Verlyn Klinkenborg

A Compilation of Pieces about Farming and Its Issues

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Why It's Still Worth Opposing Genetically Modified Crops [Unpublished]

A decade later they

Make no more sense

Than they once did.

For the past 10 years, I've been writing editorials opposing the introduction of genetically modified crops. When I began, genetically modified corn and soybeans were still just getting a foothold in American fields. Now, of course, millions of acres—here and abroad—have been planted to these new varieties, which are usually engineered to withstand the application of pesticides—pesticides often made by the same companies that engineer the seeds. Even wheat and rice producers—latecomers to the genetically modified table—are feeling the pressure to convert. There is a frenzy in the grain markets now—a new volatility in futures and soaring prices on the ground—that seems to favor genetically modified crops. It makes sense. The cost of conventionally-grown grain goes up and up because there is less and less of it. This leaves the world open to the nearly unchecked proliferation of genetically modified crops.

After 10 years, I still oppose them. This may sound like sheer truculence on my part—a Luddite reluctance to accept the future. It is certainly dispiriting. I feel, as I did a decade ago, that genetically modified crops were introduced with bland assurances of safety based on studies from small test plots, a far different thing from the uncontrolled global experiment we find ourselves in the midst of. Scientists are still discovering the extent to which genetic fragments from these new crops can drift into other organisms. There is no evidence yet of catastrophic drift, where a genetic shard from a new crop cripples other organisms. But there is plenty of evidence to show that genetically modified fragments are turning up in places they're not wanted. The worry is not just how widespread the altered versions of familiar crops, like corn and soybeans, are becoming. It's also that many more conventional crops are being modified and that many more landscapes and ecosystems, yet untouched, will be planted with genetically modified varieties.

I feel, even more strongly than I did a decade ago, that these crops close the circle on the farmer's knowledge, finally eliminating, after 10,000 years, the farmer's role in the genetics of agriculture. These crops are rigorously licensed forms of intellectual property. Every seed is a binding contract with stiff penalties attached. This represents the final transfer of the collective farming wisdom of the human race into corporate hands. Only the minutest fraction of the DNA in a genetically modified crop has been modified. The rest is the result of the infinite elaboration of working farmers choosing their own seeds, season after season, over all those thousands of years.

But the trouble with genetically modified crops isn't merely the fact that they're genetically modified. It's that they embody so completely the troubling logic of modern agriculture. They demonstrate the tendency of commercial seeds to drive out traditional, locally-adapted varieties, a pattern that has been intensifying since the introduction of hybrid corn in the 1930s. They exemplify the consistent bias toward expensive high-tech solutions, when, in much of the world, simple low-tech solutions still make much better, and much more affordable sense. They foster the spread of commodity crops, grown for cash, in place of subsistence crops. Genetically modified crops create the illusion of more and better choices when, in fact, they represent a narrowing of genetic ownership and a model of genetic diversity that is unattainable outside the laboratory. Because of that, they may well turn out to decrease food security, especially as new non-food varieties—crops genetically modified to produce pharmaceuticals, for instance—go into production.

Above all, genetically modified crops give the illusion of revolutionizing farming without actually changing much of anything. Farmers who plant them do spend less time—and less fuel—in the field, which is a good thing. But trying to pack a revolution into a seed won't do when the entire system needs revolutionizing. Industrial agriculture is antithetical to diversity of every kind—biological, social, cultural, political. To understand its real effects on diversity you have only to look at Brazilian soybeans—a commodity crop—growing where there was once Amazonian forest. There is no disputing the enormous productivity of industrial agriculture, as

long as you measure productivity solely in terms of the relationship between yield and labor and pay no attention to the health of the land or the well-being of the people who live there. But in pursuing the unrelenting logic of an industrial version of agriculture we have left a world of alternatives unexplored.

The human species is still running ahead of the Malthusian prediction that we will outgrow our ability to feed ourselves. But this is a deeply troubling time for agriculture, as even a quick scan of the headlines reveals. Soaring food prices in the poorest parts of the world, soaring profits in the richest, ongoing—and wholly unnecessary—subsidies, growing competition between food and non-food crops, the list goes on and on. To Americans, the continued resistance to genetically modified crops in other parts of the world may look Quixotic, a refusal to accept a done deal. But it is more than resistance to a type of seed. It is also resistance to a model of agriculture whose failings are all too plain.

December 8, 1997

Editorial Observer; Biotechnology and the Future of Agriculture

By VERLYN KLINKENBORG

Not long ago a cotton crop failed in the Mississippi Delta. In some fields planted with a new, genetically altered strain called Roundup Ready cotton, most of the bolls, from which the fiber is harvested, simply dropped away. For the farmers, it was an economic disaster. For Monsanto and the Delta and Pine Land Company, the developers of Roundup Ready cotton, it was a local public relations disaster -- the result, they allege, of bad weather, insects and human error. Roundup Ready cotton incorporates a gene that is supposed to allow a cotton plant to withstand the effects of a widely used weed killer called Roundup -- Monsanto's brand of a glyphosate herbicide. Monsanto has also developed strains of Roundup Ready soybeans and corn.

Nearly 14 million acres of cotton were planted in the United States this year, 3 million with Roundup Ready cotton. The failure of even a fragment of this country's genetically altered cotton is worrying because major agricultural corporations like Monsanto have committed themselves, and America's farmers, to the belief that biotechnology is the future of agriculture. This cotton failure, small as it is in national terms, dramatically demonstrates why that belief needs serious, continued scrutiny.

For thousands of years, farmers have looked for better varieties of the crops they plant, and for all but the last half century or so, farmers have been the principal means of improving crops. My grandfather, who farmed in northwestern Iowa before World War II, is a good example. He set aside some of each autumn's corn harvest, tested the ears of corn he saved and planted seeds from the best ones the following spring. He and many thousands of farmers like him controlled the genetic material on which their livelihoods, as well as America's food supply, depended. It wasn't necessarily the most efficient means of crop improvement, but it had the virtue of being broadly based -- genetically and politically -- and locally controlled. Steady observation and experimentation by farmers, after all, is how we got from the ancestral form of maize -- a thumb-sized nubbin of seeds -- to a modern ear of corn, which is as big as a man's forearm.

The genome of corn or soybeans or cotton is literally the common inheritance of humanity. Biotechnology manipulates that genome only fractionally -- inserting, say, a gene for pesticide resistance. But that is enough to allow a corporation to patent a manipulated version of the genome. Even if a patentable gene manipulation appears fairly benign, its use has an important impact on the diversity and control of agricultural genetics. A farmer who chooses to use Roundup Ready soybeans, for instance, must pay an additional "technology fee" of $5 per 50-pound bag of seed. He must also sign a licensing agreement that requires him to let Monsanto agents inspect his fields, prohibits him from using any glyphosate herbicide but Roundup and prevents him from saving seed for future planting. He also consents, implicitly, to the further

centralization of agricultural control.

Certainly, Monsanto has a right to profit on its investment in this technology and to protect it. But the past half century in American agriculture has witnessed not only the flow of people from farms to cities but also the flow of information -- and with it economic and technological power -- from farmers to agricultural corporations. The introduction of gene-altered crops, and the licensing used to protect them, is one of the final steps in the reduction of farmers to what one agricultural foundation calls "bioserfdom" -- becoming mere suppliers of labor.

What is worse, Roundup Ready cotton offers exactly the wrong solution to the needs of farmers, who grasp at any economic advantage. There has been a boom in the production of organic cotton in recent years, driven in part by consumer demand. Roundup Ready cotton leads in exactly the opposite direction. Monsanto has created a Monsanto-brand cotton that tolerates a Monsanto-brand herbicide. In other words, the use of one Monsanto product thus guarantees the use of another. This may make sense in terms of corporate profits, but it makes no sense at all in terms of the resources that really matter -- the health of the land and the people who live upon it.

March 10, 1996

Amigo Cantisano's Organic Dream

By Verlyn Klinkenborg

IT'S EARLY JANUARY, AND TODAY, NEAR Auburn, Calif., in the foothills of the Sierra Nevada, the sun is too warm to be seasonable, the blue sky washed by remnants of early-morning fog. Three weeks ago, after a dry autumn, a major winter storm blew across the north-central section of the state. As the storm moved eastward, its force began to wane, but not before it visited this small grove of olive trees 120 miles northeast of San Francisco, harvesting them with uncanny and unwelcome thoroughness. The ground here is purple with ripe olives unprofitably leaching their oil onto the roots of last year's olive seedlings.

