

## Modernity and the Hamburger: Cattle and Wheat in Ecological and Culinary Change

Every day, think as you wake up, I have a precious human life...I am going to use all my energies...to develop myself...for the benefit of all beings. (H.H.the XIV Dalai Lama, 2004)

The perfectibility of man is truly indefinite; and...the progress of this perfectibility, from now onwards independent of any power that might wish to halt it, has no limit than the duration of the globe upon which nature has cast us. (Marquis de Condorcet, 1793)

The epitome of the modern meal is the hamburger, now a world cuisine, the culinary equivalent of English as a world language. Like languages, agronomic and culinary histories reflect world-wide contests for political and economic dominance, as well as the practical engagements of humans with one another and with natural cycles in both near and distant habitats. The hamburger can thus serve as a “lens on modernity” (Counihan 1984). Not only does the hamburger shove aside diverse cuisines in favour of a uniform edible commodity recomposed out of generically reconstituted elements of ancient European domesticates – wheat seeds, cattle flesh, fats, and flavours (Goodman, et. al., 1987; Schlosser 2002). It also depends on, and extends, a radical simplification of ecosystems into uniform fields of soy and maize for cattle feed – both exotics to North American grasslands<sup>1</sup> -- and then into temporary cattle pastures on the ashes of burnt tropical rainforests. The flesh comes from cattle bred to approximate machines for converting feedgrains into industrial raw materials and converts massive fields into genetically uniform factories to feed the cattle. Also like the English language, High Modern foods such as the hamburger, depend on creative renewal of (agri)cultures and cuisines (Scott 1998). Food, however, is at the core of human relations to others --- what Max Weber called “commensality” --- and most of all, to our diverse habitats (Friedmann 2000).

This essay explores the active role of wheat and cattle in shaping the Americas, homeland of the industrial hamburger, in the hope that their diasporic history may point to an exit from apparent environmental impasse. Environmental historian Clive Ponting, for instance, concluded from his ovarian *Green History of the World* (1991:397-98) that

The expansion of Europe can be viewed as gradual establishment and expansion of empires and the bringing of ‘civilization’ to less fortunate peoples. From an ecological perspective, it seems more like a wave of destruction spreading across the world. The settlement of North America exemplifies this process. At the leading edge of the frontier the indigenous inhabitants were brought under European influence and, eventually, control, starting with the activities of traders and trappers. They were dispossessed of their land by *settlers* and pushed further westwards, where the process was repeated until they were reduced to a sad remnant of a once flourishing people. As the fur trappers and hunters extended their activities, they exterminated many species such as the beaver, bison and passenger pigeon, either totally or over a wide area. The *settlers* cleared the natural forests and established fields. With so much land the tendency was for agriculture to expand to meet the space available – moving on as poor practices rapidly exhausted the soil and left it susceptible to erosion. As productivity declined, degraded land was abandoned and the frontier of cultivation moved further west. At the same time timber companies were also cutting down the forests and mineral prospectors and companies were developing mines to extract metal ores and coal. Industries developed and with them large, sprawling cities that spread across the countryside. (my emphasis).

Another environmental historian, William Cronon, wrote in the epilogue to his magisterial *Nature’s Metropolis: Chicago and the Great West* (1991:378):

One ending to this story, then, is about the rise and fall of the greatest gateway city of the Great

West. Viewed from Chicago, the process which the historian Frederick Jackson Turner described as the reenactment of social evolution in isolated frontier places has a very different meaning. From the heart of the city, the frontier history of the Great West looks to be a story of metropolitan expansion, of the growing incursions of a market economy into ever more distant landscapes and communities. Nothing was left unchanged by this process. It brought massive *Euroamerican migrations* and the ensuing *military conquests* of Indian peoples. It profoundly altered existing ecosystems, remaking prairie and forest landscapes into farms, ranches, and Cutover districts. Perhaps most important, it imposed on the land a new geography of second nature in which the market relations of capital reproduced themselves in an elaborate urban-rural hierarchy that would henceforth frame all human life in the region. (my emphasis).

Ponting's story of human repetition, and Cronon's story of a new depth of ecological transformation based in markets, both underpin my story. However, the two authors share two one-sided views that this essay seeks to rebalance. First, their shared focus on *migration*, *settlement*, and *total war between cultures* may exaggerate the agency of humans --- especially of European humans -- relative to other species in domestic groups or "households." Although both authors credit the specific features of wheat and especially cattle with contributing to the success of Europeans in substituting their own exotic selves and co-domesticates for the very different indigenous complexes they displaced, these insights rest uneasily with the larger conclusions cited above. Second, their shared focus on the urban nature of human society at present, both in what now appear to be the "breadbaskets of the world"<sup>2</sup> and in the world as a whole, seems to concur with the wider notion that food and agriculture are now irreparably alien to most human experience. While true, the direct mapping of knowledge onto a simple urban-rural dichotomy directs attention away from potential sources of renewal of culinary and especially agronomic creativity.

In this paper I make a rough sketch of how some very large ideas might fit together to rebalance the understanding of modernity by giving more weight to its grounding in cultural and ecosystem creativity (Scott 1998). In the first section, I briefly outline a view of *co-domestication* of humans and other species, including *re-domestication* of feral species, and of *biocultural diasporas* as recurrent processes of culture formation since prehistory. This provides the basis for section two, which traces one thread of the European biocultural diaspora leading to the rise of monocultural edible commodities, especially the hamburger. Section three explores how the multiple threads of polycultural gardens and cooking pots of ordinary people, who adapted and learned about crops, animals, ingredients, tastes, and techniques from each other and through continual recreation of domestic landscapes --- what can be called *the secret history of colonialism* --- might allow communities increasingly aware of themselves as diasporic, and increasingly urban, to forge a sustainable culinary and agronomic destiny.

