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CLAIM

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COVER

RADICAL

**INTERVEN-
TIONS** **TRANSFORMING**

URBAN ECOLOGIES

Edited & Designed by Roman Jaster

Special thanks to Gail Swanlund, Kristen Coogan, Florencio Zavala,

Fritz Haeg and Lisa Tucker

Set in Brothers, Goudy Sans, Foundry Form Serif

California Institute of the Arts

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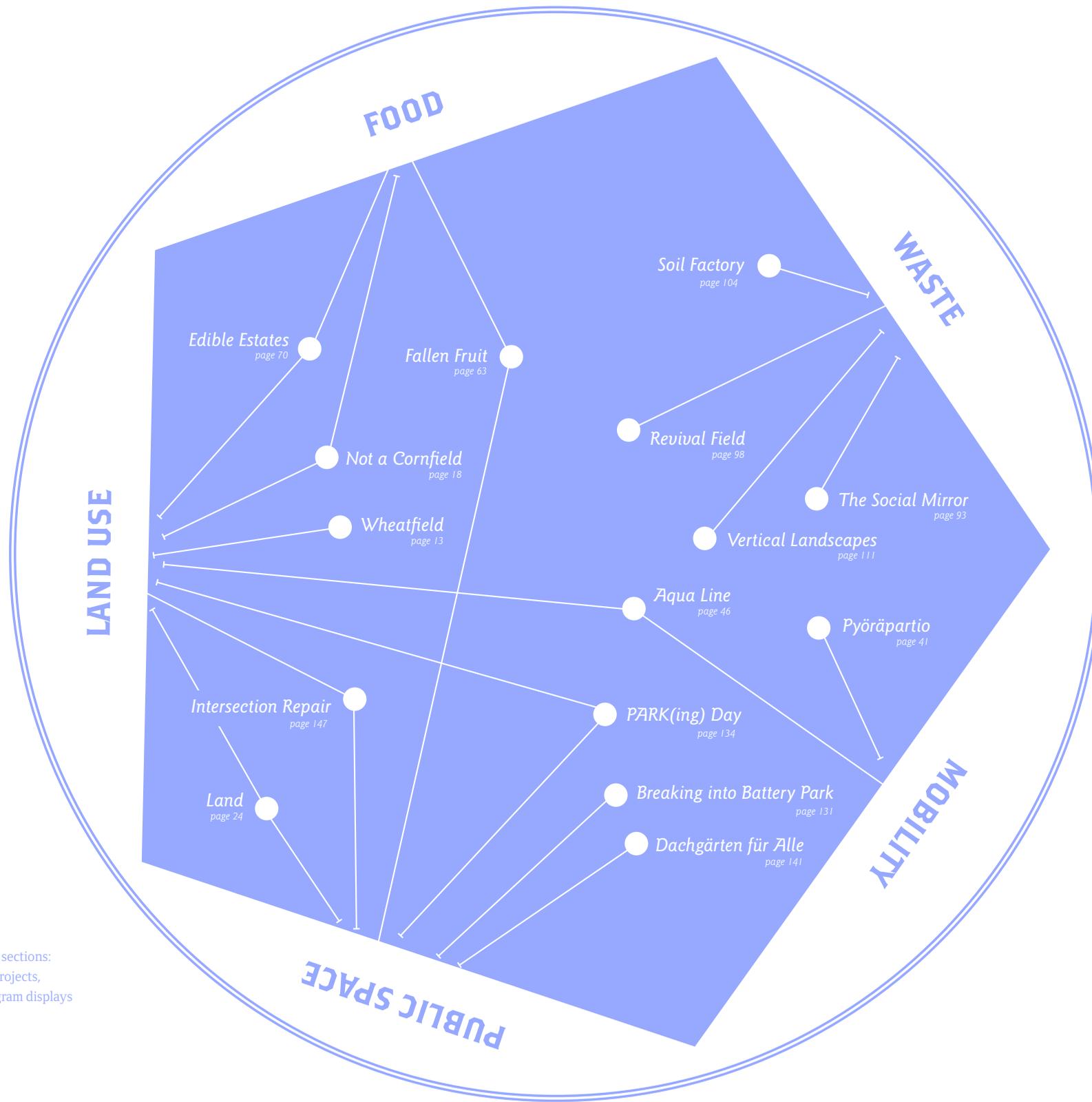
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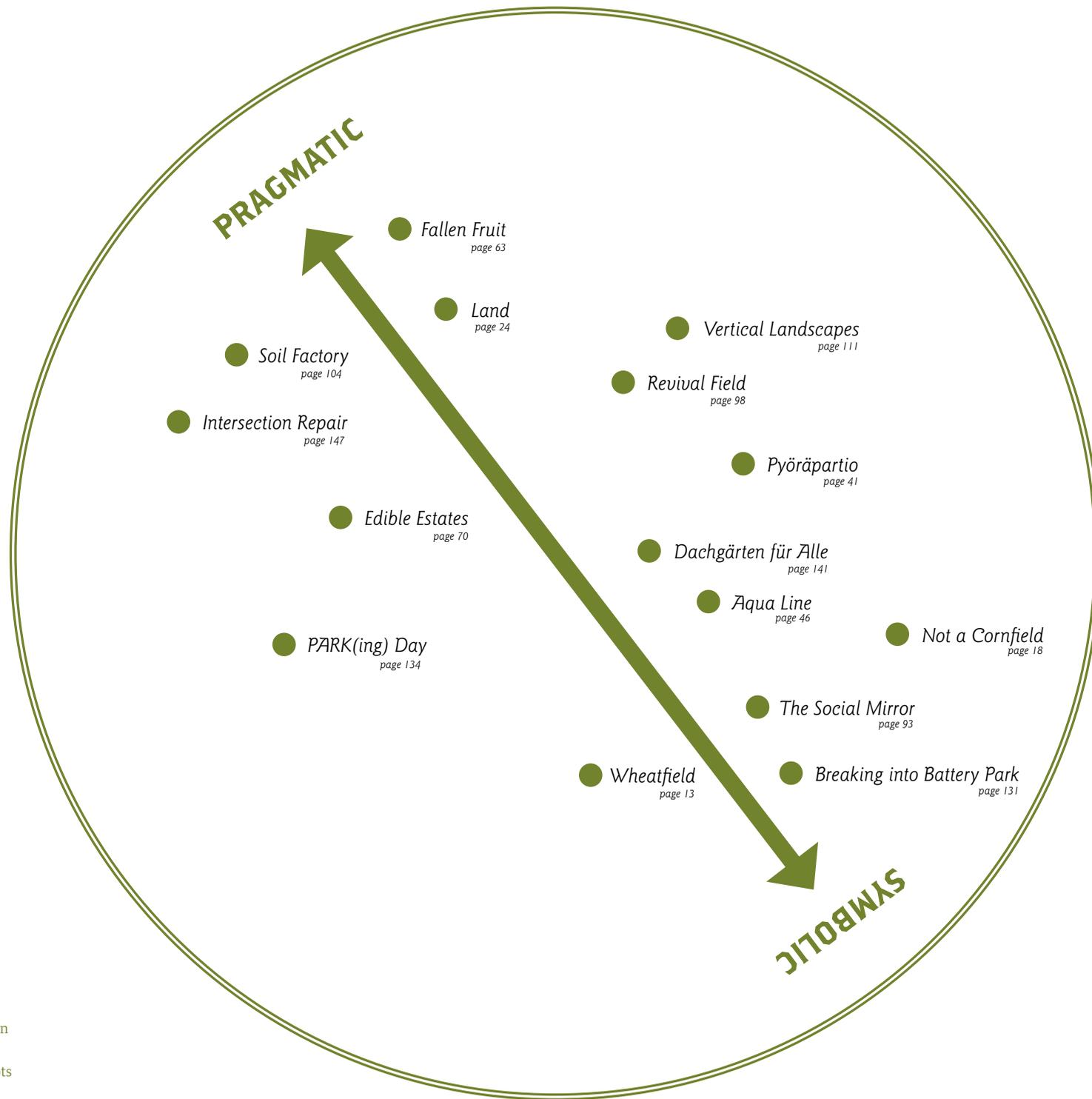
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PROJECT SECTIONS

The projects in this book are separated into five different sections: land use, mobility, food, waste, and public space. Many projects, however, do not neatly fit into a single category. This diagram displays the sections that each project addresses.



PRAGMATIC VS SYMBOLIC

Some artistic intervention projects are symbolic acts that concern themselves with asking questions and pointing to problems. Other projects also offer possible solutions. This diagram attempts to categorize the projects in this book on a continuous line from pragmatic projects to projects that are symbolic in nature.

①

*A golden field of wheat
planted among the cool steel
skyscrapers of Manhattan...*

AGNES DANES:

Agnes Denes is an American artist. As one of the originators of Conceptual art, Denes has investigated the physical and social sciences, philosophy, linguistics, psychology, art history, poetry and music and transformed her explorations into unique works of visual art.

WHEATFIELD— A CONFRON

Location

Downtown Manhattan

Date

1982

One of Agnes Denes' best known earthworks was realized in 1982 on a landfill created with debris from the construction of the World Trade Center. *Wheatfield—A Confrontation: Battery Park Landfill* highlighted the economic discrepancy between the \$158 exchange value of a wheat crop being grown on land valued at \$4.5 billion. The value of land in Manhattan, and other world capitals, is no longer attached to what it produces, but to the symbolic value and global prestige it imparts to multi-national corporations. But Denes believes it goes beyond even these issues to something more profound, coming from a relation with the Earth and a reassessment of human values.





TATION: BATTERY PARK LANDFILL

AGNES DANES ARTIST STATEMENT

In 1982 I created Wheatfield—a Confrontation, which was 1.2 acres of wheat planted and harvested in lower Manhattan’s financial district. It was commissioned by the Public Art Fund and funded mostly by donations. It became a living mural, involving months of preparation. Rather than gessoing a canvas or prepainting a wall, I had to bring in 280 truckloads of dirt to be smoothed down with tractors and bulldozers and then covered with an inch of topsoil. Then we created 285 furrows, found seed (Minnesota white durum) that would be strong enough to survive in the bad soil and harsh cross winds of the New York harbor, and planted it by hand.

The project was badly underfunded, and I had to scramble for soil, tools, and volunteers. Plus we were treated as intruders by the construction crew building Battery Park City. Although I had a fifty-page contract with the city, it protected everyone but me. But when the shoots came up, a transformation occurred: Hostilities died off, and our former tormentors, the construction workers, boasted about “our wheat field” and no longer threatened us for trespassing.

Wheatfield turned out to be the only field in the country that year not affected by wheat smut because we picked it daily by hand. There was no vandalism; even half a million people coming to see Fourth of July fireworks at the Statue of Liberty did not damage it. People don’t hurt what they like.

The ocean liners that passed us daily learned about the wheatfield and saluted us with their fog horns, and on the Fourth of July the famous tug boat came close to shore and sprayed the field with its red, white, and blue water.

The land I used was worth \$4.5 billion. It produced a field of wheat worth perhaps a couple hundred dollars on the stock exchange. But it was the first wheat in Manhattan in 300 years—perhaps the first ever, since the Indians planted mainly corn—but also the last while civilization lasted, so perhaps worth more. But that was not my intent. Wheatfield was a symbol, a calling to account. It represented food, energy, commerce, world trade, economics. It referred to mismanagement, waste, world hunger, and ecological concerns. It was an intrusion into the Citadel, a confrontation of High Civilization. Then again, it was also Shangri-la, a small paradise, one’s childhood, a hot summer afternoon in the country, peace, forgotten values, simple pleasures.

Wheatfield sprang up twenty feet from the Hudson, one block from Wall Street, flanked by the World Trade Center and the Statue of Liberty. At sunset the four-block site was my studio. Exhausted from the day’s work, I’d look out at the rushing waters of the Hudson and the yellow stalks of wheat waving in the wind, savor the heavy smell of the field and the buzzing of dragon flies, surrounded by ladybugs, field mice, praying mantis. I was on an island of peace, just a block away from the heartbeat of the city and evening rush hour on West Street.

When we harvested, people stood around in silence and wept. Wheatfield yielded several bushels of healthy, golden wheat.

②

A field of corn transforms an industrial area into a renewed space for the public...

NOT A

LAUREN BON:

Lauren Bon resides in Los Angeles and holds a Masters of Architecture degree from MIT and a BA from Princeton. She has been involved in urban, public and land art projects in the U.S., Hong Kong, Belfast and Northern Ireland.

A CORNFIELD

A quarter mile from the original city center of Los Angeles lies an elliptical plot of land known as the Cornfield. Once farmland, later a rail yard, it languished for a decade as a trash-strewn brownfield surrounded by low-income neighborhoods. When the city approved an industrial development on the site, a coalition of local groups sued to stop it, successfully lobbying instead for the Cornfield to be acquired as future parkland. In 2005 artist Lauren Bon turned the 32-acre site into a temporary “living sculpture” called *Not a Cornfield*. For one complete agricultural cycle, it was planted with corn as “an image of desire, hope, and redemption.”

Location
Downtown Los Angeles

Date
2005-06





NOT A CORNFIELD MISSION STATEMENT

Not A Cornfield is a living sculpture in the form of a field of corn. The corn itself, a powerful icon for millennia over large parts of Central America and beyond, can serve as a potent metaphor for those of us living in this unique megalopolis. This work follows a rich legacy of radical art during the 20th century on a grand scale. I intend this to be an event that aims at giving focus for reflection and action in a city unclear about where it's energetic and historical center is.

