In these and other ways, *Waste, Wealth, and Alienation* is not only a good historical interpretation but also one with modern-day, social relevance.

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Fred Magdoff, John Bellamy Foster, and Frederick H. Buttel, eds., *Hungry for Profit: The Agribusiness Threat to Farmers, Food, and the Environment* (New York: Monthly Review Press, 2000).

In the opening overview of the book, the editors quote Marx, who states in *Capital* (V. 3, Ch. 6, sec. 3):

> The moral of the tale is that the capitalist system runs counter to a rational agriculture, or that a rational agriculture is incompatible with the capitalist system (even if the latter promotes technical development in agriculture) and needs either small farmers working for themselves or the control of the associated producers.

Hungry for Profit provides a sweeping picture of the irrationality of capitalist agriculture. It is indicative that the editors draw attention to Marx's analysis of agriculture under nineteenth century capitalism. There is a central logic to the organization of the volume that links historical and contemporary enclosures and dispossessions of farmers as well as resistance movements of the past and present. The attention to historical context is one of the great strengths of the volume as a whole as well as many of the individual contributions.

Two opening chapters together provide an overarching historical framework setting the tone for the entire volume. Ellen Meiksins Wood exposes the ideological nature of the notion of the natural evolution of capitalism by examining the emergence of its unique systemic imperative to compete to maximize profit and capital accumulation. She traces how this compulsion and the system it feeds first appeared in the English countryside. She asserts that if agrarian capitalism had not emerged in England, because the conditions did not exist elsewhere, capitalism probably would never have come into existence. Land was more concentrated than elsewhere in Europe, with a large proportion of tenants paying economic rents, rates determined by market conditions rather than custom or law. Would-be tenants had to compete in a market for leases. Failure to maximize output would result in dispossession because of inability

to pay the going rent and the presence of more cost-effective competitors. In this context, English landlords and tenants became obsessed with land "improvement," defined as cultivating profitability.

Britain's Royal Society and prominent scientists and philosophers embraced this profit-oriented notion of "improvement." It was a driving force behind the enclosures and the dissolution of feudal ties of reciprocity and customary rights and obligations whereby commons were regulated to sustain whole communities. It remains today as the driving logic behind ever more extensive enclosures rationalized as necessary to remove obstacles to capitalist accumulation. Relations of production designed to achieve food security and maintain the commonweal rather than to maximize profit are viewed as hopelessly "backward." It is neither fencing nor privatization that is most significant about enclosures but rather "the extinction of common and customary use-rights." Meiksins Wood states that by studying the impacts of English agrarian capitalism we can see more clearly how "wherever market imperatives regulate the economy and govern social reproduction there will be no escape from exploitation." For this reason, she views "market socialism" as a contradiction in terms.

John Bellamy Foster and Fred Magdoff examine the environmental costs of the "productivity" of English agrarian capitalism due to the disruption of the soil nutrient cycle emerging from the separation of first people and then animals from the land. They discuss the work of a German chemist, Justus von Liebig, who uncovered the role of soil nutrients and laid the foundation for modern soil science and the use of fertilizers. In *Capital* (Vol. 1), Marx, influenced by Liebig and others, described capitalist agriculture as "simultaneously undermining the original sources of all wealth – the soil and the worker."

Marx illustrated the devastating impacts of the separation of humans from the land with reference to the crisis in soil fertility and the pollution of the Thames by London's untreated sewage. A second separation occurred in the twentieth century when livestock and poultry production were removed from the croplands that produce their feeds. Feedlots and megafarms of pigs and poultry, like the megacities that have appeared in many countries, are polluting water sources with unused animal wastes. Overcrowding makes these animals prone to disease. The excessive use of antibiotics both to control the spread of disease and as a growth stimulant has resulted in antibiotic contamination of food and development of antibiotic-resistant strains of bacteria. Monocrop production and massive use of chemical fertilizers, pesticides, and herbicides has also had a detrimental impact on the biodiversity of soil organisms, many of which are essential to soil fertility. The industrial model of agriculture is not cost efficient as it uses enormous amounts of energy to produce and distribute agricultural chemicals. However, the authors maintain that any switch to a more

rational production system would require a fundamental transformation of the "current economic-social-political structure." They suggest the strategy to get to such a transformation requires efforts to build small-scale local programs that link urban consumers to local farmers and collaboration to eliminate sources of contamination of soil, water, and food with toxic chemicals and antibiotics. These projects are not a substitute for a larger socio-economic transformation but rather an essential way to raise awareness of both the irrationality of existing production and distribution systems and the feasibility of rational alternatives.