## De-Centering (European) Humans: Re-Domestication and Biocultural Diasporas

### *Biology and Culture: Co-domestication and Re-domestication*

The problematic ideas of European "expansion" and "settlement" minimize the role of plants and animals in determining the outcomes of colonial encounters. Scholars have long disputed the ways that humans and animals came together and even how to draw lines between autonomous cooperation and mutual dependency (e.g., Bokonyi 1989, Duclos 1989). At the same time, social historians have increasingly become aware of the agency of plants and animals in the hierarchical inter-species households that constitute domestic groups (e.g., Mumford 1961, Pollan 2001). From Neolithic settlement until industrial specialization, these households have been the basic unit of villages, pastoral societies, plantations, manors, haciendas, and latifundia. Enlightenment critiques of human inequality compared human slaves to animals, and contemporary experts sometimes compare domestic animals to slaves (Brotherston 1989:241, Zeuner 1963). Despite more sacred meanings attached even to domesticated llamas, early complaints by Inca, already literate and uniquely pastoral in the Americas,

against the Spanish lawlessness, compared Indians who were taxed to domesticated animals and *meztizos* who were exempt to wild (free) animals (Brotherston 1989: 248). In European as well as other experiences, women, slaves, servants, livestock, and of course, the fields for crops and pastures, have all, until the struggle for rights brought by modern politics, been legal extensions of masters.

While domestic animals create problems of varying degrees, except in steppe or grassland ecosystems (Zeuner 1963:30-35), swidden farming and hunting cultures can manage landscapes in ways that are consistent with ecosystem integrity (Scott 1998). Cronon's (1983) brilliant analysis of colonial New England, details how early English colonists were unable to recognize Indian management of what they perceived as a natural Eden. Once colonists altered spaces that were in effect managed to attract browsing deer, they were mystified when the apparently natural deer disappeared. As environmental historians and anthropologists recover this history,<sup>3</sup> it is becoming clear that millennia of tending landscapes laid the basis for the five hundred year transformation of American ecosystems into what Alfred Crosby (1986) calls "neo-Europes." European histories until recently at best credited cultures encountered by Europeans with teaching about maize, turkey, maple syrup, sunflowers and tobacco. For the most part, the main theme was transition from "wilderness," in which local cultures implicitly lived as unconsciously as animals, to the "civilization" that recreated landscapes in the image of rural England (Cronon 1983). We can now shift our thinking to understand the existential continuity of humans as tenders of ecosystems, as well as the historical changes emphasized by histories focused exclusively on perceptions of the European diaspora.

The major exception in popular consciousness is the mounted Plains Indians, whose long resistance depended on *re-domestication* of feral horses. They fought competing cattle herders of the European diaspora for decades in forbidding, arid grassland ecosystems that the latter called The Great American Desert (Webb 1971 [c.1931]). Plains Indians maintained perennial grasses (against encroaching forests) as a vast pasture by the use of fire and with the help of trampling herds of buffalo. A minority improved their hunting by redomesticating feral horses who made their way north from Spanish America (Pyne 1997a,b). Decades would pass before steel technologies and expanding state military power allowed for a successful assault on all the species mutually supporting the landscapes and cultures of the prairies, and for their displacement by annual grasses, livestock, and techniques typical of a neo-Europe (Cronon 1991, Crosby 1986).

Biological and cultural processes combined to reshape many New World ecosystems. The effects of European plants and animals on the food base of American cultures varied with their encounters with local agro-ecosystems. For instance, llamas, which were first domesticated in the Andes, are herded by descendants of precolonial Incas in two distinct ways that can be seen as a continuum of neo-European influence; herders at lower elevations intensively control flocks of llamas and diasporic sheep and goats, throughout the annual migrations; while those on higher elevations, which cannot be tolerated by sheep and goats even after many generations in the climate, practice less intensive management of llama herds, who seasonally migrate and forage on their own at the highest altitudes (Rabey 1989). Llamas, along with alpacas and a few other camelids, were the only large grazing animals in South America. In contrast to the single North American exception, the grassland bison, European grazers did not compete with llamas. But major disruptions to Inca food crops came from a colonizing diasporic weed they called *trebol* (probably white clover), that provided familiar fodder for feral cattle and horses, who finished the destruction (Crosby 1986:154-55). Although potato cultivation, including thousands of varieties, still typifies Andean agroecosystems, many of regional food crops, such as quinoa, have only recently been revalued, and precolonial systems of cultivation that evolved over millenia remain in need of recovery after centuries of internalization by people at the bottom of racialized hierarchies of disdain by Spanish rulers (National Research Council 1989).

Destruction of domestic landscapes and the species and cultures they supported, has always been a combined effort of humans and other species. Crosby's (1986) pathbreaking concept of "ecological imperialism" in the Americas and elsewhere reveals the role of European "companion

biota” --- from horses to rats, from dandelions to smallpox --- in deciding apparently human conflicts. The complementary roles of human, animal and plant co-domesticates arriving from Europe to the Americas is the biological foundation for understanding the *disruption* of ecosystems and the cultures dependent on them. Without the destruction of indigenous ways of using the land, there could not have been put in place new ways that after five centuries culminated in the industrial hamburger.

However, *consolidation* of what Crosby calls neo-European landscapes depended on *cultural* processes of mutual learning among conquered and conquerors, including new agronomic and culinary configurations combining indigenous and exotic species, tastes, and techniques. R-domestication is also a combined effort. In each encounter, cultures emerge with new mixes of populations, or population biologies, and new forms of hierarchy and cooperation within and among species, including unwanted domestics (pests, weeds and diseases). At the same time, these particular plants and animals constitute the agronomic and culinary base for specific human cultures; the knowledge of growing and cooking, and the varied meanings of body, society, and world, are intimately bound up with those specific plants and animals.

Ecological imperialism was thus the result of what I am calling *biocultural diasporas* of Europeans. These not only undermined or destroyed the great civilizations and the smaller cultures of the Americas. They also provided new cultural raw materials for syncretic agronomies and cuisines, especially via *redomestication* of disruptive European cattle. The feral herds of goats, sheep, pigs, and especially cattle that disrupted ecosystems and undermined the food supplies of cultures also offered new possibilities to the remnants of older cultures to renew or recreate co-domestic lifeways. These in turn altered ecosystems through cultures as diverse as the *gaucho* culture of Argentina and the Mexican villages linking (culturally mixed) humans and redomesticated cattle (and descendants of other European livestock), with both adopted and indigenous crops. Like the mounted Plains Indian culture, which abandoned cultivation in favor of hunting with redomesticated horses, gaucho culture was transitional to fully neo-European wheat and cattle systems. By contrast, when cattle and humans settled down together in Mexico, indigenous maize (agri)cultures and cuisines incorporated animal power, meat, milk, leather, and tallow by rendering exotic cattle familiar.