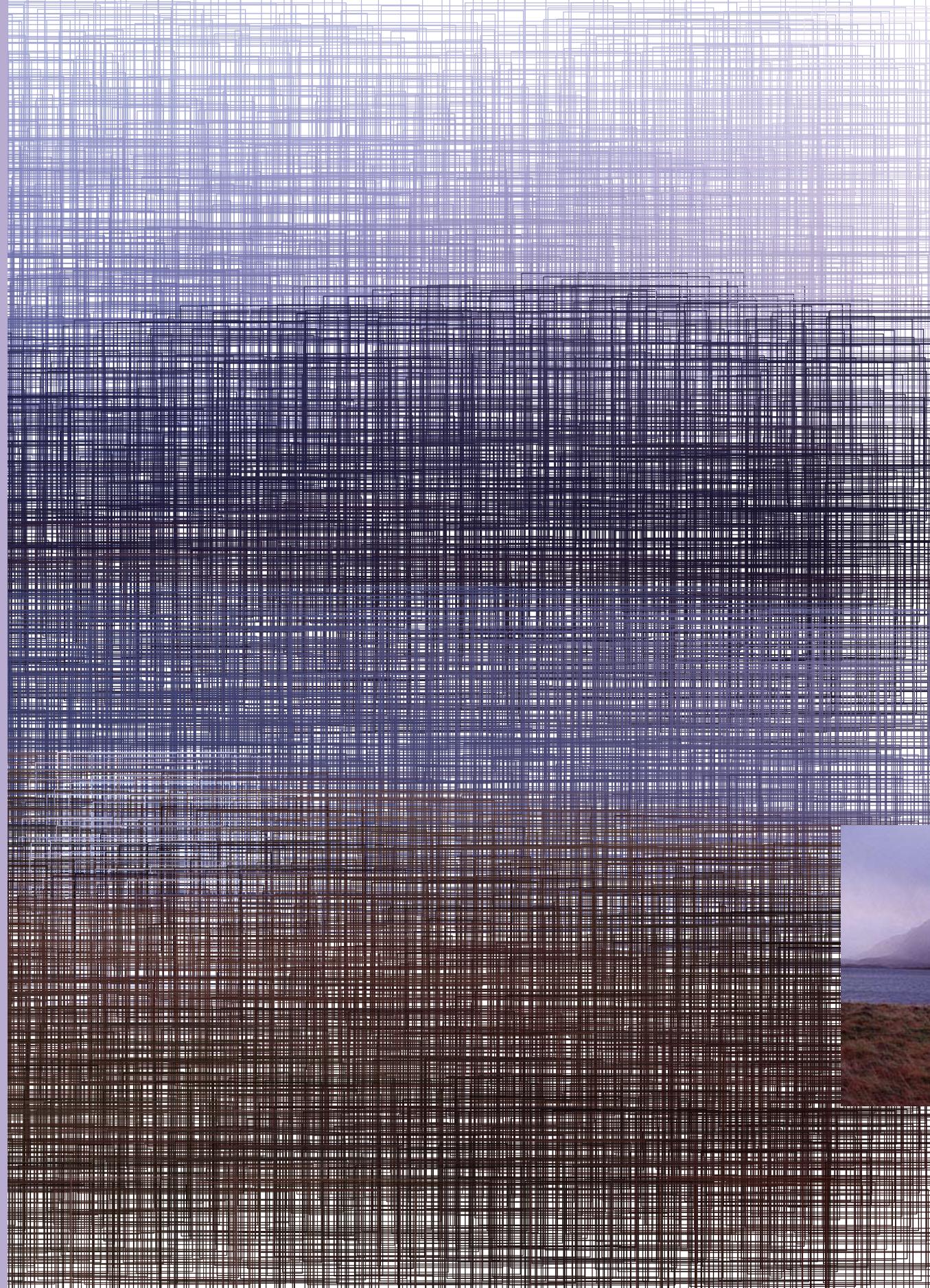
With this project I have undertaken to clean 32 acres of brownfield and bring in more than 1,500 truck loads of earth from elsewhere in order to prepare this rocky and mixed terrain for the planting of a million seeds. This art piece redeems a lost fertile ground, transforming what was left from the industrial era into a renewed space for the public. The California Department of Parks and Recreation is currently designing the historical park this site will become. This design process has taken several years so far and is a difficult process both because of the many communities adjacent to the site they would all like to serve and because of limited funding.

By bringing attention to this site throughout the Not A Cornfield process we will also bring forth many questions about the nature of urban public space, about historical parks in a city so young and yet so diverse. About the questions of whose history would a historical park in the city center actually describe, and about the politics of land use and it's incumbent inequities. Indeed, "Not A Cornfield" is about these very questions, polemics, arguments and discoveries. It is about redemption and hope. It is about the fallibility of words to create productive change. Artists need to create on the same scale that society has the capacity to destroy.

—Lauren Bon, July 20, 2005

3

Land is purchased all over the world and declared to belong to "the commons."



N55:

Working with art as a part of everyday life, N55 is an artist collective based in Copenhagen, Denmark. N55 holds that material objects ought to be shared and saved from the constraints of private ownership. For each of their projects, a manual is produced that describes the project's parameters.

Location
Worldwide
Date
2005–present

LAND

For *Land*, N55 began to acquire and dedicate to public use small plots of land, from northern Norway to the Californian desert, in less sparsely populated places in Denmark, Holland and Switzerland, and in waste patches of cities such as Chicago. On each is erected a steel polyhedric cairn (characteristic of much of N55's design) by which the area is declared to belong to "the commons". Anyone is welcome to use *Land* as long as it is acknowledged that "Land gives access to land."



Position: N 70° 09' 42.5" E 019° 56' 41.3"
Skorøya, Northern Norway
Area: 500 m²



Position: N 52° 6'04.5" E 005° 3' 04.5"
Leidsche Rijn, The Netherlands
Area: 3000 m²

MANUAL FOR LAND**INTRODUCTION**

Land gives access to land. Any person can stay in *Land* and use it.

CONSTRUCTION

Land is constructed from pieces of land in different places in the world. The various parts are added to *Land* by persons who guarantee that anybody can stay in *Land* and use it. Any person can initiate expansions of *Land*.

USING LAND

Any person can use *Land*. Attention is directed to the logical relation between persons and the rights of persons. Persons should be treated as persons and therefore as having rights. If we deny this assertion it goes wrong: here is a person, but this person should not be treated as a person, or: here is a person, who should be treated as a person, but not as having rights. Therefore we can only talk about persons in a way that makes sense if we know that persons have rights.

EXPANDING LAND

Land can be expanded by anybody who wants to add pieces of land to *Land*. Formally, the parts of *Land* remain the property of the persons participating in this way, but they guarantee that any person can stay in *Land* and use it. By informing N55 of the position, a cairn will be put out to mark the place and the position will be distributed through the manual.

TOP
 Position: N 56° 59' 55" E 009° 19' 33.7"
 Løgstør, Denmark
 Area: 625 m²

BOTTOM
 Position: N 41° 53' 03.4" E 087° 46' 06.8"
 Chicago, USA
 Area: 160 m²



CAIRNS

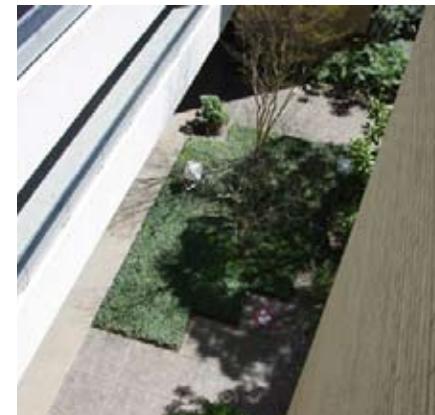
All parts of *Land* are marked with a cairn (height 1 m). The cairns have a frame of stainless acid resistant steel and built-in tanks of PE-plastic. The tanks are equipped with a transparent lid of polycarbonate, tightened with rubber strips. There is a manual and other equipment in the tanks. Apart from this, the configuration and size of the cairns will be modified according to the sites and their requirements.

MAINTENANCE

Land is maintained by persons using it. The manuals placed in the cairns will be updated continuously.

CURRENT LAND POSITIONS

- | | |
|----------------------------------|----------------------------------|
| N 70° 09' 42.5" E 019° 56' 41.3" | N 57° 10' 43.3" E 010° 05' 13.1" |
| N 41° 53' 03.4" E 087° 46' 06.8" | N 55° 58' 10.2" E 013° 45' 16.2" |
| N 33° 10' 43.9" E 117° 14' 26.7" | N 57° 20' 04.5" E 010° 30' 56.5" |
| N 44° 36' 03.2" E 001° 15' 04.6" | N 56° 59' 55" E 009° 19' 33.7" |
| N 55° 14' 24.8" E 011° 56' 22.3" | N 43° 17' 48.1" E 000° 22' 21" |
| N 52° 6' 04.5" E 005° 3' 04.5" | N 45° 09' 36" E 029° 41' 24" |
| N 47° 19' 42.4" E 009° 24' 31.6" | N 29° 43' 29.1" W 095° 20' 32.6" |
| N 52° 18' 19.7" E 005° 32' 11.7" | N 55° 14' 460" E 008° 51' 579" |
| N 41° 47' 58" E 087° 36' 23" | |



Position: N 29° 43' 29.1" W 095° 20' 32.6"
 Houston, Texas, USA

MICHAEL POLLAN

When a Crop Becomes King

With an area more than twice the size of New York State, we have given ze mays (a.k.a. corn) more of our land than any other plant.

Here in southern New England the corn is already waist high and growing so avidly you can almost hear the creak of stalk and leaf as the plants stretch toward the sun. The ears of sweet corn are just starting to show up on local farm stands, inaugurating one of the ceremonies of an American summer. These days the nation's nearly 80 million-acre field of corn rolls across the countryside like a second great lawn, but this wholesome, all-American image obscures a decidedly more dubious reality. Like the tulip, the apple and the potato, ze mays (the botanical name for both sweet and feed corn) has evolved with humans over the past 10,000 years in the great dance of species we call domestication. The plant gratifies human needs, in exchange for which humans expand the plant's habitat, moving its genes all over the world and remaking the land (clearing trees, plowing the ground, protecting it from its enemies) so it might thrive.

Corn, by making itself tasty and nutritious, got itself noticed by Christopher Columbus, who helped expand its range from the New World to Europe and beyond. Today corn is the world's most widely planted cereal crop. But nowhere have humans done quite as much to advance the interests of this plant as in North America, where ze mays has insinuated itself into our landscape, our food system—and our federal budget.

One need look no further than the \$190 billion farm bill President Bush signed in the summer of 2002 to wonder whose interests are really being served here. Under the 10-year program, taxpayers will pay farmers \$4 billion a year to grow ever more corn, this despite the fact that we struggle to get rid of the surplus the plant already produces. The average bushel of corn (56 pounds) sells for about \$2 today; it costs farmers more than \$3 to grow it. But rather than design a program that would encourage farmers to plant less corn—which would have the benefit of

lifting the price farmers receive for it—Congress has decided instead to subsidize corn by the bushel, thereby insuring that zeamays domination over its 125,000-square-mile American habitat will go unchallenged.

At first blush this subsidy might look like a handout for farmers, but really it's a form of welfare for the plant itself—and for all those economic interests that profit from its overproduction: the processors, factory farms, and the soft drink and snack makers that rely on cheap corn. Zeamays has triumphed by making itself indispensable not to farmers (whom it is swiftly and surely bankrupting) but to the Archer Daniels Midlands, Tysons and Coca-Colas of the world.

Our entire food supply has undergone a process of “cornification” in recent years, without our even noticing it. That's because, unlike in Mexico, where a corn-based diet has been the norm for centuries, in the United States most of the corn we consume is invisible, having been heavily processed or passed through food animals before it reaches us. Most of the animals we eat (chickens, pigs and cows) today subsist on a diet of corn, regardless of whether it is good for them. In the case of beef cattle, which evolved to eat grass, a corn diet wreaks havoc on their digestive system, making it necessary to feed them antibiotics to stave off illness and infection. Even farm-raised salmon are being bred to tolerate corn—not a food their evolution has prepared them for. Why feed fish corn? Because it's the cheapest thing you can feed any animal, thanks to federal subsidies. But even with more than half of the 10 billion bushels of corn produced annually being fed to animals, there is plenty left over. So companies like A.D.M., Cargill and ConAgra have figured ingenious new ways to dispose of it, turning it into everything from ethanol to Vitamin C and biodegradable plastics.

By far the best strategy for keeping zeamays in business has been the development of high-fructose corn syrup, which has all but pushed sugar aside. Since the 1980's, most soft drink manufacturers have switched from sugar to corn sweeteners, as have most snack makers. Nearly 10 percent of the calories Americans consume now come from corn sweeteners; the figure is 20 percent for many children. Add to that all the corn-based animal protein (corn-fed beef, chicken and pork) and the corn quacorn (chips, muffins, sweet corn) and you have a plant that has become one of nature's greatest success stories, by turning us (along with several other equally unwitting species) into an expanding race of corn eaters.

So why begrudge corn its phenomenal success? Isn't this the way domestication is supposed to work?

The problem in corn's case is that we're sacrificing the health of both our bodies and the environment by growing and eating so much of it. Though we're only beginning to understand what our cornified food system is doing to our health, there's cause for concern. [It's probably no coincidence that the wholesale switch to corn sweeteners in the 1980's marks the beginning of the epidemic of obesity and Type 2 diabetes in this country.](#) Sweetness became so cheap that soft drink makers, rather than lower their prices, super-sized their serving portions and marketing budgets. Thousands of new sweetened snack foods hit the market, and the amount of fructose in our diets soared.

This would be bad enough for the American waistline, but there's also preliminary research suggesting that high-fructose corn syrup is metabolized differently than other sugars, making it potentially more harmful. A recent study at the University of Minnesota found that a diet high in fructose (as compared to glucose) elevates triglyceride levels in men shortly after eating, a phenomenon that has been linked to an increased risk of obesity and heart disease. Little is known about the health effects of eating animals that have themselves eaten so much corn, but in the case of cattle, researchers have found that corn-fed beef is higher in saturated fats than grass-fed beef.

We know a lot more about what 80 million acres of corn is doing to the health of our environment: serious and lasting damage. Modern corn hybrids are the greediest of plants, demanding more nitrogen fertilizer than any other crop. Corn requires more pesticide than any other food crop. Runoff from these chemicals finds its way into the groundwater and, in the Midwestern corn belt, into the Mississippi River, which carries it to the Gulf of Mexico, where it has already killed off marine life in a 12,000-square-mile area.

To produce the chemicals we apply to our cornfields takes vast amounts of oil and natural gas. (Nitrogen fertilizer is made from natural gas, pesticides from oil.) America's corn crop might look like a sustainable, solar-powered system for producing food, but it is actually a huge, inefficient, polluting machine that guzzles fossil fuel—a half a gallon of it for every bushel.

