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WHAT ON EARTH IS THE MODERN WORLD- SYSTEM? FOODGETTING AND TERRITORY IN THE MODERN ERA AND BEYOND

Harriet Friedmann

Human continuity is virtually synonymous with good farming.

Wendell Berry, "People, Land and Community," p.149

How much force does it take to break the crucible of evolution?

Edward O. Wilson, *The Diversity of Life*, p.15

The promise, and dangers of genetic technologies have refocused the attention of city dwellers on an enduring reality of the human species: We are eating animals. We are breathing animals, too, forced (as we render them extinct) to notice that we exchange gases with plants. We are drinking animals, forced (as we render it toxic) to notice that the same water we drink and urinate in circulates through rivers, seas and clouds, and through the cells of all species. Until we pushed back the wild places of earth—that is, until very recently—humans were able to take oxygen, water, and the infinitude of wild beings for granted. Not so with food. Only since our fascination with industry developed has human attention drifted away from the source and meaning of food.

Civilizations were built on agriculture, a decisive break in human foodgetting. Agriculture inaugurated a new complex of relations between humans and our habitats—one as crucial as fossil fuels or nuclear energy.

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Luxury came through control over specific territories, over domestic species of plants and animals, and over the humans whose skills and energies reshaped domestic species and landforms. Through these hierarchies rulers and urban dwellers first entertained the idea that foodgetting was an aspect of a lower animal nature and thus appropriate to slaves, peasants, and women. However, there was no mistaking foodgetting as the basis of power and wealth, nor domesticating landscapes—transforming wild places—as the way to raise plants and animals to eat (Mumford 1961:12,17).

Only with the regional specialization of agriculture, underlying the formation of the modern world-system four hundred years ago, could humans begin to entertain the illusion of transcending our animal and earthly existence. With industry, a mere two hundred years ago, the illusion extended to more and more humans. Even those who manufacture plants and animals into edible commodities, and who carry them across the earth in ships, railways, trucks and airplanes, even those who cook and serve meals, seem to be part of something different: industrial or service workers or houseworkers, but not foodgetters. Plants and animals have been turned into homogeneous rivers of grain and tides of flesh, more closely resembling the money that enlivens their movement from field to table, than their wild ancestors (Cronon 1991). Post-animal humans appear to eat commodities rather than other living beings. Our need appears to be less food than money.¹

This essay explores a paradox of human species life. On one side, humans get food by altering the concentrations and locations of plants and animals. They necessarily alter *webs of living cycles and material cycles* of air, water and soil. On the other side, since the sixteenth century, many foodgetting practices have flowed from an illusion of transcendence over these webs and flows.

Taking a hint from the subtitle of Volume One of Wallerstein's *The Modern World-System* (1974), "Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century," I argue that the agrarian roots of the modern world-system are enduring. My interpretation focuses on the agroecological changes brought on by the modern world-

¹ This is the argument, made with considerable subtlety and grace, of Kate Soper (1981).

system through a specific link between foodgetting and territory. This suggests that ecological crisis is intertwined with crises of foodgetting and of territorial states/economies. It points to a grounded exit from the three crises of the "modern" world-system, parallel to the "modern" exit from the crisis of European feudalism. I focus my exploration on the history of the hamburger, whose banality conceals hidden depths.

LOOKING BACKWARDS: THE HAMBURGER AS GLOBAL CUISINE

The project of a common world cuisine, the culinary equivalent of English as a world language, is embodied in the fast-food hamburger (Harris 1985: 121; Ritzer 1993). The history of the hamburger and its ingredients, wheat and beef cattle, also traces the larger story of reconstellation and suppression of ecosystems, from the forests of Europe to the grasslands of North America, to the rainforests of South America.

The fast food hamburger condenses much of the simplification of human diet, of the underlying complexity of the agrofood system, and of the still deeper simplification of ecosystems to supply wheat and beef. Let us begin with some common distinctions. Is the hamburger an American food imposed on the world, an edible enticement of cultural imperialism? One could say so. It was invented in the U.S. despite its Germanic name and its culinary roots in European wheat and beef cuisines, specifically fried disks of ground flesh. It followed bottled bubbly flavoured water (Coca Cola and Pepsi-Cola, by name) into the local street food markets of the world. Like the early wordless television advertisements intended for world consumption, showing happy, healthy, frolicking, youthful people drinking Coke or Pepsi, the commercial propaganda for hamburgers devotes considerable artistry, technique, and money to create images of luxury and freedom designed to lure humans all over the world into ingesting the food of America and valuing it above the unglamorous cuisines of their ancestors.

Yet one can also argue that the hamburger is less an American than a corporate food. The hamburger did not become a standard of American diets until it became a corporate food, available in a reliably consistent texture, taste, and architecture through franchises tightly controlled by corporate headquarters. The same structure allowed it to travel abroad, sometimes modified to specific tastes or taboos, a complexity of manufacture and presentation far exceeding those of bottled drinks. The same

structure pioneered not only standard eating, but also a new way to make work standard. The very recent shift, from fixed production lines manned by stable work forces with longterm employment and structured mobility, to flexible production systems employing part-time and on-call workers with no security, was refined by fast food operations and has generated the language of McDonaldization (Ritzer 1993) and McJobs. It has individualized lives, bringing women and young people back into the workforce—often at the expense of more secure institutions once dominated by male workers (Friedmann 1999)—and made family or community meals an endangered institution (Mintz 1995).

In this sense, the hamburger is the commodity condensing many aspects of a new relation between human individuals and the fictive individuals called (as if they had bodies) corporations.² It condenses an emergent way of organizing foodgetting and all that is built upon it, what McMichael (1996) calls the Globalization Project. Through this project, national cultures and national states, which were both created in recent centuries (Anderson 1991, Tilly 1990) are subordinated to corporate freedom, usually called freedom of that far more abstract fiction, the “market.” Agreements among states increasingly empower such institutions as the International Monetary Fund, the World Bank, the World Trade Organization, and institutions created by the North American Free Trade Agreement. However, at the same time, both national states and international institutions set rules that empower private corporate actors. Of course, the power of corporations is illusory: they exist by virtue of state-made rules and state-enforced agreements that create and sustain the fiction that they, like persons, are agents. The Globalization Project allows these legal constructs to reshape individuals into a working class with some global dimensions, and into consumers within a market with some global dimensions.

At the same time, through arrangements with media giants (Disney) and retailers, images such as the Golden Arches of McDonalds appear on

² The Shorter Oxford English Dictionary (1973) gives the first legal definition of corporation, dated 1611 as “A body corporate legally authorized to act as a single individual; an artificial person created by royal charter, prescription, or legislative act, and having the capacity of perpetual succession.”

dolls (which still teach children about parenting), on games (which are the play of youth) and on musical and theatrical spectacles (which are the common expressions of the cultural life of human groups). Both, therefore, are true: the hamburger is at once American and corporate, a bearer of meaning and a commodity.

The elements of the hamburger, crushed wheatseeds and minced cowflesh, acquired these paradoxical qualities long before the hamburger became a common object of desire and a standard way to organize food manufacture. This happened within the United States in the nineteenth century. Yet, in a prior paradox, wheat and cattle, like the humans who bred them, were exotic transplants to New World ecosystems.

LOOKING FORWARD: THE ORIGINS OF THE GLOBAL FOODGETTING

Domestic species travelled slowly before the sixteenth century. It took thousands of years for wheat cultivation to spread from the rivers flowing into the Persian Gulf to the ancient Greek and Roman Empires and to Northern Europe.³ Something totally new happened when Europeans transplanted themselves and their dependent species to the ecologically distinct New Worlds of America and Australia/New Zealand. The first stage of global foodgetting began with wheat and cattle from the Old World displacing native species in the New Worlds of America and Australia/New Zealand. It speeded up the simplification of human-affected ecosystems from millenia to centuries. The second stage of global foodgetting began only in the twentieth century, with industrial agriculture, and corporations that organize production on a world scale. This development speeded up human-induced ecological simplification from centuries to decades or even years.