A chapter by William Heffernan examines the concentration of ownership and control first in the United States and then globally. He argues that agricultural production dominated by transnational corporations is driven by a struggle for market share that has nothing to do with economic efficiency. He utilizes examples of deliberate overproduction and selling below cost to drive out competition to illustrate the irrationality of the system. With global operations, trans-national corporations now regularly utilize profits from one country to cross-subsidize efforts elsewhere to overproduce and dump cheap products so as to eliminate competitors thereby destroying national markets.

Heffernan provides much detail on contract production whereby hog and broiler producers are transformed into "hired workers paid on a piecerate basis." He suggests that with the recent integration of seed companies with chemical and pharmaceutical giants and their metamorphosis into Life Science companies producing patented genetically engineered varieties, "One can predict that up against such power, the yeoman crop farmer will soon resemble the broiler grower" (75).

Agroecologist Miguel Altieri writes about the ecological impacts of industrial agriculture and the feasibility of alternative diversified agroecosystems that depend on low-input technologies. He argues that widespread transformation, however, will require land reform and redesign of farm machinery to facilitate diversified, small-scale, ecologically sustainable highly productive farming systems.

Altieri observes that the biotech revolution in agriculture, despite claims to the contrary, is actually exacerbating the ecological hazards of industrial agriculture. For example, he points out that the US Department of Agriculture reported that increased cultivation of genetically engineered *Roundup Ready* soybeans produced a 72% increase in the use of glyphosate (the scientific name for Monsanto's herbicide *Roundup*). Exposure to glyphosate has been linked to non-Hodgkin lymphoma in research by Swedish oncologists. It has been shown to be toxic to earthworms, fish, and many insects and soil organisms essential to plant and soil vitality. Corn, cotton, potato and other crops engineered to express a gene for a natural insecticide produced by the soil bacterium, Bacillus

thurengiensis (Bt), threaten to cause widespread resistance among the targeted pests and to harm various butterflies, bees, beetles, lacewings, and other beneficial non-target species. Altieri also writes about the possible generation of new viral strains as viruses infest plants and pick up exotic viral genes present in the genetically modified plant as a result of utilizing viral genes to produce transgenic varieties.

Richard Lewontin writes about the transformation of farmers into proletarians with the maturing of capitalist agriculture. He describes the "essence of proletarianization" as "the loss of control over one's labor process and the alienation of the product of that labor" (97). At the heart of this process are efforts by transnational seed companies to commodify seed supply. This was first accomplished with hybrids that do not produce reusable seed. With the monopolization of the seed industry, open pollinating varieties whose seed can be collected and used freely year after year have gradually begun to disappear from seed catalogues and retail outlets. Lewontin suggests that conventional hybrids could not maximize corporate control because it did not work for important crops such as soybeans and wheat as well as larger livestock. Growth of profits from inputs such as fertilizers and agrotoxins was also limited because of contamination of soil, water, and people. Lewontin asserts that there was "no growth in fertilizers after 1975 or in synthetic pesticide application rates beginning in about 1980."[1] He argues that this impasse was behind a drive by chemical companies to find other ways to increase the appropriation of surplus from agriculture. The answer lay in "radical changes in the biology of agronomic species" and use of intellectual property rights to maintain "ownership and control" over them.

