

Wanted: A new American Agriculture

By Clay W. Stauffer

Holland Professional Club

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In texts from Leviticus to Levi-Strauss, what we eat, how we eat, and most of all, how we grow and harvest what we eat says volumes about who we are. The great gastronome, Jean Anthelme Brillat-Savarin, went so far as to say in his *Physiology of Taste*,

The destiny of nations depends on the manner in which they are fed (13).

And more pointedly he wrote:

Tell me what you eat, and I will tell you what kind of person you are (13).

We understand this intuitively. Why else would hundreds, if not thousands of Holland-area residents and visitors stream through the farmers' market downtown twice each week from mid-May till mid-November? Shoppers crowd the market stalls to buy fresh tomatoes, sweet corn, peaches, blueberries and all sorts of other local produce—as well as meats, cheeses, honey, maple syrup, breads, and other products—just as they do in thousands of other farmers' markets across the country. Some of the produce is organically produced. The real draw, however, is the fact the market and most of its produce is local.

The intent of this paper is twofold, and quite simple: to encourage greater practical and philosophical interest in the food we eat, and to argue for a quiet revolution aimed at creating a new, greener American agriculture—helped along by changes in American palates and cuisine.

Clearly something is going on. The increasing popularity of farmers' markets nationwide is only one of the more outward signs. By now, according to popular science in the 1950s, we were supposed to be dining on convenient, space-age miracle meals, made in home kitchens that resembled laboratories. This was the vision of food production and shopping that was promoted to Americans after World War Two. The supermarket was the retail face of the future of food. It offered the American

housewife—who typically did the food shopping and cooking—convenience, sanitation, variety, and standardization.

Things have changed. No longer is the household kitchen a female domain. The American palate has changed. The reasons are several and complex: increased affluence and leisure, exposure to other cuisines through international travel, more interest in nutrition as baby boomers age, and the development of American cuisine have all played a part in this change. People have become more thoughtful about their eating. They have understood that eating is not only a political act, it is the central fact of our economic life—I mean economics in the original meaning of the word: *oikonomikos*, the art of householding, of settling, of living.

Eating, as the poet, essayist, and farmer Wendell Berry contends, is above all an agricultural act (Wirzba 321). The increasing appreciation of this philosophical point has created a sea change in American life that may well hold the key to the maturation, and in some ways, the redemption of American culture. In this sense Brillat-Savarin's aphorism about the destiny of nations fits our era. It would not be hyperbolic to say that the future of human freedom globally may well hinge on American agriculture. For if Western representative democracy offers the best chance for adaptation to the problems inherent in humanity's growth—finite resources, pollution, degraded ecosystems, military annihilation, inequality of wealth, boom-bust economic cycles, species monopoly—we cannot have a healthy democratic society without changing American agriculture to a more Jeffersonian, agrarian model. Without the United States as an advocate and supporter of widespread reforms, they are unlikely to happen globally.

It is self-evident—except among the most willfully obtuse—that we face a global environmental crisis, first presaged by Sir Albert Howard, the originator of the organic farming movement, Rachel Carson and others. We cannot go on as we have, blithely assuming that we do not have the capability of destroying the earth's regenerative capacities. Since the 1980s humans have been mining biological resources at an unsustainable rate (Vermeij 297).

Anyone who examines global economic growth and power, especially in terms of agriculture, would disagree with the statement that the status quo is sustainable. Again, as Berry puts it so trenchantly, “we have before us the spectacle of unprecedented

“prosperity” and “economic growth” in a land of degraded farms, forests, ecosystems, and watersheds, polluted air, failing families, and perishing communities (Wirzba 253). We can choose to retreat into our own corners of the world, choosing to adapt our beliefs about the world by making them “factually less true.” Or we can rationally encounter this “unprecedented prosperity” we “enjoy” and recognize that it is “predicated on the systematic, unsustainable exhaustion or destruction of life’s sources—soil, water, and air—and the communities that inspire, define, and support our being” (Wirzba vii).