#### *Diasporas As Biocultural Phenomena*

All the innovations underpinning the hamburger --- as well as those that produced the “creole” cultures of the Americas --- were intrinsically *diasporic*.<sup>4</sup> To a lesser degree than Mexico’s *chicken mole*, and still less than the Jamaican dish of African ackee, North Atlantic dried codfish, and (Asian or African) rice, the hamburger itself was a product of diaspora. Beef had been difficult to eat back in Europe, and where sheep were plentiful, mutton had often been preferred by those who could afford it (Revel 1982:4). Ground beef patties were part of the culinary legacy of the German diaspora, but they had often been prepared with fried onions, and never put between slices of bread; even if they had, buns made of hard wheat flour would not have been available until new varieties of hard wheat were bred for the arid plains, and steel roller technology allowed them to be milled into white flour after 1880. The hamburger originated anonymously, probably around the turn of the 20<sup>th</sup> century, in one of the county fairs that were a site of organized agronomic and culinary creativity of diasporic European farmers in the North American grasslands (Harris 1985: 121). It exemplifies what Scott (1998: 309-41) calls *metis* --- the cultural creativity and natural resilience that are appropriated by the powerful for radical projects of simplification, and which nonetheless allow human communities and ecosystems to survive their deprivations.

By the time of the invention of the hamburger, beef and wheat were at least as different from their precolonial ancestors in Europe as were their steel-based agronomies. European agronomy, and the cuisines it supported, had evolved over millennia by clearing forest ecosystems and plowing the deep soil with wooden plows. Fallows, mixes of plants and animals, rotations, and other innovations deeply grounded in specific European habitats, were impossible to apply in the grasslands of the

Americas. The innovation of placing minced cattle flesh between two pieces of wheat bread --- the preindustrial or craft hamburger --- was genuinely syncretic.

If ecological imperialism de-centers humans in the story of European conquest of the Americas, then replacing the idea of “settlement” with that of *diaspora* de-centers Europeans in the story of changing cultures in the Americas. The European diaspora was neither the first nor the last. Cultural repertoires of all the diasporas, including the companion plants and animals with which they work, are part of the story of the Americas that began with the first settlement of America at least 13,000 years ago. This was the last great prehistoric movement of humans across the earth, and it took about 3,000 years to complete the ecological transformations attendant on inhabitation and enduring cultures (Ponting 1991: 30-31). The huge time span between that diaspora and the European diaspora launched in 1492 accounts for the extraordinary rapidity and depth of the changes that ensued.<sup>5</sup> The European diaspora could not have succeeded without the prior domestication of American landscapes, including the foods and cultural techniques that supported exploration, trading posts and stable settlement. For instance, Usner (1986) describes how trade with existing cultures, such as the Pascagoulas, supported successive attempts by the French in the early 18<sup>th</sup> century to create a stable settlement at the mouth of the Mississippi. After a two-year famine that devastated the 7000 Europeans and 2000 enslaved Africans ended in 1721, the French fort was re-established through trade with the Pascagoulas and other aboriginal peoples, who provided maize, beans, fruit, vegetables and meats, in exchange for manufactures. Rather than commanding the enslaved Indians in the military settlement to grow food, and unable to afford the expense of importing wheat already available in Veracruz, Mexico, the French colonists induced autonomous indigenous farmers to grow both their own crops and introduced species, such as chickens.

The European diaspora could not have succeeded either without the many diasporas that provided labour, food crops and skills to cultivate them. Before the South Asian, Chinese, Lebanese, and many other diasporas that would later add to the mix of agronomies and cuisines of the Americas, enslaved Africans were the first diaspora to support European plantations. Not their labour alone, but their homeland rice and skills to cultivate it allowed early European plantations to survive. African rice was a co-domesticate of several West African cultures. Captive women carried their companion rice with them when they could, even in their hair (Carney 2004). African rice cultivation and preparation was part of the cultural repertoire of (mainly female) slaves, who adapted their skills, and the local ecosystem, to feed themselves and their masters, as well as supply the first trans-Atlantic food export to Europe (Carney 2001). The slave trade also introduced maize to Africa, which in turn meant that later captives carried knowledge of maize cultivation and preparation to the Americas, while others learned it after arrival.

Their diasporic foods and skills gave African slaves a modicum of autonomy. To return to the example of the Louisiana colony, in the four decades after 1721, a completely new food system arose based mainly on a mix of elements from the food systems of West Africans and New World peoples. Louisiana’s colonial governor requested to buy slaves with prior knowledge of rice cultivation. Slave cooks in the colony used maize and rice interchangeably in a dish called “couscou.”<sup>6</sup> By the 1760s, descendants of Africans and of American cultures routinely shared both crops and horticultural skills. Marketing skills brought by women from West Africa sometimes enabled them to earn enough to buy their freedom (Usner 1986).

To close the circle, I view diasporas as *biocultural*. *Biocultural diasporas* of Europeans, Africans, and Asians all contributed to cultural transformation of the Americas.<sup>7</sup> “European,” of course, is a composite category that glosses imperial wars among Spain, Portugal, Holland, France, and England, as well as the wars of independence waged by American-born descendants of European cultures who “turn[ed] against their homelands” (Cohen 1997: 67).<sup>8</sup> Yet conceptualizing a European diaspora focuses attention on the relative ecological and cultural unity of the species that arrived, of the cultural techniques, perceptions and tastes that were utterly exotic to the Americas of 1500, and distinct

from (also diverse) African and Asian diasporas. Reconceptualizing encounters (both violent and cooperative) between successive waves of migrants as biocultural diasporas opens the possibility for understanding the agroecological and culinary simplifications that (via commercial, technological, and financial inventions that adapted European practices to a more yielding context) led to the industrial hamburger. At the same time, it connects that story about the massive simplification of cuisine and agronomy to the cultural creativity that has always enhanced agricultural and culinary diversity. Following Scott (1998: 273-82), I call these, respectively, *monocultures* and *polycultures*.

