological category termed symbiosis, i.e., that category specifying mutual dependence/beneficence. To lump all relationships between all coevolved/ing species under the single rubric "symbiosis" renders that term meaningless. And simply asserting that two (or more) species are symbionts does not make them so.

Currently I choose to view the probable bison/tall grass prairie coevolutionary relationship in the following way: the buffalo needed the tall grass prairie a lot more in their evolution than the prairie needed the buffalo. Or to put it another way, the grasses were here before the buffalo. The grasses do need fire and fire was here first of all.

Domesticated Livestock: Boon, Menace, or Inescapable Reality?

Lynn Jacobs

After reading "The Role of Livestock in Sustainable Agriculture" in Spring 1992 *The Land Report*, I feel compelled to submit *Waste of the West* in response. Coppinger, Clemenco, and Coppinger's article is exceedingly distorted (and potentially environmentally destructive) and should not go unchallenged.

Terming our relationship with domestic livestock "truly symbiotic" is stretching the truth beyond its tensile strength. Cattle, sheep, goats, etc. are helpless slaves. They are (with minimal exception) abused in countless ways, forced to lead very unnatural lives, genetically manipulated in grotesque ways, and slaughtered at an early age. They "benefit" from us only in that we "produce" them in huge numbers.

Sheep, goats, and cattle are not "like wild ruminants" and inherently can never be so as long as they are domesticated. A domestic animal can never truly "simulate" a naturally evolved one.

Proposing to utilize a wide diversity of domestic grazing animals on the same range is like begging for environmental disaster. Look at the devastation wrought by combination-grazing of sheep, goats, cattle, horses, etc. on the Navajo Reservation in Arizona, in Africa, and elsewhere around the globe.

We read that "The Spanish have an old proverb: Wherever sheep feet touch the ground, the land turns to gold." Well, large portions of Spain have been converted from lush forest,



Feed lot on Water Well Road near Ohio Street.

brushland, and grassland to pathetic wastelands through the magic feet and mouths of domestic sheep (and range "improvements" by their owners). Aren't the authors aware of this fact? And, historically, Spanish colonizers with their sheep, cattle, and horses were the cause of widespread overgrazing devastation in huge areas of the "New World," including California.

The authors claim that with domestic livestock "One never needs to have naked soil, exposed to the sun, leaching rains, dehydrating temperatures, and eroding winds. For this reason livestock can be raised on sloping land or on land that is vulnerable to wind or water erosion... marginal and fragile lands..." The authors should rename their article "How to Ruin the Land." They recommend the exact opposite of wise stewardship. Aren't they aware of the damage this kind of livestock grazing has caused around the world? They seem to base their conclusions on wishful thinking, baseless theory, and conjecture rather than proven reality.

Claiming that we need ranchers to preserve wildlife is patently absurd. No other group in North America has destroyed as much wildlife or its habitat. Without ranching much of the West would be *de facto* wilderness with much larger wildlife populations (which has been the case in by far most areas where ranching has been eliminated).

It is true, as the authors point out, that the use of domestic animals has helped humans populate large areas of the Earth that would otherwise be less hospitable. Earlier in their article the authors say that the ability to support "a greater number of people" is "a dubious virtue." I agree. Why should humans enslave billions of domestic animals so that they may overpopulate (and degrade) large areas of the Earth that they would otherwise be less able to survive in?

The authors' dietary claims also bear scrutiny:

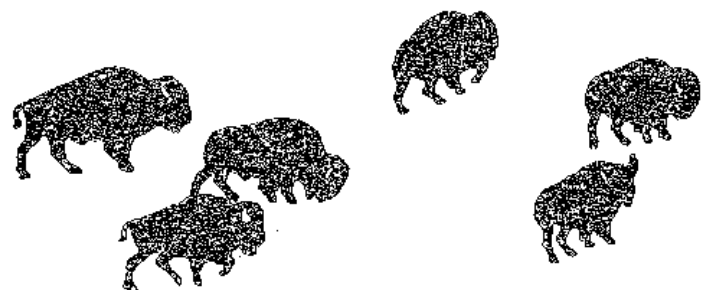
They say that "The simple truth is that animal tissue is more digestible, has better ratios of essential amino acids, and as most people forget, has better ratios of essential fatty acids than do plants." The real truth is that animal tissue has virtually *no* dietary fiber, which is a main reason Americans and other heavy meat-eaters have the world's highest rates of stomach, intestinal, and colon cancers, *etc.* The human digestive tract is designed much more for plant than animal food, basically because we are plant-eating — not omnivorous — animals (see book for further explanation). Essential amino acids are actually supplied better by a diverse vegan diet than by a