As agriculture has evolved into large “monocultures” we have lost smaller, integrated, productive and community-supportive farming operations. Prime farmland soils are at risk of development because of tax and land-use policies that encourage farmland loss. According to the Biodiversity Project and the American Farmland Trust, 70 percent of prime farmland in the United States is threatened by sprawl—234,500,000 acres. Every minute, according to the AFT, the nation loses two acres of prime farmland soil. (www.biodiversity.com, www.farmland.org). Many of us have simply acquiesced, accepting as conventional wisdom the idea that a successful farmer must practice industrial-scale farming, and that there is nothing we can do about the loss of our best farmland to development.

If it is no exaggeration to say we are what we eat, we can say with equal confidence that a culture *is* how it farms. Our relationship with the greater, natural economy is reified in agriculture. However much lip service we might pay to ideals, agriculture is and always has been the foundation of cultural practice. Again, Berry, the agrarian movement’s most articulate voice, warns: “If we corrupt agriculture we corrupt culture, for in nature and within certain invariable social necessities we are one body, and what afflicts the hand will afflict the brain.” (Wirzba 289). The fundamental metaphor that expresses the nature of our agricultural system is itself not even agricultural, but industrial: We *mine* our soil, rather than farm it. The industrialization of agriculture, which we have more or less taken for granted, entailed consolidation. To drive across rural America is to drive through a depopulated region, where the average age reflects the flight of young people to urban areas in search of jobs. Industrial agricultural as practiced is unsustainable.

In 1900, when my paternal grandfather was a 14-year-old boy on a Kansas farm, considering what to do with his life, roughly six of every 10 Americans lived in rural areas. The farm population was 29.4 million, or 38 percent of the labor force. The number of farms was 5.74 million. The average size was 147 acres, and the average number of commodities produced was about 5. A century later the picture had been reversed: The U.S. farm population was 2.98 million—about one-tenth what it was in 1900—and represented about 2.6 percent of the work force. The number of farms was 2.14 million, less than half what it had been a century earlier. Their average size has tripled to 461 acres. The average number of commodities produced was about one (Dimitri 2005).

We regard this consolidation and massive movement away from agricultural employment as an achievement, indicative of an advancing society. But what if it is a huge mistake? To be sure, farm productivity has grown astronomically. (Although larger farms are not necessarily the most productive.) Is putting most of our food supply into the hands of two or three corporations—notably Archer-Daniels-Midland and Cargill—the wisest strategy for the nation as a whole? In an era in which vulnerability to terrorism is a real issue, consolidation puts the security of our food supplies more at risk. And in terms of employment and rural development, wouldn't it make more sense to encourage farming as a career choice for rural young people?

It's essential that we not sentimentalize the agrarian life. Farm work offers few days off, much less paid vacations, and it's often dangerous—though it is arguably more dangerous than it needs to be because of the large-scale use of synthetic fertilizers, pesticides, and herbicides. The point is not that everyone should be a farmer, but that integrated farming can point us to sustainable practices throughout our “little economy,” which is itself a part of the great economy of the natural world.

Twentieth-century Americans were told by their governments, and of course by big agriculture itself, that the American farmer could and would feed the world, that American ingenuity would usher in an era in which hunger would be a thing of the past, and that Americans would enjoy the cheapest, most abundant, and highest-quality foods of all kinds. That isn't exactly what has happened since Secretary of Agriculture Earl Butz challenged American farmers to plant “hedgerow to hedgerow.”