### Modernist Monocultures: An Inter-Species Collaboration

The dominant stories of agriculture emphasize increasing human alteration of natural ecosystems; positive stories anticipate a continuation of the heroic march towards feeding ever larger populations, for instance, through genetic technologies (Runge et.al.2003); and negative ones anticipate disaster unless present practices are drastically altered. The critical story credits two features with the survival of the human species so far: the resilience of natural ecosystems, together with possibilities for humans to move on to undamaged habitats (e.g., Ponting 1991, Eisenberg 1998). These, of course, are radically diminished and rapidly diminishing. One thread of this story is a doomed march towards monoculture.

In natural ecosystems, species succeed each other leading to a stable and breathtakingly complex web of relationships that define a limited number of broad types, such as temperate forest, tropical forest, desert, grassland, and various marine ecosystems. All species alter ecosystems, but humans are unique in our ability to consciously improve our foodgetting and our ability to adapt to virtually every terrestrial habitat. Humans have hunted their prey to extinction and great civilizations have collapsed because of desertification, soil salinisation, and overgrazing of livestock (Wright 2004, Eisenberg 1998). Most great civilizations were founded on cultivation of a specific grain,<sup>9</sup> which are annual grasses. The reproductive strategy of grasses is to produce many seeds. This makes it an efficient plant for human food. However, grasses thrive in early stages of succession. Over time perennial plants take over, effectively competing with more elaborate root systems to take up nutrients and moisture and larger and higher leaves that capture sunlight and cast grass seedlings into shade. For humans to create fields of grasses is to interrupt natural succession at an early stage and henceforth to fight competing “weeds” that naturally move in to grain fields. This, as the biblical story reminds us, is a lot of work. Grazing animals are most likely domesticated via attraction to cultivated fields, and their gradual bond with humans in turn requires reshaping of landscapes to ensure their food (Bokonyi 1989: 23). The reorganization (domestication) of human relationships and ecosystems to create and recreate fields of seed-bearing plants and pastures changes all of the elements. They come to depend on each other, and often on features of soil and climate which also change and eventually undermine the civilizations that have altered them.

In the West, wheat has been the favored plant, and other grains, such as barley and rye have shared its agronomic relationship to both field agriculture and livestock, notably cattle. Wheat and barley emerged as domestic plants from their wild ancestors in relation not only to humans but also to sheep and cattle. The integration of large livestock into farming systems as direct sources of food (as well as traction) is, according Braudel (1974: 64-68), the most important difference between the (agri)cultures of Europe and China. Grazing probably contributed to the transformation into deserts of many forested landscapes of Mesopotamia and other civilizations that arose across the Mediterranean. At the same time, combined agriculture and herding gave Europeans not only the cheeses that Braudel is rightly pleased to have inherited, but also advantages in moving on and colonizing new ecosystems. Humans, especially northwest European ones, developed into “champion milk-digesters” (Crosby 1986:48); horses and oxen became “energy slaves” for plowing dense soils cleared of forests (Bayliss-Smith 1982:37-55), and their manure enriched fallow fields for renewed grain cultivation.

This story may be different in rice systems, and the unification of the Old and New Worlds

would certainly have unfolded differently had rice rather than wheat and cattle accompanied early contact, trade, and even colonization (Palat 1995). Given the far more sophisticated technological and commercial experience of China, the internal crises that prevented it from ‘discovering’ the Americas before Europeans are a turning point in human history (Abu-Lughod 1989, Ponting 1991: 127). Remembering that it did not have to happen as it did, it is important to note what the specific effects of wheat and cattle, as the domestic companions of European humans, have been on connecting and transforming the ecosystems of the earth.

Wheat and cattle emerged as human co-domesticates whose agency was key to the colonizing success of European diasporas in the Americas. Twentieth century grain and cattle monocultures in the North American prairies were the culmination of a 350 year destruction and reconstruction of American ecosystems by successive European biocultural diasporas. “Extended families” of European humans and their “portmanteau biota” enacted what Crosby (1986) calls ecological imperialism. Cattle and horses arrived with Columbus, and escaped into a paradise (except for the Andes and the North American plains) devoid of large grazing animals. Huge herds of feral cattle, horses, sheep, and pigs grazed and trampled ecosystems across South and Central America, the Caribbean islands, and parts of North America.

Small societies and large civilizations crumbled under the combined pressures of damaged agro-ecosystems, vulnerability to alien disease organisms, and the arrogance of European cultures that forced remnant populations to reshape cultivation in ways familiar to the conquerors (National Research Council 1989). Spaniards planted Old World crops on every farm and enslaved Indians to cultivate them. Within half a century, wheat was being exported from Mexico, and the landscapes of Peru and Colombia had been permanently transformed by feral cattle (Sokolov 1991: 69, 87). Wheat also arrived with Columbus, but failed to thrive in the tropics. Only when cattle, horses, sheep, and humans had transformed parts of Mexico into a neo-European landscape were wheat fields able to thrive (Crosby 1986). Thus began the staggering project of successive, warring waves of Europeans to make themselves feel at home --- a project built not only on cultural arrogance but also on the arrogance that took credit for the role of their servants, both obedient and fugitive, in weakening rival domestic groups.

The transformative power of wild cattle and horses ended when they reached the North American prairies, where wheat, cattle, and human co-domesticates found their counterpart triplex of species: grasses, large grazing animals, and a human cultures based on managing the vast pastures to support a population of bison numbering tens of millions. The deep roots of perennial grasses survived periodic burning, which renewed the nutrients they supplied to grazing bison. Roaming herds of bison, which were never domesticated, trampled and grazed the perennial grasses, keeping them short, tough and resilient. Perennial grasses held moisture in a climate with very low precipitation, and held soil in place against violent downpours unknown in forested ecosystems. The bison had few predators other than humans, who also assisted their populations to grow. Their size and numbers made their stampedes fearsome. The longstanding cultures of the North American grasslands hunted bison on foot to supplement maize-based horticulture in river valleys. They burned competing vegetation to managed the perennial grasslands as a vast pasture for the wild bison (Pyne 1991a,b; Cronon 1991:213-16).