So it seems corn has indeed become king. We have given it more of our land than any other plant, an area more than twice the size of New York State. To keep it well fed and safe from predators we douse it with chemicals that poison our water and deepen our dependence on foreign oil. And then in order to dispose of all the corn this cracked system has produced, we eat it as fast as we can in as many ways as we can—turning the fat of the land into, well, fat. One has to wonder whether corn hasn't at last succeeded in domesticating us.

GEORGE PENDLE

New Foundlands

How many countries are there in the world? Not an easy question to answer when you consider micro-nations, model countries, ephemeral states, and new country projects.

On 21 June 1972, the world's heaviest monarch, King Taufa'ahau Tupou IV of Tonga, accompanied by members of the Tonga Defense Force, a convict work detail and a four-piece brass band, set sail from his archipelago kingdom aboard the royal yacht Olovaba. On the king's stately mind was one thought—the invasion of the Republic of Minerva, located 270 miles to the west of his country's capital, Nuku'alofa.

The Republic of Minerva had done little to warrant the 400-pound sovereign's considerable wrath. It lay outside of Tongan territorial waters, it had been in existence for less than six months and, other than crustaceans and limpets, it had no inhabitants. Indeed seeing as the Republic was situated upon the hazardous Minerva reefs, whose surface was completely submerged at high tide, it hardly seemed conducive to sustaining any human population whatsoever.

Yet the Republic was not entirely lacking the impress of humanity. Some of the reefs had been piled high with sand, and a small stone platform jutted through the waves. From this edifice flew the flag of the Republic of Minerva—a white torch on a blue background—clearly signaling dominion over the amphibious territory. But while this lone construction had survived the attentions of the tides, it could not hold out against the attentions of its new visitors. As the brass band played the Tongan national anthem (rough translation: *"Hear our prayer, for though unseen / We know that Thou hast blessed our land. / Grant our earnest supplication, / and save Tupou our King"*), King Tupou himself tore the scurrilous flag down and read a proclamation of sovereignty over the reefs. Within a few hours the platform had been dismantled, and the Republic of Minerva had been annexed without so much as a whimper.

Well, almost without a whimper. One curious footnote to this incident states that as the convict work detail set about removing all trace of Minerva from ex-

istence, a fight broke out between two of its members. By the time it could be stopped, one man lay slain on the reef. So it was that when the Tongan forces finally sailed for home, back to their presidential palace and prison cells, they left the former Minervan Republic with the remarkable statistic of having a murder rate higher than that of its population.

+++

How many countries are there in the world? The question is not as simple as it seems. The United Nations claims 191 members, the United States Department of State supposes 192 independent countries, while the C.I.A. World Factbook spreads its net even further by suggesting 268 nations, dependent areas, and other entities. But leaving aside whether territories or colonies such as Puerto Rico or Bermuda should be included (not to mention the political status of such "non-countries" as Palestine, Tibet, and Taiwan) there are a vast number of claims from other, less well-known nations asserting their independent status.

Call them micro-nations, model countries, ephemeral states, or new country projects, the world is surprisingly full of entities that display all the trappings of established independent states, yet garner none of the respect. The Republic of Counani, Furstentum Castellania, Palmyra, the Hutt River Province, and the Empire of Rania may sound fantastical, but they are a far cry from authorial inventions, like C.S. Lewis's Narnia or Swift's Laputa. For while uncertain territories like the Realm of Redonda might not be locatable in your atlas, they do claim a very genuine existence in reality, maintaining geographical boundaries, flaunting governmental structures, and displaying the ultimate necessity for any new nation: flags. Admittedly they may be little more than loose threads on the patchwork of nations, but these micro-nations offer their founders a much sought-after prize—sovereignty.

Such idiosyncratic nation-building can trace its roots back to the early nineteenth century, when even the mightiest empire had yet to consolidate its grip on the more far-flung regions of the world. The swampland of the Mosquito Coast was just such an untouched area, and it was here that the Scottish adventurer Gregor MacGregor decided to found his new kingdom—the Territory of Poyais. The Scot might never have been heard from again had he chosen to live out his life in his small and inhospitable nation, but MacGregor was keen to transmute sovereignty into sovereigns. Granting himself the title "His Highness Gregor, Cazique of Poyais," MacGregor traveled to Britain in 1821 and was received with all the hoopla that accompanies a visiting head of state. With the aid of a fictitious guidebook and hundreds of doctored maps, he proceeded to amaze the general public with tales of Poyais's European-style capital city and enlightened government (for a fuller appreciation of the scam read *David Sinclair's The Land That Never Was*). Poyais land offices were set up in London, Edinburgh, and Glasgow, and he even managed to charm the London Stock exchange into advancing him a 200,000 pound loan for investment in the new state.

The hoax was only exposed when 250 Scottish investors who had been won

over by tales of the bucolic and resource-rich country chartered a boat to take them to Poyais. They were greeted by the untamed jungle. Those who tried to eke out a living on the inhospitable coast swiftly died from disease. Others managed to escape to more temperate climes. MacGregor, however, grew rich from the scheme and lived out the rest of his days in Venezuela where upon his death he was accorded a state funeral fit for a monarch.

The Territory of Poyais displayed many of the themes that would appear in micro-nations for the next century-and-a-half: Firstly, that the love of money is usually a significant incentive in a micro-nation's foundation. Secondly, that a micro-nation's founders will always bestow upon themselves thoroughly dramatic titles. Thirdly, that since all the world's good spots have been taken, micro-nations are usually gifted with dire and hazardous geography. And finally, should any other country enquire into the status of a micro-nation, it is liable to collapse.

For example, take the Republic of Indian Stream, a self-declared republic in North America that existed from 1832 to 1835. An ambiguous border treaty between Britain and the U.S. had created a 500-square mile legal loophole between Canada and the state of New Hampshire. Three hundred enterprising American citizens, all hoping to avoid federal taxes, quickly established a government and constitution and declared Indian Stream a sovereign state. The Republic went unchallenged, but when one of its members was arrested for unpaid debts and taken to serve time in a debtors' prison in Canada, the Republic of Indian Stream swiftly planned a counterstrike. Crossing the border into Canada, they shot up a local judge's house, broke their fellow "Streamer" out of prison, and returned triumphantly home. This bravado did not last for long. By the next morning, doubts about the attack were mustering, British retaliation was feared, and before long the Republic voted to be annexed by the New Hampshire militia. Indian Stream was soon incorporated into the state where its libertarian longing would continue to be nurtured for years to come.

There have, of course, been some exceptions to the avaricious underpinnings of micro-nations. In 1860 a French lawyer named Orelie-Antoine de Tounens traveled to South America to live among the Mapuche Indians. Horrified by their treatment at the hands of the Chilean and Argentine authorities, de Tounens argued that the Mapuche's lands did not automatically belong to either Chile or Argentina. With the apparent consent of his Indian hosts, he immediately declared himself King Orelie-Antonie of the Kingdom of Araucania and Patagonia, wrote a national hymn, designed a flag, and posted notices in the Chilean newspapers telling of the foundation of the new Araucanian kingdom. Despite his best efforts he was roundly ignored.

In an effort to be taken seriously, de Tounens began to formulate plans for the Mapuche to attack the Chilean army. However before he could send his subjects into glorious combat, he was betrayed to the Chilean authorities, declared insane, and deported. He would return to his realm on numerous occasions over the following years, traveling under false identities and bringing arms and ammunition to aid the Indians in their struggle. Each time he would be captured or turned over

to the authorities. He eventually died in France in 1878, penniless and thousands of miles from his kingdom. (The Kingdom of Araucania and Patagonia was briefly revived in the 1880s when it was claimed as a real country in an import/export scam perpetrated in Morocco. Thus despite de Tounen's idealism, his country never totally escaped the micropatrolological lust for money).

Micro-nations rose and fell over the next sixty years. But by 1945, it seemed as if the consolidation of boundaries following the two world wars would somewhat stem their growth. Occasional micro-nations were still being formed, but they seemed a little more frivolous than those of the previous century. In 1948, the Principality of Outer Baldonia was founded on a four-acre rocky island 16 miles off the coast of Nova Scotia by Russell Arundel, self-proclaimed "Prince of Princes" and president of the Pepsi-Cola Bottling Company. With its governmental charter and sixty-nine admirals of the Baldonian Navy (fishermen who harvested tuna in the surrounding ocean), Outer Baldonia bore all the hallmarks of what would become an increasingly common type of micro-nation—the whimsical state. Its governmental charter insisted that citizens swear, drink, and lie about the size of fish they had caught, yet Outer Baldonia showed that even a joke country could punch above its weight when Arundel declared war on the Soviet Union. It took some time for this news to reach the USSR—diplomatic channels had yet to be formed between the two nations—but when it did, a coruscating article in a state-controlled Soviet publication condemned Baldonia's war-mad "fuehrer" and declared that Outer Baldonia's constitution had the aim of "turning his subjects into savages."

It was not until the 1960s and 1970s that a true renaissance of the ephemeral state took place. As Erwin Strauss recounts in his seminal *How To Start Your Own Country*, these seemed inspired most dramatically by the writings of Ayn Rand. The nineteenth century adventurer had transformed into the twentieth century libertarian. Filled with the prickly passion of libertarianism, many of these new nation-builders seemed edgier and more fanatical than in the past, as if the ever-increasing spread of legitimate nations had made their quest all the more desperate. Although charlatans, jokers and a few idealists could still be found setting up new nations, they were now joined by survivalists and neo-Nazis wanting to start their own countries (such as Aryana and the Aryan Nation). Many of this new breed were thinking of more rigorous ways to ensure their sovereign rights.

One of the major problems in founding a new country, second only to being ignored, is the threat of invasion by a more legitimate nation. As a result, when a group of Ayn Rand disciples tried, in 1969, to set up a new country named Oceana, defense of the realm was paramount. Even though the exact location for Oceana had not been definitely fixed, boot camps were organized for all those who wanted to live there. Most ominously of all, plans were made to steal a nuclear missile, the ultimate deterrent should another country come knocking on their door. Fortunately the group was disorganized and lacking in funds, and when the ringleaders decided to rob a bar to fund their project, the hapless group was promptly arrested and their startling story discovered.

Perhaps the most persistent character to stem from this era of ephemeral states is Michael J. Oliver. A concentration camp survivor, coin dealer, and land developer, Oliver wrote the treatise *A New Constitution for a New Country* (1968) in which he created a model constitution for a nation whose extremely limited government could be financed voluntarily. Along with his sinister-sounding group, the Phoenix Foundation—whose members included John Hospers, the Libertarian Party's first presidential candidate—Oliver would spend the next decade in an emphatic quest for his tax-free independent state.

It was Oliver who, in 1972, had hired a dredging ship to deliver tons of sand to the Minerva reefs as part of a plan to build a resort there named Sea City. Before the Tongan intervention, he had hoped that Minerva would one day attract a population of 30,000, who would have “no taxation, welfare, subsidies, or any form of economic interventionism.” A few years after the Minervan debacle, Oliver was at it again, this time aiding separatist movements on both the Bahamian island of Abaco and the South Pacific Island of Vanuatu, in the hopes that the new governments would be sympathetic to his libertarian cause. But Oliver had overreached himself. Despite having provided financial support to 800 separatists on Vanuatu, his revolt was quickly crushed by the arrival of troops from Australia and Papua New Guinea. Oliver denied any wrongdoing, but by now the Phoenix Foundation had caught the eye of the FBI. With charges threatened against him for violating the Logan Act, which prohibits private citizens from interfering in US relations with foreign powers, the Phoenix Foundation slowly melted away. Oliver, unfortunately for those interested in his monomaniacal quest, has not been heard from since.

+++

[The United States Office of the Geographer stresses that five factors are needed to become a country: space, population, economic activity, government structure, and recognition from other countries.](#) Of these, it is the last factor that has always been the hardest to attain. However, one micro-nation has perhaps come closer to fulfilling these requirements than any other. Founded by a former “pirate” radio operator, Paddy Roy Bates, Sealand is situated on an abandoned World War II anti-aircraft tower, seven miles off the British coast. Consisting of 550 square meters of solid steel, it was declared independent by “Prince” Roy in 1967. (The country's initial economic activity consisted largely of selling passports and minted coins—both common practices amongst modern micro-nations out to make a quick buck).

The first step in gaining international recognition came in 1968 when Roy's son, the Prince Regent Michael, was ordered to a British court for firing his rifle at a Royal Navy vessel that had come too close to the platform (he claimed they were planning an invasion). However, the court decreed that since the incident occurred outside British territorial waters, it had no jurisdiction in the matter. The second step came in 1978 when Alexander G. Achenbach, a German Professor whom Prince Roy had named as prime minister of Sealand, staged a coup d'état

and invaded the platform with the help of some Dutch heavies. A furious Prince Roy hired a helicopter and retook the platform within a day, holding his invaders captive. Although he released the Dutch miscreants, he claimed Achenbach was guilty of high treason and imprisoned him indefinitely on the island.

Hearing of this strange event, the German authorities petitioned the British government for Achenbach's release. But the British government, citing the court decision of 1968, disavowed all responsibility for Prince Roy. Eventually Germany was forced to send a diplomat to Sealand to negotiate with the Sealand monarch, allowing a delighted Prince Roy to claim that this official visit amounted to de facto recognition by the German government (the German government strongly denied this). Sealand's status remains uncertain but it still exists to this day. Its latest guise has it acting as an offshore data haven, hosting secure web servers that are free from all international registration requirements.

Just as Sealand now plays host to the Internet, it is the Internet that has revealed itself as the host for a whole new generation of fictional state projects. As the libertarian fetish for micro-nations weakens, the virtual geography of the Internet grants a modicum of affordable tangibility to new micro-nations, without any of the traditional perils associated with abandoned anti-aircraft platforms or disputed South Pacific atolls. The Institut Français de Micropatologie does its best to keep track of them all, but these new micro-nations can be formed in little more than a day of battering at the keyboard. This new breed of countries does not try and make any actual claims on statehood, preferring instead to act as vehicles of whimsy and wonder.