In fact, hunger persists in our country, incongruously obesity is an ever bigger global problem, and our diets have been, at best, problematic from a medical standpoint (Stix 54). True, affluent Americans have recently developed a taste for the finest olive oil, fresh fish, whole grains, and organic produce. Organic foods sales increases are running at about 17 percent to 20 percent a year, according to the Organic Trade Association. But despite the widespread availability of fresher, higher-quality foods in the past 20 to 30 years, we are, as Michael Pollan argues in his book, *The Omnivore's Dilemma*, dependent on one crop: corn. Analysis of Americans' hair and flesh using mass spectrometry has revealed that we are "corn chips with legs," as one researcher quipped (Pollan 23). Of the roughly 45,000 items available in a typical American supermarket, more than 12,000 of them—including non-food items such as trash bags, cleansers, building materials, and printed products—are derived from corn, whether in the form of high-fructose corn syrup, starch, oil, alcohol, glucose syrup, maltodextrin, or many other compounds (Pollan 23). The ill-advised drive to produce ethanol from corn on a massive scale promises to be ineffective at reducing fossil-fuel consumption. And it will increase the use of nitrogen fertilizers, which emit nitrogen oxide, a potent greenhouse gas (Nature).

So what are the particular problems industrial agriculture creates? What in particular is so bad about the way things are done now, and why do we need to change? Here are seven misunderstandings about industrial agriculture, with some supporting case analyses:

1. Industrial agriculture will feed the world

The problem of hunger is real: Nearly 800 million people in the world go hungry each day. Malnutrition and related illnesses kill roughly 12 million children a year. In our country nearly 33 million men, women, and children are classed among the world's hungry.

We wonder how this could be, especially when we have so much food. Studies by the United Nations Food and Agriculture Organization indicate that the problem is not a lack of food. Enough food is produced worldwide annually to provide each human being

with 3,500 calories a day, or 4.3 pounds of food per person, per day, including 2.5 pounds of grain, beans, and nuts, a pound of fruits and vegetables, a pound of meat, milk, and eggs (Kimbrell 6).

Industrial agriculture's implication is clear: Give us sway and our methods will produce more than enough food. What is needed, however, is not agricultural imperialism, but land reform, which is at the heart of the problem.ⁱ

The migration of people from rural areas to cities worldwide only amplifies this problem. A recent UN study predicts that by 2030 nearly 5 billion people will be urban dwellers (Dugger). When people move off land, whether forced by circumstance or “voluntarily,” they must buy their food. Cities are the engines of economic upward mobility, but they are also the sites of abject poverty. A sixth of the world's people live in slums, 90 percent of which are in developing countries (Dugger). Large concentrations of jobless young men, in particular, provide a volatile source of political unrest that can be manipulated by demagogues. In other words, the problem is what it has been: poverty and ownership of productive resources (Pinstrip-Andersen, Cheng 96). Since land is still regarded as the ultimate source of wealth, true land reform has always been more easily discussed than achieved. Yet this is a key to adapting to our circumstances.

2. Industrial food is safe, healthy, and nutritious

Since 1989 overall pesticide use has risen by about 8 percent, or 60 million pounds. The widespread industrialization, beginning in the late 1970s, of the poultry and livestock industries has contributed to the increase in food-borne illnesses: Researchers at The Centers for Disease Control estimate that food-borne pathogens, such as *E. coli*, infect up to 80 million Americans a year and cause more than 9,000 deaths a year in the United States (Kimbrell 12). Recent contaminations of spinach, green onions and other produce by *E. coli* demonstrate the vulnerability of the centralized industrial agricultural system. It is interesting to note that nearly 50 percent of the antibiotics administered in the United States are given to animals, raising issues of whether resistance to antibiotics—the 11th leading cause of death in the United States—is an issue. Animals

raised in less confined surroundings require far less preventative administration of antibiotics—and often none.

Eric Schlosser, the author of *Fast Food Nation*, chronicled the rise of the fast-food industry and its effects on agriculture, as well as its ramifications throughout our culture. Obesity among adults has become a national health problem. Increasingly it is an international public-health issue, as sugary soft drinks become more widely consumed in developing countries (Nestle 68; Stix 54). Among U.S. children the obesity rate has doubled since the late 1970s. Driven by the ubiquity of sugar-laden foods, as well as sedentary lifestyles, Type II diabetes, previously known as “adult onset diabetes,” is now regarded by public-health agencies as an epidemic—particularly among minority populations.