Unlike the mountains of the Incas or the many ecosystems devoid of large grazing animals elsewhere in the Americas, the prairie west of the Mississippi was not amenable to the diasporic techniques that had supported colonization east of the Mississippi, where cleared forests and well-watered tallgrass prairies had soil, moisture and other conditions similar enough to those of northwest Europe. At first European farming seemed impossible in the Great American Desert. European pioneers were the cattle drivers. Some Plains Indian cultures resisted successfully, paradoxically by abandoning farming when re-domesticated horses improved their ability to hunt. The Crow in the 17<sup>th</sup> century, followed much later by the Cheyenne and Blackfoot, repeated the success of the Old World human-horse alliance in improving hunting and warfare. This biocultural adaptation also improved their mobility as warriors. The bison played their part in resisting competition by cattle for pasture.

For decades, the Plains co-domesticates, now including the horse, met the first military challenge of the European biocultural diaspora. Cowboys thrived briefly when the Civil War cut off ranchers in Texas from cattle markets in the Caribbean and slave states of the Confederacy, and cattle increased dramatically in numbers and began to wander freely. Seeking new markets in the north, and responding to westward extension of railways and trading frontier cities at the edge of the Great Plains, cowboys drove vast herds of semi-wild cattle along paths recently followed by bison and Indians. It was a stylized reversal of long domestication of animals after the creation of fields of grain in western Asia millennia before. The Wild West was a period of contention between two cultures based on wild or semi-wild animals, each a branch of earlier agricultural complexes (Cronon 1991: 218-24).

The conflict between cowboys and Indians ended with defeat of both by a massive modernist assault. After the U.S. Civil War, steel railways cut straight across the natural features of the landscape, with their changing river courses and fluid grazers and hunters. They carried “sports” hunters to the bison. Pioneering European destroyers fired bullets directly from the trains and left masses of carcasses to rot. They were quickly followed by commercial hunters in search of skins to sell in the east. But the numbers of animals was so great that three to five animals were “wasted” for every one whose hide was taken. Finally, the hunt was professionalized, with teams of specialized workers supported by merchant outposts that received skins and shipped them to Omaha, St. Louis, Chicago, and New York. Europeans systematically and intentionally destroyed in a few years not only the competitors of cattle, but also the means of life of the Indians. The Indian wars of the 1870s finished the destruction of human cultures already decimated by the wars against the buffalo, which was their means of life (Cronon 1991: 213-18).

Steel rails and bullets quickly destroyed Indian and bison co-domesticates, and cowboys became wage workers bringing meat to market. Their new conflict arose with European wheat farmers, the next pioneers of monocultural transformation. Surveyors mapped the land into regular “sections” a quarter mile square, using railways as orientation. Governments and railway companies collaborated to finance the scheme of recruiting millions of European settlers to farm --- many with little or no experience of farming in grassland ecosystems. Steel plows were strong enough to cut through the tough prairie grasses fences and replace them with wheat and other annual grasses that required continual plowing (Jackson and Bender 1984). Barbed wire fences, also made of steel, protected the fields from roaming cattle (Webb 1991) and carved permanent ranches out of the open landscape. Capitalist ranchers monopolized springs and streams and stored winter hay. Diasporic weeds, which were “relatively free of ecological constraints,” colonized the disturbed soils and have plagued diasporic farming ever since (Evans 2002: 48). Together with cattle hooves and hay, neo-European grains altered the vegetation of the grasslands. Wheat farmers, for their part, could get little from the ecosystem to support life, and had to buy everything from steel tools to cloth.

The new triplex of cattle, wheat and European farmers/ranchers was a highly simplified and vulnerable substitute for bison, perennial grasses, and Plains cultures. The prairie soil should never have been turned over (Jackson and Bender 1984). Soil exposed to sun and violent rain ran into waterways and blew into the air. The accumulated organic richness of millennia held in place by the perennial grasses could support only two generations between 1870 and 1930, when the ecological crisis called Dust Bowl forced another massive exodus of the European diaspora.

What kept all this together in a denuded and alien ecosystem was what Cronon calls “second nature:” markets that substituted elements from afar for the complex web of inter-relationships that had supported plains co-domesticates for millennia (see also Naess 1994). The European diaspora invented ever more elaborate abstract instruments to solve the spiraling problems created by its attempt to colonize the Great Plains with a mix of species unable to establish (agri)culture in that ecosystem.

In that time, beef and wheat themselves became abstract. Where early commercial farmers had sent bags of wheat identified with their names on small boats to be offloaded to large boats to



reach eastern cities, Great Plains farmers brought wheat to elevators served by railways, where it was divided into “grades” according to uniform standards, mixed similar grades grown by different farmers, and sent them by rail and ship to anonymous buyers. Where early cattlemen drove herds of branded cattle to feed lots in market towns, Great Plains ranchers sent cattle by railway car to the great disassembly lines of Chicago meatpacking factories, where their flesh, bones, and fat were separated and sent to multiple sites for sale or further manufacture. To make all these anonymous flows possible, futures markets created abstract ways to buy and sell ownership of “rivers of wheat” and “tides of flesh” (Cronon 1991).

These were the ingredients of the industrial hamburger. The renewal of wheat and cattle production on the Great Plains after 1945 depended on still shallower roots. Grains and animals were more intensively divided, as tractors (introduced in the 1930s) displaced animal labour in cultivation (Berlan 1992) and their manure was lost to soil fertility. Soil fertility was pumped up with industrial fertilizers, and pests and weeds so prone to invade monocultural fields were attacked with industrial toxins. Both were based on fossil fuels and nitrogen-based technologies converted to peaceful from military uses. Both were part of a perpetual war made necessary by the vulnerability of elements connected not to one another, but to distant industries via anonymous transactions (Evans 2002). The animals were now High Modern commodities, valued only for their bodily components (see Scott 1998). They were concentrated into intensive feeding stations, where their conversion of food into flesh, and the speed of reproduction by females, could be measured and manipulated.