Lewontin describes the contracts farmers must sign giving up any proprietary or customary right to use the seed produced by a genetically engineered variety. With Meiksins Wood's chapter in mind, the reader can easily see that this use of intellectual property rights amounts to the enclosure of a seed commons and the outlawing of customary rights and practices of seed selection, saving, and exchange. Lewontin also mentions the first patent application for a "terminator" seed technology that causes plants to destroy their own embryos. Since the book was published, the number of "me too" patent applications for comparable death-dealing engineering feats has mushroomed to more than two dozen.

Lewontin opens up the implications for third world producers as genetic engineers begin to tinker with genes to find alternative production schemes to eliminate dependence on imported crops such as vanilla, palm oil, cocoa, coffee, sugar, etc. If bacteria can be used to produce flavorings such as vanilla or soybeans can be given genes to express the essential oils and caffeine of coffee, production can be relocated.

Four authors from the Department of Sociology at Michigan State, Gerad Middendorf, Mike Skladany, Elazabeth Ransom, and Lawrence Busch, discuss the "compression of space and time" made possible by cell culture techniques in the laboratory to produce foods and flavorings. This is the one chapter devoted entirely to "new agricultural biotechnologies." While it provides much useful information, it suffers from a need for extensive updating to capture what is admittedly a fast moving target. The opening paragraphs stress the "precision and speed" of transformation made possible with recombinant DNA techniques. This echoes the claims of the biotech industry and needs to be examined carefully. There is no dispute about the *speed* of the change process, but the *precision* is a subject of considerable controversy. Many safety issues hinge on the precision of foreign gene insertion into host genomes and the stability of the constructs. There is considerable concern about the degree to which scientists are working in the dark with inadequate understanding of the typically multiple effects of gene insertions and manipulations. There is concern about "jumping genes" (*transposons*) that do not stay put. There are concerns about "horizontal gene transfers" whereby genes move from one organism to another of the same or a different species by means other than crossbreeding. Microbiologists have reported evidence of potential transfer of antibiotic resistance to bacteria in the saliva and rumen of cows consuming feeds made with transgenic insect-resistant corn. There are concerns that similar horizontal gene transfer could occur in the mouths and guts of humans ingesting genetically engineered foods.[2] Such concerns caused the British Medical Association to call for a ban on use of antibiotic resistance marker genes in the creation of transgenic crops.

While these and other authors of this volume argue that agricultural biotechnology poses a threat to food security and farmers' autonomy, the threat is not adequately explained. Readers may reasonably ask why farmers cannot return to using traditional varieties if the genetically engineered seeds don't pay off. The real threat of the new varieties is actually the same as the hybrids. Seeds are living organisms. They eventually lose their fertility and die if they are not grown out and reproduced year after year. If farmers turn to new varieties on such a scale that the old varieties actually disappear, there is no turning back. Food security depends on use of a diversity of crop types with different capacities to resist frost, drought, water-logging, disease or insect pests, etc. If one fails, another will survive, and no one will starve.

The authors also fail to discuss the potential hazards of environmental release of crops engineered with genes to express chemicals for pharmaceuticals. The possibility of horizontal gene transfer between pharm crops and food crops is particularly disturbing. Transgenic fish are mentioned but nothing about possible impacts on wild populations.

The authors of this chapter are, in my opinion, much too sanguine in their overall assessment of this technology when they state: "Biotechnology is one valid and reliable way of knowing, representing and manipulating nature. In principle, there is nothing inherently harmful about this new set of tools." They go on to correctly observe that "the institutional basis of industrial capitalism reinforces an increasingly illegitimate distinction between the political and technical." On the one hand, they suggest that this is a neutral technology whose consequences will be shaped by the industrial capitalist context in which it has emerged. On the other, they question "the illegitimate distinction between the political and technical," but is this not exactly what they do when they fail to examine hazards inherent to the technology itself related to its very design and the inadequate level of knowledge behind its dazzling techniques? They refer to the disasters of the Green Revolution; however, it was not just the distorting effects of the industrial capitalist context but rather the marriage of big business with bad science that explains the impacts of such innovations in the name of "progress."