Recent scandals involving the importation from China of unsafe food components, many of which go into widely consumed processed foods, such as breakfast cereal, have demonstrated that our industrial food system is not as safe as we might like to believe. Consumer groups have long advocated that food labels include country of origin of components in foods, a step that the Food and Drug Administration has resisted because of industry pressure (Schwartz 1).

3. Industrial food is cheap

For all our preoccupation with commerce and “the economy,” we Americans do a lousy job of accounting. Yes, the aim of American agricultural policy has been cheap food. But at what cost? The real cost of industrial agriculture, like the real cost of a gallon of gasoline, cannot be found at the supermarket checkout stand or the gasoline pump.

How do we, for instance, place a value on topsoil? According to some sources the United States has lost half its topsoil since 1960, and we continue to lose topsoil 16 times faster than nature can replenish it (Kimbrell 16).

Wouldn't it make more sense to pay more for higher quality food that comes to us through a decentralized, more locally based system? This would create jobs in basic row crop farming and fruit growing, livestock production, as well as artisanal products such as cheese, wine, beer, honey, baked products, and the like. Different regions would

continue to develop their special products and tastes. Such an agricultural system would be far less vulnerable to interruption, terrorist acts, more energy-efficient, and most important, it would more sustainable and its products would taste better.

Moreover, apply life cycle accounting to industrial agriculture and the real costs of industrial practice become clear. From the natural gas used to manufacture the fertilizer to the petroleum needed to make pesticides and power tractors, as well as to harvest, dry and transport the corn, every bushel of industrially farmed corn requires about 50 gallons of oil an acre. (Some estimates are higher.) Or look at it this way; it takes more than a calorie of fossil fuel energy to produce a calorie of food energy. Before the widespread use of chemical fertilizers an Iowa farmer would produce two calories of food energy for every calorie of energy invested. (Pollan 43-44). Now, however, the American food system is dependent on petroleum: Between seven and 10 calories of fossil fuel energy are required to bring one calorie of food energy to an American plate (Pollan, 183).

“The application of herbicides, pesticides, and artificial fertilizers temporarily drives up yields, but continued use depletes the soil of its native nutrients, destroys regulation of resources and pathogens by the soil’s micro fauna, and makes the soil completely dependent on energetically expensive chemical subsidies” (Vermeij 296).

4. Industrial agriculture is efficient

Industrialization is about economies of scale—efficiency and productivity. American agriculture over the past century has steadily consolidated, ostensibly to become more efficient: Farms have generally gotten bigger, and the number of commodities raised per farm has gone from five to one. Bigger, Americans tend to believe, is better.

Smaller farms, however, actually are more efficient in their use of fertilizers, pesticides, herbicides, and antibiotics. A 1989 study by the National Research Council, part of the National Academy of Sciences, found that well-managed alternative farming systems, which use fewer inputs, can increase per-acre crop yields (National Research Council 9). Part of the reason large, monoculture operations win the single-crop yield

comparison involves the difference between yield per acre and total agricultural output per acre. Intercropping, which is the practice of growing plant mixtures, as well as combining crop and livestock operations in an integrated operation, produce far more agricultural output, while minimizing external costs to society.

A 1992 USDA Agricultural Census report found that smaller farms are 2 to 10 times more productive per unit acre than larger ones. The smallest farms surveyed, 27 acres or fewer, are more than 10 times more productive in dollar output per acre than large farms, defined as those 6,000 acres or more. Extremely small farms, those 4 acres or smaller, can be more than 100 times as productive as large operations (Kimbrell 22).

5. Industrial food offers more choices

The phrase “more choices” conflates quantity with quality. More than 15,000 new food products come to market annually in the United States. Yet nearly all – 95 percent – of the calories we eat come from only 30 plant varieties. Two varieties of apple constitute more than half the apple market. In 2000 roughly three-fourths of the lettuce grown in the United States was iceberg (Kimbrell 24). Indeed, wheat, rice, and corn alone accounted for 42 percent of harvested cropland globally in 2004.