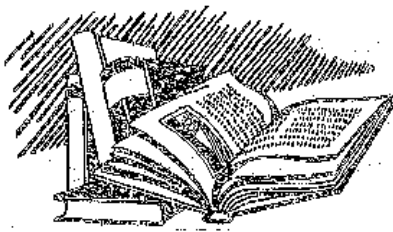
"balanced" omnivorous diet (heavy in animal tissue). Essential fatty acids are also supplied better by a vegan diet; science has shown conclusively that the more animal fats ingested the worse the impact on health, the less the better. The so-called "balanced" diet between plant and animal products we were indoctrinated with by the meat and dairy industries via "the 4 basic food groups" is dying a deserving death.

The authors' attempt to justify and promote domestic animal production by citing the "need" for and use of various animal products around the world is seriously flawed. For example, why do many poor peoples around the world use domestic animal dung for fuel? It's usually because their domestic animals gradually destroyed the trees, brush, and grass they used to use for fuel in the first place. Why do fields "need" to be fertilized with livestock manure? Because livestock were released on the field to eat crop residues that would otherwise have been incorporated into the soil (a net loss of organic matter and nutrients, by the way). Why do certain peoples use animal skins for dwelling materials? Because their animals (and range developments) destroyed the natural plant materials previously used for dwellings. Many of the domestic animal products used around the world today are "necessitated" by destructive domestic animal production in the first place; most of the others could be substituted by plant- or inorganic-based products if need be.

The authors say they "could continue to extol the virtues of our symbiotic life-preservers (domesticated animals)." Widespread and intensive domestic animal production is a main reason we need life-preservers in the first place, though admittedly this is not evident to most people. Perhaps, in this modern world, when it seems we are sinking in a flood of social and environmental problems, we clutch onto whatever has the *appearance* of a life-preserver, even if it doesn't float.

Yes, bring back the *wild* buffalo; don't bring on the bovine. Promote the *wild* prairie dog; don't send in the sheep. Nature is the *only* truly sustainable system. The more we rejoin it, the closer we come to it, the better.





Book Previews

Becoming Native to this Place

By Wes Jackson

University of Kentucky Press, Louisville, 1993

When one of my great grandfathers entered Kansas in 1854, the first day he could legally do so, the day the Kansas-Nebraska Act was ratified, our nation had fewer than 30 million people. Had national policy been directed toward us all trying to become natives to this place, the nature of that nativeness would have been different from what our "nativeness" is today. Now, too many people and the products of the technology explosion interacting with our desires and perceived, as well as *bona fide*, needs dictate the terms.

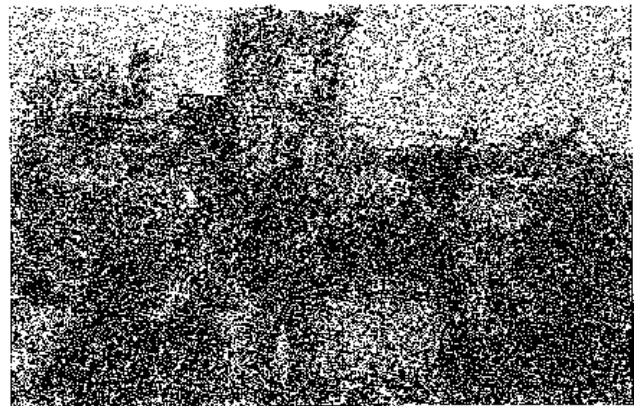
The standard was always changing. By the time one of my grandfathers (the above-mentioned great grandfather's son-in-law) made it to Kansas from Shenandoah in 1877, the standard we might have employed for an 1854 nativeness was already rapidly disappearing. The great herd of bison would be nearly finished off. The Santa Fe Trail at age 56, as an *official* highway of commerce, would soon be totally irrelevant; and by the time that great grandfather died in 1925, 45 acres of pristine prairie would be broken by tractors and horses and planted with wheat. Eleven years later, I was born; it was the height of the Dust Bowl era, a consequence of that Great Plowing. It was an era in which the heart of the continent would send its finest soil particles for observation far overhead to Washington and even to ships at sea.