"Nature bats first and last," Amigo Bob Cantisano says. He is kneeling in cool shade, his bare knees and fingers stained purple. He raises his triangle hoe, a kind of hand adz, and drives it into the earth beside a seedling with smooth opposed leaves. The soil within this canopied garden is light and friable and falls away readily as Amigo -- it seems inamicable to call him by anything but his nickname -- lifts the seedling and sets it in a small plastic pot on a flat full of pots. A few yards away, Scot Woodland, Amigo's business partner, digs at a faster pace, gathering seedlings that will be bedded for another year, then planted in other groves. Amigo is talking as well as transplanting, and when thoughts begin to crowd about him, his arms grow still. "So much work just to have it all fall on the ground," he says, dislodging another shoot. "Agriculture!" he exclaims, in mock apostrophe to that bountiful but fickle deity.

Amigo Cantisano is 44 and bluffly built, the result, genetics aside, of 23 years of farming. His appearance and manner are disarming only if you think you know what a farmer should look like and how he should behave. Long black hair falls down Amigo's back, and he tends to animate, in a pliant, husky voice, the stories he tells. In conversation he can be openly skeptical, but he's a pragmatically cheerful man. By almost invisible stages he has become one of the most important figures in California organic agriculture. He has had an enormous impact on wine grape growers in the Napa Valley, at wineries like Sutter Home and Frog's Leap and E. & J. Gallo, helping them adopt organic practices. It is among the farmers who seek Amigo's advice, who worry over soils and crops and marketing with him, that the future of American agriculture is being deciphered.

In 1973 Amigo became one of the founding members of California Certified Organic Farmers. He helped start the Committee for Sustainable Agriculture, which sponsors the Ecological Farming Conference held every January in Pacific Grove, Calif., one of the most important annual events in the world of organic farming. In the late 1980's he created a company called Organic Ag Advisors and began consulting with farmers, large and small, all along the West Coast and in Arizona, Central America and Hawaii, sometimes helping them convert entirely

from conventional agriculture to organic farming, sometimes helping them add organic practices to otherwise conventional operations. "I get paid to get educated," Amigo says. "We set up trials, do research on farms, try out new ideas. My main job is to get my clients to rethink the problem of soil fertility. How are we going to get to fertility without buying fertilizer? How are we going to get to pest control without buying pesticides? We've forgotten that fertility is inherent and just needs managing."

There's something, too, in the shape of Amigo's career -- in his transformation from consumer to farmer to adviser -- that reflects a broader shift, still being painfully negotiated, in the consciousness of Americans, a growing awareness of the social, cultural and environmental dimensions of every item in the market basket. When I was growing up in the late 50's and early 60's, food seemed to be merely about the nutrient load it was capable of carrying. It was an atomic vision of food -- storehoused, canned, vacuum-sealed, archived for the day the bombs went off and it came in handy.

But Americans are looking for different kinds of essences these days. Although the number of certified organic growers nationwide is very small -- about 0.2 percent of farms, according to the Department of Agriculture -- the organic food market is one of the fastest-growing sectors of American agriculture. In the last eight years the number of organic growers in California has nearly doubled, while the certified organic acreage planted with field crops and fruits and nuts in California more than doubled between 1990 and 1994. According to Natural Foods Merchandiser, a trade journal for natural foods stores, the organic market has grown "well over 20 percent annually since 1989." Some of the largest increases have been in sales of produce, especially in supermarket-format stores, and in exports -- largely to Japan -- which were up some 80 percent from 1993 to 1994.

One major reason for this rapid growth is, of course, a concern for health. But the other major reason is quality. Food is no longer solely about its nutrient cargo. It is about the place food

comes from, about what growing, harvesting and eating it are like, and about what else is nourished in the process. The industrial food my generation grew up eating (still available at your local supermarket!) may have been mechanically complex at every stage -- sowing, cultivating, harvesting, processing, packaging, shipping -- but it was grown in a palette of soils that are becoming, under the burden of modern farm chemicals, biologically simple, dangerously deprived. Amigo's life work has been to help recover the complexity of farming, the complexity of the earth itself.

"EVEN THOUGH THIS GROVE DOESN'T YIELD very well, and the olives fall on the ground, I love this place," Amigo says, as his hoe bites again, unearthing another seedling. "The other groves we harvest have an economic potential. This one has a passion potential. This is the romantic one." What makes it romantic is the taste of its oil -- what Amigo calls "this intense green flavor, new-mown lawn."

"There are 600 named varieties of olives around the world, but a lot of the names are synonyms," Amigo says. "It's hard to tell how many varieties there really are." He calls the type littering the ground here Saracena, though at least one of the people he has shown it to thinks it may be a Nicoise. They're small olives, scarcely bigger than the pit of a large variety like the Sevillano, and they sprout well from seed. They yield about half as much oil as other olives do, and their oil contains more wax. It clouds readily in cool temperatures, and its flavor seems especially responsive to climatic shifts.

The Gold Hill Orchard, where these olives grow, lies not far from the site of the first gold-mining settlement in Placer County, and its trees were planted sometime between 1905 and 1915. It is one of six historic olive orchards being managed by the small Aeolia Organic Olive Company, whose only full-time employee is Scot Woodland and whose spiritual and technical director is Amigo Cantisano. Like all the orchards they lease, this one was badly overgrown, just another vestige of a moribund industry in the foothills northeast of Sacramento, a region that was

abandoning agriculture and rapidly subdividing.

"In Placer County in the 30's there were six operating oil mills," Amigo says. "By the 70's there was one, and it closed in 1974 or '75." Because of higher labor costs, California olive producers couldn't compete on the international bulk oil market with Italy and Spain or Turkey, Morocco and Tunisia, whose oils are often sold under Italian and Spanish trademarks. "But we saw that there was a niche coming for specialty oils," Amigo says, "and organic oil is one part of that niche." Its value has only been enhanced by recent medical reports stressing the health benefits of a Mediterranean diet, a main component of which is olive oil.

The word Amigo has used most often in my presence is "inspired," a word I'm not accustomed to hearing in farmers' mouths. And when Amigo talks about being inspired, he's likely to be talking about Felix Gillet, a Frenchman who arrived in Nevada City, Calif., 30 miles north of the Gold Hill Orchard, in 1859, when he was 24. There Gillet, who came from a family of nurserymen, opened a barbershop and began importing plants.

"One of his visions," Amigo says, "was that the foothills" -- where gold was the ruling passion -- "could become productive orchard lands. He imported the first almonds, the first walnuts, the first plums, the first chestnuts. He got the Willamette Valley in Oregon started on filberts." Gillet, who died in 1908, also helped start a silk industry in the foothills by promoting the planting of 170,000 mulberry trees, whose leaves are the sole food of silkworms, in Nevada and Placer Counties.

Amigo has continued some of Gillet's work. Ten years ago he began a census of chestnut trees in the Sierra Nevada foothills. He and his friends collected nut samples from 275 trees, most of them nearly a century old. During three successive harvests, they sampled nuts for taste, peelability and size. Then they selected the five best varieties, propagated them and gave saplings to 60 people, who altogether planted more than 4,000 trees, which at maturity will each yield 200 to 300 pounds of nuts, with virtually no care.

In this story there are two things worth noticing. One is Amigo's almost uncanny ability to find a business where no one suspected a business was hiding. The other is the cooperative, community-based nature of his work. These have been hallmarks of his career from its inception -- Earth Day 1970. "I realized we could talk a lot about the environment, but really what the environment needed was care," he says. "Agriculture seemed like a way to be involved in the environment and do positive things and also potentially make a living, raise a family." The next year Amigo walked into a health food store in Tahoe City, Calif. "I kinda went, 'You know, this isn't exactly what I would think of as the most direct way to buy food from farmers.' " So he began a food-buying club, which before long became a storefront food co-op called We the People on the north shore of Lake Tahoe. That, in turn, spawned a natural foods bakery and a wholesale distribution business. IN 1973 AMIGO, WHO GREW UP IN SAN Francisco and had never farmed, got the chance, with his future wife, Kalita Todd, to raise organic vegetables on six acres owned by friends near Yuba City. "So we started planting," he says. "Learned how to drive a tractor. Made some horrendous mistakes. I liked the challenge. I loved getting out and growing stuff. It was like a rebirth. It was amazing to be able to grow something and get it to a finished, harvestable stage and put it into a box and put our label on it and send it to the food co-op."