To their credit, however, the authors of this chapter make a solid critique of the "narrow objectivity" of decision making regarding this technology and the political character of the "scientific enterprise." They call for learning from initiatives to democratize decision making such as the citizens' consensus conferences organized by the Danish Board of Technology and emulated by other countries. A similar citizens' consensus conference on Food Biotechnology was held at the University of Calgary in 1999. It was certainly a worthwhile endeavor, but it does not appear to have had any significant impact on either private or public research and technological innovation or government policy formation.

Chapter 7 by Philip McMichael deals with "global food politics." He explains how subsidies and new trade rules make southern agriculture appear relatively inefficient when, in fact, just the opposite is the case. He outlines a shift from agro-colonialism to agro-industrialism making it clear that global food trade has always been central to the organization of capitalism. In the British model of imperialism, Britain was developed as the "metropolitan industrial workshop" while the agricultural hinterland in the periphery was essential to provide food and raw materials for the workshop and its workers. The U.S. developed a different model of development involving "*national* integration of manufacturing and agricultural sectors" (128). In this model, industry provides inputs for intensive agricultural production. The suppliers of these inputs eventually became powerful transnational agribusiness corporations supplying agro-industrial complexes in Europe, Japan, Korea, Brazil, etc. At the same time, U.S. agriculture came to depend on export markets and the Third World was encouraged to become dependent on food imports. McMichael

traces how domination by huge vertically integrated agro-industrial complexes has transformed farming in the U.S. and throughout the world. He discusses how the neo-liberal trade regime and intellectual property rights imposed in the name of globalization and free trade effectively displace citizen rights with property rights. In effect, the commons being enclosed here is that of the democratic public sphere.

Chapter 8 by Farshad Araghi is entitled "The Great Global Enclosure of our Times." It analyzes the dispossession and uprooting of hundreds of millions of farmers around the world over the past five decades. Neo-liberal regimes are slashing price supports and subsidies to farmers, deregulating land markets, and restructuring national economies to open them up to foreign investment and foreign commodities and thereby causing a massive dispossession of millions of farmers. What is being enclosed are both national markets and means of subsistence. Araghi proposes to reframe "the peasant question" to examine the potential for alliance building in the face of the devastating impacts of the neo-liberal agenda for subsistence farmers. He breaks down the issues they face into seven interrelated concerns. The first is homelessness with approximately one billion people lacking adequate shelter and ten million a year dying as a consequence. The second is the dismantling of labour protections and construction of the global assembly line with maquiladoras, subcontracting, putting-out systems, and increased use of female, child, and bonded labour in sweatshops. The third is massive international migration of people looking for work or to escape repression. They have become a huge reserve labour force in the industrialized countries to which they are drawn. The fourth concern is the rise of identity politics, racism, and religious fundamentalism in a context of tension between international migrants and workers in the industrialized countries of immigration. The fifth issue is widespread hunger in a context of food surpluses, which is directly related to the commodification of food and commercialization of agriculture. The sixth concern is the devastating environmental impacts of commercialization and industrialization of agricultural production. The seventh and final issue is the need for land reform to solve the plight of one billion rural people who are landless or nearly landless. Araghi ends by emphasizing that although the forces of dispossession have been unrelenting, billions of rural people are still "holding on against the tide of the global commodification of food." Their struggle to organize should be supported and efforts made to link with them in a worldwide web of resistance.

Linda and Theo Majka analyze how dispossessions and labour migrations have affected wages, working conditions, and organizing among U.S. farm workers since the late nineteenth century. They chronicle the struggles and achievements of the United Farm Workers as well as their defeats in the 1990s. They also discuss the less well known Farm Labor Organizing Committee,

which has worked since the 1980s to organize farm workers in midwestern and southern states. They analyze the labour contractor system and why its elimination has been a central goal of labour negotiations of both the UFW and the FLOC. The authors make clear how neo-liberal policies are a cause of destitution and desperation among farmers in Mexico, which then causes waves of legal and illegal migration. They examine how the chronic oversupply of cheap migrant labour creates the conditions for exploitation, discriminatory policies, and dangerous working and living conditions. They conclude with a reminder of the importance of consumer boycotts and support in the successful organizing drives of the 1980s and the need to sustain comparable support for the ongoing struggle.