It has never been our national goal to become natives to this place. It has never seemed necessary to even begin such a journey. And now, almost too late, we perceive its necessity. Unfortunately, the nature of our nativeness toward which we must work is better characterized as severely compromised rather than merely altered. Part of the reason is that we have eight times as many people in our country now as when my grandfather was born. Perhaps even worse is the fact that the forces which have given us our modern problems — the ozone hole, Three Mile Island and Chernobyl, soil erosion and the loss of family farms, and so on—gain power by the decade. Destruction is occurring at an accelerating pace. It has all happened so fast (more than 80% of all the oil ever burned was burned in my lifetime) and it is going to get worse (half of Mexico's population is

under fifteen years of age, ready for a major explosion). The world is slated to add 1 billion people in this decade alone; more people will be added in ten years than the total population of the earth at the time of Columbus!

This book is dedicated to the idea that the majority of solutions to both global and local problems must take place at the level of the expanded tribe, what civilization calls community. In effect, we will be *required* to become natives to our little *places* if we are to become native to this *place*, this continent. Even though we have told one another on bumper stickers and at environmental conferences that we must "think globally and act locally," we tend to drift towards mega solutions. Rather than get busy, we introduce new terms like "sustainable" to apply towards a perceived solution that catches our fancy. Instead of looking to community, we look to public policy. We even hold a global conference in Rio.

To a large extent, this book is a challenge to the university to stop and think what it is doing with the young who are supposed to be getting prepared for the future. The university now offers



Wes Jackson giving a tour of Matfield Green to the new intern class.

only one serious major: upward mobility. Little if any attention is paid to educating the young to return home or to go someplace and dig in. There is no such thing as a "homecoming" major. But what if the university were to seriously ask what it would mean to have as our national goal to become natives to this place, this continent? We are unlikely to achieve anything close to sustainability in any area unless we work for the broader idea of becoming a native in the modern world, and that means becoming native to our places *in* a coherent community, which in turn is embedded in the ecological realities of any surrounding landscape.

What the discussion is about is not just another way of talking about sustainability or bioregionalism, though that would be the result to some degree. The subject is broader than that, for it is largely cultural and ecological in scope.

The first natives here were not burdened with the exercise of technology assessment. They were the lucky ones in the sense that they did not have the technological array developed during the industrial revolution that now has to be inventoried and assessed for a world approaching the end of fossil fuel.¹ That won't be easy! We will soon discover how limited our imaginations are as we begin to anticipate what we can or should take with us into that sun-powered future. Quite frankly, one of my major worries is that we will become so discouraged that we'll seek to repeal Murphy's law and opt for nuclear power. There are bound to be numerous surprises once we get into the inventory and assessment stage. The global market has given us so many intersecting loops that we now have an economic ecosystem so complex that the most fancy systems programs cannot accurately predict what we will be able to keep and what will be selected against. This alone is argument enough for that second major, the "homecoming major." We are not talking about mere nostalgia. To resettle the countryside is a practical necessity for everyone, including people in the cities. To gather dispersed sunlight in the form of chemical energy in a fossil-free world from across our broad landscape will require a sufficiency of people even though we may do it with some modern technological equipment. The area over which we would have to range to collect the sunlight can be so large that the economics that would follow the energy cost would make it prohibitive.

This resettlement will be no small matter. It will have to happen by those who see the necessity of such dispersal, by those intelligent enough and knowledgeable enough about the necessity that they will evidence staying power. What they are up against is horrendously formidable; an affluent society with all of its temptations to embrace the extractive economy that the rich and powerful offer as a lure to keep our incomes and the global non-renewable resources flowing their way.

Think of what this would mean for our universities which now hold the majority of our young people hostage for four years with always the implicit and explicit promise of upward mobility. For tens of thousands of students, the universities have become little more than holding pens that keep them off the job market where millions of hours are devoted to turning out work too shoddy to be either useful or artistic. Think about what is likely to be the eternal judgment of the generation now in power. As a result of the excesses of that generation, it is likely to be the first, and for that matter the last, generation which, after it has died off, will be regarded at best as simply comical and pathetic and at worst hated. Isn't it time to begin

the transition toward figuring out a way to earn a living and amuse ourselves while we live until we die, cheaply, which is to say inexpensive to the life support system? The binge is just about over. It's time to find our way home and use what little time is left for partial redemption of this prodigal generation.