It so happened that Amigo began looking for organic solutions to a pest called the walnut-husk fly at the same time that entomologists from the University of California at Davis were looking for an organic test plot, still a rarity in the mid70's. "So I became a test plot," Amigo says -- a metaphor that describes his working life almost perfectly. "At the time, most people thought of organic farming as just letting nature take its course. I learned that there were proactive things you could do that were environmentally responsible but were also successful. We tried traps using ammonium carbonate and molasses. We became one of the first test plots to use beneficial nematodes. We actually made it work. We took that orchard from 90 percent infestation to like a 10 percent infestation in one year."

Amigo began to gather the missing information base for California's organic farmers. "I became a vacuum cleaner for that kind of stuff. I walked into every office in the university's entomology department and introduced myself and asked them, 'What kind of alternative work are you doing?' " After moving up to the foothills in 1976 he opened a small organic-farm-supply business in the back of his barn. That grew into Peaceful Valley Farm Supply, which Amigo sold in 1989. Today Peaceful Valley publishes a 128-page catalogue -- still mostly written by Amigo -- full of tools, beneficial insects, natural pest-management products and, especially, natural fertilizers, many of which he first developed.

At Peaceful Valley, Amigo realized that what he enjoyed most was the time he spent visiting farms. The solution was Organic Ag Advisors.

"It's not like I went out to become a farm adviser," he says. "It's that there was virtually nobody else doing this. The reason farmers hire me is that I might cut six months or a year off the learning curve and help them save money at the same time. One of my goals is to minimize the use of off-farm inputs, organic or chemical, as much as possible. So a lot of the work I do with people is figuring out how to make composts, how to do it inexpensively so they don't have to buy as much fertility from off the farm. I'm just thrilled to hang around with the group of farmers I hang around with. These are some of the most brilliant people I know. They could be rocket scientists if they chose to be. They love the work, they love being outside, they love the plants, they love feeding people. They redefine the image of farming."

Jack Pandol Jr. is the undersecretary of the California Environmental Protection Agency, and he works with Pandol & Sons, the family farm near Delano, Calif., where Amigo has been a consultant since 1989. Pandol & Sons primarily grows table grapes, using conventional and organic practices.

"Amigo doesn't have a college degree," Pandol says. "I have a degree in viticulture from UC

Davis, one of the best ag schools in the country, and I learn from him all the time. He's self-taught, and he's a tremendous observer. He's bridged over to the conventional farm community to help conventional farmers reduce the use of pesticides and fertilizer. We learned a lot from Amigo about soil nutrition, cover-cropping, composting and about the relation between the balance of minerals and nutrients in the soil and plant health, a plant's ability to resist pests and disease. From what he taught us, we found that there's an economic return. We didn't spend less on materials -- we spent more, at first -- but we improved the quality of our products." IT'S AFTERNOON, AND WE'VE MOVED TO A GROVE of olives called the Golden Bear Orchard because it rises from the banks of the Bear River, a tributary of the Sacramento. This is rolling, dry pasture studded with olive trees, and in the distance, the high, pale ridge of the Sierra Nevada is visible. In the mid-19th century this land was part of the Johnson Rancho, one of the first places settlers chanced upon as they descended from the mountains. The olive trees in this orchard were once evenly planted, but many of them were dug up and moved to Sacramento housing developments during the 60's and 70's -- a historically null fate for these historic trees. Red-tail hawks circle above us, and bluebirds cluster on a power line over the highway. We cross a barbed-wire fence. The trees around us are dark with olives: Missions, Sevillanos, Frantoios, Nevadillos. The Nevadillos, especially, seem to have been dredged in some purple dust until they look almost like giant Concord grapes. "Hey, we got a crop here!" Amigo shouts. A small herd of cattle begins to drift away. These olives will go to the press within days.

Spending the morning amid a ruined olive harvest made me wonder why this man grows olives. "I'm really committed to having fun in life," Amigo says. "Nobody makes enough money in agriculture just to do it for that. It's too hard a work to be sour. I was just dying to get back to growing things. I like to get my fingers dirty. I still like doing farm advising, but I'd rather be a grunt any day." It's a simple answer, a joke and a truth at once. But I had also been presented with answers to that question all day long, in the taste of the oil, in the sight of Amigo and Scot Woodland performing the most basic of agricultural tasks, kneeling in an orchard, parting the

earth with their hand tools.

The complexity of olive oil becomes more evident the more simply it is presented. Olive oil is like wine in that regard: you are consuming the place, the microclimate, the character of the soil and, too, the character of the human who has produced it, the care with which it has been handled and pressed. And something of the same relation prevails in farming. The simplest methods often reveal the greatest complexity. The word "organic" still seems to imply, falsely, that something has been left out of the growing process, that a farmer merely surrenders to nature in order to produce a crop whose virtue is the absence of chemical fertilizers and pesticides. "The best of organic farmers have to be highly skilled," Amigo says as we drive back across the foothills. "I mean this is not a low-tech system. You have to plan for things, you have to take actions way in advance of what the guys with the chemicals do."

While we were walking through the Gold Hill Orchard that morning, slipping on the olives underfoot, it occurred to me to ask Amigo -- who is producing, after all, an expensive specialty-food product -- how we were going to feed the world. Amigo put down his hand hoe. "We're not going to feed the rest of the world, I'll say that. I think we can only feed the group that we can feed economically. Where the rest of the world can get fed, though, is with foods that are being produced conventionally but can be farmed organically at virtually the same cost. The other place where people can keep costs down is by dealing direct -- at farmers' markets. You see a lot of lower-income people shopping at farmers' markets because that gives them an opportunity to get quality, freshness and a reasonable price."

As I listened to Amigo, I realized that my question had contained a false, half-hidden assumption -- that the world can be fed only with processed food, Government cheese -- and that it was based on the wrong syntactical model. The question isn't how do we feed the world, but how do we all feed ourselves. The vision of agriculture that will sustain a world is necessarily a complex one. It includes, as it has for millenniums, oil pressed from olives grown organically in small groves, and

it includes, for the moment, tank cars filled with corn oil moving in trainloads across horizon-wide, chemically fertilized cornfields. Both crops are staples. The conflict between the way they are grown may one day turn out to be nothing more than a historic anomaly, though it often takes a person of Amigo's persistent cheerfulness to believe that agriculture is headed in the right direction.

January 23, 2008

EDITORIAL OBSERVER

Closing the Barn Door after the Cows Have Gotten Out

By VERLYN KLINKENBORG

Last week, the Food and Drug Administration cleared the way for the eventual sale of meat and dairy products from cloned animals, saying, in effect, that consumers face no health risks from them. The next day, the Department of Agriculture asked farmers to keep their cloned animals off the market until consumers have time to get over their anticloning prejudice. That is one prejudice I plan to hold on to. I will not be eating cloned meat.

The reason has nothing to do with my personal health or safety. I think the clearest way to understand the problem with cloning is to consider a broader question: Who benefits from it? Proponents will say that the consumer does, because we will get higher quality, more consistent foods from cloned animals. But the real beneficiaries are the nation’s large meatpacking companies — the kind that would like it best if chickens grew in the shape of nuggets. Anyone who really cares about food — its different tastes, textures and delights — is more interested in diversity than uniformity.

As it happens, the same is true for anyone who cares about farmers and their animals. An agricultural system that favors cloned animals has no room for farmers who farm in different ways. Cloning, you will hear advocates say, is just another way of making cows. But every other

way — even using embryo transplants and artificial insemination — allows nature to shuffle the genetic deck. A clone does not.

To me, this striving for uniformity is the driving and destructive force of modern agriculture. You begin with a wide array of breeds, a truly diverse pool of genes. As time passes, you impose stricter and stricter economic constraints upon those breeds and on the men and women who raise them. One by one, the breeds that don't meet the prevailing economic model are weeded out. By the beginning of the 21st century, you've moved from the broad base of a genetic pyramid to its nearly vanishing peak, which is to say that the genetic diversity present in the economically acceptable breeds of modern livestock is minute. Then comes cloning, and we leave behind all variation.