Genetic diversity suffers under industrial monoculture practice. The United Nations Food and Agriculture Organization estimates that more than three-quarters of agricultural genetic diversity has been lost in the past century. A study by the Rural Advancement Foundation International found that we have lost 93 percent of lettuce types, 96 percent of sweet corn types, and 95 percent of tomato types (Kimbrell 24).

6. Industrial agriculture benefits the environment and wildlife

Perhaps the best place to begin a discussion of the ecological impacts of industrial agriculture is with the soil itself. It is no exaggeration to call the soil a living thing. A teaspoon of rich grassland soil can contain 5 billion bacteria, and 20 billion fungi. Soil is a fragile mixture of organic and inorganic matter, microbes, clay, silt, and sand, as well as the remains of plant matter and aquatic life. The industrialization of agriculture through

the profligate use of petrochemical fertilizers, pesticides and herbicides has accelerated erosion, increased salinization, leaching of essential nutrients, and reduced the biodiversity of soil flora and fauna (Kimbrell 167).

In spring, when runoff is greatest, “blue baby” alerts caution central Iowa households not to drink tap water—proof that excessive levels of nitrogen fertilizers are running off monocultured farmland into watersheds and water tables. Nitrates build up in humans’ bloodstreams, preventing the uptake of oxygen.

The runoff problem is exacerbated by the fact that only about 50 percent of chemical fertilizer actually contributes to plant growth. The other half is washed away, absorbed by weeds or microbes, or evaporates (Kimbrell 175). Fertilizer runoff has created a hypoxic “dead zone” about the size of New Jersey in the Gulf of Mexico at the mouth of the Mississippi (Pollan, 46; Kimbrell 172; Vermeij 298). At least 50 scientific studies have documented adverse ecological effects of pesticide use on bird, mammal, and amphibian populations throughout North America, according to the Henry Wallace Institute (Kimbrell 29).

Pollution problems are particularly acute in developing countries, where environmental regulations typically are not as stringent. In Cost Rica, the use of fungicides, including accidental spills, and other compounds on huge banana plantations has caused large fish kills, as well as skin lesions and birth defects reported among children swimming in nearby affected coastal waters. Export-dependent monocultures, such as oil palm plantations, encourage local farmers to leave their own farms to work on plantations so that they become dependent on imported food. Pollution also becomes a problem. In New Guinea, for instance, oil palm monocultures have caused large-scale environmental created by fertilizer and pesticide runoff.

7. Biotechnology will solve the problems of industrial agriculture

“Biotechnology,” particularly the genetic modification of seeds to make them resistant to proprietary herbicides or pests, does not necessarily increase crop yield. A two-year study by University of Nebraska researchers found that herbicide-resistant soybeans actually resulted in lower productivity, compared with conventional soybeans.

A review of more than 8,200 field trials showed that RoundUp Ready seed produced fewer bushels of soybeans than similar, natural varieties (Kimbrell 34). Much of the effort by multinational agribusiness is clearly directed by a desire to sell more RoundUp herbicide. From creeping bent grass for golf course grass to canola, companies such as Monsanto have been working hard to market GMO seeds that enable farmers to spray glyphosate, the generic name for RoundUp, a Monsanto trademark.

Argentina's experience with RoundUp-ready soybean production has turned out to be a disaster, according to numerous reports, including Britain's Guardian newspaper. Argentina, strapped for cash after its economic collapse, looked to soy as a source of sorely needed export currency. Roughly 150,000 small farmers were driven off the land because of the rush to plant large soy plantations (Brown). The amount of RoundUp used per acre actually increased, instead of decreasing, as Monsanto promoted (Joensen, Ho). Whether glyphosate actually is safe is uncertain. Recent research, including work done at the University of Pittsburgh, points to RoundUp's catastrophic effects on amphibians. Work done in Ontario showed that exposure to glyphosate in pregnancy nearly doubled the rate of miscarriages (Phillips 78).