1. We can imagine a future in which fossil fuels will be stretched out for a long time to come. At the end of oil, we move to natural gas, then liquid fuels from coal, and so on. Ironically because of global warming, we should probably be worrying more about the abundance of fossil fuels than the short supply.

Home Territory: Communities Social and Ecological

By William Vitek and Wes Jackson (in progress)

In a culture best identified by its uncompromising commitment to individual rights, enlightened self-interest, and the icon of the self-made person, any discussion of community life will seem quaint, romantic, idealistic, and thoroughly backward looking. But we forget, or never knew, that there is an alternative view of human nature that sees membership in a community as the central feature of a successful and prosperous life. The intellectual traditions of civic humanism and communitarianism are kept alive in the writings of Aristotle, Machiavelli, James Harrington, Thomas Jefferson (according to some), Michael Oakeshott, Charles Taylor, and Daniel Kemmis, to name a few. Less than a century ago populism was a vital social, intellectual, and political movement in America. And as David Shi demonstrates in his Book, *The Simple Life*, there have been a myriad of small communities in the United States dedicated to staying put, working together, and living well.

Community, both as an intellectual concept and a way of life, continues to attract attention across a spectrum of writers, activists, intellectuals, and everyday Americans. The novelist John Berger writes eloquently of the tragic loss of peasant life in twentieth century France. Marty Strange and his staff at the Center for Rural Affairs work with rural/agricultural communities so that they can preserve their way of life. Many sociologists and anthropologists, including Walter Goldschmidt, Jack Kloppenburg, Cornelia Flora, and Janet Fitchen, study human communities and search for the connecting threads that hold them together. Novelist, poet, and essayist Wendell Berry defends

and promotes traditional agricultural communities. And there is a new and growing Community Supported Agricultural movement that seeks to link together in one whole healthy community those who grow food and those who consume it. Implicit in these writings and commitments is the notion that community life at the social level is valuable, and perhaps even critical, for the development of virtuous, healthy, and happy human beings.

The community concept is gaining prominence in the science of ecology and environmental ethics as well. It was Aldo Leopold who first used the community concept to link ecology and ethics when he said, "That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics." In the past fifty years biologists and ecologists have enlarged their study of life by examining it at the level of species and ecosystems. There is still a good deal of controversy in the scientific community regarding the exact parameters of a species and an ecosystem, for example, but there is little doubt that Leopold's remark has become a starting point in the ecological sciences. Eugene Odum, J.M. Cherrett, T.F.H. Allen, Greg Cooper, James Lovelock, and E.O. Wilson, among others, are addressing the theoretical issues of the community concept at the ecological level.

Some scientists, however, have already put their theoretical knowledge to work. The Land has worked for nearly two decades sustainable agricultural methods that mimic prairie ecosystems. Ecologists have designed waste water treatment systems that depend entirely on wetlands ecosystems. Inherent in these projects are the notions that life is complex and interconnected, and that humans benefit most when we seek membership in, and an understanding of, the biocommunity rather than control and domination.

Environmental philosophy has taken up Leopold's challenge to construct an environmental ethic wherein the land is both loved and respected. At least some of this literature seeks to redefine the relationship between humans and nature as a symbiotic and interdependent one, a relationship that, in Leopold's language, turns human beings "from conquerors of the land-community to plain member and citizen of it." The writing of Gary Snyder, Holmes Rolston, Baird Callicott, and Frank Kalinowski, for example, seek to give sense to the ethical ramifications of the biocommunity, a life shared and nurtured by each of its members.

There is urgency and excitement in these writings, projects, and lifestyle choices. One hopes that they have not come too late and that they will attract a larger audience and help begin the process of building anew communities of families, friends, workers, and citizens living interdependently with the flora and fauna of vital ecosystems.

Home Territory: Communities Social and Ecological invites writers across the intellectual and ideological spectrum to contribute essays, in clear and non-technical prose, that explore their reflections of, commitments to, and insights into the nature of the living community, both social and ecological. This collection is guided by the recognition that the biocommunity encompasses both humans and the natural world in an interdependent relationship, and that an understanding of social and ecological communities is critical both for the health of our planet's ecosystems and for the well being of the human spirit.