Cloning is not unnatural. It is natural for humans to experiment, to try anything and everything. Nor is cloning that different from anything else we've seen in modern agriculture. It is another way of shifting genetic ownership from farmers to corporations. It is another way of creating still greater economic and genetic concentration in an industry that has already pushed concentration past the limits of ethical and environmental acceptability.

It always bears repeating that humans are only as rich as the diversity that surrounds them, whether we mean cultural or economic diversity. The same is true of genetic diversity, which is an essential bulwark against disease. These days there is less and less genetic diversity in the animals found on farms, and farmers themselves become less and less diverse because fewer and fewer of them actually own the animals they raise. They become contract laborers instead.

It is possible to preserve plant and crop diversity in seed banks. But there are no animal banks. Breeds of animals that are not raised die away, and the invaluable genetic archive they represent vanishes. This may look like a simple test of economic efficiency. It is really a colossal waste, of genes and of truly lovely, productive animals that are the result of years of human attention and

effort. From one perspective, a cloned animal looks like a miracle of science. But from another, it looks like what it is: a dead end.

May 6, 2001

The Way We Live Now: 5-6-01; Pox Populi

By Verlyn Klinkenborg

Since Feb. 19, Britain has been under the pall of foot-and-mouth disease, or aftosa fever, as it's called in other parts of the world. The clinical slides of afflicted animals are unpleasant enough. They show blistered tongues and gums, lesions on the coronary band, where hair meets hoof, a look of slackness and profuse salivation. But the news photographs are genuinely gruesome -- stiff, swollen cattle stacked on their backs in long rows for mass interment, sheep penned in great herds for killing, farmers looking away from the sight of it all in grief and disgust. If you believe Daniel Defoe, whose "A Journal of the Plague Year" is closely attested fiction, one of the worst horrors of the 1665 London plague was the shutting up of houses where infection was discovered. By official order, healthy occupants were imprisoned with the dying, a red cross marked on the door, a watchman posted outside. That's how the containment of foot-and-mouth disease works too.

Foot-and-mouth disease is a viral infection that causes fever, blisters and lesions, and results in weight loss and a reduction in milk production. It doesn't kill adult animals. It doesn't have to. The human fear of contagion kills them. Every disease is economic, to some extent, but foot-and-mouth is nearly a purely economic disease. Its worst effects are caused by fear of the economic consequences of its spread. Beasts that are healthy or would otherwise get well are destroyed not to save them from suffering but to keep them from endangering the market value of other, unaffected livestock. Above all, they're destroyed to protect international trade, since countries like the United States ban imports from countries where animals have been infected as well as

those where they have been vaccinated (since it can be hard to tell vaccinated animals from infected ones). People who have no contact with agriculture -- most of us, in other words -- are sharply reminded from time to time that in the common agricultural view of things, cattle and sheep are primarily economic beings, their well-being, their care, their ultimate fate determined almost entirely by the investment they represent. This is one of those times.

It's not just images of mass killing, however, that make foot-and-mouth so disturbing. It's the fear of mass contagion, a fear that returns us, somehow, to a time of epidemics like smallpox or bubonic plague or Spanish influenza, a time when effective barriers against the spread of disease were almost nonexistent. Foot-and-mouth disease is an old-fashioned, pestilential scourge -- a word derived from the Latin excoriare, meaning, aptly, to strip off the hide. Foot-and-mouth moves swiftly, vehemently. It sifts across borders, carried on the wind, on the breath of animals, its symptoms condemning entire herds, whole regions. This is a mode of disease -- highly and pervasively contagious, like smallpox -- that's no longer familiar to most of us, not even in our nightmares.

The diseases we tend to dread these days are what might be called deep diseases: slow to catch, the catching and the ultimate causes often hidden as a result. Many cancers are deep diseases, and so is AIDS. Even when they are epidemic, we tend to think of these as inherently personal diseases. They don't rush through a whole society, sweeping away entire neighborhoods in a week or a month, driving the population into exile or seclusion. Deep diseases turn the body against itself, slowly twisting biological coherence into incoherence, inciting rebellion from within.

Bovine spongiform encephalopathy, better known as B.S.E. or mad cow disease, is a deep disease, too, caused by prions, abnormally folded proteins that form clusters and slowly perforate the brain. Like AIDS, it's a relatively new deep disease. The European outbreak that was first recorded in 1986 was almost certainly caused when animal protein (some of it tainted with

prions) was fed to cattle, part of the quest for a cheaper protein supplement and a greater profit margin in intensive agriculture. When humans eat meat containing prions, they don't contract B.S.E., but they can contract a related disease called new variant Creutzfeldt-Jakob, which results in dementia, abrupt muscular jerking, seizures and death.

Terrible as foot-and-mouth disease is, its superficiality and epidemiological haste are almost merciful. More than 1,400 cases have been identified in Britain since Feb. 19, and 2,240,000 animals, most of them sheep, have been either slaughtered or marked for slaughter. It's a staggering rate of destruction, but when the destruction is done, there's an ascertainable chance that the disease will have been contained. B.S.E. is a different story. Britain has destroyed nearly five million ruminant farm animals, and the number of British B.S.E. cases has fallen from nearly 37,000 in 1992 to fewer than 1,500 last year. But because it can take years to show itself, and because the official response to it was so sullen and so politically corrupt at first, there's really no gauging its spread. In recent months, it has appeared in several European countries where it was unknown before. The question waiting to be answered is, Where is B.S.E. still lurking? A pungent question, since it may be lurking in some of us.

That deep fear is the lingering ghost behind the present foot-and-mouth outbreak. Though the two diseases are profoundly different, the imagery that surrounds them is so close -- the verdant countryside, the piles of dead animals, the grief-stricken farmers -- that it's impossible to consider one in the absence of the other. On a practical level, the decision to kill all the livestock even remotely at risk for foot-and-mouth conforms to the standard agricultural and mathematical models for how to handle this scourge when vaccination is not an option. But on another level it is a form of political self-preservation. When people see the news images of this slaughter and its consuming fires -- smoke billowing out of the green hollows of Cumbria and Devon, smoke tainted by the smell of burning flesh -- they don't think back to the foot-and-mouth outbreak that hit Britain in 1967. They think back only a few years to the discovery of B.S.E. They remember

how vociferously John Major's government insisted that nothing was wrong, and how ready it was to put public relations before public safety. The present government remembers it, too, which is one reason that in March and early April parts of Britain looked like the landscape of forgotten contagion.

One disease is never a perfect metaphor for another. There are always fundamental differences, as there are between B.S.E. and foot-and-mouth disease. From a human perspective, these two epidemics are almost ideally distinct: the fatal disease is not contagious; the contagious disease does not affect humans. But it's the resemblance between them that haunts us, not the dissimilarity, a resemblance that evokes other epochs, other epidemics when humans, not animals, were the victims.

March 25, 2001

The Rural Life; The Logic of Pigs

By VERLYN KLINKENBORG

For the past three months, I have been thinking about raising pigs. Ask anyone who knows me. Sooner or later, the conversation turns to raising pigs. I have a small shelf full of books whose titles include the words "pigs" and "successful." I have even sold, as futures, the four quarters of a prospective pig to friends who have decided to humor me. At this moment in Montgomery County, N.Y., a sow is pregnant, or "in pig" as the pig farmers say, with a litter of piglets from which I hope to take two in May, when they should weigh about 40 pounds apiece. The sow and the boar who bred her are Tamworths, an uncommon, endangered breed, lean, gingery, bacon types, good foragers, good mothers.

What decided me on pigs was meeting a farmer who still raises pigs on pasture. "I have a pasture," I remember thinking. What all this means is that I am giving in to the logic of where I live and the land I live on. A place like this -- a very small farm in Columbia County with

pasture, garden, woods and rock -- is always asking of me, "What can you do yourself?" I didn't even hear the question at first. All I meant to harvest was lettuce and metaphors and peaches in a good year and, of course, bushels of horse manure. But each added layer of complexity -- reseeding a pasture or keeping bees -- points toward other layers of complexity, like pigs, that lie just a short logical leap away. I have no illusions of attaining self-sufficiency. The only sufficiency I want is a sufficiency of connectedness, the feeling that horses, pigs, bees, pasture, garden and woods intertwine.