Take the website for the Republic of Howland, Baker and Jarvis. It claims to comprise a group of small islands that do actually exist (they can be found about 600 miles north of Tuvalu). Yet read the Republic's official history and you soon find that all is not as it seems. On 2 July 1937, Amelia Earhart is reported to have landed on Howland Island on her famed around-the-world trip. However, this was the leg of Earhart's journey on which she went missing, never to be heard from again. The founders of the Republic take this one fantastic moment as the starting point for a wonderfully convincing alternate history that shows how Earhart's brief visit to the island led to the growth of a modern nation-state.

In comparison, the Royal Kingdom of Elgaland-Vargaland (KREV) has no pull on believability. Although it claims physical territory, it insanely suggests that this consists of all the border frontier areas between all countries on earth. In doing so, the joint kings of KREV (for even these post-modern micro-nations can rarely resist the traditional attraction of a royal title) seem to be taking the artist Gordon Matta-Clark's “Fake Estates” project—in which Matta-Clark bought small, inaccessible, and unusable lots of land, situated between buildings—to its furthest logical extension. KREV is a country made up of the intersections between real countries, a nation of negative space—a micro-nation that is best to debate rather than to visit.

While these new nations rarely dare to enforce their claims to nationhood, it seems to be their unspoken hope that they will, one day, break out into the real

world. In Jorge Luis Borges's short story "Tlön, Uqbar Orbis Tertius," the author describes finding an entry in an encyclopedia for a country named Uqbar. No such country exists, but the author slowly comes to see it as the first indication of a massive conspiracy of intellectuals to imagine a whole new world named Tlön. Slowly but surely, the world of Tlön begins to seep into the real world, first in mentions in encyclopedias, then with the appearance of actual objects from Tlön, until the world of the narrator slowly and inexorably becomes Tlön itself. How long before a micro-nation makes this fateful leap into actuality?

④

Shock troops correct traffic signs that are incorrect or misleading...



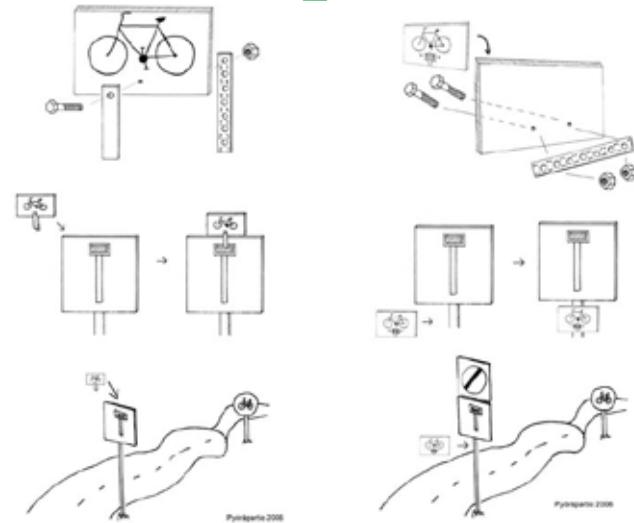
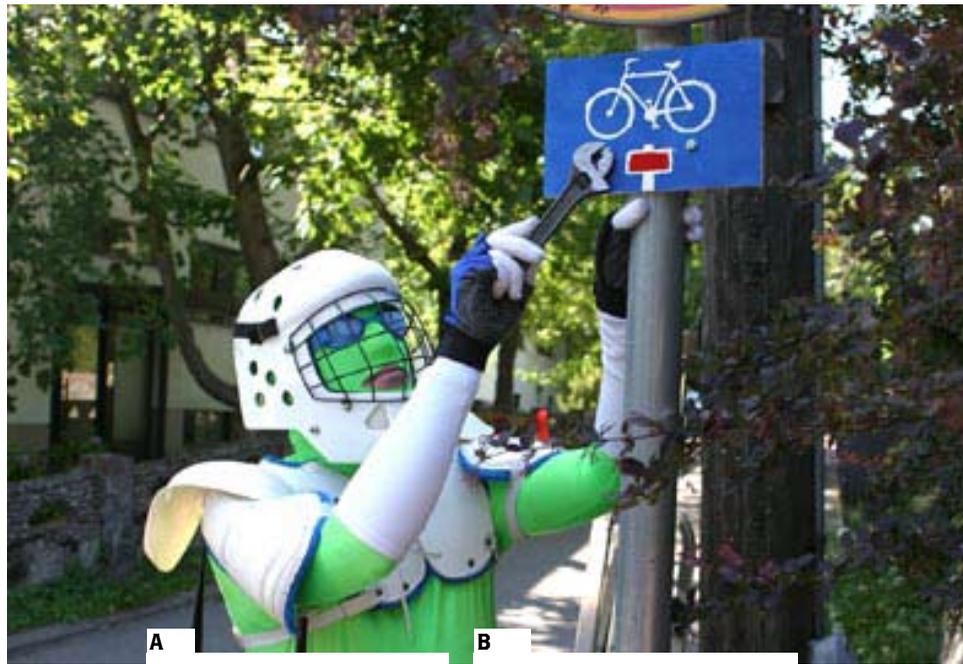
PYÖRÄPARTIO (CYCLE PATROL)

Location
Helsinki, Finland

Date
July 2006

Pyöräpartio (Cycle Patrol) performed shock actions around Helsinki during July 2006. The shock troops corrected traffic signs that are incorrect or misleading from the cyclists' point of view. The traffic sign "Dead End" was amended to indicate that its restriction only applies to cars, but not to cyclists. Of course, for a public intervention, shrill clothing is always a plus.





These diagrams illustrate how to manipulate road signs—in Finland at least—which do not take into consideration that cyclists can often travel where cars cannot.

Figure A shows the installation above a sign.

Figure B demonstrates what to do when the sign must be installed below.

5

Faux signs advertise the construction of a new subway line...

AQUA



LINE

HEAVY TRASH:

Heavy Trash is an anonymous arts organization of architects, artists, and urban planners. Heavy Trash creates large, disposable art objects that draw community and media attention to specific urban issues. By explaining a particular urban problem and suggesting a solution, Heavy Trash seeks to provoke dialogue among citizens.

Location
Los Angeles

Date
August 13, 2000

On August 13, 2000, Heavy Trash installed eight “Coming

Soon” signs along a 15-mile route that suggest the construction of the “Aqua” subway line that would connect the Westside to downtown and the rest of the Los Angeles metro system. Heavy Trash created this project in an attempt to promote civic dialogue about the need for better transportation in Los Angeles and in response to the attitudes taken by many upscale neighborhoods towards the implementation of mass-transit in their area. Homeowner groups often see mass-transit as an encroachment upon their living space by lower income residents. This “not in my backyard” mentality has stopped many plans for the expansion of the metro in its tracks. If the Aqua Line actually existed, it would not only serve to break down barriers between neighborhoods, but it would also benefit the environment by decreasing automotive pollution. In a city where most people rarely leave a small selection of zip codes, the metro line has the power to increase interaction between Angelenos throughout the area; the Aqua Line takes action where the rhetoric of diversity falls short.



Signs Point to Westside Transit Mystery

■ **Billboards:** Maps of a new commuter line create a rush-hour buzz, and a variety of theories.

By BOB POOL
METRO STAFF WRITER

It seemed to some Westside motorists stuck in traffic Tuesday that relief was in sight.

"Future Station Location, Metro Aqua Line," announced a series of large signs—sporting the familiar Metropolitan Transportation Authority logo—that seemed to sprout overnight along San Vicente and Wilshire boulevards.

A map included on the 5-foot panels showed that 10 new Metro Aqua Line stations were planned between Santa Monica and the existing Metro Rail Red Line subway.

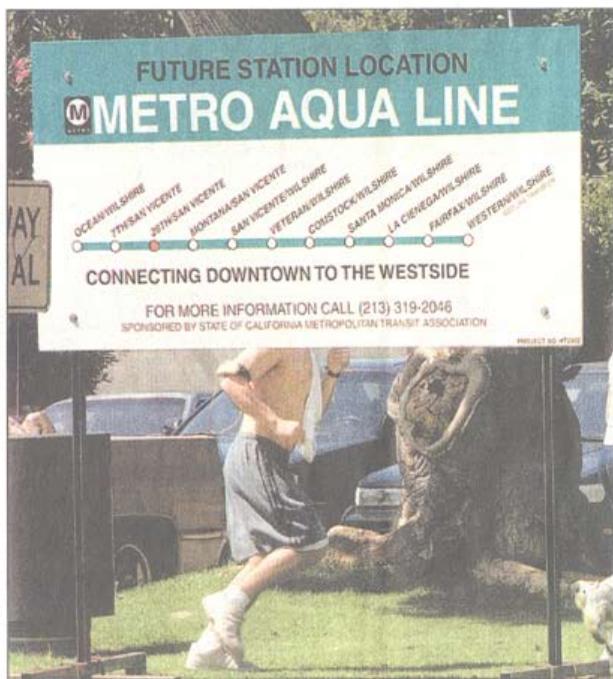
But with what kind of mass transit was the MTA planning to link downtown Los Angeles and a broad swath of the Westside? One that would connect the Fairfax district, West Hollywood, Beverly Hills, Westwood, Brentwood and Santa Monica?

Some were certain the Aqua Line would be an above-ground trolley, like the MTA Blue Line light rail system between Los Angeles and Long Beach.

"They wouldn't make it a subway because of the methane gas beneath Fairfax," said a Santa Monica man studying the Aqua Line construction sign at San Vicente and 28th Street.

"I just hope they're not going to take out any traffic lanes for it. But this is fantastic. This will run three blocks from my house and there's a station at Comstock and Wilshire, near my brother's place," said the man, who would identify himself only as Stan.

Nearby, boutique operator Robert Keirstead was convinced that the Aqua Line would be underground. He was happily anticipating the new customers it would bring to his store, Dungerees.



A sign at 28th Street in Brentwood leaves many guessing. Some speculated that it might be a subway.

"I think it's a subway. I'm assuming they're already building it underneath us. I think that's what's been knocking out my electricity the last few weeks," Keirstead said.

Given the Aqua Line name, some wondered whether the signs announced a pending water pipe project. Or maybe another sewer

line project, suggested Brentwood resident Katie Grimsditch.

But that would probably be called the Brown Line. "If it's a sewer line, I'm embarrassed," she said, laughing.

A man sipping a noontime drink outside the Jamba Juice shop at San Vicente and Montana Avenue

speculated that the Aqua Line was simply a new bus line.

Brentwood resident Sue Nordhaus said she drove past the sign twice to read it.

She suggested that it might be something officials put up for the Democratic National Convention "to make visitors think we have a

transit system."

Her friend Monique Martin, also of Brentwood, wondered whether the Aqua Line was actually a canal. "Not a canal. A Canal. You know, Robbie Canal"—the Los Angeles street artist whose work is often posted on corners all over town.

Promoting Dialogue About Transportation

Turns out Martin's guess was the closest of all.

A recorded message greeted callers to the "Aqua Line Hotline," whose number is printed on the signs. All Aqua Line operators were "busy" and unable to answer calls, it advised.

MTA officials denied involvement in the project.

Ed Scannell, a spokesman for the agency, said the MTA suspects that the Aqua Line signs are part of an elaborate art project.

And sure enough, a group called Heavy Trash took credit Tuesday afternoon for creating the fictitious subway plan.

The group posted eight signs Sunday "in an attempt to promote civic dialogue about the need for better transportation in Los Angeles," it said in a statement.

"Heavy Trash created this project in response to the attitudes taken by many upscale neighborhoods toward the implementation of mass transit in their area. Homeowner groups often see mass transit as an encroachment upon their living space by lower-income residents. This 'not in my backyard' mentality has stopped many plans for the expansion of the Metro in its tracks."

No names were attached to the announcement, but Heavy Trash was described as "an anonymous organization of architects, artists and builders" who create urban art installations.

In other words, the Aqua Line was created by underground artists, not underground tunnels.

ONTO

Bikes, Death and Sacrifice: A Short Story of my Night and Critical Mass

A story and meditation on strange adventures with death, bikes and sacrifice in New York City.

I started out biking from Brooklyn to Union Square to catch this months critical mass bike ride. Saw

a friend on the bridge. "I'm heading off to Seaport to see Ted Leo." "Cool, I'm going to Critical Mass." "Have fun." "Later." I made it to Union Sq north by 7pm. Chilled for an hour listening to the Rev Billy give his spiel with the Hungry Marching band behind him. Flyers galore, beautiful bikes and beautiful people too. About 30 scooter cops on Union Sq. east waiting. Another batch on Broadway waiting to snatch us. Fuck it. Let's go.

I'm near the west side of the square. Looks like we're going this way. Ah shit, here we go. Down 1st. 7th. Almost made it. Fuck, coppers. OFF the bikes. TURN around. SPLIT up. Its already chaos. But a nice chaos. The front turns left on 5th and left again on 16th and we're back to Union Square to catch the end of the ride which is now the front. The mass swarms together and we're off.

We keep going. Up 6th I think. Its pretty fun. Eventually, on some street where we turn right, the cops are there. I turn around, and fuck, more cops. I'm off my bike, and walking with it, right into the cops. This one guy grabs me and says, "Why you running away?" "Because you're chasing us!" I shout. Then he gets closer, and whispers into my ear, "Just play stupid." A bit shaken up, I do what he says and I just kinda fake being an outsider caught up in it all. He lead me to the corner, grabbing my bike with me, and then lets me go. Sheesh! That was close.

It takes me about 30 minutes to find the mass again. I find an arkansas imcista, and after some phone calls, and following the green hats and a mini mass down 12th (escorted by scooter!), we're back in the mass. Nice! Going up Ave A past Tompkins and its beautiful. We head west to 1st Ave, going slowly and its great. Open. But we're so slow, waiting for all the lights. Sitting ducks. And we're trapped again. That fuckin big white shark copper with a neck that breathes grabs some

friends. TURN around again. Off the bikes! And its 9pm or past and I think we're done. We never made it to Grand Central, or the east river, but it was alright.

"How was your ride?" I say to a friend on the phone. "Good, but we both got tickets." "Fuck. Well, I'll meet you at a bar in Brooklyn and we'll share stories." "Ok, see you there."