Patented "terminator" seeds, which are genetically engineered to produce sterile seeds after one season, ensure that farmers cannot save seed and will have to buy from the patent-holding corporation every season. Whether farmers whose fields have been contaminated by wind-blown, genetically modified seed, must pay damages to the patent owners remains to be seen. A well-known 2003 Canadian court case, *Monsanto Canada Inc. v. Schmeiser (C.A.)*, held that a Saskatchewan farmer, Percy Schmeiser, violated Monsanto's patent rights, though Schmeiser claimed that the contamination was accidental. Such disputes highlight the difficulties inherent in biotechnological farming. About 100 similar cases have gone to court in the United States. In those cases farmers have paid an average of \$100,000 in penalties to Monsanto (Simon). Recent court rulings may require more stringent oversight by the USDA of genetically engineered seed trials.

Regardless of biotechnology's promises, through the use of bioengineered seeds or growth hormones, the fundamental issues inherent in industrial agriculture remain unaddressed: an overdependence on synthetic fertilizers and herbicides, reduction of genetic diversity, destruction of soil, and energy inefficiencies that increase our

dependence on fossil fuels – thus contributing to the production of greenhouse gases and global warming.

One pressing issue—the ethical implications of proprietary ownership of seeds, once considered the heritage of humankind—extends far beyond the limits of this paper. Consider only the implications of a multinational corporation having the right to charge abjectly poor farmers royalties for the use of its seed. That licenses may be granted, depending on circumstances does nothing to refute the fundamental objection, which is that the genetic diversity of crop seed ought to be consider humankind’s patrimony.

II. Possible solutions

So, what is to be done? How can we further this revolution? How can we support an adaptive design for the future, particularly as it might occur in that most fundamental of human acts, eating?

First and perhaps easiest: Support local, community-supported agriculture projects. CSAs, as they are abbreviated, typically offer the member a share in the produce of the farm in exchange for a membership fee, and often, a modest amount of sweat equity. One local CSA operation is Groundswell Farm in Zeeland Township started a couple of years ago by two young women. Another is the Eater’s Guild, which is based in Bangor, Mich. Most CSAs either farm organically or with minimal use of pesticides, herbicides, and chemical fertilizers. Another benefit from supporting CSAs is the encouragement it offers younger people interested in farming as a vocation.

Buy locally produced meat. One producer is Providence Farms, which offers grass-fed, hormone-free beef, and organically produced pork, chicken, and lamb.

As we see in Holland, food shoppers prefer locally grown food. They will take the trouble to go to special farmers’ markets to get it. We need to encourage supermarkets to work with local producers when possible. Ask your produce manager to stock as much locally grown produce as possible.

Eat according to the seasons. Globalization offers us the choice of apples year-round, as well as fish from New Zealand and salmon all year. Just because we can take advantage of these offerings doesn’t mean they make sense. Does it really make sense to

import apples by air year-round, increasing carbon in the atmosphere, figuratively drenching the food in jet fuel?

It's essential that we support local agriculture in developing countries using economically sustainable techniques, enabling people to move to the cities as an option and at a more sustainable pace, rather than under compulsion. Large-scale cultivation of export commodities, such as sugar cane, palm nuts, cotton, coffee, bananas, and soybeans, accounts for much of the growth in agricultural activity in developing countries. These operations do little to help the people of the country where the commodities are grown.

A more difficult step: political action. Increasing the supply of subsidized commodities in the United States enriches corporate farming concerns at the expense of the poorest farmers globally (Stiglitz 253). Reforming a farm-subsidy system that was put together over generations will take a huge, concerted effort. This summer a small nucleus of farm-state Democrats and Republicans failed in their effort to reform the lopsided system of price supports and payments for producers of corn and soybeans.

Despite the difficulties of political change, individuals can make a difference. Thousands of farmers' markets, food co-ops, and increasing demand for more sustainable practices are revolutionizing the American palate. Eating, it turns out, is both an agricultural act, as well as a political one—a lot more complicated than it once seemed. Brillat-Savarin was—and is—right: Our destiny as a nation, indeed as a species, increasingly depends on how we are fed.

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