The Modern World-System: Reconstellating Ecosystems

In Wallerstein’s theory (1974:90-94), coerced cash-crop labor, which defined the peripheries of the emerging capitalist world-system, was

³ The spread was not linear or even. Wheat spread along with civilizations and conquest, and was long associated with cities and markets. When the latter contracted, for instance during the centuries following the end of the Roman Empire, wheat cultivation also declined. It revived with Medieval commerce and rule (Montanari 1998: 50-54).

devoted to monocultures for export: wheat in Eastern Europe and a variety of transplanted species, notably sugar, in colonial Hispanic America. The importation of wheat allowed for more complex mixes of crops in Western Europe, the core of the world-economy. The world-economy made possible and necessary both specialized production and sale in world markets. The complementary ecological effects of specialization on agro-ecosystems remain to be explored.

Commerce mimics natural cycles. Commerce, in a way, replaces natural cycles, by inducing ecological simplification and substituting in its place social complexity (division of labor). The circulation of cultivated plants and animals, and the parallel circulation of money, insinuate themselves into the livelihoods and perceptions of humans. The price of wheat creates a new value in tension with old values defined by taste, texture, nourishment of body, spirit and community. The price of meat or cheese takes over the rate of breeding of cattle—not how many bullocks are needed to pull the plow, nor how many animals can be grazed on fallow land to drop their manure, nor how much meat, milk or leather can be obtained with the resources of land and labor in the village. The production of cattle or wheat becomes determined by markets rather than mixes of natural species and material cycles. The effects of displacement from material and biological cycles may not be noticed as long as the prices, as the economists say, are right.

Agriculture inherently disrupts processes of natural succession and simplifies mixes of species. Farmers clear an area—a field—of its interdependent species and plant one (or a small number) of species with the intention of harvesting them. The banished species try their best to return. Farmers treat them as competitors, either for space and nutrients in the field, or for the crop. They pull weeds, chase birds or land animals wanting to eat the crop and select and breed plants resistant to diseases that thrive with the concentration of their hosts. Not only that: the specific plants chosen for cultivation in the five to ten thousand years of agriculture are seedbearing grasses (grains). They are annual plants, which thrive at early, simple stages of natural succession. In an undisturbed state these annual grasses give way to more and more complex plants, mainly perennials, until a stable, climatic and most stable stage, the most complex or climax, is reached (Duncan 1996:14-24). Perennial plants, such as cedar and maple trees, are not dense in edible foods for humans. As a result, humans have to work to keep natural

succession at bay—a reality to match the myth of banishment from Eden (Sahlins 1972). Yet in domesticating plants and animals, and controlling the activities of unwanted species, humans continue to work with, to monitor, to live within the possibilities of intertwined biological and material cycles—or they move on to domesticate untouched regions.⁴

Complex civilizations grew up within living cycles, discovering practical ways to replace soil nutrients removed by cultivation and to incorporate byproducts or to allow them to be reabsorbed. For instance, the city of Edo (now Tokyo) in the early 18th century, then the largest city in the world, supported a population of one million at a comfortable standard by working with the material cycles of sea, city, and agricultural hinterland; soil runoff from terraced cultivated mountains fed micro-organisms in the bay, which fed fish, which (together with crops) fed people, whose fishing sustained the balance of life in the bay; human nightsoil from the city was collected daily by farmers to use as fertilizer, otherwise the sea would have been polluted and the soil depleted (Murota 1998: 128-29). Civilizations that failed to renew material cycles had to adopt new ways of life or move to new regions; for instance, by overclearing forests and then overgrazing domestic animals on the grasslands that replaced them, humans changed the Mediterranean region over several thousand years from forest to dry, sandy lands.

Europe before the rise of the modern world-system grew wheat as much as possible, mainly for rent payments for landlords. Peasants relied on coarser grains, such as barley, oats, spelt and the hardiest one, rye, which were more reliable (Montanari 1992:30). Because wheat cannot be grown twice in succession, farming systems grew up around the complementary grains and fallows developed over centuries in each ecosystem. A two-year rotation roughly characterized Southern Europe, and a three-year rotation Northern Europe. Complementary crops included rye, oats, spelt, millet,

⁴ When European wheat-eaters unified the globe through colonial expansion in the sixteenth century, they inaugurated the first major shift in a global balance of self-contained ecosystems that had evolved over millenia. Until then, human groups either adapted to changes in ecosystems (such as deforestation of the Mediterranean) or moved to adjacent ecosystems, and the wildness surrounding them absorbed depletion and wastes.

and barley. These lesser desired grass-seeds provided food for most humans and for animals. Animals came to be used for other purposes—transport and war—but were integrated into European agronomy and diets in a way unique to the farming systems of the world. Europeans, especially Northwest Europeans, are “champion milk-digesters” (Crosby 1986:48). They included dairy products and meat in their diets. Horses and oxen became “energy slaves” for plowing dense soils of cleared forest lands (Bayliss-Smith 1982: 37-55). Manure of animals grazing fallow lands or stubble in harvested fields was the principle method for renewing soil. Wheat and cattle emerged from the wider mix—unique to Europe—of crops and livestock (Braudel 1974: 68-78).

As regions shifted from self-renewing agronomy to specialized crops and livestock, both practices and experiences changed. Interdependence of species with local configurations of soil and water was, in part, substituted by interdependence of specialized regions linked by trade. Wheat and cattle became not only useful to eat, to renew soil, and to pull plows, but also, and more significantly, to bring in money. Circulation of money became a referent for farming as much as, and perhaps more than, interdependent cycles of species and material cycles.

If we shift focus from one periphery to another, the ecological implications of the modern world-system come more into focus. Wallerstein focused on Eastern Europe’s specialization in wheat. Here, the crop was pre-existent so increasing monoculture was a question of degree rather than transformations. The American colonies of Europe, the other periphery, were less clearly defined by specific exports in the sixteenth century. The reason, perhaps, was the staggering challenge of a project to replace all native species, not only native humans, with transplants from Europe. European colonists settled, with a panoply of dependent species. Wheat and cattle were two of many “portmanteau species” (Crosby 1986), wanted and unwanted, carried by Europeans as they crossed the Atlantic to a world that was more deeply “new” than our political economy recognizes. Columbus reported on experiments to transplant wheat and cattle, along with other domestic species. The Spanish planted Old World crops in every farm; by 1535 wheat was exported from Mexico and imported European cattle were transforming the ecology of Colombia and Peru (Sokolov 1991:69,87).

World commerce and regional specialization enlarged the scale of interaction between domesticated species and self-organizing earthly processes, making this interaction more difficult to observe. It would take the advent of the science of ecology, late in the nineteenth century, to make conscious the interactions that formed the practical knowledge gained over centuries of experience by farmers. That science is still rarely applied in agriculture, which has instead become industrial in method and consequences.

Industry and Monoculture: Subordinating Ecosystems

Commerce made possible material, geographical disconnections between the inputs and outputs of manufacture. Eventually, through the domination of prices over material and biological cycles, commerce itself became the necessary link among production sites. Supported by commerce across ecosystems, industry was a step beyond specialized agriculture, working by a logic that not only displaced, but necessarily disrupted, earthly cycles.