Organic farmer-activist Elizabeth Henderson discusses "Rebuilding Local Food Systems from the Grassroots Up." She describes the diversity within the grassroots movement for a sustainable food and agriculture system, which includes farmers, farm workers, community activists, church groups, environmentalists, animal rights activists, people concerned about nutrition and food safety, and their many organizations. She links this diversity to the diverse impacts of industrialization and corporatization on the world's food systems. She argues that the lack of a unified resistance to this restructuring is related to a common failure to grasp the "systemic nature of problems" and the "need for an integrated analysis and multifacted response" (176). She goes on to describe a set of encouraging examples of collective resistance. At the end of the chapter, the editors comment that some on the left might consider efforts to build local food systems as diversionary and unable to bring about the transformation that a systemic critique of capitalist economics and corporate agriculture makes clear is necessary. However, Henderson argues persuasively that each initiative in this direction "becomes a small piece of liberated territory in the struggle for a just and sustainable society" (188).

Janet Poppendieck analyses the "commodification of hunger" to produce "the hunger industry," which competes in "a sort of social issues marketplace." She says that "hunger" crowds out competing definitions of the problem that would focus on injustice and inequality. She does a brilliant analysis of how anti-hunger campaigns and "the hunger lobby" have opened the way for dismantling welfare programs and given substance to the right-wing critique of public programs and notions of public entitlement. She discusses with empathy how anti-hunger activists get diverted to organizing emergency food relief in the face of undeniable suffering and desperation, however she is adamant about the need to shift the discourse from hunger to justice and equality.

The final two chapters by Peter Rosset and William Hinton examine how recent agricultural policy reforms have affected sustainability in Cuba and China. Rosset argues that large-scale farming cannot be ecologically sound on the basis of analysis of Cuba's experience with monocrop production and heavy dependence on imported chemicals, machinery, and fuel. Hinton, on the other

hand, argues that the switch to family farming in China is proving ecologically disastrous because farmers are depleting the soil of nutrients and organic matter "due to a lack of human, animal, and mechanical power to incorporate crop residues back into the land" (226). Both authors, however, favor cooperative modes of production to achieve sustainability. Hinton does not discuss state farms in China, nor does he examine the ecological impacts of the proletarianization of labour in people's communes, some of which became very large. China has gone through its own Green Revolution with the introduction of modern hybrids, building of irrigation systems, and increasing use of fertilizers and pesticides. This began during the Maoist era and cannot be described as a recent innovation. Desertification, salination, declines in soil organisms and nutrients are not a new phenomenon, although, I agree that the pace and degree of deterioration does appear to be increasing. The contrast between Cuba's turn to organic agriculture and China's deteriorating soils is striking, but it cannot be simply linked to the household land-use contracts introduced in the early 80s. Rosset points out that we can learn from Cuba the importance of "agroecology, fair prices, land reform, and local production, including urban agriculture" (213). In China, when farm-gate prices were raised early in the reform, it had a dramatic impact on output because land-use contracts allowed farm families to keep and consume or sell whatever they produced above the required quotas. Hinton does not examine how the government pushes farmers to "modernize" their operations and the effects on the health of both the land and the rural population. He is so dismayed by the dismantling of collective agriculture that he appears blinded to other explanations of ecological damage. I share much of Hinton's dismay and conviction that cooperation is necessary to achieve ecological sustainability and food security in China. However, the heavy-handed bureaucratic control systems that made possible excessive collectivizations have left their mark on the minds of Chinese peasants and their offspring. Organization from above will not work. It must be a grassroots movement. This will require rebuilding an autonomous civil society able to speak to power without fear of reprisals.

This volume is a rich source for those wanting to correct the neglect of food in much of contemporary political economy.

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[1] Unfortunately, Lewontin provides no source for this assertion nor footnotes of any kind throughout this provocative chapter.

[2] For information on research regarding the hazards of horizontal gene transfer and the scrambling or instability of manipulated genomes, see *http://www.i-sis.org.uk*, the website of the Institute of Science in Society.