These conversion ratios were enhanced by forcing cattle to eat grain rather than to graze on pastures. Demand for commercial feed in turn induced farmers to convert fields to monocultural maize and soy, in a narrow range of varieties prospected in Central America and Asia and bred by specialized agricultural scientists. Maize and soy constituted the simplest possible rotation in monocultural fields. Together they provided caloric and protein elements to fatten cattle quickly. While maize was at least native to the Americas, soy was first introduced in service of modernist food. Margarine, the first true industrial food in its use of substitutable ingredients --- abstract “fats” instead of the cow milk necessary for butter (Goodman et.al. 1987) --- had inspired introduction of soy to North America. It thus arrived in the Great Plains (and to replace cotton in the South) not as a companion of diasporic humans, but as an industrial raw material with desirable technical qualities. As a byproduct of margarine, soy meal was cheap and readily available. Demand for meal grew with demand for meat until the meal became more important commercially than the oil (Bertrand et.al. 1983).

This system became celebrated as the Breadbasket of the World, and through a variety of mechanisms, many people across the world have come to depend on wheat, soy, and maize grown in the North American Plains. Not only do exports displace local polycultures in other parts of the world with imported monocultural commodities; this is the complaint against “dumping” by organized voices of the global South at the World Trade Organization (Friedmann 2004). They also deepen the ecological fragility of the world’s food supply, adding depletion of fossil water (the Ogalala Aquifer that runs the length of the U.S. plains) to depletion of topsoil, and multiplying the “food miles” of edible commodities in constant motion by sea, air, rail and truck (Millstone and Lang 2003). It also reinforces old patterns of colonial monocultural exports, and reorganizes new monocultures of cattle, potatoes, and tomatoes (Barndt 2002) as ingredients for a globally sourced industry offering a global cuisine whose emblem is the hamburger.

#### Elements for Polycultural Futures: Past and Present

Exit from a food system hurtling towards crisis will have to be polycultural and regrounded in local ecosystems. The costs and risks of ignorance about agronomic (and related culinary) cultures that work with micro-ecologies specific to farms, fields, and gardens have increased with each leap in technological capacity to simplify nature and society (Naess 1994). A better balance suggests humility about the manifest powers of mechanical, chemical, and genetic technologies, and appreciation of the practical and natural creativity that provides grist for the mills of science in service of wealth and

power. Site-specific variations of, and contributions to, abstract knowledge suggest cooperation between laboratory and field workers that can be captured by the emblems *farmer-scientist* or *scientist-farmer*. A parallel development, whose often distorted beginnings are already part of public consciousness, would be promotion of *cook-nutritionists* or *nutritionist-cooks*. Knowledge and skills in agroecology and food preparation are, I argue, as important to citizenship as literacy and numeracy.

Such a project faces distinct opportunities and challenges in every part of the world, but most particularly in North America, home of the hamburger. The specifics lie in two related historical threads. One is the extreme shallowness of agronomic (and increasingly culinary) experience of the most deeply commodified and least ecologically rooted food system in the world, and its related population biology: human populations are concentrated in cities, and cattle, wheat, maize, and soy populations are concentrated in monocultural “rural” areas. The other is the intensity of continuing diasporas, now from places other than Europe, intersecting in neo-European North America, especially (but not only) its cities.

### *Recovering Polycultural Histories from the European Homeland*

One starting point is to recognize that the High Modernist hamburger was not the only possible outcome of scientific farming. Indeed, the story of the hamburger suggests that transplantation of monocultural wheat and cattle were the unique outcome of technical innovations (material, commercial and financial) by the European biocultural diaspora to accommodate themselves in an alien ecosystem. Mass consumption of anonymous foods that used reconstituted, abstract wheat and cattle ingredients are the necessary (market) complement to such agriculture.

A great historical irony is that the depleting and polluting system of producing wheat and beef in North America displaced the most ecologically benign and productive system of farming ever known. English High Farming of the mid-19<sup>th</sup> century, which was destroyed by its inability to compete with cheap imports after the repeal of tariffs in 1846, was the culmination of a century of application of science (not machines) to farming. High Farming rightly has a bad name in social history, as it was the most extremely exploitative labour system of an intensely exploitative era that saw the consolidation of capitalist industry. Yet recovery of ecological awareness requires that we recognize the astonishing agronomic achievements of the first application of experimental methods to farming and livestock production in England.

The first farmer-scientists developed and applied formal agronomic principles to the systematic observation and experimentation that has always been part of polycultural cultivation. Working with natural cycles of plants, animals, climate, and terrain, they developed a four-crop rotation (wheat, turnip, barley, and clover) in conjunction with sheep rearing in order to maintain and even improve soil fertility. Only within this framework did they maximize commercial wool and wheat. Despite the fully capitalist nature of the enterprise, High Farmers were oriented toward the proper balance between wheat output, animal power, manure, nitrogen fixing plants, animal fodder, and pasture, and the proper way of organizing their relationships. Even the size of the farm was set by the distance the farmer could supervise on horseback, so that human management remained part of the co-domestic household even as it became more systematic in its methods (Duncan 1996: 64-80). As a result, according to Bayliss-Smith’s (1982:107) ecologically appropriate measure of productivity as a ratio of energy inputs to outputs, an English High Farm in 1826, using mainly human and animal work, yielded 40 times more food energy than energy put in. In a monocultural wheat field in England in 1971, food energy output only doubled energy input, which 99 percent of which consisted of fossil fuels. A New Guinea swidden cultivator, using only human energy, created almost 15 times more food energy than s/he put in.

English High Farming developed out of one of the innumerable thriving smallholding systems all over the world (Netting 1993). It offers historical proof that it is possible to enhance the practical knowledge of farmers through science, rather than displace it by specialized scientific practices of

modernism (see Scott 1998: 266-82). Thus, historians of agriculture and theorists of agro-ecology, particularly those who emphasize the specific deprivations of industrial agriculture (Duncan 1986, Bayliss-Smith 1982, Leopold 1999, Fox 1986, Dahlberg 1993), offer hope that humans can *regenerate* agriculture.