Industry ignores natural cycles. Duncan (1996:116), following the distinction of eighteenth century Physiocrats, puts it this way: while “agriculture necessarily rides on living ecological cycles... industry transforms dead matter, changing only its form.” Industry works on matter that has been removed from the earth, either through mining or through harvesting wild or cultivated plants or animals. These may come from any region, and industry may be located in any region.⁵

Industry disrupts natural cycles, not only where it creates waste, but also in distant places where matter is removed to supply raw materials. Separated from local cycles, industry contains no way to replace substances taken from the earth or to absorb the multiple substances yielded. Rather, industry simply turns natural substances (from anywhere) into “resources,” and divides multiple products into commodities (to be sold anywhere) and “wastes” (with no good place to go). Resources, or inputs, are external to the linear material process of industry, and the market that connects raw mate-

⁵ This statement applies to matter transformed. Industries were tied to energy sources until fossil fuels replaced water and wind power. They were tied to waterways until manmade transport routes came to dominate: roads, railways, and airports.

rials regions with industrial regions cannot link either one to living cycles. Resources must be depleted; wastes cannot be absorbed.

This focus on material aspects suggests a more complex understanding of the capitalist nature of the modern world-system. Several decades before ecological thought was formulated theoretically, during the same period that industry was becoming the new way of organizing human energy, capitalist farmers in England began to apply site-specific science, and rational control of natural cycles to achieve an ecological agriculture unrivalled in the following years. Called High Farmers, they developed the most sophisticated form of self-renewing agriculture known in the West, rivalling the rice cultivation of Asia in both yields and sustainability.⁶

This flowered for only a few decades, until new laws exposed it to world commerce. It succumbed to the ecologically catastrophic, implicitly industrial, lower-priced monoculture of North America.

The controversies over High Farming focus on its capitalist, rather than material aspect. That is, how it structured relations among people, rather than how people worked with physical substances and processes. Some historians celebrate the "agricultural revolution" brought about by "improving landlords," who greatly increased yields per acre and per worker. Other historians condemn the misery inflicted on masses of villagers evicted by the

⁶ Of the three great seed-based civilizational complexes, the wheat-based European civilization became the basis for organizing the world-system. The great rice and maize civilizations of Asia and the Americas were colonized or marginalized by European colonial conquest. The rice-based civilizations had far more productive, labor-intensive, and sustainable agricultural systems than those of Europe. The ratio of rice seeds per plant at the time of colonial integration of the world, had long been 100:1, compared to the 4:1 or 5:1 of European grains, and the labor and land-intensive techniques of terracing, irrigation, and transplanting had supported vastly different but equally complex human hierarchies and specialized occupations and regions (Palat 1995). Until the introduction of industrial techniques through the so-called Green Revolution, the intensive system of cultivation relied on highly sophisticated attention by the farmer of each small paddy, so that natural cycles of complementary plants (blue-green algae) and other features of the altered ecosystem allow for renewal of soil fertility even with multiple cropping (Bayliss-Smith 1982:70-73). There may be something to recover from the untaken rice path, with its continuing close relation between humans and specific natural cycles.

same landlords. Indeed, capitalist tenant farmers, who had engrossed village lands and enclosed commons, forced some of their former neighbors to leave for work in exploitative mines and mills, and employed those who remained in even more exploitative relations on the land. Duncan (1996:50-87) emphasizes that English High Farming demonstrates that under specific conditions (not likely or even desirable to repeat) capitalist agriculture was ecologically sustainable. Despite the exploitation of agricultural laborers, there is much to learn from the techniques of High Farming.

In ecological terms, High Farming introduced a four-crop rotation (wheat, turnip, barley, and clover crops), which was precisely integrated with sheep rearing (and horses for pulling plows) in such a way that the condition of the land was maintained indefinitely, and previously infertile land was improved and brought into sustainable production, all the while increasing yields per acre of wheat. The key to this achievement was "biological or ecological, as opposed to industrial (chemical), methods" (Duncan 1996: 65). The farmer sought to achieve the proper balance between wheat output and animal manure, which in turn required including winter forage crops for the animals in the rotation. Turnips and clover added nutrients to the soil, allowing wheat yields to rise. Most importantly, sheep carried nutrients from uncultivated to cultivated soils. After grazing on hillsides by day, by night sheep were enclosed in movable fences called folds, located where manure was needed. Experience of the specific cycles of species in each field, taught farmers how to adjust rotations to achieve what is now called biological pest control.

Bayliss-Smith (1982: 37-55), who equally celebrates the *ecological* merits, insists on the *social* unsustainability of High Farming. Using an energy measure of material inputs and outputs, he shows that High Farming, using horses as "energy slaves," achieved the most productive and sustainable wheat farming ever known. However, the distribution of the grain product, the wool byproduct and money income was so unequal that agricultural laborers worked far more hours and received less food than swidden cultivators in New Guinea. The comparison is quite specific as, in both situations, pigs supplemented the starchy staple. Only a few agricultural laborers in a Wiltshire High Farm, described by William Cobbett in 1826, could afford to keep a pig.

Yet High Farming succumbed not to social inequality or popular resistance (the Luddist uprising) but to exposure to world commerce. In 1846 the British Parliament abolished protective tariffs, called Corn Laws. Russian wheat, already exported since the rise of the world-system more than two centuries earlier, flowed in (Fairie 1965, Friedmann 1983). Ecologically, this was still a trade in Old World wheat which had moved gradually throughout Europe before and during the Roman Empire. A true world wheat market, spanning Old and New Worlds, began in the 1870s, with the flows of wheat transplanted to, and then exported back from a distinct ecosystem in North America (Friedmann 1978a). Only then, through transplantation of Old World cultivated foodgrains to an alien ecosystem, were High Farmers prevented from continuing their ecologically benign mix of domestic species.

Old World humans faced challenges and opportunities in transplanting themselves and their dependent domestic species—wheat and cattle—to the untilled soils of the semi-arid Great Plains of North America (Webb 1931). First of all, breaking the soil was difficult. Pioneering European farmers faced thick mats of native grasses which had evolved to withstand the trampling of the vast herds of native buffalo. These grasses would not yield, even to the deepcutting iron plows which had allowed cultivation of the heavy soils of the forest ecosystems of northern Europe.⁷ Native cultivators in North America were tilling corn, beans, and squash with hoes, using only human labor, and only in small areas. European settlers finally broke the matted grasses with a steel plow, invented and manufactured by John Deere in the 1840s (Cronon 1991:99, McNight 1997:169). The plow was drawn by animals, more like European farming than that of indigenous people. The draft animals of settlers and, the cattle herded by cowboys, filled the niche of the slaughtered native buffalo. Both exotic crops and animals had to be fenced. Lacking wood in the treeless plains, fencing awaited the invention of barbed wire. Dwellings, made of buffalo skins by native people, required the import of lumber.

⁷ From the seventh century onwards the new plows transformed not only Medieval agriculture but the whole of village life (White 1962, 1995).

Plows, land, animals, materials to construct and enclose farms, all came from outside the farm and even the region. Cash was therefore scarcer and more pressing than natural fertility. Transplanted exotic humans were compelled from the beginning to grow and sell as much as possible (Friedmann 1978a). Mining the nutrients accumulated by nature over thousands of years, settler farmers, cowboys and ranchers could sell the products of transplanted species back to the Old World at cut-rate prices. However, soil that is not renewed is depleted. Settlers were more deeply embedded in markets than in the earthly cycles of the Great Plains.