On the way to the Williamsburg bridge, a group of 4 of us are together, sharing stories of the night. "You used to live in San Diego, also? Cool." "The mass isn't that big out there, but they got a nice pirate radio." "What are you doing out here?" "Interning with Times Up actually." "Awesome." We're about to go the downhill side now. "Is your friend ok on that fixed gear?" "He's never ridden one before. And there's no brake." We see if he wants to switch, but he's ok. Down the bridge, I'm off to the bar, ask her if she wants to come. "Maybe." Ok, see you later.

Meet up at the bar. Tell our stories. Drink and eat some veggies from his bag. A girl comes in that I've met before. We look at each other, and try to figure out how we know each other. A half-hour later, we still can't figure it out, although we found a mutual friend. Getting hungry, we're off to get some tacos, and see more friends. She invites us to a "swing" party in central park in the future. "Cool. See you later."

My one friend just returned from Argentina. His stories are incredible. The education popular, the stencils, recuperated factories, and daily struggles of ordinary people breaks down the mental barriers to what we think is possible. "Can it happen here?" "It has before."

On the way home, a friend yells my name and I stop on the road. "Later!" I scream to the other friends are long gone by now. On the right side of a two way street. On the side but a little in front of a parked car, right beyond an intersection. I'm facing the direction that traffic is going in. My back is to the cars coming at me. This friend and I talk a little. Haven't seen him in a while. Forgot that he moved here. Its nice. A friend calls, and damn, its M. I haven't talked to him in a long time. Say goodbye to my friend right there, pick up the phone, standing with my bike, and we're chatting. "What's up!?" "Nothing, just got back from S." "Cool, are you going t-ughghg shit"screeeeeeech.....plop.... "Are you ok? What the fuck was that?" My back is wet. My bike got pushed into me leg; something hit me. That car is screeching away. What the fuck is going on? "I'm ok, M. Its just, (turning around), oh shit. Let me call you back." YOU OK?" "Yeah, I think this guy just got hit. Later."

I saw him fall on the ground. I didn't know if he got hit on the street or thrown from the car. I didn't hear anyone walking behind me. FUCK. He's bleeding from his head. Bright red. Its forming a puddle, heading toward my bike. SHIT! SOMEONE CALL 911. The blood by his mouth is bubbling. "IS HE BREATHING?" A nurses assistant checks and thinks he's breathing." "Are you OK?" onlookers say both to him and me. I respond; he doesn't. WHAT THE FUCK JUST HAPPENED? The side mirror of the parked car is smashed. Some car hit this pedestrian, smashed him against the side of the parked car right behind me, and then a bottle flew out of hand, getting my back wet; then he pushed into my bike pushing into me. I think that's it. SHIT. He's dying. The cops, fire truck and ambulance are there in minutes.

"What color was the car?" "Black." "What kind was it?" "I don't know." "What was the license plate?" "I don't know."

They lift him up on stretchers and take him off. Someone interviews me. They ask me again about the car. A chief or something says to me, "He's probably not gonna make it." He's already lost a couple pints of blood.

Before the cops came, all of us bystanders were thrown into this situation together. Figuring out what to do next. Its all been seen before on TV. But the bright color of the blood hits you and you know this shit is real. And this guys family is gonna be torn. And the driver who hit him is gone. He'll probably get caught soon. What is manslaughter these days? 25 years-life? And if he's not car, he'll be plagued by it in his dreams.

And all this on a night where I was celebrating bikes. The damage of cars to the planet is sometimes so abstract because we're forced to just make due and live with it. Railing against global warming and pollution, the global death urge, feels different than seeing a car murder someone in your face. But is it so different? On the way home, after the sirens and interviews were done, I thought to myself, "What am I supposed to think? How am I feeling?" I felt lucky to be alive, I felt horrible that this other guy was dead, I felt mixed feelings about the driver who killed him. Should he go to jail forever for this? I felt confused about the car. Should we punish the carmakers and not the drivers? Who's really driving us to death? Why is this so common?

I heard once that an artist proposed to add something to the Vietnam memorial in Washington DC: a printer spooling out lists of all the dead killed in car accidents. Our "other" sacrifices. Sacrifice sometimes seems like the only word to describe it. The random bodies thrown to the gods, the acceptable lot of death that only smoothes the pavement more. We seem to think secular society gave up sacrifice years ago, or that sacrifice only occurs by soldiers in war to consecrate the nation. I don't know though. More people die in car accidents than all our wars combined.

Who are the real victims of sacrifice? Who is really consecrating the nation, making it sacred? Or are we consecrating something else? What? Cars? Transportation? Speed? Oil? Technology? Individuality? What is the meaning that all these bodies, like the one I saw last night, give and to whom or what do they give it? Its easy to say that's its meaningless death. I don't think so though. The consistency, normalcy, complacency, and universality of such deaths in the USA are too blatant to ignore. If the highway is our national graveyard, the cars the tombstones, the police and ambulances the priests, then what is the prayer that ties it all together?

Some will say, the violence of our subconscious. The violence of capitalism. The violence of nation-states. The violence of patriarchy. But the violence of car accidents, the violence that kills cyclists, pedestrians, and drivers daily, is, in some strange way, a guarantor of safety and peace. "At least, we have something stable in this country." Human road kill. Our gift to the roads that separate and connect us. A common melody within a world of chaotic change. Our sacrifice. Our sick, fucking sacrifice.

SEAN DOCKRAY, STEVE ROWELL & FIONA WHITTON

Blocking All Lanes

Sig-Alerts, detection loops, and the management of traffic

The word traffic is always a little slippery, one of those words that escapes us when we try to pin it down. When engineers say traffic, they mean the movement of vehicles along a roadway, or what you'd find if you asked a dictionary. For the rest of us civilians, however, traffic has come to mean the exact opposite: that phenomenon of vehicles crowding a roadway until everything slows down to a frustrating crawl.

Roughly ten years and 400,000 automobiles into the twentieth century, the phenomenon was given its own name by the Saturday Evening Post: the traffic jam. While this seems quaint to a driver accustomed to four-hour-long rush hours, engineers continue to categorize it as “traffic congestion” even if there's no consensus on what that means. Is it slowness at a point over time—or over an area at a point in time? If so, how slow? Or maybe it's just a feeling? In cities all over the world, congestion is becoming the rule, which is to say that it is simply becoming “traffic.”

The word “traffic” originally referred to the movement of commodities; and only in the last two centuries did it explicitly take on vehicles and people. In the modern definition, we are traffic (which reminds us that it was once quite accept-

able for one to be a “computer” or a “typewriter”¹). Of course, we don't talk that way: we say that we are “in traffic,” but we never admit to being traffic. Although this point was made into a German roadside ad campaign (“You're not stuck in a traffic jam. You are the traffic jam.”²), it hasn't found traction in our speech.

Our attachment to the preposition is an expression of our profound ambivalence to driving. The automobile, the capitalist vehicle par excellence, promises freedom while the often frustrating experience of driving leaves us feeling quite out of control. We hold onto the idea that although we might be stuck now,

¹ See Katherine Hayles' book – *My Mother Was a Computer: Digital Subjects and Literary Texts*, from University of Chicago Press – or the sentence from Anne Balsamo's *Technologies of the Gendered Body* that inspired her title: “My mother was a computer, but she never learned to drive.”

² *Urban Transport International*. Quoted from Asphalt Nation. Jane Holtz Kay, 1998

there is a way out. But what if our agency was underpinned by an organizing, computational mechanism? We stop. We go. We turn. We yield. What if these were not simply rules to follow (code as law), but instructions to follow (code as program), an instruction that gives a green light?

HISTORY

It's impossible to say where the first traffic jam was, but modern traffic control probably originated in 1722 in response to “the great inconvenience and mischiefs which happen by the disorderly leading and driving of cars, carts, coaches, and other carriages over the London Bridge, whereby the common passage there is much obstructed.”³ Here, the Lord Mayor ordered that three able-bodied men be appointed as public servants to keep traffic to the left, and keep it moving.

Beginning in 1860, New York City's police department was given the task of regulating the increasingly competitive and reckless horse-drawn bus drivers. Not long before, the City Council had given permission for the livery corporations to franchise, and many pedestrians were killed in the aftermath as drivers raced each other to their destinations. The police officers who brought order to the streets were not ordinary men: they were some of the tallest on the force (“Broadway's Finest” were all over six feet tall) so that they could be seen above the confusion of carriages and pedestrians, and they would point and wave, moving traffic with their hands, and shouting through it all to eliminate uncertainty.

It is the policeman who marks the origin of modern traffic control. He represents a system of rules and enforces them, apprehending violators. But he does more than this—he also directs the traffic and his professional presence keeps traffic from degenerating into a stall. As Burton Marsh wrote in 1927, “The officer can take advantage of variations in the volume of traffic on the two streets and give to each street that proportion of time best suited to it at that minute.”⁴ In the beginning, each officer was a responsive, real-time traffic control system.

There were problems with this immediately. It was difficult enough for any single officer to coordinate his activities with another officer, one block away. But it was practically impossible for that officer to work with officers at the four adjoining intersections, each of whom might be coordinating with three more intersections, and so on, throughout the urban grid. Over time, the traffic cop was slowly transformed: his hands took on white gloves for visibility; his voice was replaced by a whistle; and, eventually, he was elevated in a tower and communicated with the traffic via signs or colored lights. The police officer slowly vanished, his body evolving into mechanical and electrical devices. His hands were replaced by standardized, colored signals. His eyes were replaced by sensing actuators, such as microphones, pressure sensors, electromagnets, or video cameras. All that was left was to replace his brain.

A very early experiment with non-human control occurred in London in 1868. There, the first ever traffic signal using colored lights was installed at a busy intersection near the Houses of Parliament. These gas-powered semaphores attracted

³ “Traffic Engineering and Control Before the Motor Vehicle” by R.A. Paxton, in *Traffic Engineering & Control*, August 1969

⁴ An article in the *Annals of the American Academy of Political and Social Sciences*, September 1927

throng of Londoners; and merchants, selling food and drinks, rounded off the spectacle. Part of the intrigue of this sort of innovation was the premise that a machine could do some aspect of the policeman's job. These sorts of innovations proliferated in the 1920's, during which time most regulated intersections were equipped with discrete signals. William Phelps Eno, "Father of Traffic Safety," and author of New York's first printed traffic regulations in 1903, wrote a quarter-century later that "students of traffic are beginning to realize the false economy of mechanically controlled traffic, and hand work by trained officers will again pre-

vail."⁵ This nostalgic error was by no means unusual—it was said that the police officer could handle traffic "in a way which no mechanical device could do... often being able to 'weave' it through the traffic from the opposite direction without

entirely stopping either line."⁶

In spite of these reservations, the technological development towards automated traffic control accelerated. The explosion of automobile use in the first two decades of the twentieth century put an unusually large strain on police departments in major metropolitan areas. Until the early 1920's, traffic control, even in its most advanced forms, had been a series of independent installations—traffic signal systems had not yet been born. In New York and Detroit, officers positioned in a series of traffic towers synchronized with one another to allow automobiles to flow freely in one direction. Houston built this logic into a string of electronically interconnected signals in 1922. The police officer was practically unnecessary in such an automatic, "simultaneous system."

SYSTEMS

Not all urban plans were conducive to this design, however, and other methods were introduced in the following years: the alternate system, which created staggered movement through cross-traffic; and the flexible-progressive system, which allowed for the tuning of timing gears within each individual signal. By 1926, Chicago had a room in the basement of City Hall full of such timers, so that from there an individual could immediately control dozens of important intersections. Strangely, the space of traffic control migrated from elevated towers to subterranean bunkers. In 1930, Philadelphia put the "master controller" (both a device and a person) of its flexible-progressive signal system in the basement of its City Hall; and the groundbreaking Automated Traffic Surveillance and Control (ATSAC) center, created for traffic management during the 1984 Olympics, operates four floors below City Hall in Los Angeles.

Once envied for its vast, efficient freeway system, Los Angeles eventually became the smoggy symbol of destructive automobile dependence and gridlock. Both images, however, are outdated. With one of the earliest and now most extensive traffic management systems, L.A. has become paradigmatic for "intelligent" urban traffic control worldwide. The Los Angeles district of the California Department of Transportation (CALTRANS) operates a traffic management center (TMC) in a fortified building, blocks away from the ATSAC center. ATSAC & CALTRANS

combine with the Los Angeles County Public Works TMC to handle traffic flow throughout the region.

Examining Los Angeles further as a case study in both traffic and traffic management, we find a feedback loop between the environment and the system: the environment can be described as the collective movement of vehicles across the urban grid; the system is the infrastructure designed to measure, monitor, and control the environment. More specifically, the system in Los Angeles has two primary realms: the physical and the virtual.

In the physical realm, over 50,000 buried loop detectors, the insulated wire loops that passively detect subtle magnetic field changes from vehicles, combine with over 700 weatherproofed video cameras, some of which are remotely controlled to pan and zoom, to monitor and control traffic flow. Loops automatically trigger software in switching boxes linked to intersection signals but also send data to TMCs that allow traffic engineers to monitor flow patterns and adjust timings remotely. A simple click of a mouse button can start or stop the flow of movement on the grid.

The surveillance power of 700 cameras seems oppressive, but neither CALTRANS, which controls 250 freeway cameras, nor ATSAC, which controls 350 street cameras, are allowed to archive footage or to feed a single frame of video to the Los Angeles Police force. Apparently, privacy concerns outweigh the value of surveillance on this scale. Aside from monitoring, an increasing number of these cameras can actually control traffic flow through sophisticated software interfaces. As vehicles pass in designated zones of the frame, they are counted and measured for speed and direction. The policeman and the loop detector are replaced.

DATA

Taken together, actuators, control centers, and signals largely comprise the physical infrastructure of traffic control in Los Angeles (and many other highly populated regions). Cameras and inductive loop detectors transmit data to a centralized location, from which computers can adjust signal timing and freeway metering—a process resembling the "sense-think-act" cycle of classical artificial intelligence. In 1935, twenty years before the birth of experimental AI, Bernard Schad wrote that "the control mechanism is the most important part of this so-called 'robot' system. Its function is to receive the impulses from the detectors and assign the right-of-way 'intelligently' by means of the signals, in exact accordance with the indications received."⁷

When the controller "receives" and "assigns," it does so from a distance: through buried phone lines, ethernet, microwaves, or whatever communication technologies are available at the time. Data circulates incessantly through these connections, animating the devices. It is as much a part of the story of traffic control as the hardware, but it is ephemeral and dynamic, useful only in the present. As new data supplants old data, the old fades into obsolescence, inscribed only in the strange memory of traffic patterns.