Home Territory will celebrate community life in essays that are meditative, provocative and exploratory, and that describe, defend, and advocate a myriad of forms of living together and sharing in common. It will be important contribution to the literature because of its multidisciplinary breadth. It will raise awareness of the community concept and be unabashedly partisan in its support of sustainable social and ecological communities.

Home Territory is centered on three themes: The Community Spirit, Standing Firm, and Going Native. Although there is ample literature across disciplines regarding the status of the self and of individuals, very little work has been done addressing the foundational issues of the community concept. What is a community? What are its boundaries? Both Aristotle and Plato, for example, claim that the ideal community consists of a specific number of people. Thomas Jefferson worries that commerce and the migration to cities will destroy the moral values inherent in small rural communities. Essays devoted to the theme of community spirit will address foundational questions concerning the size of social and ecological communities, their function, how they cohere and undergo change. Answering these philosophical and seemingly esoteric questions is the preliminary step in bringing the community concept to the forefront of our discourse.

There is no shortage of authors who defend community life and many of them will be represented here. John Berger and Wallace Stegner, among others, eloquently remind us how a sense of place gives wisdom, friendship, and well being. Staff at The Land seeks to demonstrate the vitality and fertility of an agriculture whose communitarian roots are in the soil and on the prairie. Wendell Berry and Marty Strange have shown how this same vitality and fertility can be found in the farm families and communities who work the land.

The final theme addresses the practical concerns of putting down roots, becoming native to a place, and finding home territory and a community of people. Here authors will offer advice and warn of the challenges that come when we put the community concept to work in our personal lives. Whether we want to build a natural waste water treatment system, farm sustainably, or to become native to a landscape that we have decided to call home, those who have preceded us can serve as role models and teachers.

Invited authors will be asked to center their essays on one of these three themes. Although the book project is in its initial stages, the editors are pleased to announce that the following authors have committed their efforts to the project: Wendell Berry, Walter Brueggeman, Greg Cooper, Cornelia Flora, Frank Kalinowski, Helena Norberg-Hodge, Eugene Odum, Holmes Rolston, Gary Snyder, Robert Swan, Terry Tempest-Williams, and Donald Worster.

Wes and I invite friends of The Land to drop us a note with your input, suggestions, and support. We'll keep you posted.



Matfield Green: A Book In Progress

By Terry Evans and Wes Jackson

Terry Evans and Wes Jackson have begun work on a book about Matfield Green. The following article is adopted from their grant proposal.

In the valley of the South Fork of the Cottonwood in the Flint Hills of Chase County, Kansas, is nested the near-abandoned town of Matfield Green, population 50. Here a combination of The Land Institute, I and some friends, have purchased both land and abandoned buildings including the school, adjacent gymnasium, and

eight tumble down houses. I have restored and now live in one of those houses much of the time. A typical house costs \$1,000; the abandoned bank, \$500. The Land Institute is restoring the old hardware store for student quarters. Our respect for the never-plowed surrounding prairie and the local history encourages us to want to find ways to sustain and develop this community which means to think about how to set up the books for a non-extractive economy and develop a rich culture.

Matfield Green deteriorates as a victim of a cultural and historical mindset: a mindset embedded in the fact that, as Dan Lutton said, we came as poor people to a seemingly empty land that was rich in resources. We created institutions with that perception in mind and went on to settle the interior of this great continent and westward with those assumptions and those institutions to back them. But then came an industrial revolution following the Age of Enlightenment and the social consequences that attended the fossil fuel epoch. Long before this area had reached its peak, we had already greatly substituted capital for people.

Now we are embarking on a new era, developing a new consciousness about the finiteness of resources and land and are faced with the necessity to build a sustainable future. If it is to be powered by the sun — the way the earth has operated over the millennia — there will have to be a resettlement of this countryside by people instead of the heavy reliance on capital. But this time we dare not settle with the same set of assumptions that we settled with in the first place. No other continent, indeed no other hemisphere, will ever again be vouchsafe for us.