When tractors arrived in the 1930s, followed by fossil-fuel driven harvester-threshers and fossil fuel-derived replacements for soil nutrients, the deepening of market penetration was a matter of degree. Replacement of horses by tractors, for example, opened land for cultivation formerly devoted to hay or grazing. Lost, but unrecognized, was the manure and the benefits of crop rotations among human and animal foods. Indeed, the separation of mixed animal and grain farms into specialized monocultures accompanied the replacement of horses by tractors and chemicals (Berlan 1991). By the odd accounting of modern governments, the purchase and sale of fertilizers from nonrenewable fossils (and later, toxins to kill weeds, fungi and insects that thrived in monocultural fields) added to national wealth, while the loss of organic self-renewing, living nutrients was unrecorded. Money, rather than enhancement of living processes, was the mark of improvement, soon to be called development. Market logic, reinforced by ever greater vulnerability of self-renewing cycles, was dominant. The introduction of machinery further undermined the “natural integrities that precede and support agriculture” (Berry 1997:150).

The grasslands of North America, called the Great Plains, are a distinct ecosystem not amenable to methods and implements used to colonize regions east of the Mississippi River, which were more similar to the cleared forest lands of northern Europe. Later called the breadbasket and cowranch of the earth, the unbroken prairies were called the Great American Desert until the Civil War (Webb 1931:152-60). The native grasses held moisture and soil in place. Both were crucial under the conditions of low rainfall punctuated by violent downpours unknown in Europe or Eastern North America. After the prairie was broken by the new steel plows, soil could not hold moisture and was washed away by rainstorms. Settler farmers, with

their experience of the gentle steady rains of northern Europe, were not prepared to understand or cope.

Ecologically unaware, and trapped into markets, settlers created the ecological catastrophe of the Dust Bowl within two generations. Within that time, they sent enough cheap grain, holding the stored fertility of the ages, to England to destroy High Farming. After that time, when the U.S. (and Canadian) economy recovered from Depression, prairie wheat farms recovered from the Dust Bowl by deepening the industrial transformation of wheat farming. After World War II, farmers turned to the markets to replace the lost riches of dark earth, measured in feet rather than inches (Cronon 1991:98). They bought industrial fertilizers, made from fossils stored in the earth over millions of years, and tractors, run by fossil fuels, to replace each season the nutrients that had once seemed inexhaustible.

The transplanted wheat and cattle of the Old World simplified the agro-ecosystems of North America. One rule of thumb is that every alien species displaces about ten native species (Mills 1997:276). The Great Plains weren't settled according to the contours of land and water, by following river systems and other natural features. The fields were laid out in a grid, a design simplified for monocultural wheat or cattlefeeds implemented by mapmakers, surveyors, and government officials. Unlike the slow adaptation to natural features of landscapes, to mixes of species in relation to natural predators, competing species (weeds), pollinating insects, and the intricate self-renewing webs of life in soil, exotic farmers were set down in fields organized in a mathematical grid (Cronon 1991:102). Despite the subtlety of prairie microregions, this imposition on natural topography is very far from riding living cycles. This was a break with all agriculture that came before.

When the prairies were first broken in the 1840s and 1850s, farmers simplified only partly, building on their experiences in land cleared in forest ecosystems. They created monocultures in each field, but rotated among wheat (the most desirable but also the riskiest crop), corn, and to various degrees oats, rye, barley, and hay, all supplemented by vegetables, dairy cows, poultry, hogs, sheep, and apple orchards. These are the farms of the American imagination, resembling the mixed farms of Europe. Except for corn (native, but grown in greater quantities to convert to pork or whiskey), all were the domestic plants and animals of Europe. These first farms extended out from the forest ecosystems of Eastern North America first along the

rivers, bordered by trees and allowing for bags of grain to be shipped to market. These were not the farms, however, that became the dominant suppliers of wheat and beef, driving out old world farmers, from the 1870s onwards.

To create a world market, the colonized ecosystem (Crosby 1986) was subjected to a series of far more radical simplifications. This was accomplished by means of some very complex social inventions that turned wheat and cattle into commodified substances detached from any specifics of the land or people which had created them. Wheat was transformed from a specific product of a specific piece of land cultivated by a specific farmer, to a "golden stream" of commodified seeds, as anonymous as the new futures contracts bought and sold to sustain its flow. Wheat left the bags that had previously maintained its identity in relation to a field and a farmer right up to the final purchaser in New York or London. Railways replaced natural waterways for transportation. Elevators mixed and stored wheat from many farms, substituting a new set of distinctions called "grades." Wheat poured through railcars, elevators, and ships. To manage this physical flow of uniform seeds, traders in Chicago invented new forms of money called futures. Eventually futures contracts not only organized markets in wheat, but themselves came to be traded on markets (Cronon 1991:97-147).

A parallel story can be told of beef. It took considerable violence to slaughter the native bison, whose numbers have been estimated between twenty and forty million. After the end of the Civil War, railways cut into the wild grasslands roamed by vast herds and the slaughter began, first for sport and later for commerce. Within twenty years only a few stragglers could be found. Destruction of the animals that provided food, clothing and shelter to the indigenous nations of the Great Plains was more profoundly damaging than the military campaigns that completed the removal of native peoples. The native Great Plains mix of humans, animals and plants was undone with astonishing rapidity by alien humans using trains and guns. In their place, Europeans and their cattle were first driven on the hoof to new slaughterhouses in Chicago. Those that grazed the unbroken prairie to some extent replaced the native bison in sustaining short native grasses. But the larger movement was to fence the prairies, turning grasslands into managed pastures. These in turn gave way to feedlots, where animals were fattened on grains grown for the specific purpose in monoculture fields. Cattle

(and pigs) were bred to fatten more quickly and to adapt to continuous feeding rather than seasonal cycles. They were transported in rail cars to giant industries where “disassembly lines” turned them into tides of packaged flesh to be transported again in refrigerated railcars and ships. Like grainseeds, animal flesh became physically organized into standard commodities whose flow was organized through complex financial instruments (Cronon 1991: 207-59).

The ingredients of the global diet, then, are deracinated—their roots torn from Old World agro-ecosystems. Transplanted to North America, wheat and cattle became tightly integrated into commercial networks of unprecedented complexity. The radical simplification of North American prairie grasslands was ecologically disastrous. Like the massive murder of native human inhabitants, the destruction of native grasses and bison was not simply the replacement of one mix of species with another. The substitution diminished the numbers and varieties of plants and animals, the complexity of inter-relationships among species and the inter-relationships among those species and the water cycles and renewal of soil.

Agriculture became industrial in North America some fifty years later because it was integrated into commerce at the expense of integration into living cycles. In Polanyi’s (1965) terms, exotic domestication of the Great Plains *disembedded* practices of farmers and ranchers from the land. The land, understood in this way, is not an abstract “factor of production,” but the habitat of multiple interdependent species, from humans to the vast web of micro-organisms composing fertile soils. With settler agriculture, specific cycles and flows of the region were disrupted.

The land thenceforth required management or compensatory inputs, in some way organized through markets, to substitute for recycling of nutrients. These included industrial fertilizers to replace depleted soil, and toxins to kill pests that thrive in the concentrated food supply provided by monocultural fields. Some pests were imported unintentionally with European species; seeds of European weeds mixed with wheat and other grain seeds or were carried on the clothing of immigrants. Others were native insects or birds eager to feed on the new arrivals (Crosby 1986). Dependent on outside resources, wheat and beef production became industrial. Managers of the land found themselves more dependent on markets and money than on the living cycles of their fields and wild surrounds.

Global Ingredients for Industrial Food: Exotics Rule

Having reconstellated North American grassland ecosystems in the nineteenth century, monocultural production of wheat and cattle in the late twentieth century leapt to a third ecosystem: tropical rainforests. Here ecological simplification was even more gross, as rainforest ecosystems are more fragile than temperate grasslands. Not only is ecosystem disruption deeper and more difficult to reverse in each phase, but the cumulative effect of successive transplants of exotic domestic species is to reduce the wild places between the disrupted areas, thus reducing the diversity of life forms, self-organizing regions, and human cultures adapted to specific places. The organized project to adapt techniques of U.S. industrial agriculture to post-colonial countries, many of them tropical and subtropical, was called the Green Revolution.