⁷ *Traffic control at signalized street intersections*, Bernard T. Schad, 1935, pg. 101. It should also be noted that, according to the OED, the word "robot" once referred to automatic traffic signals in South Africa.

Some of this data is disseminated through the internet to the public, so that motorists can make adjustments based on current traffic conditions; and by intercepting this feedback of information, we have been able to collect the data before it is deleted and lost forever. In this data, one experiences the elastic city through abbreviated narratives of minor mishaps, inexplicable slowdowns, and tragedy.

The four diagrams that accompany this essay represent part of Los Angeles on Friday, 11 June 2004, the day of Ronald Reagan's funeral. Ever since Lincoln's body was preserved by the—then unconventional—process of embalming, Presidential funerals have taken full advantage of the nation's transportation infrastructure. After beginning the day in a ceremonial horse-drawn caisson Washington D.C., Reagan was flown from Andrews Air Force Base to Point Mugu Naval Air Station in California, and then taken by motorcade to his namesake library for burial. As the motorcade headed east on the 101 at the tail end of rush hour, crowds along the route waved flags, and traffic going west came to a halt.

There is one diagram for each direction of two Los Angeles freeways. The center corresponds to one end of the freeway and the outer edge, the other—the distance between them corresponds to the amount of time required to drive from one to the other. As one traces the shape clockwise, from top to bottom, one passes from midnight to noon. Continuing from the bottom, up along the left edge, and back to the top, one passes from noon to the following midnight. A perfect day would be a set of concentric circles; as traffic builds, however, the circles deform outwards. Beneath each diagram are the "incidents" that occurred over the course

of the day.⁸

⁸ The incident stream inexplicably went down at the time of Reagan's funeral.

Traffic, unlike weather and the stock market, is a complex system without a popular visual representation that would allow it to be remembered and internally differentiated. What is the analogy to the swirling radar image of a hurricane cloud or the plunging graph of a market crash? How can one day's traffic be distinguished from another's? The traditional topographical map of Los Angeles is radically divorced from each motorist's perception of it, expanding and contracting over time. These diagrams provide an alternative way of imagining the city, centered at an individual point—a person at an origin—and outwardly directed to any number of destinations.

Of the three complex, chaotic systems, traffic is one that exists at the human, bodily scale, which is perhaps why it is so fascinating for us. We built the roads, we created its rules, we drive the vehicles, and yet it remains an inaccessible mystery. As the possibilities for adding highways (or even lanes) dwindle in many cities, most new progress is made at the level of code (both legislative and software). To put off the inevitable stall, a truly monumental traffic jam, we incrementally transfer agency to optimizing algorithms. But still, in the heart of the rational system, there is the incessant irrationality of human behavior, the imprecision of reflex, and a perpetual reappearance of chance.

INCIDENTS

Despite the success of the Los Angeles traffic management system and its contributions to the evolution of systems in other cities, states, and nations, the environment is organic and is ultimately impossible to fully control. "Incident" is the term used for this breakdown of the system. Drivers lose control of their vehicles, vehicles malfunction and dump cargo; animals stray onto roadways; wind-blown fires engulf mountain passes and mudslides bury highways.

When traffic incidents occur, the system acknowledges and responds in various ways depending on the technological level of the area's infrastructure. In the case of most freeways or major intersections in the city itself, cameras are the first observers, recording the collision or obstruction and the immediate effect on the surrounding flow. An extreme incident is known as a Sig-Alert and is defined by the California Highway Patrol as "any unplanned event that causes the closing of one lane of traffic for 30 minutes or more, as opposed to a planned event like road construction, which is planned separately," and is named after Loyd C. "Sig" Sigmon. Mr. Sigmon developed a customized radio receiver and tape recorder that would detect a particular tone and record the bulletin, providing radio announcers with an analogue database of recent traffic incidents. This relieved dispatch from answering phone calls from the press. The first use of this device was in 1955 when doctors and nurses were requested to respond to a train derailment outside the Los Angeles Union Station. A traffic jam was the unintended result. It's oddly appropriate that Mr. Sigmon was to pass away only days before President Reagan's postmortem journey from a Santa Monica funeral home to Simi Valley, north of Los Angeles, shutting down miles of the busiest stretch of freeway in the country (the 405), causing multiple Sig-Alerts in surrounding areas.

Most incidents are accidents, meaning that they are unplanned events occurring without control by parties involved. Incidents also include planned events that interfere with the flow to the driver's dismay. Hollywood production companies close entire blocks in downtown Los Angeles, affecting not only immediate parking and routing, but entire flow patterns if more crucial one-ways are blocked. Detour routes can send drivers into unknown areas of the drastically divided downtown sectors. Construction crews and LAPD officers interact with convention guests, who are pitted against jaywalking pedestrians in skid row between the business districts and Little Tokyo; commuters, exiting the freeway to avoid a fuel spill, are routed to avoid rigging trucks and make-up trailers through throngs of Lakers' fans in front of the Staples Center, causing confusion and compounding delays.

During the course of incident response, field units and management centers continue working until the blockage is removed, the disruption relieved, and steady flow reinstated. Dispatch relays information via voice and text messaging to units in the field. The same infrastructure used to monitor traffic patterns is put into use here. People do talk to people to report incidents and route response crews, but increasingly, data is streamed and automatically routed and detected by devices on the grid—the computers autonomously interacting before relaying information on to their masters. Responders typically communicate with management cen-

ters during the course of an incident, providing greater detail for a report, and enriching the potential narrative by providing an interaction of code. This code is intercepted by the public in many ways: through radio traffic reports and scanners, internet traffic sites, and via real-time monitoring on consumer-grade GPS enabled mobile gadgets. Compelling to the public observer, this new, truncated vocabulary is assimilated into the vernacular.

This is an example of an email alert dynamically issued from sigalert.com:

10:56 AM / 405 South Before Getty Center Dr / Possible Fatality
 10:56 AM—4 Vhs and Motorcycle Blocking #1, 2 and 3 Lanes
 11:02 AM—Car Pool, #1, 2 Lane is Blocked—Please Issue Sigalert
 11:02 AM—Rider Hit Possible By a Taxi That is Still On Scene
 11:03 AM—Transportation Management Center Copies Message/Item Delivered Media and Chiefs
 11:08 AM—Per 64 Says the #1, 2 Lanes Blocked on the North Lanes of the 405—Please Update the Sigalert

⁹ From: Msg@Sigalert.com
 Subject: Possible Fatality—
 405 South before Getty Center Dr.
 Date: April 06, 2004 16:26:29 PDT

11:12 AM Per S3 the Body is Blocking the North Lanes of the 405 Freeway ⁹
 On neighborhood streets or on remote stretches of highway outside of the reach of the system's network, visual reporting by a passerby with a cellphone is the only immediate link. The California Highway Patrol's website provides the public with the raw data:

Location: BARSTOW

¹⁰ <http://cad.chp.ca.gov/default.asp>
 July 31, 2004

7:08AM -SIL NISS 4D SPUN OUT TO R/S INTO DESERT ¹⁰

Location: SAN BERNARDINO

¹¹ <http://cad.chp.ca.gov/default.asp>
 January 18, 2005

7:58PM—AUTO VS COMMUNITY MAILBOX * PIECES OF MAIL EVERYWHERE ¹¹

Engineers take note of the calls or the camera feeds and speed graphs and notify the appropriate dispatch offices of the police, highway patrol, fire, public works, and/or animal response team. Extreme incidents might involve ATF or the National Guard. Incidents involving spills and animals call for less drastic action, but are still a constant problem and become an element in the feedback loop.

7:37AM—GREEN TOMATOS, OR GRAPES, SPILLED ACROSS THE ROAD

8:03AM—NEED SAND FOR 200 YARDS OF SPILL

8:03AM—NOTIFY CALTRANS, GRAPES AND GRAPE JUICE, IN BOTH LANES

8:05AM—Incident: 0350 Type: Traffic Hazard—Animal Location: 3604 N FERNDAL AV

Zoom Map: 547 7B Info as of: 7/31/2004 8:13:20 AM

ADDITIONAL DETAILS:

8:05AM—1144 CAT IN THE ROAD

¹² <http://cad.chp.ca.gov/default.asp>
 July 31, 2004

8:05AM—KIDS ARE IN THE ROAD TO LOOK AT THE CAT ¹²

LINES OF FLIGHT

As bodies-in-vehicles are captured by cameras, averaged into speed data, and described in the machine-prose of incident reports, the informational essence of the body is amplified. Data streams to and from the central computer. The motorist's foot presses and releases to the rhythm of red lights. One gets the feeling that the optimizing algorithm connects everything, that a car going a little too slow at Point A will produce a shorter green light, on the other side of the city, at Point B.

Still, commuters find openings in the traffic system. Engineers at ATSAC—and who would know better—move to outlying cities and customize their work schedule around unusual commute times, some have stopped driving and rely on underfunded public transportation, while others drive motorcycles in between lanes in a refusal to participate. But the population of the Los Angeles area grows, the openings become fewer, and motorists dream of escape. For Los Angelenos, the Mojave Desert to the north and east provides a blank canvas for the traffic weary driver. If the steep and narrow passes can be navigated, escape velocity is possible. As an analogue to sub-atomic particles hurtling away from a densely packed nucleus, energy is scattered as each vehicle spins from the city in limitless directions into this void. Where there is no grid, there should be no gridlock.

There will certainly be a time when maintenance ceases and detection loops short-circuit, cameras rust, signal lights burn out, and the asphalt cracks and splinters at its edges, the roads becoming overgrown with weeds. One can't help but wonder where we will be when the traffic system sinks back into the Earth's geology.

6

*Mapping all fruit trees in
a neighborhood so that fruit
can be harvested and eaten
by the public...*

FALLEN FRUIT:

Fallen Fruit is a Los Angeles based activist art collective founded by Matias Viegner, David Burns and Austin Young. Their goal is to get people thinking about the life and vitality of their neighborhoods and to consider how we can change the dynamic of our cities and common values.

PUBLIC FRUIT

Public Fruit is the concept behind the Fallen Fruit, which started as a mapping of all the public fruit in their Los Angeles neighborhood Silver Lake. Fallen Fruit encourages everyone to harvest, plant and sample public fruit, which is what we call all fruit on or overhanging public spaces such as sidewalks, streets or parking lots. They also ask all to contribute maps so they expand to cover the United States and then the world. Fruit is a resource that should be commonly shared, like shells from the beach or mushrooms from the forest.



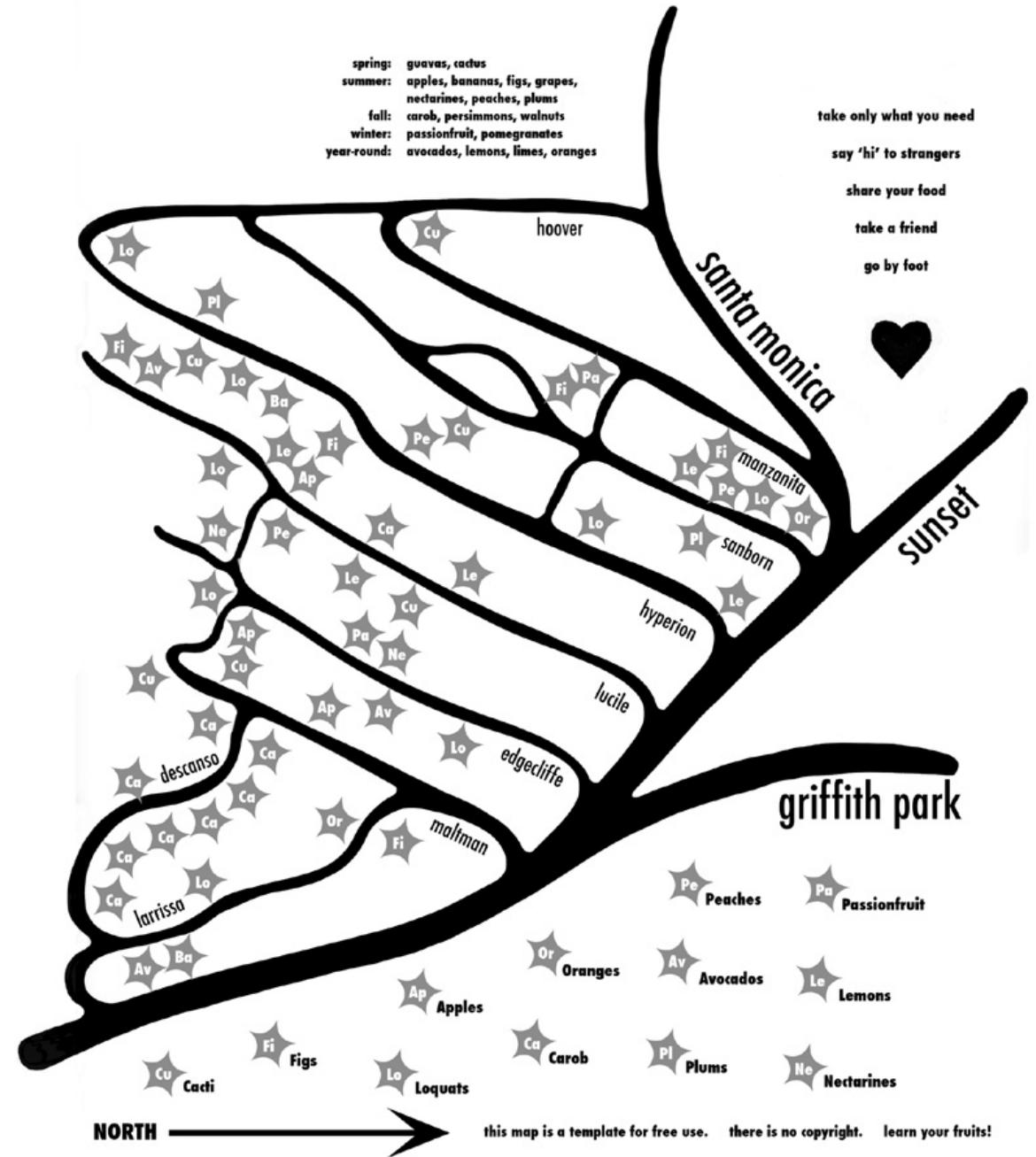
Location
Los Angeles
Date
2005–present

FALLEN FRUIT ARTIST STATEMENT

We began this project by mapping our neighborhood, Silver Lake, going street by street to identify untapped public resources and cataloging their location. We set out to only mark sites that involved no trespassing. Right away we began to speculate on the ethics involved, both on the part of residential growers and local harvesters. Free food is available at every time of the year on the streets of Los Angeles. According to the law, if a fruit tree grows on or over public property, the fruit is no longer the sole property of the owner. Fruit trees in particular are highly decorative, and often demand no greater care than any other landscape ornamental. Los Angeles is particularly rich in this respect: bananas, peaches, avocados, lemons, oranges, limes, kumquats, loquats, apples, plums, passion fruit, walnuts, pomegranates and guavas, just to name a few, grow year round in every neighborhood in the city. These fruits ripen at different seasons, so free food is available year round in Los Angeles.