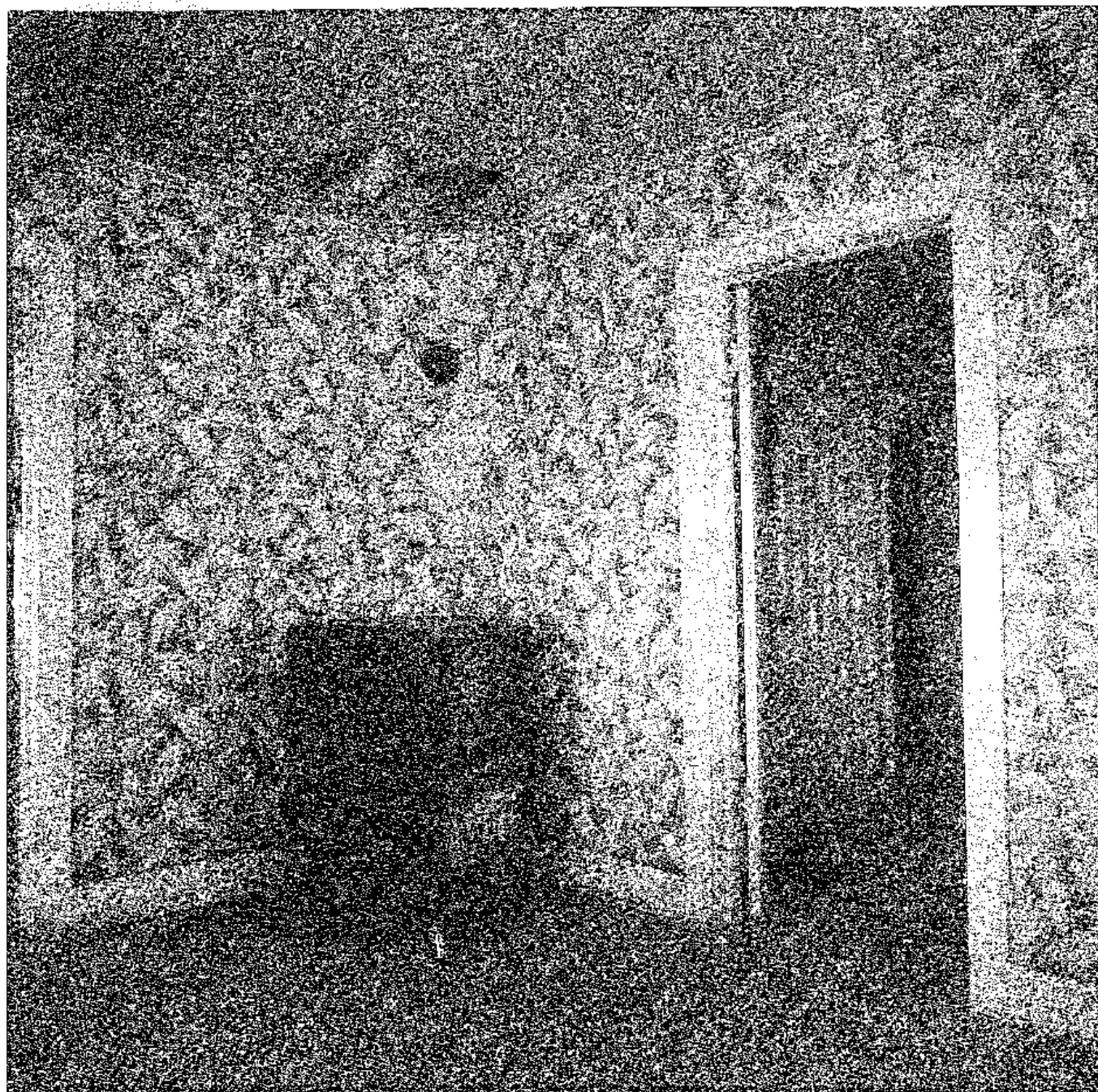
The Great Depression has been called one of the two great failures of the American system, the other being the Civil War. One of the major symptoms of the Great Depression, depopulation of the countryside, never quit. We are at the exact instant in our history, some half-century later, when a small but significant number see the need to reverse the trend.

We need to record that re-entry into the countryside, into the small towns. Our book will be a part of that record.