It is difficult to grow wheat in warm, humid regions. The Nigerian government is a well-documented case of the folly of transplanting wheat to a tropical ecosystem. Andrae and Beckman (1985) show how the Nigerian government tried to induce farmers to grow wheat instead of subsistence crops in the late 1970s and early 1980s. In seeking explanation for such folly, we must investigate the strange twists the wheat market took between the Depression of the 1930s and the “food crisis” of 1973.

After World War II, an entirely new pattern of specialization and monoculture grew up around wheat production and trade. The United States became the “breadbasket” of the world through an innovative combination of government subsidies for domestic prices, restriction of imports into the U.S. and subsidies for U.S. exports (Friedmann 1981, 1994). Domestically, the New Deal programs restabilized prairie production after the Dust Bowl through a combination of measures designed to prevent soil erosion, remove the least productive (most fragile) lands out of production, convert many acres to soybean and maize for intensive livestock feed and to subsidize wheat prices at a high level, keeping farmers on the land (and voting for the government). This worked in a particular way that led to the U.S. government’s holding large, chronic surpluses. It disposed of these surpluses outside the framework of markets (which were referred to as if they existed, despite government management of trade and administration of prices). Recipients were governments with no dollars to pay for wheat. The mechanism was subsidized exports, called food aid. Other exporters, such

as Canada, Australia, and Argentina, could not afford to support farmers or subsidize exports to the same extent; in this way U.S. exports came to dominate world trade.

Countries of what came to be called the “Third World” (and later the “South”) became major wheat importers, whether or not wheat was part of their traditional agriculture or cuisines. Because it was subsidized by the U.S. government twice—once to support U.S. farmers and again for sale via specially negotiated prices in the soft currencies of countries short of dollars—wheat became more widely used in these countries. Governments of Third World countries found cheap wheat a convenient way to lower wage costs to foster industry. It could also be used in a variety of ways to create political stability and support for the government. U.S. subsidized wheat became most popular in cities, echoing the place of wheat as the privileged and urban grain of pre-industrial Europe.

Suddenly, in 1973, after decades of strictly separating trade between the Soviet and U.S. centered blocs of the Cold War world order, the U.S. and the Soviet Union entered into a massive grain deal—the economic aspect of Detente, a thaw in the Cold War. Prices shot up from two three times their previous levels just at the time that oil prices also shot up. Third World countries were caught in a trap of dependence on imported wheat and oil. Under these conditions, it was tempting for the Nigerian government to try to induce farmers to grow wheat within the country. This policy was consistent with the practice of import substitution that had been key to building up national economies in the period 1945-75, what McMichael (1996) has called the “development project.”

The development project celebrated industry, and, with it, a faith in technology blind to the limits of nature. The Nigerian government attempted to overcome resistance from farmers, a group which, after all, had experience with cultivation in the various regions of the country. The government was not unusual in valuing, above the experience of its farmers, a widely shared faith that science could overcome natural ecosystem obstacles. Narrow studies of temperature, water, and soil underlay incentive programs to convince farmers to participate in government projects. They not only failed to grow wheat, but also caused much damage to the farmers, their communities, and the natural cycles on which cultivation of traditional crops depended (Andrae and Beckman 1985:100-38). Industrial fertilizers,

which were part of the project, came from international agencies as part of the Green Revolution. The Green Revolution was an international project to apply industrial principles to Third World grain cultivation, following the pattern set in the U.S.: hybrid seeds combined with industrial chemicals and machinery. Sometimes these increased yields, though at the cost of other crops in farmers’ diets and in the destruction of self-renewing agroecologies. The results included soil depletion, water pollution and loss of biodiversity in both farms and surrounding forests (Shiva 1992).

Cattle were more successful than wheat in colonizing and simplifying tropical ecosystems, and the results were correspondingly serious. Tropical rainforests were cleared on a massive scale from the sixties onwards. Timber, plantations, and other replacement of tropical forests with simplified, often monocultural land use, had long been a feature of colonial economies. Late twentieth century land clearing occurred for multiple reasons; chief among these cattle grazing for the burgeoning fast food hamburger industry.

Clearing of rainforests involves displacement of indigenous peoples and destruction of the most diverse array of species in the most complex ecosystem on earth. Just as the soils of North American temperate grasslands were more fragile than the soils of temperate forests in Europe, so the soils of tropical forests were again more fragile. The nutrients cycling through a tropical rainforest are kept primarily in the fast growing vegetation. Few nutrients are stored directly in the soil, rather they are taken up by new growth as the old growth rapidly decomposes. Virtually no soil runs off into waters; waterways fed by undisturbed forests are almost as pure as distilled water. Yet the nutrient cycle is mainly carried through the water cycle, through evaporation and rain. Small areas indigenous shifting cultivators are quickly recolonized by surrounding species. When large areas are cleared the soil quickly dries, wicking clay from the subsoil that, if allowed to harden, forms a hard crust. Destruction is irreversible as new growth consists of a far simpler mix of shrubs (Collinson 1977:121-34).

Two social and historical aspects of the transformation of rainforest ecosystems into grazing lands are also significant. First, in the smaller areas of rainforests cleared by peasant farmers in South and Central America between the sixteenth and mid-nineteenth centuries cattle were part of peasant mixed farming. Peasant farmers were, and are, various mixes of indigenous and European peoples who formed new cultures and adapted,

often over generations, to the living cycles of farms and farming regions. They created agroecologies that mix indigenous and exotic species with pre-modern staples, such as potatoes and maize, dominating the cycles. Sideline cattle became difficult to maintain when commercial ranching and intensive livestock took over and squeezed out local cattle markets (Sanderson 1986). These mixed peasant farms using mixtures of indigenous and transplanted species as well as indigenous shifting cultivators and foragers, are displaced by monocultural cattle raising. This is the second stage of ecological imperialism.

Second, the cattle in the cleared rainforests are part of a second phase of economic and political reorganization of the world economy, organized not by governments but by transnational corporations. In the first phase of ecological imperialism wheat and beef were exported by small farmers to distant markets. In the second, there is direct organization of international production chains by transnational corporations. During the nationally-focused years of the development project, transnational corporations formed international links beneath apparently national agricultures. Intensive livestock sectors grew up in core national economies; meat production and consumption was an important sign of development. Yet each one depended entirely on soybeans and maize, usually imported from the U.S., to feed the livestock. This livestock feed industry was transnationally organized (Friedmann 1994).

After relying on this deeper private transnational structure for thirty years, agrofood corporations eventually rejected the limits of national frameworks and pushed for free trade agreements—notably the World Trade Organization—to allow them to operate freely across national boundaries. Corporations are attempting to regulate transnational beef production chains on their own. Cattle in cleared rainforests are part of their global supply system, as are the deepening monocultures and the growing farm crises in the U.S. and other industrial export regions since the late 1970s. These crises were precipitated by export promotion's neglect and abandonment of conservation practices introduced after the Dust Bowl of the 1930s.

Now the corporations respond to the crisis from which they grew, and which they have fostered, by offering the solution of biotechnology. So far, biotechnologies developed for agriculture have mainly been devoted to

overcoming limits to the use of toxins. By creating plants that can withstand heavier doses, sales of chemicals and deepening of monocultures will continue. With them the dependence of farmers on industrial inputs that continually disrupt and simplify natural cycles will deepen and the manufacture of replacements for these cycles will grow (Lappe and Bailey 1998).