Some communities have plantings of decorative fruit trees, such as sour oranges, which look charming but have little use. Public plantings almost never incorporate edible fruit trees, with one exception being the guava trees that shade parts of the Rose Bowl parking lot. Echo Park is known for the quantities of walnut trees at its northern end. Many parks and wild spaces have prickly pear cactus plantings, which yield both young cactus pads for nopales and prickly pear fruit. Accidental fruit trees arise from stray seedlings, an echo of Johnny Appleseed’s mission to populate the American frontier with apples, native to Eurasia. One of the most common street trees in California is the carob tree, source of a nutritious flour that can be used as a cocoa substitute, or the pods can be chewed whole. Often a resident is reluctant to plant fruit trees because of the litter, fallen fruit that has to be disposed of; likewise, locals are often reluctant to pick food within their grasp because they perceive it to be private property. The slow, “natural” processes of growth and fruition dramatize the shadowy nature of private property. Who does the sun belong to, and rainwater? Why is this lemon in our public space? Is this my banana? It is no small irony that most Americans eat less than the minimum recommended amounts of fruit and vegetables, even though they are all but free for the taking. Supermarket produce is quite expensive if you count it by caloric content, but the cost of processed food is ridiculous once you factor in the nutritional debit it incurs. Public fruit is more efficient to grow than farmed fruit because it eliminates the cost of transport. Since it is not a mono-crop, as in an orchard of a single variety of apple, there are far less pests and less chemicals required. A further irony is that most of the public fruit in Los Angeles is organic, blessed by neglect. Is it safe to eat? Absolutely. Should you worry about car exhaust fumes? No. Those molecules are too large to penetrate the fruit and any smut that lands on the fruit can be washed off.

We call upon the city and urban planning groups to begin plantings that yield edible goods to be shared by the city’s citizens. How can these resources be developed to the benefit of all parties? What ethical or contractual obligations are incurred? It has been observed among many hunter-gatherer societies that when people “have more of something than they immediately need, they should carry out their moral obligation to share it out.” All property owners with suitable sites should be obliged to



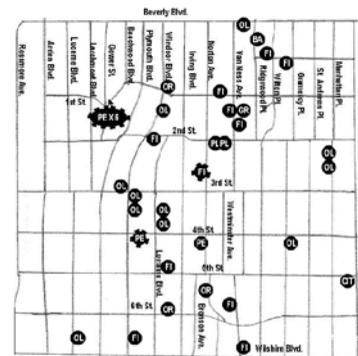
plant edible trees, or else be taxed to provide food for the poor. Most European cities have communal gardens, which often provide up to half the food of poor families. We need city fruit parks that open their fields to anyone who is hungry. To discourage profiteering, individuals could be limited to taking only as much fruit as they can carry in their hands. This way everyone could give according to their capacities and receive according to their needs. The utopian promise of California always pictured orange trees with snow-capped mountains in the distance. The new California should have oranges planted between office buildings and bananas in parking lots. Silver Lake is full of the ghosts of old Hollywood: James Dean, Rock Hudson, Judy Garland, Norma Talmadge and Buster Keaton lived here. Their ashes and discards filter through the soil to this day. Dead illusions feed the carnival of fruit that lines our streets. Over time, we hope to involve more people, especially local activists best equipped to map their own neighborhoods; the life of such a map is quite long, since fruit trees live for decades. While the Internet would seem to be the likeliest venue for such a project, a printed form is essential; the most disenfranchised Angelenos have no access to a computer. Maps must be given to them in person.

FALLEN FRUIT MANIFESTO

A SPECTER is haunting our cities: barren landscapes with foliage and flowers, but nothing to eat. Fruit can grow almost anywhere, and can be harvested by everyone. Our cities are planted with frivolous and ugly landscaping, sad shrubs and neglected trees, whereas they should burst with ripe produce. Great sums of money are spent on young trees, water and maintenance. While these trees are beautiful, they could be healthy, fruitful and beautiful.

WE ASK all of you to petition your cities and towns to support community gardens and only plant fruit-bearing trees in public parks. Let our streets be lined with apples and pears! Demand that all parking lots be landscaped with fruit trees which provide shade, clean the air and feed the people.

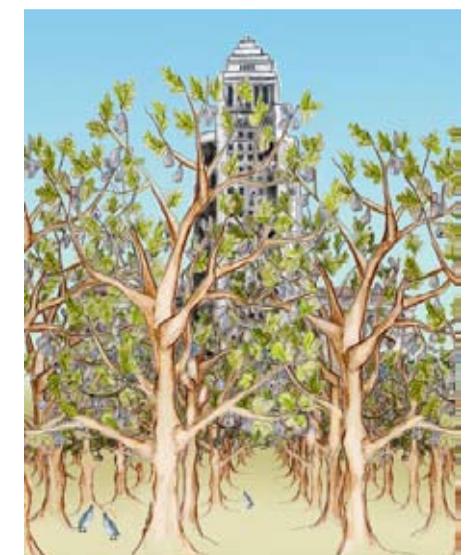
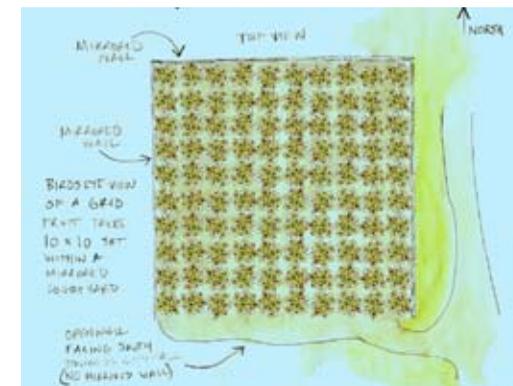
FALLEN FRUIT is a mapping and manifesto for all the free fruit we can find. Every day there is food somewhere going to waste. We encourage you to find it, tend and harvest it. If you own property, plant food on your perimeter. Share with the world and the world will share with you. Barter, don't buy! Give things away! You have nothing to lose but your hunger!



ENDLESS ORCHARD

The park between the Music Center and City Hall in downtown Los Angeles, currently a hodgepodge of outdated and underused "green space," is going to be totally revamped. The Norman Lear Center at USC is coordinating artist and community proposals for renovating the park. Our submission made it through the first round and we're waiting to hear what happens.

Endless Orchard is a 10 by 10 grid of fruit trees spaced 20' apart, the size of two city lots. It's enclosed on three sides by mirrored walls, so when you face it with City Hall behind you, you'll be looking at an infinite orchard. This connects the agrarian past of California with its current industry of creating illusions. When the fruit is ripe everyone will be able to share it (sample, don't hoard, as we say).



7

*Replacing front lawns with
gardens to grow food locally...*



FRITZ HAEG:

Besides practising architecture & design at the Fritz Haeg Studio, and curating and organizing the happenings & gatherings of Sundown Salon, and working as a college educator, Fritz Haeg leads the ecology initiatives of Gardenlab, which he established in 2001. With the garden as a metaphor and actual laboratory, Gardenlab supports ecology based initiatives in art and design.



EDIBLE

ESTATES

In summer 2005, the *Edible Estates* initiative to replace American front lawns with edible landscapes was initiated in the geographic center of the country, Salina, Kansas. This first of nine planned regional prototypes was sponsored by the Salina Art Center. *Edible Estates #2: Los Angeles* was established in the city of Lakewood in spring 2006.

Location
 Salinas, Kansas
 Lakewood, California
 Seven more planned

Date
 2005–present



MICHAEL POLLAN

What's for Dinner?

Community supported agriculture supports local farms and reestablishes the seasons as the principle determinant of what we eat.

I've spent the last two months mostly on the road, talking to audiences around the country about my book, "The Omnivore's Dilemma," and the questions it raises about how and what we eat. Most of the posts here on TimesSelect represent my thoughts in response to questions put to me by those audiences as well as readers of this site. Complicated as they may seem, many of the questions—Local or organic? Carnivore or vegetarian?—boil down to variations on the most basic question of all: What should we have for dinner?

People often ask how I answer that question for myself. They're curious to know how my investigations of the food chain have changed the way I and my family eat, whether we still eat meat (yes, but much less often and only from a handful of suppliers I can vouch for); whether I buy organic (usually, though given the opportunity I much prefer to buy local); whether I go out of my way to avoid high-fructose corn syrup (yes, though not so much because it's an evil molecule as because it's a reliable marker for the kind of highly processed foods I try to avoid); and whether I ever eat junk food. (Busted. I have a weakness for Cracker Jacks, corn chips and pizza, and therefore I don't think of those delicacies as junk food.) So after spending the past month trying to answer the dinner question in the largest ethical, environmental and nutritional sense, I thought a good way to wrap up my column here would be to answer it in the narrowest sense: What am I having for dinner night?

The answer to that question is found in a box.

One of the biggest changes I've made in my eating was to join a c.s.a. farm. c.s.a. stands for community supported agriculture, an awkward name for an elegant scheme. c.s.a. farms are a little like magazines: you "subscribe" to them, on an annual or monthly basis, and in exchange for a fee (\$60 a month in my case),

you receive a weekly box of produce, which you can pick up either from the farm or from a drop-off location or, for an additional fee, have delivered to your door.

Dozens of good c.s.a.'s operate in the Bay Area, where I live. I chose to join—and that is the operative word, as I'll explain—Full Belly Farm's. (To find a c.s.a. near you, go to localharvest.org.) I was familiar with Full Belly Farm from shopping at the Berkeley Farmer's Market, where they sell produce every Tuesday. The farm in the Capay Valley, a couple-of-hours drive northeast of Berkeley, grows 80 different fruit and vegetable crops, and they've offered c.s.a. boxes since 1992. (America's first c.s.a. was started in the 1980's in Western Massachusetts; the concept began in Europe a few years before that.) Full Belly has always been highly diversified, economically as well as biologically. In addition to the c.s.a. and farmer's markets, they sell food wholesale to small and large grocers in the Bay Area, including Whole Foods. I'd always been impressed by the quality and variety of their vegetables. So when we decided to join a c.s.a., Full Belly seemed a logical choice.

I pick up my box from the front porch of a house a couple of blocks away from mine. I have no idea whose house it is, or why they lend their porch to a c.s.a., but every Tuesday the porch is stacked high with boxes. There's also a table on the porch, set with a vase of fresh flowers, some brochures and a sign-up sheet. I initial my name on the sheet, return last week's box to the pile of empties, and pick up a new box, wondering what this week's harvest will bring—and what we will have for dinner that night.

It is less like shopping for food than going out in the garden to see what's ripe. On Tuesdays and Wednesdays we never plan dinner in advance, preferring to let the farmer—which is to say, a particular patch of soil and the weather—determine the menu for us. I remember reading in one of Alice Waters's cookbooks that she would never decide on the night's menu at her restaurant Chez Panisse till she'd visited the farmer's market, where the vegetables would speak to her and tell her what to cook.

Sometimes the vegetables speak loud and clear, as when asparagus is in season. Last week, these spears, cut just hours before they were boxed, were so fresh it would have been criminal to do anything more elaborate than to steam them and drizzle a little lemon juice and olive oil on them. But there are times when the vegetables in the box speak inscrutably, or not at all. For a few weeks this winter, the box offered rather more rutabagas than you ever want to see, and I had to consult a few cookbooks before determining how best to deploy them. One week I made a puree with carrots, also from the box; another time I sliced and simply roasted them with olive oil. Interesting. I would never buy rutabagas at the market, but I was happy to be forced into exploring this vegetable's (mildly) underestimated possibilities.

Actually the folks at Full Belly—who include a helpful and nicely written newsletter, *The Full Belly Beet*, with each box—sounded a little apologetic about some of those late winter, rutabaga-heavy boxes. But as the newsletter explained, the winter rains were brutal and unremitting this year clear through April, delaying

spring planting and devastating some of the crops, including the peaches and strawberries. So we got more root crops than usual and, to make up for it one week, a gorgeous bunch of flowers.

But that's the point: as "shareholders" in a c.s.a., we share equally in the farm's bounty and shortfalls, its triumphs and disasters. The word shareholder is not empty in this case; certainly it more closely describes the relationship we've entered into than the words "consumer" and "producer" would. As John Peterson, the c.s.a. farmer from Illinois who is profiled in the new documentary "The Real Dirt on Farmer John," describes it, the "c.s.a. is a new socioeconomic form in which the farm and consumer enter into a sort of partnership, an alliance to take care of each other's needs." For the farmer, the c.s.a. relationship means a reliable cash flow through the growing season (with money up front to help pay for planting) and shareholders who share in the risks and rewards of an enterprise that will always be at the mercy of the weather. For the shareholder, it means the freshest possible food received at the end of the shortest possible food chain.

More important, the c.s.a. reconnects you as an eater with the source of your food, offering a vivid reminder that, whatever we eat, we eat by the grace of farms and farmers, of the land, the weather and the season—not supermarkets. The c.s.a. means I also eat in the knowledge that I'm doing my small bit to defend a gorgeous patch of bottomland along Cache Creek outside the tiny town of Guinda from the oncoming wave of sprawl that threatens to engulf California's entire Central Valley into one big, wall-to-wall housing development.