The 19th-century English ruralist Richard Jefferies once wrote that "every condition of modern life points in the direction of minute cultivation. Look at all the people in great cities (and small cities, for the matter of that) who cannot grow a single vegetable or a single apple for their own use." I don't know whether Jefferies would have argued that if you can grow vegetables and apples (and pigs, for the matter of that), you should. But he did argue that instead of growing a single crop, like wheat or corn, it might be better for many farmers to grow a wide variety of crops on their land, to cultivate minutely, an idea that has proved true all over the world. The agriculture Jefferies had in mind was a deep biological complexity, not quarter-sections of soybeans.

I am no farmer, and the land I live on is naturally better suited to growing a little of many crops than to growing a lot of one. The economic argument for raising vegetables and apples and a couple pigs is small change anyway. But the garden waste and the windfall apples will go to the pigs, as will pasture grasses and hickory nuts and beech mast and some commercial grain. Meanwhile, the pigs will fertilize the pasture and grub out the underbrush at the edge of the woods. In late autumn I'll haul them up the road to a local, independent slaughterhouse, which has a smokehouse of its own. I don't know what I will think when that happens, though nearly everyone tries to tell me how it will be. VERLYN KLINKENBORG

January 24, 2002

Editorial Observer; Finding Out How the Neighbors Are Faring

By VERLYN KLINKENBORG

According to the venerable Adam Smith, "the great commerce of every civilized society is that carried on between the inhabitants of the town and those of the country," who are, he writes, "mutually the servants of one another." In some deep-down sense that must still be true, though everything has changed since those words were published. Food still comes from farms, and farmers still buy products made in cities. Farmers, of course, never forget that reciprocity. But to city dwellers, who now make up nearly the entire population of America, agriculture tends to look, unfortunately, like an afterthought, a remnant industry fighting in Congress for a disproportionate share of the national wealth.

The farm-bill debate will begin again in the Senate next week, taking up where it left off after a wearisome round of deliberations just before the Christmas recess. It looks now as though the single most important moment in this long season of fitful farm legislation will turn out to have been the publication on the Internet of the Farm Subsidy Database by the Environmental Working Group, a nonprofit research organization based in Washington.

This is a searchable database that allows anyone to see just how much money individual farmers -- 2.5 million of them -- have received in federal subsidies during the past five years. The database Web site is www.ewg.org and has been searched 18.3 million times. You have to wonder how many of those searches were made by farmers.

It takes some imagining to grasp the impact of public information like that. Like the rest of us, farmers naturally wonder how the neighbors are doing. But farmers are much more intent in their assessments. When I ride to town with one of my farming aunts or uncles they see a completely different countryside than I do.

They know who owns the fields they pass, or who rents them and what they rent for. They identify the places where a corn planter broke down last spring by the breakdown in the symmetry of the rows. They are up to the minute on the price of soybeans and soybean futures. They can take one look at a new confinement hog barn on a neighbor's place and factor out all of the costs and tell you in a split second the likelihood of that neighbor ever making a profit on hogs.

If you've ever visited a grain elevator during the harvest season, you realize that many things about farm finances are an open book, to those who understand how to do the reading. The grain trucks lined up at the elevator are mostly the same size and filled with grain dried to the same degree and being sold or borrowed against or stored at prices that are openly discussed. No mysteries there.

And now no mysteries in their subsidy checks either. Now farmers can look up five years of federal payouts on the Web and compute a rough but reasonable profit-or-loss statement for the people down the road. It's a little like suddenly knowing the take-home pay of everybody on the block, how their debt and investments are structured and which of them have made a mess of their tax planning.

I'm not sure how much this new knowledge changes the kind of conversation farmers are having among themselves. It's one thing to know something you don't want the neighbors to know you know. It's something else entirely to admit that you actually checked to see how the neighbors are faring.

The farmers I know tend to speak elliptically about most matters anyway, economic or otherwise. Even the knowledge that they're all in this together -- all of their subsidies out in the open -- won't necessarily get them to talk to each other about how much they're getting or not getting. To them, after all, the farm supports that look so byzantine to us are a way of life. The news here, for them,

isn't the way the system works. It's the detailed numbers the system generates. Knowing those numbers makes nobody comfortable, neither the ones who are doing well nor the ones who are doing poorly.

September 3, 2000

Editorial Observer; Attracting New Immigrants to the Heartland

By VERLYN KLINKENBORG

Iowa isn't a crowded place. It wasn't crowded when I was growing up there in the 1950's and early 60's, and it isn't crowded now. In 1960, when I was in third grade, the state population was 2,757,537 and still slowly climbing, as it had been all century, until it reached a peak of just less than three million people in 1980.

Yet things haven't been as static in Iowa as these figures suggest. The way that Iowa isn't crowded has changed. The number of third graders has plummeted, and the population as a whole has gotten older. The percentage of the population over 80 is larger in Iowa than in any other state. Iowa is the only state besides Florida with more people over 75 than under 5.

That is one of the reasons the state -- which has nearly always experienced annual net migration losses -- wants to encourage immigration. A plan to do just that, produced by a bipartisan governor's commission called the 2010 Committee, has caused an uproar in a state that is overwhelmingly white. In fact, the commission's report merely recognizes a demographic reality. Without immigration, the state's labor force will steadily dwindle. The only reason Iowa's population has not fallen further is because of immigrants who have come from Mexico, Vietnam, Bosnia and elsewhere. The greatest demand for labor comes from industries like meat packing.

The population problem in Iowa isn't merely that its residents are getting old and its young people

are leaving. The problem is tied directly to the character of agriculture in the state. In 1960 there were 174,707 farms in Iowa, down from a peak of around 215,000 in 1930. Last year there were about 96,000 farms, though the amount of farmland in cultivation had barely changed. There are 15 million hogs in Iowa, but they are raised on fewer than half as many farms as just a decade ago.

It can be hard to grasp the implications of a shift that large. Think of a farm, for a moment, not as a tract of land or so many acres of corn and soybeans. Think of a farm instead as a constellation of people, each of whom has ties to a local community -- to churches and schools, to banks and farm-implement dealers, to co-ops and Lions Clubs. In 1960, small towns were thriving not on the prosperity of town residents alone but on the prosperity -- and the population -- of farms in the adjoining countryside.

Now half of those farms are gone, their groves cut down, their houses bulldozed, their constellations of people dispersed. Year by year, the size of farms increases and their work force diminishes. The towns are very quiet, except the ones lucky enough to hear the roar of enormous grain driers at the elevator out by the railroad tracks. School districts have consolidated, and small-town business is just a ghost of itself. It is not uncommon to come across a sense of disinheritance among Iowans, especially those living in small towns. The bond that tied them to the farmland around them -- a bond that was social as well as economic -- has to a striking degree been severed. There is no one on the farms, and the towns have no one to serve except their aging residents.

All of this has come about because of a faith -- an unproved faith -- that the only way for agriculture to prosper is for farms to become bigger and bigger. There is no question that Iowa raises vastly more corn and soybeans than it did in 1960. But at what cost? Farm prices are as low as they have ever been, and farmers now pray for emergency funding from Congress the way they pray for rain. One of the indisputable results of large-scale corporate farming in Iowa has been

the depopulation of the countryside. An agricultural job in Iowa is now a meat-packing job, highly dangerous, badly paid and emblematic of an approach to farming that will serve Iowa's new immigrants as badly as it has served its longtime residents.

May 9, 2004

Editorial Observer: A Meeting of Cattlemen From Two Cultures on the Mexican Border

By VERLYN KLINKENBORG

In modern, industrialized agriculture, the benign cow sometimes looks like a nightmare creature, a carrier of human fears about E. coli, environmental degradation, mad cow disease and dire concentration in the meatpacking business. But none of this is the cow's fault. And in a few places, the cow is still something more than a warm-blooded economic integer or a plague on the hoof. In those places cattle still anchor a way of life, a grassland culture of great subtlety and beauty. Not long ago, I visited a windswept region in New Mexico and Arizona, along the Mexican border, with representatives from two of those cattle cultures: a coalition of local ranchers and scientists, called the Malpai Borderlands Group, and a group of Masai from Kenya and Tanzania.