These practices have pushed back natural limits for local ecosystem disruption to the point where the renewal of soil, water, air, temperature, and other conditions supporting human life are in danger. Forests regulate temperature everywhere on earth, the exchange of gases between plants and animals (which humans remain as long as we are embodied), and the cycles of water and minerals that sustain living cycles of all species. The attempt to substitute finance, management, technology and the circulation of commodities for self-renewing ecosystems, took humans to the next stage. Here the choice is between faith in continuing human substitutions for disruptions to earthly cycles (both technical and financial/commercial), or using our big brains to redirect science, society and livelihoods toward a more harmonious, post-industrial sourcing of food supply.

EMERGENT PROPERTIES OF RULE: RETHINKING TERRITORY AND FOODGETTING

Territories and states have been crucial to the complementary stories of ecosystem disruption and social integration. Colonies, transplanted species, markets, and limited liability corporations—whether national or international—are organized by actions of states (e.g., Arrighi forthcoming). These are states of a particular kind that originated, like the use of the word territory itself, in the sixteenth century.⁸ For Wallerstein the territorial state was a defining feature of the modern world-system. It is now, like many of

⁸ Building on Latin words, territory is a word of late Middle English. Its earliest use, according to the Shorter Oxford English Dictionary, was 1494: "the land or country belonging to or under the dominion of a ruler or state." Even the more general use of territory to mean a less well bounded region includes an defining element of governance or rule: "The land or district lying round a city or town and under its jurisdiction." The five hundred year usage combining clearly demarcated spaces with absolute rule (in principle) or sovereignty has come to seem obvious. If the two elements were to diverge our language would be an obstacle to understanding.

the ways of ruling and of living from the earth, in crisis. Ruggie (1993) asks whether the territorial state may be yielding to a post-territorial, and therefore post-modern, form of rule. Foodgetting, as the central human relation to the earth, is a grounded way to explore the question.

Territory: An Earthly Perspective on the State System

Wallerstein (1974) reshaped our views of states, markets and the division of labor by arguing that a *modern* world-system emerged in the sixteenth century that consisted of three defining features. The first was world commerce, different from ancient trade in that it set prices for local sellers and buyers. It operated on a global scale, detached from the specifics of any place. World commerce in turn allowed for the second defining feature of the modern world-system: a larger-than-local pattern of specialized production and interdependence.

What Wallerstein called regions can be seen as physical *territories* whose borders were not clearly demarcated, which were sometimes larger than states and sometimes smaller or cross-cutting. These regions came to specialize in commodities for exchange with other specialized regions. The endpoint of regional specialization in agriculture is monoculture. While Wallerstein's emphasis was on ways of organizing relations among humans, from serfdom and slavery to sharecropping to free wage labour, I have redirected attention to the effects of specialization on local webs of interdependent species and cycles of minerals, water, and air. These are organized not through statemaking but through self-organizing complexes of vegetation, animal life, soil contours, and water flows. Such areas, nested from very local to vast areas such as grassland ecosystems, can be called bioregions (Sale 1991).

The third feature was a system of states, whose autonomy or sovereignty, was defined relative to the encompassing market. Each state was one in a *system of territorial* states, whose sovereignty depended on mutual recognition of borders between states. As eighteenth century thinkers understood it, the relation among states, like the surrounding market, was a "self-regulating equilibrium" in which "sovereign states followed their ordered paths in a harmony of mutual attraction and repulsion like the gravitational law that swings planets in their orbits" (Wight 1973:98, cited in Ruggie 1993: 146).

Wallerstein located the metaphorical gravitational field of states within the circulation of commodities on a world scale.

The ecological grounding for the vision of global circulation is the concept of *biosphere*. The earth consists of self-organizing *material cycles*—flows of water, light and air, biochemical renewal of minerals and organisms in soil, and successions of complexes of mutually dependent living organisms. These self-organizing cycles constitute specific ecosystems, each entwined with the planetary ecosystem, the self-renewing biosphere of earth. Since the successive creation of water and oxygen billions of years ago, water/air cycles, plant photosynthesis and animal (including human) respiration have regulated temperature and other conditions of life (Murota 1998). Until recently wild areas separating and surrounding local ecosystems were numerous and large enough to absorb the effects of local human disruptions. It was not sufficiently consequential that the territories ruled by states and the simplified, even monocultural, farming created by the world-system in no way corresponded to the contours of the earth or the interdependent cycles of living beings and material flows.

Via the market, territorial states, and specialized productions, then, the modern world-system inattentively reshaped local ecosystems. First, it *linked* parts of the earth in ways that allowed for greater ecosystem simplification vis a vis local farming. The latter requires humans to engage with, as they disrupt them, the self-renewing cycles in their habitats. Second, it *displaced* material and biological cycles with the circulation of commodities and money. By linking and displacing local ecosystems, the modern world-system *obscured* humans relations to the rest of nature. It created the first basis for human illusions about markets and money as the apparent basis of life. The second basis came with industry, which was made possible by world markets and specialized agriculture. Industrial agriculture not only displaced and obscured earthly cycles, but *ignored* them. Industrial agriculture is linear rather than cyclical. It is in principle separate from the sources of physical "inputs" and from the destination and use of physical "outputs." What formerly had to be renewed could be depleted, and what formerly had to be absorbed could become waste—but only for local ecosystems. *Suppressed* material cycles eventually *reappeared* at the global level, bringing awareness of the biosphere supporting human economy and human life.

The connection between bioregions and the biosphere parallels the connection between nation-states and the world-system. The material/biological and political/economic systems are mismatched, one reason so many problems are emerging in material and living cycles, and in relations of rule—e.g. the state system. The earth preceded human existence, and will certainly outlive it. It makes sense, therefore, to look to earthly cycles to interpret problems of human economy and rule.

John Ruggie (1993: 151, 165) explores the paradoxical quality of territorial rule, and the possibility of epochal change in forms of governance. The modern system of rule, he writes, “appears to be unique in human history.” Territorial rule is different from earlier Medieval patterns of overlapping sovereignty among landowners, local rulers, kings, and religious officials. It is based on the differentiation of subject populations into “territorially defined, fixed, and mutually exclusive enclaves of legitimate dominion.” The key feature of modern territorial rule was “the consolidation of all parcelized and personalized authority into one public realm...[creating] two fundamental spatial demarcations: between public and private realms and between internal and external realms” (Ruggie 1993:151).

Yet absolute jurisdiction, to adapt Polanyi’s (1944) term for the self-regulating market, is “utopian”—by pursuing the ideal, its opposing tendencies are continually called into existence. A minor but persistent theme in the history of national states is “unbundling” of the various dimensions of governance combined in territoriality (Ruggie 1993:165). Unbundling began with the creation of “extraterritorial” spaces for foreign embassies; each ruler had to accommodate representatives of other “absolute” rulers, allowing them to practice religion and other activities forbidden to territorial subjects (Ruggie 1993: 165). Waterways have often required extra-territorial adjustments. Over time, more and more extra-territorial issues have become recognized in “international” law and institutions.⁹

⁹ In past work (Friedmann 1993) I have explored inherent limits to territoriality evident from colonial rule, followed by the system of military and monetary alliances of the Cold War era. I argued there that military alliances and monetary rules structured the world-system into units between states and the totality, which I call “blocs.” Types of bloc can differentiate periods in the history of the world economy. Imperial blocs were the organizing structures of rule from the sixteenth to the early twentieth century. Cold

As extra-territorial aspects implicit in territorial rule become explicit, ruling institutions may move towards something that is, in Ruggie’s phrase, “beyond territoriality.” Now, in Ruggie’s account, and also in many accounts of the world-system, various types of territorial unbundling are pressing the limits of absolute sovereignty, suggesting an old/new, even “neo-medieval,” system of overlapping sovereignties. The identified agents of transformation are the corporate creators of transnational webs of production, trade, and finance. Yet Ruggie (1993:147) also suggests that the recent vision of the ecosphere implies the possibility of “postmodern” forms of rule.