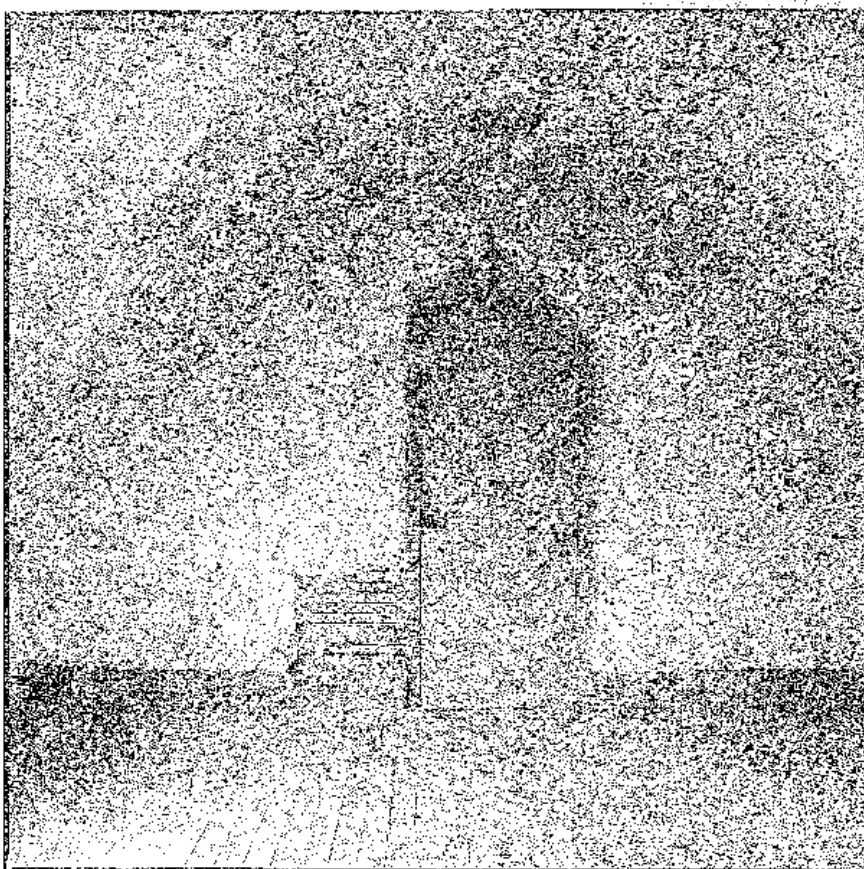
Matfield Green is a town, not a subdivision. Old names are there yet, founders' names, names which when mentioned evoke memories and stories, foibles and virtues. They're mostly names of old people now. Their young go and don't come back, hardly look back. How to record and properly represent this reality is no small matter. We will give attention to understanding with word and image the present and, we hope, future reality of Matfield Green. The book will cover a three year period.

Matfield Green: A Book In Progress

By Terry Evans and Wes Jackson



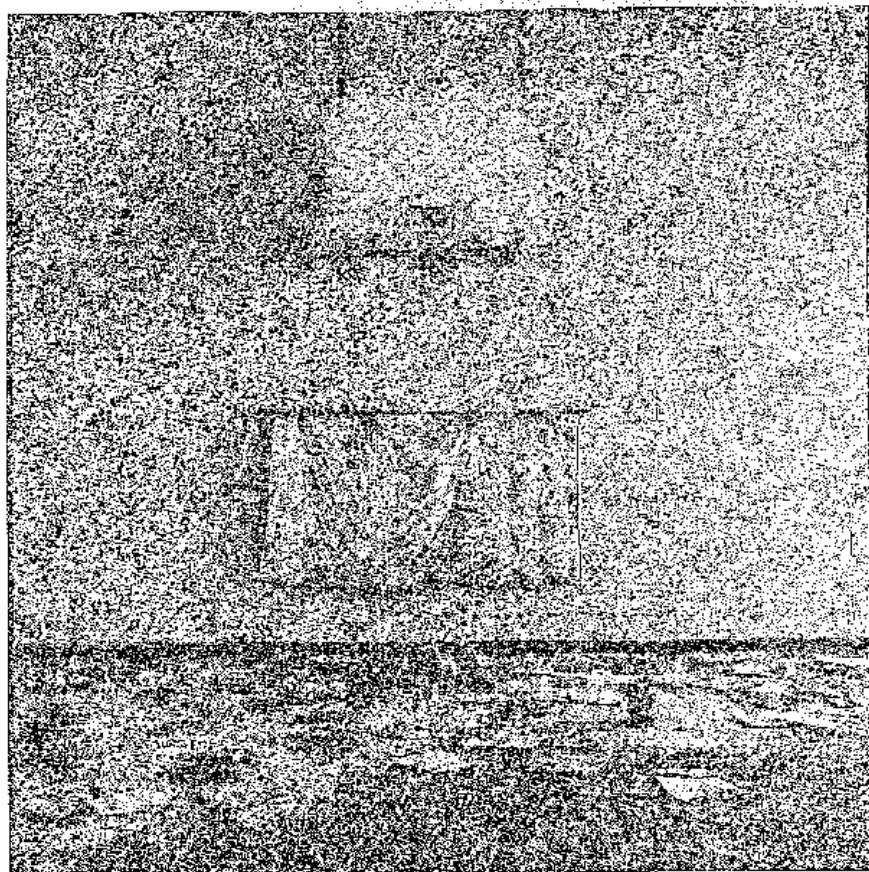
Abandoned house, August 17, 1991 - Matfield Green