At first, the differences seemed almost overwhelming. The Masai live intimately with their zebu cattle, naming each one, walking them long distances to water and good grazing, and they could not quite believe that the Malpai ranchers gathered and counted their cow-calf pairs only twice a year, at branding and shipping. The wildness of American range cattle amazed the Masai. It seemed just as surprising to the ranchers that Masai women milked their beef cattle, sharing the udder of a lactating cow with its calf, and that a zebu could lower its metabolism in response to drought.

Some of the ranchers had been to Kenya a couple of years earlier and knew firsthand what the

subsistence living of Masai pastoralists looked like. But this was the first trip to America for the Masai, and they asked penetrating questions. Sitting on the bunkhouse-porch of a 500-square-mile ranch owned by the Animas Foundation, a Masai named Joseph Mioron, from a group ranch near Amboseli in Kenya, asked whether the things he saw around him -- the pickup trucks, the beautifully restored buildings, the vast adobe barn -- were paid for by cattle. he answer, of course, was that they were merely justified by the cattle.

But beneath the differences -- dusty jeans and silver belt buckles versus traditional red-checked blankets and beaded bracelets -- lay profound similarities. The Malpai ranchers, most of whom ranch on a modest economic scale, banded together a decade ago to collectively manage their delicate ecosystem, which lies at the confluence of several biomes. With state and federal agencies, they planned a fire regime that allows natural fires to burn themselves out instead of being suppressed. They have turned this harsh region into a laboratory where scientists can study the natural rhythms of grasslands. The ranchers argue, and science has begun to show, that natural fire and appropriate grazing keep the grasslands healthy and open and that cattle are an environmentally valuable presence.

The same issues confront the Masai but in more extreme forms. Over the past few decades their lands have dwindled to the point where some Masai have begun to feel that the only way to hang onto any land at all is to convert it to private ownership. That would be death to a pastoralist culture, whose villages, easily moved in search of fresh grass, become biological hot spots -- fertile sources of new diversity -- once they've been abandoned. And, as the Masai explained in our front-porch conversations, they and their cattle have coexisted with wildlife for thousands of years. The cattle graze among wildlife and, since the Masai traditionally subsist on the milk, blood and meat of their cows, the cattle form a buffer that protects wildlife from hunting. Only in severe drought have the Masai in the past hunted wildlife, which they call their "second cattle." Like the Malpai ranchers, the Masai have begun to learn that sometimes sound ecological

management is not left to the government or outside experts.

For four days, the cattlemen talked and I listened alongside them. We rode mules up into the Peloncillo Mountains -- the first time the Masai had ever ridden -- and we convened at a barn dance on a Sunday night that brought nearly the whole Malpai community together. There was an acoustic western band and a singer (also the cook) named Kip Calahan, who belted out songs like "What Cowboy Means" and "Al Valle de Animas." The Masai performed a traditional dance -- imagine a slow train huffing forward, heads bobbing like puffs of smoke blowing back over the cars -- and darted into the crowd to drag their new friends into the dance. We ate beef, and then the cowgirls taught the Masai to waltz and two-step. The next morning they learned to rope a straw bale with a plastic calf's head on one end.

Those were the diverting gestures of friendship, but the real bond was formed in the long talks themselves. As with any discussion of serious problems -- in this case subdivision, the threat to a way of life, the pervasive misunderstanding of a culture -- there were moments of sober doubt, when the Masai and the ranchers suddenly seemed wrapped in the fragility of what they were trying to protect. But then it would occur to us that here we were, working together on the problem, trying to understand how communities could teach each other what they know. The knowledge of how to serve these lands, the Malpai and Masai land, belongs to the people who live on them. It was always an encouraging thought.

February 9, 2005

EDITORIAL OBSERVER

Keeping Iowa's Young Folks at Home After They've Seen Minnesota

By VERLYN KLINKENBORG

Lately the Iowa Legislature has been trying to find a way to solve a basic problem: how to keep young people from leaving the state. Right now, Iowa's "brain drain" is second only to North Dakota's. The Legislature is toying with a simple idea, getting rid of state income tax for everyone under 30. This proposal was front-page news in California, where most of Iowa moved in the 1960's.

Let me translate the economics of this plan. The State Legislature proposes to offer every young tax-paying Iowan a large delivery pizza - or its cash equivalent, about $12 - every week of the year. But smart young Iowans know this is only an average figure. The more you earn, the more state income tax you save.

If ever there were an incentive to earn your first hundred million by the time you're 30, this would be it. Never mind that South Dakota, right next door, charges no income tax no matter how old you are.

Of course, there are serious questions about financing this tax break, which could cost as much as $200 million a year. The best bet would be to require young people to spend their dole on the Iowa Lottery.

Iowans are resolutely practical about such proposals. One state legislator, quoted in The Minneapolis Star Tribune, said: "Let's face it. Des Moines will never be Minneapolis." He might

have added that Council Bluffs would never be Kansas City. Another Iowan, when asked what the state needed to keep its young people, said, "An ocean would help." This is the kind of big thinking Iowa has always been famous for.

But $600, the average yearly state income tax for Iowan 20-somethings, is not enough to undo decades of social erosion. The problems Iowa faces are the very solutions it chose two and three generations ago. The state's demographic dilemma wasn't caused by bad weather or high income taxes or the lack of a body of water larger than Rathbun Lake - an Army Corps of Engineers reservoir sometimes known as "Iowa's ocean." It was caused by the state's wholehearted, uncritical embrace of industrial agriculture, which has depopulated the countryside, destroyed the economic and social texture of small towns, and made certain that ordinary Iowans are defenseless against the pollution of factory farming.

These days, all the entry-level jobs in agriculture - the state's biggest industry - happen to be down at the local slaughterhouse, and most of those jobs were filled by the governor's incentive, a few years ago, to bring 100,000 immigrant workers into the state.

Business leaders all across Iowa have been racking their brains to think of ways to spur economic development. But nearly every idea leaves industrial agriculture intact. That means a few families living amid vast tracts of genetically modified soybeans and corn, with here and there a hog confinement site or a cattle feedlot to break the monotony.

People love to blame the death of America's small towns on the coming of Wal-Mart, but in Iowa, Wal-Mart is just a parasite preying on the remains of a way of life that ended years ago. Every farming crisis - they seem to come at least once a decade - has shaken a few more farmers out of the business, consolidating land holdings and decreasing the rural population that actually depends on small towns to do business in. The complex connection between town and country

that characterized the state when I lived there has long since been broken.

There is not enough life in the small towns of Iowa to keep a young person, and there is no opportunity on the land. The state faces an excruciating paradox. It can foster economic development of a kind that devours farmland - the sort of thing that is happening around Des Moines. Or it can try to reimagine the nature of farming, with certain opposition from farmers themselves and without any help from the federal government, which has fostered industrial agriculture for decades.

I used to joke that Iowa's two leading crops were rural poverty and crystal meth. But it's not a joke. The fact is that Iowa is a beautiful state. Minneapolis isn't that far away. Iowa would be a great place to live, if only the air and the water weren't polluted and you could be sure you wouldn't find yourself living next to 10,000 sows in a hog prison. There was a time, well within my dad's memory, when Iowa's agriculture was diversified and when the towns were rich in a culture of their own devising.

I grew up in the latter days of such a town, and I find it hard to imagine a better place to have been a kid.

My family moved away from Iowa in 1966, for reasons that had to do with my mother's health and not with economics or even the decline in pheasant hunting. I'd like to say I stared out the rear window as we pulled out of town, watching the state of my boyhood recede, but I didn't. We were going to California, which trumps Minneapolis. I was lucky to leave before I knew I would need to.

January 10, 2004

Editorial Observer; Coming to Terms with the Problem of Global Meat

By VERLYN KLINKENBORG

The DNA proves that the Washington State Holstein found to have bovine spongiform encephalopathy, or mad cow disease, in December definitely came from a Canadian herd. You can almost hear the relieved sighs of the American cattle industry, joined by the sighs of grain farmers and exporters and meatpackers and the U.S.D.A. itself. In the world of bureaucratic borders, this fact of origin makes a vital difference. It will probably allow the United States to retain its status as a non-B.S.E. nation, and that in turn will allow us to pry open the borders that slammed shut, stranding shiploads of frozen meat and causing cattle prices to drop sharply, almost as soon as that one case was discovered.