I hope that the link I have made between two types of territory, social and ecological, opens the way to understanding possibilities for epochal change. I have tried to show how a recurring process of consolidation and displacement of *territory* has underpinned the evolution of wealth and rule. Consolidation of territorial borders remains the only possible goal of statemaking elites (Tilly 1995). Yet the accumulation of wealth within larger-than-national markets, and through transnational property ownership and wage relations, displaces material activities—making and using goods—from concrete places.

Mobility of capital and labor, global sourcing and marketing, all disrupt the living and material cycles of local ecosystems and then attempt to compensate for the disruptions through more technology, more purchase of inputs, more selling or using of wastes. This can sustain itself for a prolonged period of time, but not indefinitely. Over time, capital movements and markets eliminate the remaining wild places surrounding ecosystems. Thus, ecosystems are relinked through the very social institutions—markets and transnational corporations—that disrupt them. Markets and industrial techniques are called upon to find ever larger solutions, yet the only place that substances (and models) can be found is in the very earthly cycles needing repair.

War blocs were the structure of rule from 1947 to 1991. It remains to be seen whether a new system of rule will create new blocs, or move beyond blocs. If so, it may move beyond states, which in my view have not had a stable existence apart from one or another type of bloc.

It follows that disruptions to ecosystems eventually become greater than Polanyian limits to self-regulating markets. Political movements for self-protection could at some point be more than recurring cycles in the relation between markets and territorial states; they may signal a crisis in territoriality itself. If so, it is a crisis both of governance and in human inhabitation of the land.

Foodgetting: An Emerging Imagination

Agriculture, the method of human foodgetting, is key to transforming economy and governance. Our techniques of foodgetting, which have underlaid the immense carapace of social organization, culture, and rule from the beginning of civilization, remain key to human effects on earthly webs of life. Humans not only continue to interfere with natural and material cycles in domesticating plants, animals, landscapes and waterways, but must do so. Colin Duncan (1996) argues that an ecologically sustainable society must transform human foodgetting by placing it at the center of economy, governance, and science. Foodgetting, and the activities built around it, will be responsible only when they respect and accommodate living cycles. In other words, after a half century of agricultural subordination to industry, and disruption of the living cycles, the future depends on reviving human capacities to secure necessities in ways that work with, alter, even enhance (from a human perspective) living cycles. This will require subordinating industry to agriculture.

The living cycles of the earth are self-organizing. They exist as contours of earth, formations of living soils, flows of waters and currents of air. These cycles support, and are renewed (and changed) by, webs of living organisms. The oldest smallest—the single-celled organisms that break down matter and allow it to recombine in new forms—are also the most important. They renew soil, which is not dead dirt, but a staggeringly complex and dynamic weave of mutually dependent organisms. Micro-organisms also work within human bodies to digest the hamburgers we eat, to allow our bodies to turn them into energy and the substance of new cells. Earthworms and ants are more important to human life than cattle and wheat. Yet human foodgetting in the modern era has multiplied the numbers of cattle and wheat at the expense of many other organisms, in ways that diminish the numbers and interactions of other organisms. Industrial agriculture, monocultures

and trade operate with far less attention to the web of living beings than our peasant ancestors showed.

This understanding is sound and sensible, yet highly divergent from the principles and ideas governing the present rules and practices of markets, capital, industry, and industrial agriculture. To shift society requires, as Ruggie argues, a new social imagination. This is not something willed—it is far too large and long—but something that can be identified in history and may guide our attention to, and interpretation of, apparently small changes. It seems unlikely that anyone in fifteenth century Europe could have envisioned the modern capitalist economy or state system.

Ruggie (1993:157-60) argues that modernity was based on the emergence around the sixteenth century of a radically new “social episteme”—a web of meaning and signification.¹⁰ Its elements included: the right of the ruler to choose religions, the shift of imperial powers to territorial rulers, the rediscovery of the Roman legal concept of absolute property, the creation of national languages, the rise of individual subjectivities and new interpersonal sensibilities and, perhaps most significantly, the invention of single-point perspective in the arts. This transformation, Ruggie states, was “literally mindboggling” to contemporaries. He offers examples of administrative decisions at the time that equally boggle a late-modern mind.

Ruggie cites global ecology as a potential source of a “new and very different social episteme—a new set of spatial, metaphysical, and doctrinal constructs through which the visualization of collective existence on the planet is shaped.” Ecology, and a variety of other named perspectives, such as Chaos Theory, offer holism and interdependence in place of absolute separation (of individuals and states) as organizing principles. Ruggie cites as an example of post-territorial thinking the concept of international custodianship, in which no institution tries to replace territorial states, but states mutually enforce community norms, such as preservation of cultural heritage or biodiversity. Such innovations displace one of the defining features of social episteme of modernity that underlay the vision of the state as the defining point of “its” territory—the single-point perspective (Ruggie 1993:

¹⁰ See also Anderson (1983).

157-60,173). In its stead, something more akin to a medieval multiperspectival approach displaces the state from the absolute centre, just as it displaces the human species from absolute dominion over the earth.

As the principal image of modern rule, property, and individuality, territory is a site of transformation. Ruggie's (1993:149-50) invocation of medieval rule is suggestive, not because we could or should go back (though there may be something to learn), but because it opens our minds to the possibility of overlapping jurisdictions. Medieval rulers belonged in common to an intertwined (if not harmonious) set of ruling lineages (royalty or nobility), whose marriage and inheritance united them across territories and separated them from their subjects. These rulers assumed patchwork governance across the European continent, relying on a fluid continuum between public territories and private estates. These were divided not by clear boundaries but by large transitional zones. Christendom and the Universal Church (whose language was Latin) provided an overarching moral universe, constituting fluid jurisdictions over sacred and secular matters, and overlapping sovereignties.

A unifying ecological imagination may be key to resituating human society within nested, overlapping, ecologically defined terrains (bioregions)—from the microcosms of fields to watersheds, climatic zones, and the biosphere. As agriculture is pivotal to human relations with greater-than-human nature, an ecological imagination can begin with agriculture. Our species life depends on the inescapable need for food. Foodgetting is the crucial and inescapable intervention humans make into more-than-human natural cycles.¹¹ By reimagining social organization in light of this reality, we can begin to see how to enhance the material and biological cycles of the earth to human benefit. This requires a redefinition of what it means to be human.

CONCLUSION: ANTICIPATIONS OF A POST-HAMBURGER WORLD-SYSTEM

The hamburger, then, condenses the dominant movement of human integration of the planet since the sixteenth century. First European colonists carried their favourite domestic species (and their pests, e.g., dandeli-

¹¹ —which of course are effects on ourselves.

ons, rats and smallpox), which thrived at the expense of New World grasses and buffalo. It was a drastic ecological simplification. Chief among the favored dependents were cattle and wheat. Then, in the nineteenth century, transplanted species became the basis for a startling leap in social complexity and ecological simplification. European humans, like exotic wheat and cattle, had shallow roots in North American grassland ecosystems. They substituted complex social, technical, and financial instruments to turn wheat and cattle into rivers of seeds and flesh (Cronon 1991:120). Deracinated settlers specialized in industrial monocultures of wheat and cattle, compromising the living cycles of untilled grasslands.

Within the context of wheat and cattle monocultures, there arose in the middle of the twentieth century two new phenomena. The U.S. rose to hegemony in the state system and in world agrofood markets. Markets became deepened by corporations that organized transnational sectors of food (as other) production. The corporate hamburger thus arose in the United States, produced from ingredients gone rampant in an alien agroecosystem. Fast food corporations transplanted the cattle (especially) once again, this time to a still more fragile ecosystem, tropical rainforests. Thus another stage in social complexity, the organization of commodity chains across the globe, accompanied another stage in ecological simplification.