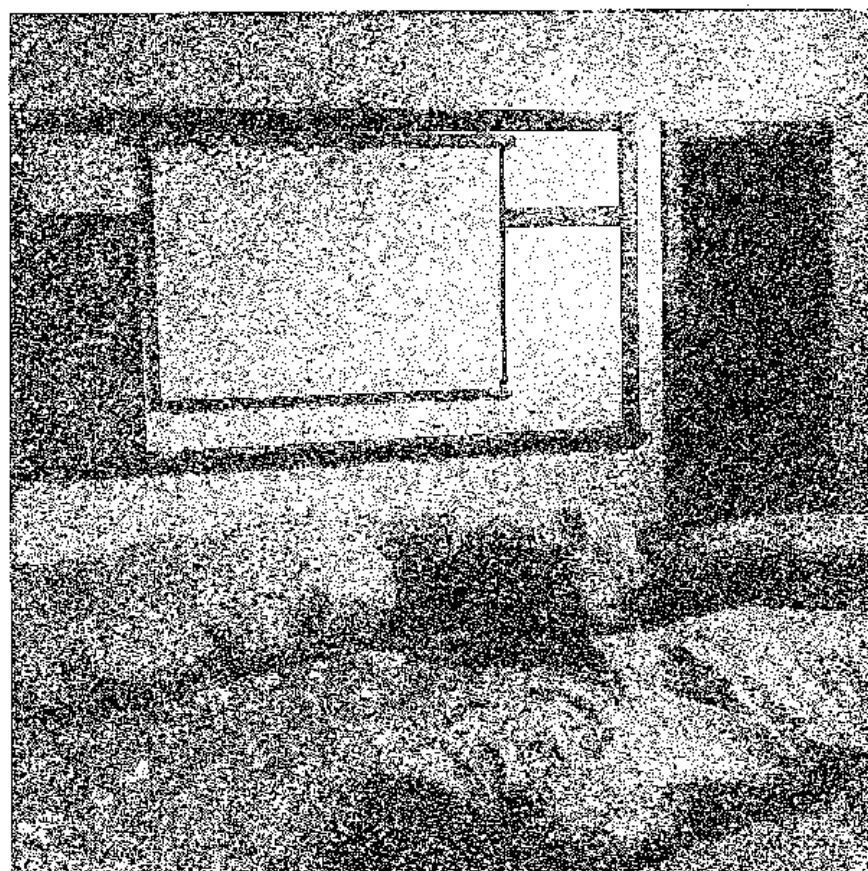
Abandoned room, July 12, 1991
-- Matfield Green



Cellar, September 13, 1992
— Matfield Green



School gymnasium, July 12, 1991
— Matfield Green



School classroom, July 12, 1991
— Matfield Green

The 1993 Prairie Festival

The Land Institute's 15th annual Prairie Festival will be held on May 29-30, 1993.

A celebration of the prairie ecosystem and prairie people, past festivals have brought nationally and internationally known scholars, activists, and artists together with local notables and friends to help us think through ways of making the transition to a more sustainable society. The theme of this year's festival is "BECOMING NATIVE: Our Paleolithic Past, Modern Gatherer/Hunters, and Subsistence Farmers."



John Ellefson, Prairie Festival coordinator, on a recent field trip to Matfield Green.



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- ___ Joining the Friends of The Land



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