But in the world of global meat, the DNA doesn't make a bit of difference. Moving cattle, meat and meat byproducts across borders is one of the things our agricultural system does extremely well. That becomes obvious only when the system stops, and it stops only when a disease looms, whether it's a slow plague like mad cow disease, which takes several years to incubate, or a fast plague like hoof and mouth disease, which ravaged British farming just as it was beginning to recover from the effects of mad cow disease.

Industrial agriculture is indeed industrial. It is designed to move parts along a conveyor belt, no matter where the parts come from. And if one of the parts proves to be fatally defective -- a dairy cow with the staggers, for instance -- then shutting down the conveyor nearly always comes far too late.

It has been instructive watching American agriculture respond to this minicrisis. The usual players have retreated to their usual corners. Some cattle growers have publicly praised the beef checkoff program, which collects a small percentage of the sales from every producer for

advertising, because it creates the illusion of a unified voice in a time of trouble. Supporters of country-of-origin labeling, which would identify the source of every cut of meat, have promoted its potential virtues, while opponents argue that it would make no difference or be too expensive. The real necessity is to provide accurate, detailed tracking of every individual animal, though the United States Department of Agriculture is poorly equipped to make it happen anytime soon. The inherent logic of all these positions is simply to make the status quo safer, so global meat can go about its business uninterrupted.

But what is needed to avert a major crisis is real change, from the bottom up. The global meat system is broken, as a machine and as a philosophy. In America, meatpacking has gone from being a widely distributed, widely owned web of local, independent businesses into a tightly controlled, cruelly concentrated industry whose assumptions are utterly industrial.

Modern meatpacking plants are enormous automated factories, as void of humans as possible. The machinery, like the now-notorious automated meat-recovery system, is very expensive. Profitability requires an uninterrupted flow of carcasses. To packers, that means that they, rather than independent farmers, should own the cattle, hogs and poultry moving through the line. The federal government agrees. Every effort to outlaw packers' ownership of livestock has failed.

The result is a system in which the average drives out the excellent, and the international drives out the local. I know a large-scale rancher in north-central Wyoming who does everything he can to raise beef cattle of the highest quality. That means good genetics, good grass and as few chemical and pharmaceutical inputs as he can possibly manage. But then the cattle are loaded onto trucks, shipped to feedlots and hauled to slaughter, where they merge with the great river of American meat, indistinguishable from all the rest. There is no real alternative to the concentrated meatpacking and distribution system. Any alternative -- grass-fed, organic beef, separately slaughtered, separately marketed -- is merely a niche so far.

In science fiction movies, there is often a moment when space colonists talk about "terra-forming" a suitable planet. They mean giving it a breathable atmosphere and terrestrial flora and fauna. We are going through a different process on the one planet we have. We are agri-forming it. We have given over vast tracts of rain forest to cattle production. We have exported our confinement system of hog production to Brazil, which is now a major producer of soybeans, and we are doing everything we can to force it on Poland, which is one of the remaining pockets of relatively indigenous agriculture in Europe. Every distinctive food culture, every island of genetic difference in farm animals and crops, and every traditional relationship between humans and the soil are threatened by global meat and its partner, global grain.

The consequences are more far-reaching than we like to think. Last month a U.S.D.A. spokesman said that a herd of cattle in Washington State was going to be "depopulated" as a preventive measure. Apart from the coarseness of the euphemism, the word is a perfect summary of the effect of agri-forming.

Take Iowa, where I was raised. As farms have gotten larger and larger, the number of farmers has plummeted. As a result, the towns have dwindled, and there are not enough workers for the industrial meatpacking plants in the state, which officially encourages factory farming. A few years ago, the governor started a program to invite 100,000 immigrants to Iowa to fill those empty meatpacking jobs. A depopulated countryside is, in effect, a de-democratized countryside, no matter what the Iowa caucuses may suggest. But so is a town filled with captive workers in a captive industry. We like to pretend that the problem with global meat stops at the borders. But it reaches right down into the heart of our own lives and institutions.

January 5, 2004

Editorial Observer; Holstein Dairy Cows and the Inefficient Efficiencies of Modern Farming

By VERLYN KLINKENBORG

Sixteen years ago, I met a Holstein cow named Juniper-Mist Bell Paula. She lived in splendid solitude in a stone-walled paddock on a venerable Massachusetts farm. Bell Paula was, in fact, more chicken than cow. Her job was to produce eggs, not milk. Several times a year, she was given hormones that caused her to super-ovulate -- to release many eggs instead of one. These were flushed from her, fertilized and implanted in receptor cows as near as the next stone paddock or as far away as China and Japan. The reason was Bell Paula's milking record. At the time, an average Holstein in America -- the ubiquitous black-and-white dairy cow -- gave some 16,000 pounds of milk a year. Bell Paula could give 31,000 pounds a year when she was still being milked.

If Bell Paula represents one end of the Holstein spectrum -- the long-lived queen of the hive, so to speak -- the Holstein in Washington State that was found last month to be infected with bovine spongiform encephalopathy, or mad cow disease, represents something much closer to the middle. She was unusual only in the disease she carried. When it became clear that she was unhealthy, she was slaughtered. And, under a testing regime that was changed only last week, her carcass, once tested, was presumed to be safe and fed into the system, instead of being held until the test results were in.

There was nothing anomalous in that Holstein's slaughter. Beef cattle and dairy cattle represent two different types of animal, but their fates are identical. What most Americans do not realize is that nearly every dairy cow eventually becomes either hamburger or the cheaper variety of steak when her profitability drops. Holsteins are frequently culled for slaughter when they are between

5 and 6 years old. When you figure that a Holstein first gives milk when about 2 years old, that means a productive life on the dairy farm of about three years. In that brief life span, everything is done to maximize yield, including the regular use of antibiotics and the feeding of high-protein concentrates of the kind that used to contain meat and blood meal from other Holsteins, a practice that has since been banned.

After poultry and pigs, the dairy industry has become one of the most concentrated forms of agriculture in America. The old mental picture of a herd of Holsteins standing hock-deep in pasture bears no relation to the way milk is produced in much of America. Some herds, especially in the West and Southwest, number in the thousands, which means the animals spend their lives in barns on cement where they are milked automatically, in some cases on huge rotating platforms that look like something out of science fiction.

For all their adaptability, even Holsteins can put up with only a certain amount of this. By the time they mature, at around 5 years old, many begin to break down from leg and foot problems. Dairy organizations distribute locomotion charts to help workers assess lameness, which can lead to reproductive failures -- another reason for culling animals. Other cows begin to fail from the stress of carrying an udder that can weigh as much as a full-grown man. To prepare them for slaughter, the cows must be given time to get any residue -- the word means traces of drugs -- out of their systems.

As always, the goals of industrial agriculture create a perverse logic. Instead of adapting the agricultural system to suit the animal, we try to adapt the animal to suit the system in order to eke out every last efficiency. We may take it for granted that dairy cows will eventually be slaughtered. But strange as it sounds, it makes greater financial, ethical and social sense if we subscribe to the cows' notions of efficiency, which do not include living on concrete or eating anything but grass and grain, rather than to ours. The animals would be healthier, their milk would be better, and we would not have to worry quite so much about what was in our food.

At some point Americans will begin to judge agriculture not by its intentions but by its unintended consequences. The intention in the dairy industry has always been to streamline, modernize, automate, all in the interest of greater profits. But the consequence has been to concentrate power and money in the hands of a few, to drive down prices and to create a national surplus of milk that forces small dairy producers out of business. That, in turn, frees former dairy land for development, for suburban sprawl. The consequence has also been to breed an animal that can barely sustain the way she is forced to live.

The river of milk in America brings with it a river of ground beef made from dairy cows, a river that is almost impossible to inspect adequately in a deregulated industry. The problem isn't just a concentration of meat. It's a concentration of political power that hamstrings any calls for closer inspection. The industry has been quick to point out that far more people die from salmonella and E. coli than from mad cow disease. That's not exactly a reason to stand up and cheer.

It's possible that the Washington State Holstein may have had the only case of mad cow disease we come across. But if so, it will have been luck rather than good planning. According to the philosophers at Cow-Calf Weekly, an online journal for the beef industry, "Perception is reality." That's the sort of thing one says when the reality is too unbearable to look at.