In this regard, pioneers are working in two complementary directions. Wes Jackson has taken up an enormous multi-generational project to recreate the Great Plains as a sustainable agro-ecosystem that yields enough food to feed non-agricultural human populations. Raised on a prairie farm and with an advanced degree in genetics, Jackson has undertaken the botanical challenge of balancing the trade-off between edible and inedible (to humans) parts of perennial plants (think how little food is available in a mature forest, which is composed of large perennial trees). His experimental approach, using both native and exotic species, to creating perennial polycultures that can feed humans is a prototype of the *scientist-farmer* (Jackson and Bender 1984). Rotational grazing on terrains inappropriate for cultivation revives an ancient practice, now in a conscious and intentional way. Prototypes of *farmer-scientist* can be seen in the many proponents of permaculture and other agronomic systems that experiment with site-specific ways to substitute plants with desirable qualities (of any origin) for those that complement one another agronomically (e.g., Lyle 1994).

### *Renewing Diasporic Polycultures: The Secret History of Colonialism*

The dominant North American agricultural system has resulted from a project of successive, warring waves of Europeans to make themselves feel at home in alien landscapes. The history of the hamburger reveals the intimate link, now substituted by markets, between agronomy and cuisine. Polycultural renewal depends on reconnecting the two. One extreme challenge in North America is the separation between urban and rural populations. Another is the growing rift between the inherited tastes, ingredients, and techniques of cooking and growing familiar to immigrants from all over the world, and the products of monocultural farms and factories. Both open up when we see the problems in light of biocultural diasporas.

In the long time of humans on earth, polycultures have always been diasporic. The sudden encounter of domestic species that had evolved in mutual isolation for millions of years began with the "Columbian exchange." Starting in 1492, transplanted crops and livestock, along with human techniques of growing and cooking, forever altered agronomy and cooking in both Old and New Worlds (Crosby 1972). This is the *secret history of colonialism*: all diasporas have been biocultural, in that they have included non-human species inseparable from human cultures; all have required rapid adaptation to new conditions, which have been both ecological and cultural, and have included both remnants of disorganized and ancient domestic groups, and encounters with multiple diasporic biocultures.

In the Old World the Columbian exchange had to strike deep roots in order to stabilize: New World capsicum (chili pepper) entered gardens and transformed cuisines all over the Old World on the terms of gardeners, cooks, and eaters (Mintz and Friedmann 2004). Maize and potatoes reshaped agroecologies and cuisines in Africa, Europe, and China only when they fit with (often hierarchical) social and ecological conditions. Adoption of new plants, and adaptations of old ones to new combinations of domestic plants and animals, in the Americas was for the most part far more extreme.

By contrast, the biocultural diasporas that melded in the Americas created completely new cuisines, often called Creole, hybrid, or as I prefer, polycultural, and blended agronomic systems in fields and gardens to supply ingredients. Unlike plantation crops, the gardens and cooking pots of slaves and indentured labourers were sites of immense creativity that have given us the brilliant cuisines of the Americas --- from the Argentine *asado* (cattle) and *mate* (herb tea) to Jamaican *escovitch* (local fish, Central American sweet and hot peppers, and South Asian seasonings), Louisiana *gumbo* (African okra, local seafood, sassafras), and Mexican *mole* (European chicken, local cocoa). The species that accompanied unequal human diasporas --- what Cohen (1997) calls imperial, labour, and trading

diasporas --- contributed to survival as well as destruction. Humans carried their seeds and knowledge of how to grow and prepare them to the New World, often in extreme conditions, because they were part of their survival as biocultural beings (Carney 2001, 2004). They learned to adapt them to new conditions and to combine them with plants that had settled with humans who had arrived millennia earlier. All these biocultural diasporas learned from one another. Their creativity in a new and rapidly changing biocultural context was the complement --- the secret history --- of the modernist response to the same ecological challenge. Rather than suppress cultural diversity, they enhanced and renewed it.

### *Food Practices in a Diasporic and Urban World*

The diasporas that characterize a city like Toronto today are a renewal of biocultural diasporas that have intersected in the Americas since 1500. Now farmers, and of course cooks, from all over the world, many displaced by agricultural modernization, find themselves in cities of North America, which are manifestly sites of culinary creativity. Able to maintain closer ties to home than previous generations of immigrants, they are at once more attuned to familiar tastes, and open to appreciate and experiment with adapting familiar cuisines to available ingredients and mixing elements of familiar cuisines with those encountered among neighbours. Perhaps more interesting, and less conspicuous, is the adaptation by local farmers to changing tastes by reviving old domesticates (e.g., goat for Caribbean dishes), revaluing weeds (called *callalo* by Jamaican cooks), or adopting new cultivars (ginseng). Another, and one that is increasingly entering consciousness among those involved in food policy, is urban agriculture and community gardening, which is beginning to explore the possibilities of mutual learning and sharing among immigrant cultural communities --- in the terms of this paper, among biocultural diasporas that include seeds and agronomic knowledge as well as tastes and culinary knowledge.

Toronto had the double gift of a kaleidoscope of cultural communities with gardening, farming, and cooking skills from many recently intact (agri)cultural systems, and a network of community and municipal organizations that initiate and coordinate citizen involvement in local food systems. The Toronto Food Policy Council, which is within the municipal Public Health Department and has two paid staff member, is run by a volunteer council of “stakeholders”, including local farmers. It advocates for policies ranging from retail sites, farmland preservation, wholesale and public markets for local farmers, and community gardens in urban planning to community-run, publicly supported school meal programs. FoodShare Toronto is a non-governmental organization closely associated with TFPC. In contrast to food banks, with which it cooperates from time to time, FoodShare runs a variety of programs on a scale beyond most North American cities, including distribution of fresh produce boxes to more than 8000 people a month.<sup>10</sup> Their diverse projects bring together street kids and professional gardeners to do large-scale composting and run an organic seedling business, young entrepreneurs to grow sprout and other food businesses on site, professional nutritionists and public health workers to promote healthy infant feeding, and much more. Two projects of particular interest here focus on the mutual learning of cultural groups about growing and cooking.