The effects, of course, are cumulative. As wild places are destroyed, local ecosystem disruptions become linked. The substitution of money circulation for disrupted earthly cycles approaches a material/biological limit (Wilson 1992). The official recognition of common danger came with the first United Nations Conference on the Human Environment in Stockholm in 1972 (Knelman 1999: 124-42). The biosphere concept entered public discourse at about the same time that food and energy markets became turbulent in the early 1970s. Since then, humans have developed two competing and evolving visions of the earth: global production chains managed by transnational corporations, which disrupt and attempt to replace self-organizing cycles; and a biosphere in which humans work with the self-organizing material living processes of the planet.

Foodgetting is at the crux of the choice, as foodgetting is the necessary relationship to larger-than-human nature. Are there practices and relationships in foodgetting that, parallel to Medieval cities and trade, might prefigure a new social episteme and a post-territorial world of nested bioregions?

In the prairie heartland, limits of both industrial agriculture and exotic monocultures are being noticed. U.S. farmers have reached the limits of chemical fertilizer use, where additional units no longer increase yields. They have applied steady, or even declining, quantities since the early 1980s (Brown et.al. 1992:38). Two solutions are offered. One is the further development of industrial technology in the form of genetic engineering and so-called "precision farming." The latter directs equipment on the ground to dispense specific mixes of chemicals according to satellite-generated analysis of soil composition in small areas.

The second solution reverses this logic, and at first seems as strange as Galileo.¹² Wes Jackson is a pioneer farmer-geneticist-ecologist who founded the Land Institute in Salina, Kansas, in 1976. Based on studies of soil degradation and the decline of ancient civilizations, and practical and scientific knowledge of prairie ecosystems, Jackson has taken up the challenge of sustainable farming in North American grasslands. He notes that European methods of tilling and row planting in the prairie ecosystem lead to soil loss and decline in soil water retention. His solution shifts both methods and crops. He seeks to enhance (for human benefit) what he calls the "wisdom of the prairie"—the complex inter-relationships among living beings and material cycles that evolved over millions of years. Like evolutionary biologists (e.g. Wilson 1992), like nineteenth century thinkers who emphasized the parallel between forest ecologies and field ecologies, like present-day ecofeminists who criticize the linear, simplifying practices of the Green Revolution (Shiva 1993), Jackson emphasizes the astonishing and *unknowable* complexity of living processes and the appropriate cultural attitude of respect (if not awe). He experiments with "no-till" farming, using mixed perennial grasses to approximate the original (untilled) prairie ecosystem and creating a renewal of interwoven cycles of crops and micro-organisms.

Jackson's experiments are, after a century of monoculture and exports, a return to the self-organizing processes of the specific ecosystem upon which

¹² Galileo still seems strange if we consider that most of us still experience the sun as rising, that is, as revolving around the earth. It takes a mighty effort to imagine what I "know" to be true, that I am held by a giant ball as it turns towards the vastly larger ball of fire that holds my planet in orbit.

many of the world's humans depend for grain. Jackson mimics through scientific observation and experimentation what peasant cultivators learned over thousands of years: how to practice self-renewing foodgetting. In its systematic guidance of living processes, and its incorporation of changes from year to year (ecosystem succession), it resembles the extraordinary experiments of pioneer self-taught Japanese agronomist Fukuoka (1978), who substitutes attention and minimal intervention for annual disruptions of tilling, planting and leaving the soil bare after harvesting. This recalls the English attitude of High Farming, not in its disregard of people, but in its attention to the living cycles of plants, animals, and soils.

These experiments in self-renewing agriculture, in what is being called "habitat-enhancing agriculture" (Imhoff 1998:8), reverses the logic of industrial agriculture. Because North American grasslands were never farmed by a peasantry, the application of socially and ecologically sustainable methods have no traditions to draw from. A scientific approach is necessary. It is a different science, working from and with different principles from the linear, industrial methods that broke the matted grasses and mined the riches of soil continuously manured by millions of buffalo.

Meanwhile, monocultural farming based on industrial techniques, vast transport systems and elaborate commercial and financial instruments, are being rapidly exported to the rest of the world. The complexity and self-renewal of those systems are in danger, as is biological diversity and the renewal of water and air cycles necessary to human life. Jackson's experiments, and those in other North American agro-ecosystems (see Imhoff 1998) by necessity pioneer a type of agriculture based in ecological science. Agroecology self-consciously recovers the self-renewing qualities of much (not all) traditional agriculture, such as traditional paddy rice cultivation in South India (Bayliss-Smith 1982:69-73).

It is encouraging to consider the urban-inspired changes in farming. Jacobs (1985) argues that agriculture may have emerged after cities rather than before them. From ancient Rome on, cities, wheat cultivation, and agronomy waxed and waned in tandem (Montanari 1992: 30, 50-54). Today, when the majority of people inhabit cities (what Crosby [1986] calls "monocultural stands of humans"), the choice of crops, the knowledge of cultivation and the application of human energy will likely find their renewal in cities. In a time of degraded employment, it is encouraging to consider the pos-

sibilities of combining skill, work, and roots in a specific place. In a time of cultural confusion, it is encouraging to anticipate a movement of individuals into intentional communities centered on wise, self-renewing practices for foodgetting. In a time of rapid change in climate and other signs of biosphere disruption, it is heartening to consider the possibility of refocusing human livelihood in the self-renewing processes of local fields, watersheds, and bioregions.

But no doubt utopian. International custodianship and recognition of common interests in regulating climate, biodiversity, air and water quality and cultural diversity seem puny in comparison to growing wars, specialization, trade and loss of public regulation. Habitat-enhancing agriculture is dwarfed by the rapid plantings worldwide of genetically modified crops (often with associated increases in toxic chemicals), by concentration of small companies specializing in “organic foods” and by cooptation of the “organic” market, including standards and farms, by transnational agro-food corporations (Imhoff 1998). Yet our future depends on alternatives in place if and when local collapses occur, particularly in monocultural export regions.

If epochal change in social relations and governance are upon us, then they will be either intentionally guided or disastrously eruptive. Ruggie reminds us that modern territorial rule, together with capitalist social relations, arose from prolonged crises. They were not the functional outcome of changes “necessary” for “capitalism” or “sovereignty,” words that became imagined only in the course of the long, arduous birth of modern institutions. The institutions of feudal society and rule were deeply entrenched in the imagination and practices of people throughout Europe and formed the world against and within which town dwellers and merchants, farmers and landowners, experimented with new ways of life. Feudal institutions succumbed to massive suffering and chaos in the fourteenth century—which we blandly summarize as the Black Death and the Hundred Years War. Perhaps there was no other option then, and perhaps not now either.

New epistemes, Ruggie reminds us, grow in obscure corners of the old. Consider the following commercially successful enterprise in Toronto. Three young people, two women and a man, own and work in a company called Annex Organics. They sprout seeds in a facility belonging to an innovative, quasi-public, quasi-non-governmental organization called FoodShare,

and in season grow vegetables on the large roof. One of them conceived the idea after dropping out of graduate studies in biology, after discovering that research would always be in a laboratory. The three individuals share knowledge at home and abroad. One of their educational projects is to teach urban gardeners how to save seeds from crops to replant in future years. Imagine their surprise when commercial farmers turned up to learn how to save seeds! It is a sign of the times that farmers did not know this, and that they went not to government extension agents, not to seed corporations, not to agricultural programs in universities, but to educated, enterprising young people engaging in a self-conscious version of what farmers used to do.

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