January 20, 2004

Editorial Observer: The Whole Cow and Nothing but the Whole Cow

By VERLYN KLINKENBORG

In the mid-1990's, British officials had been trying for almost a decade to respond to the appearance of bovine spongiform encephalopathy, or mad cow disease, in a herd near Ashford, England. At first, they simply dismissed public concern or proclaimed their faith in British beef. Even when humans began dying of variant Creutzfeldt-Jakob disease -- the human equivalent of B.S.E. -- government officials found it hard to act coherently. They had the one excuse that we

lack: they didn't know what they were confronting. In time, the British government put in place a set of prohibitions against the use of meat and bone meal as food for cattle and against the sale of certain kinds of offal for human consumption. Those steps have seriously reduced the incidence of mad cow disease.

The British government also introduced a strict system for tracking every cow in the country, something we are only now edging toward. By the mid-1990's in England, you could follow a cow's paper trail right up to the slaughterhouse door. But what then? Live cattle almost certainly can't spread mad cow disease. Dead cattle can, if the wrong things are done with them. After a decade of wrangling, the British decided to create an system to track cow parts.

It sounded like a good idea, but it was never completed. The reason is that the parts of a slaughtered cow go everywhere. The official British B.S.E. Inquiry Report put it this way: "It has been said, and not altogether facetiously, that the only industry in which some part of the cow is not used is concrete production." The problem isn't just global meat. It's global cow.

Here's the scale of the question. In 2002, commercial slaughterhouses in the United States killed 36,780,000 cattle and calves. How much of a cow carcass becomes meat depends on whom you talk to. The United States Department of Agriculture says 70 percent, some knowledgeable cattle buyers say 63 percent, and the British government's studies say 53 percent. Even the U.S.D.A.'s figure means that if you add up the non-meat remains of the cattle slaughtered annually in this country, you would have a herd of 11 million whole animals. You can begin to see why it seemed like a smart idea to feed bovine meat and bone meal to other cows -- the practice, now banned, that transmitted mad cow disease in the first place. There's just so much of the stuff.

What isn't meat leaves the slaughterhouse for the rendering plant. There it is converted into basic raw materials that are processed all around the world into a thousand different forms, most broken down all the way to their molecular components, into proteins and fats and fatty acids. Just how

widely these are dispersed industrially can be gauged from a letter sent out from an office of the Food and Drug Administration in 1992, asking manufacturers of dietary supplements to check the sources of bovine "neural and glandular tissue(s) or tissues extracts" to make sure they were not contaminated. Letters also went out to the manufacturers of "drugs, biological drugs, medical devices and biological device products," to the manufacturers of veterinary drugs and animal feed, and to the makers and importers of cosmetics.

In fact, the list is nearly endless. Vaccines are often prepared in media that may contain byproducts from slaughtered cattle. Until recently, heparin, a widely prescribed anticoagulant, was made from bovine mucosa and lung, and steroids come from adrenal glands. Chemicals derived from bovine tissue appear in plastics, paper coatings, rubber and asphalt. Glycerin appears in countless products. Collagen is a bovine byproduct.

Some of these products -- vaccines, for instance -- are strictly regulated, and many of the industrial uses of cattle parts derive from cow parts that are not associated with mad cow disease. In fact, it is possible to stand back and marvel at the industrial ingenuity that has found so many uses for what looks utterly useless as it comes out of the slaughterhouse. The logic behind this ingenuity is blunt. The F.D.A., explaining why vaccines are prepared with cattle byproducts, said: "Cow components are often used simply because cows are very large animals, and thus much material is available."

It isn't clear whether we would be better off, environmentally and economically, if other raw materials, not from animals, were used for products made from cow parts. But the inventiveness that converts cattle tissue into thousands and thousands of apparently nonagricultural products -- like gelatin capsules and jet engine lubricants -- also provides part of the economic rationale for expanding the global cattle herd, regardless of the consequences. It's easy to grasp the problem of feeding bovine blood and bone meal to cows. But economic pressure forces the use of cow parts further downstream, until blood and bone meal are fed to farmed fish.

Without the industrial market for bovine byproducts, the size of the cattle herd in the world could never have grown as large as it has. When people talk about industrial farming, they usually refer to the often deplorable conditions in which livestock is raised these days, usually confined in close quarters, often indoors. But you might also call the capacity to turn a cow into fabric softener a kind of industrial farming as well, a kind we all participate in, whether we know it or not, whether we choose it or not.

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Editorial Observer; Keeping a Lost World Alive: A Last Remnant of Iowa's Tallgrass Prairie

By VERLYN KLINKENBORG

Look deep enough into the history of almost any Iowa town and you come to the primordial 19th-century tale of breaking the prairie as if it were a herd of wild horses. It took special plows and large teams of draft animals. The first step was skinning the earth, turning over the sod, exposing unimaginably fertile soil. But what really broke the prairie was ending the cycle of wildfires and then draining the land, ditching the sloughs and laying tile to carry away water that was good for wildlife and thick stands of native vegetation but not so good for alien row crops.

In a modern Iowa soybean field in midsummer, it's easy to see that fire isn't much of a threat anymore. What's hard to see is the drainage network that underlies much of the arable land in the state. Farmers are still adding to that network even now.

The Iowa prairie was well and truly broken. The conventional figure is that 80 percent of the state was once prairie and that 99.9 percent of it is now gone, replaced by what used to be mixed farms and are now almost exclusively corn and soybean fields. A couple of weeks ago, on a beautiful windswept day, I turned off the blacktop in Cherokee County, in northwest Iowa, onto a gravel road not far from the tiny town of Larabee. Down that road, two small pieces of land totaling 200

acres -- a little more than half the average size of an Iowa farm last year -- interrupted the symmetry of soybeans and corn. There was a sign identifying this as the Steele Prairie Preserve, another that said "Do Not Spray" and a wide spot in the road with room for one car. That was it, except for the wind and what that small prairie remnant implied.

Standing at the edge of that swath of unmowed, unsprayed, untilled vegetation was like visiting a small body of water preserved to commemorate what an ocean looked like before it was drained. Two hundred acres barely permits the word "prairie," which, in the American experience, implies a horizonwide stretch of grassland. And yet for all its meagerness, the Steele Prairie Preserve suggests the grandeur to which it had once belonged. It had been kept alive by a family that cut wild prairie hay from it well after their neighbors were planting hybrid corn and alfalfa.

Biological complexity and diversity sound like abstractions, until you see a patch of prairie beside the monotony of a soybean field, a whole county of soybean fields. Though these acres could only hint at the way real prairie would reflect the wind -- catching its oceanic sweep -- the wind was different here. Instead of a sound like rustling newsprint from corn and soybeans, there was a sibilance that seemed to merge with the birdsong rising from the community of tallgrass plants. It was a richer note than anything you hear in a pasture or a hayfield, if only because no one ever lets a pasture or hayfield grow so tall.

There are tiny stands of native prairie all across the Midwest, in graveyards, along rail lines, in parks and flood plains. There is even a "Prairie Directory of North America," by Charlotte Adelman and Bernard Schwartz, that will guide you to the sites. Most are only a few acres, and it takes work to keep them from being invaded by non-native plants. In states where the prairies were richest, like Iowa, those last stands serve as much to remind people of oxen shouldering the plows forward as to preserve the species that once made up the great sweeps of grasses and forbs. It has always been easier to see the wealth of the black soil that lay under the prairie than the wealth of the prairie itself. Last month, I saw that soil freshly turned by a moldboard plow at a

threshing bee in Granite, Iowa, and its blackness was still exhilarating.

There's no getting back to the prairies, of course. The time for preserving a larger share of them slipped away even as modern agriculture was coming into its stride. The great figure in preserving Iowa's prairies was Ada Hayden, and she died in 1950, after canvassing the state for remnants worth setting aside. And though the prairie restoration movement has gathered force over the past decade, restoring a prairie is a little like restoring an ocean. It takes more than the right collection of species and the best of intentions. It means regenerating the elemental forces of nature, unleashing a biological synergy that dwarfs what we usually mean when we use that word. To this day the Steele Prairie Preserve is maintained by fire. As beautiful as it is in full bloom, I wished I could be there to see it burn.