FoodShare was an early participant in the heritage seed movement. In addition to selling “heritage” seedlings each spring, the organization has hosted seed-sharing events and workshops to teach about them. A coordinator was amazed when conventional farmers showed up, worried about their futures as public farm extension was scaled back in favour of seed packages, complete with instructions, from private corporations. Participants are aware of the difference between what Barndt (2002) calls the “corporate” (monocultural) tomato and “*tomatl*,” the word for the cultivar by descendants of its human co-domesticates in central America.<sup>11</sup> The point is that *tomatl* now exists in gardens all over the world. Gardeners in many cultures have *increased* the varieties of tomato by adapting them for centuries to local tastes and growing conditions.

Building on this perspective, FoodShare’s *Seeds of Our City* project, coordinated and documented by Lauren Baker, brought together for three years (1999-2002) dedicated gardeners from

China, Ghana, Jamaica, Sri Lanka, Vietnam, among others, to learn how much food could be grown and how to increase the plant varieties familiar to them from other parts of the world. The gardeners kept meticulous records in a standard format. This was simply a record of what they already did, making their observations more systematic, comparable to other gardeners, and capable of sharing. In partnership with an urban environmental organization and the largest culturally specific independent food box program --- AfriCan --- Seeds of Our City had sites throughout urban and suburban Toronto. The project organized visits among gardeners, and brought gardeners together to exchange stories, meals, produce and seeds (Baker 2003). The global complement to the indispensable politics of preserving sites of origin of food plants, mainly in the global South (Kloppenborg 1988) may be the conscious adaptation of cultivars in all sites. Biocultural diasporas can, as they have in the past, increase diversity of food plants. This is the work of farmer-scientists.

In an urban milieu in the early 21<sup>st</sup> century, it is easier to see the elements of knowledge that connects an intense interest in nutrition with a revival of culinary curiosity and enthusiasm for cuisines of the world. The monocultural food system has been subject to a number of well-publicized safety and health crises in recent decades. Obesity and other health problems connected to consumption of industrial edible commodities has made nutrition a concern among all social classes, and now among health professionals in the global South, too. By itself, with food corporations (including sellers of diet-related commodities) providing most “education,” nutritional interest is often anxious to the point of obsession, and socially ineffectual (Nestle 2002).

However, FoodShare has pioneered a regrounding of nutritional science in cultural foodways by adapting the Latin American institution of community kitchens to a diasporic city. Instead of sharing in the cooking of a single cultural cuisine, women who participate learn from one another how to prepare dishes from many cultures in a new context, how to substitute ingredients, how to modify tastes. They learn to value their often taken-for-granted cooking knowledge and skills and gain confidence in themselves and their cultures by telling stories to each other. At organized community events they can offer their foods and stories to a wider appreciative public. This confidence extends into commerce through FoodShare’s catering business, which creates an income stream and trains cooks to use inspected professional kitchens. FoodShare’s industrial kitchen also serves as an incubator for small food businesses; women (mostly) can experiment at small cost on a small scale, with experienced assistance, with commercializing cultural food products.

While the hamburger conquers ever more corners of urban cuisine and agricultural landscapes, cooks and gardeners are inventing as they have always done. This time the stakes are higher.

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For illustrations, see the web site of FoodShare multi-ethnic community gardens and a description of the book about the Seeds of Our City project, with its own beautiful photo, at

(1) <http://www.foodshare.ca/garden11.htm>

and

(2) [http://www.foodshare.ca/publications\\_06.htm](http://www.foodshare.ca/publications_06.htm)

## Notes

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<sup>1</sup> Maize was a food crop throughout the Americas, but it originated in Central America and the current varieties in North America are not based on those used by indigenous peoples in this region.

<sup>2</sup> For a historical critique of this idea, see Friedmann 2004.

<sup>3</sup> For just one specialized history, see Minnis and Wayne (2000). As a contemporary example, Philippe Descola (1994: 5-6,73,161-64,324) interprets Achuar lifeways in the Amazon as both socializing and adapting to nature. Gardening allows for more reliable harvesting than foraging alone, and both are done. He counted 175 domestic species in Achuar gardens, used for food, medicines, narcotics, dyes, pottery glazes, and the like, and 41 forest species either spared during clearing or acclimated in gardens or tolerated weeds. The Achuar do not make a distinction between domestic and wild. Their term “aramu” distinguishes plants which are subject to human manipulation from others, whether in the garden or not. The same term describes plants found in the forest when they can be managed in place or when they can thrive in gardens. The Achuar also hunt and fish.

<sup>4</sup> I am grateful to Tony Weis for pushing me to take this step away from the perspective of “settler agriculture.”, which privileges European movements over those of other peoples, often organized by Europeans to serve empire or profit, but whose contributions to new agri- and culinary cultures, e.g., in the Caribbean, are manifestly equal or greater. The legacies and current contributions of “indigenous peoples” are more readily taken into account, along with those of colonial and postcolonial diasporas, by recognizing both that everyone in the Americas came from the Old World at one point or another; have altered the landscapes they found, and have contributed to cultural formations in each intersection of cultures whether they remain distinctly recognizable or not. This latter is crucial in light of the fact that pre-colonial ways of life are no longer appropriate to profoundly altered landscapes, even if descendants of indigenous peoples could somehow politically recover full use.

<sup>5</sup> Thus the dichotomy between indigenous and exotic is a matter of time. In politics, claiming priority by chronology is always tempting, especially by those who have been displaced, but this perspective suggests it may be more fruitful to understand cultures and ecosystems are continually reconstituted, and that conscious collaboration, working with the full repertoire of cultural techniques, may be the most promising way to renewal of damages to both.

<sup>6</sup> This was a French term, borrowed from the Moluca tongue, indicating the range of influences entering into the Creole cuisine of Louisiana.

<sup>7</sup> And other neo-Europes such as Australia and New Zealand, as Crosby emphasizes, but they are not part of this essay.

<sup>8</sup> Robin Cohen (1997: 67, 201n.6) proposes the term “imperial diaspora” to describe “settlement for colonial or military purposes” and applies it to British (and in a qualified way to other European) networks of settlers and a few others, such as ancient Greeks (who originated the phenomenon and the term *diaspora*).

<sup>9</sup> At least one, Inca, was based on a tuber, the potato.

<sup>10</sup> and

<sup>11</sup> Indeed, Barndt developed and shared her ideas with staff and participants at FoodShare and in the larger food security and food policy movement in Toronto, as well as in Mexico and Central America.

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