Eating from the c.s.a. box constitutes the very opposite of industrial eating, that sort of unconscious consumption based on our desire to eat whatever we want whenever we want it—tomatoes in January, strawberries in October—food that's been cleaned, cut up, processed, cooked, everything but chewed and digested for us. That food chain offers convenience, sure, yet in the end it depends on ignorance—of the cost of eating that way, and of all the labor, energy and technology it requires. To eat from the c.s.a. box, with its newsletter chronicling the week's doings on the farm, is to eat in a fuller knowledge of all that's involved in getting food to our plates, including the necessity, and pleasure, of cooking. (Most c.s.a. newsletters offer recipes.) There's a lot more going on than the exchange of money for food.

So what's in the box this week? It's a good one, suggesting we've arrived on the cusp of summer. There's asparagus again, a big bunch of pencil-thin spears; a bag of new potatoes and a bunch of carrots; a big bag of salad mix; a little bag of walnuts; a fat head of garlic; and—I could smell it through the box the moment I lifted it from the porch—the season's first bunch of basil. Even before I consulted the newsletter, which offered the suggestion and a recipe, I recognized the summery possibility: pesto for dinner tonight.

T. CORAGHESSAN BOYLE

Top of the Food Chain

A Short Story

The thing was, we had a little problem with the insect vector there, and believe me, your tamer stuff, your Malathion and pyrethrum and the rest of the so-called environmentally safe products didn't begin to make a dent in it, not a dent, I mean it was utterly useless—we might as well have been spraying with Chanel No. 5 for all the good it did. And you've got to realize these people were literally covered with insects day and night—and the fact that they hardly wore any clothes just compounded the problem. Picture if you can, gentlemen, a naked little two-year-old boy so black with flies and mosquitoes it looks like he's wearing long johns, or the young mother so racked with the malarial shakes she can't even lift a diet Coke to her lips—it was pathetic, just pathetic, like something out of the Dark Ages.... Well, anyway, the decision was made to go with DDT. In the short term. Just to get the situation under control, you understand.

Yes, that's right, Senator, DDT Dichlorodiphenyltrichloroethane.

Yes, I'm well aware of that fact, sir. But just because we banned it domestically, under pressure from the birdwatching contingent and the hopheads down at the EPA, it doesn't necessarily follow that the rest of the world—especially the developing world—is about to jump on the bandwagon. And that's the key word here, Senator: developing. You've got to realize this is Borneo we're talking about here, not Port Townsend or Enumclaw. These people don't know from square one about sanitation, disease control, pest eradication—or even personal hygiene, if you want to come right down to it. It rains a hundred and twenty inches a year, minimum. They dig up roots in the jungle. They've still got headhunters along the Rajang River, for god's sake.

And please don't forget they asked us to come in there, practically begged us—and not only the World Health Organization, but the Sultan of Brunei and

the government in Sarawak too. We did what we could to accommodate them and reach our objective in the shortest period of time and by the most direct and effective means. We went to the air. Obviously. And no one could have foreseen the consequences, no one, not even if we'd gone out and generated a hundred environmental-impact statements—it was just one of those things, a freak occurrence, and there's no defense against that. No that I know of, anyway... .

Caterpillars? Yes, Senator, that's correct. That was the first sign: caterpillars.

But let me backtrack a minute here. You see, out in the bush they have these roofs made of thatched palm leaves—you'll see them in the towns too, even in Bintulu or Brunei—and they're really pretty effective, you'd be surprised. A hundred and twenty inches of rain, they've got to figure a way to keep it out of the hut, and for centuries, this was it. Palm leaves. Well, it was about a month after we sprayed for the final time and I'm sitting at my desk in the trailer thinking about the drainage project at Kuching, enjoying the fact that for the first time in maybe a year I'm not smearing mosquitoes all over the back of my neck, when there's a knock at the door. It's this elderly gentleman, tattooed from head to toe, dressed only in a pair of running shorts—they love those shorts, by the way, the shiny material and the tight machine-stitching, the whole country, men and women and children, they can't get enough of them.... Anyway, he's the headman of the local village and he's very excited, something about the roofs—atap, they call them. That's all he can say, atap, atap, over and over again.

It's raining, of course. It's always raining. So I shrug into my rain slicker, start up the 4X4 and go have a look. Sure enough, all the atap roofs are collapsing, not only in his village, but throughout the target area. The people are all huddled there in their running shorts, looking pretty miserable, and one after another the roofs keep falling in, it's bewildering, and gradually I realize the headman's diatribe has begun to feature a new term I was unfamiliar with at the time—the word for caterpillar, as it turns out, in the Than dialect. But who was to make the connection between three passes with the crop duster and all these staved-in roofs?

Our people finally sorted it out a couple weeks later. The chemical, which, by the way, cut down the number of mosquitoes exponentially, had the unfortunate side effect of killing off this little wasp—I've got the scientific name for it somewhere in my report here, if you're interested—that preyed on a type of caterpillar that in turn ate palm leaves. Well, with the wasps gone, the caterpillars hatched out with nothing to keep them in check and chewed the roofs to pieces, and that was unfortunate, we admit it, and we had a real cost overrun on replacing those roofs with tin ... but the people were happier, I think, in the long run, because let's face it, no matter how tightly you weave those palm leaves, they're just not going to keep the water out like tin. Of course, nothing's perfect, and we had a lot of complaints about the rain drumming on the panels, people unable to sleep and what-have-you....

Yes, sir, that's correct—the flies were next.

Well, you've got to understand the magnitude of the fly problem in Borneo, there's nothing like it here to compare it with, except maybe a garbage strike in

New York. Every minute of every day you've got flies everywhere, up your nose, in your mouth, your ears, your eyes, flies in your rice, your Coke, your Singapore sling and your gin rickey. It's enough to drive you to distraction, not to mention the diseases these things carry, from dysentery to typhoid to cholera and back round the loop again. And once the mosquito population was down, the flies seemed to breed up to fill in the gap—Borneo wouldn't be Borneo without some damned insect blackening the air.

Of course, this was before our people had tracked down the problem with the caterpillars and the wasps and all of that, and so we figured we'd had a big success with the mosquitoes, why not a series of ground sweeps, mount a fogger in the back of a Suzuki Brat and sanitize the huts, not to mention the open sewers, which as you know are nothing but a breeding ground for flies, chiggers and biting insects of every sort. At least it was an error of commission rather than omission. At least we were trying.

I watched the flies go down myself. One day they were so thick in the trailer I couldn't even find my paperwork, let alone attempt to get through it, and the next they were collecting on the windows, bumbling around like they were drunk. A day later they were gone. Just like that. From a million flies in the trailer to none....

Well, no one could have foreseen that, Senator.

The geckos ate the flies, yes. You're all familiar with geckos, I assume, gentlemen? These are the lizards you've seen during your trips to Hawaii, very colorful, patrolling the houses for roaches and flies, almost like pets, but of course they're wild animals, never lose sight of that, and just about as unsanitary as anything I can think of, except maybe flies.

Yes, well don't forget, sir, we're viewing this with twenty-twenty hindsight, but at the time no one gave a thought to geckos or what they ate—they were just another fact of life in the tropics. Mosquitoes, lizards, scorpions, leeches—you name it, they've got it. When the flies began piling up on the windowsills like drift, naturally the geckos feasted on them, stuffing themselves till they looked like sausages crawling up the walls. Where before they moved so fast you could never be sure you'd seen them, now they waddled across the floor, laid around in the corners, clung to the air vents like magnets—and even then no one paid much attention to them till they started turning belly-up in the streets. Believe me, we confirmed a lot of things there about the buildup of these products as you move up the food chain and the efficacy—or lack thereof—of certain methods, no doubt about that....

The cats? That's where it got sticky, really sticky. You see, nobody really lost any sleep over a pile of dead lizards—though we did the tests routinely and the tests confirmed what we'd expected, that is, the product had been concentrated in the geckos because of the sheer number of contaminated flies they'd consumed. But lizards are one thing and cats are another. These people really have an affection for their cats—no house, no hut, no matter how primitive, is without at least a couple of them. Mangy-looking things, long-legged and scrawny, maybe, not at

all the sort of animal you'd see here, but there it was: they loved their cats. Because the cats were functional, you understand—without them, the place would have been swimming in rodents inside of a week.

You're right there, Senator, yes—that's exactly what happened.

You see, the cats had a field day with these feeble geckos—you can imagine, if any of you have ever owned a cat, the kind of joy these animals must have experienced to see their nemesis, this ultra-quick lizard, and it's just barely creeping across the floor like a bug. Well, to make a long story short, the cats ate up every dead and dying gecko in the country, from snout to tail, and then the cats began to die ... which to my mind would have been no great loss if it wasn't for the rats. Suddenly there were rats everywhere—you couldn't drive down the street without running over half-a-dozen of them at a time. They fouled the grain supplies, fell in the wells and died, bit infants as they slept in their cradles. But that wasn't the worst, not by a long shot. No, things really went down the tube after that. Within the month we were getting scattered reports of bubonic plague, and of course we tracked them all down and made sure the people got a round of treatment with antibiotics, but still we lost a few and the rats kept coming....

It was my plan, yes. I was brainstorming one night, rats scuttling all over the trailer like something out of a cheap horror film, the villagers in a panic over the threat of the plague and the stream of nonstop hysterical reports from the interior—people were turning black, swelling up and bursting, that sort of thing—well, as I say, I came up with a plan, a stopgap, not perfect, not cheap; but at this juncture, I'm sure you'll agree, something had to be implemented.

We wound up going as far as Australia for some of the cats, cleaning out the SPCA facilities and what-have-you, though we rounded most of them up in Indonesia and Singapore—approximately fourteen thousand in all. And yes, it cost us—cost us upfront purchase money and aircraft fuel and pilots' overtime and all the rest of it—but we really felt there was no alternative. It was like all nature had turned against us.

And yet still, all things considered, we made a lot of friends for the U.S.A. the day we dropped those cats, and you should have seen them, gentlemen, the little parachutes and harnesses we'd tricked up, fourteen thousand of them, cats in every color of the rainbow, cats with one ear, no ears, half a tail, three-legged cats, cats that could have taken pride of show in Springfield, Massachusetts, and all of them twirling down out of the sky like great big oversized snowflakes....

It was something. It was really something.

Of course, you've all seen the reports. There were other factors we hadn't counted on, adverse conditions in the paddies and manioc fields—we don't to this day know what predatory species were inadvertently killed off by the initial sprayings, it's just a mystery—but the weevils and whatnot took a pretty heavy toll on the crops that year, and by the time we dropped the cats, well, the people were pretty hungry, and I suppose it was inevitable that we lost a good proportion of them right then and there. But we've got a CARE program going there now, and something hit the rat population—we still don't know what, a virus, we

think—and the geckos, they tell me, are making a comeback.

So what I'm saying is, it could be worse, and to every cloud a silver lining, wouldn't you agree, gentlemen?

CLAIRE PENTECOST

What did you eat and when did you know it?

It's such a mess now anyway
 wish fulfillment every day
 I don't believe you
 now I can't hear a word you say
 —*Sonic Youth*

One of the tutelary phantasms of Las Vegas is abundance, abundance without labor, without

sacrifice. Despite the work ethic that the Puritans brought to what would become the United States, or maybe because of it, the American dream is of the free and the big. An American's life is awash in surplus, and the cheapest, most reliable experience of plenty is eating.

If Vegas is any indicator, in the matter of food, Americans love value: large quantities for cheap. Companion to the visions of luxury and sin illuminating the Vegas strip, lurid food images invite pilgrims to gorge themselves with all things coded as forbidden by health preachers and the diet industry. But the consumer is also expected to master the groaning table. One of the prime signs of the failure to command abundance, i.e., the condition of downward mobility, is the overweight body. Just imagine Roseanne and Tom svelte and trim: it would suggest a control over their lives that would neutralize the show's basic traction. Like most failures to master our culture's pitfalls, this one is shouldered by the individual.

A few months ago Barbra Streisand was in the news witnessing to her moral psychology of eating: "One day I tell myself, 'Screw everything, I'm getting a Carl's Jr. hamburger and eating fried chicken three nights in a row. I don't care about my weight.' The next day, my optimistic side takes over and I think, 'Wait a minute, life goes on, people will get wiser, justice will prevail. Maybe I should watch my diet.' I'm still in that state of confusion." The historian Peter Stearns, who has written a history of attitudes about body weight, compares American food culture to that of the French, a slimmer population. Of the many intriguing differences, he finds that, unlike the French, Americans are moralistic about issues of body weight, a factor that Stearns proposes as counterproductive to healthy eating.

Vegas is the predictable inverted reflection of American moralism. It's a Pu-

ritan's vision of hell, a cheesy market-driven saturnalia, pitched full-tilt now to the whole family. In this city the usual contradictory cultural messages about eating are temporarily resolved. Women's magazine headlines (Lose 30 Pounds! Get Ready For Swimsuit Season! Lunches To Avoid!) tip into oblivion. The mandates of compensation for whatever we lack (Treat Yourself—You Deserve It; You Know You Want It) reign uncontested. When I walk out of my Motel 6 the first morning I feel giddy with the sense that anything is allowed here. How do they put that in the air of a crummy parking lot? The feeling makes a person wonder what she really wants to do. It could make a person, an artist even, that hypothetical cipher of freedom from drab social fetters, wonder if she has been doing what she wanted all along.

For years (when asked) I defined my artistic practice as being concerned with the shifting line between what we call the natural and the artificial. This of course allowed me to include almost anything, but in good faith, it inevitably led me to look into the latest flash-point for that border: biotechnology. In 1998 my curiosity uncovered the fact (now common knowledge) that Americans had been unwittingly eating transgenic foods or genetically modified organisms (GMOs) since 1994. When I started to look into how our food is produced and marketed, I was stunned by the degree of complexity, secrecy, and opacity surrounding the almost completely vertically integrated path from seed to shelf, as the multinationals like to say, or from dirt to dinner plate, as we like to say in the course I am currently teaching on the subject.

Thanks to complicated subsidies and the almost complete economic marginalization of that threadbare icon, the American farmer, food stays relatively cheap in our country; consumer capital wouldn't be what it is if people were spending all their wages on necessities. But food production still turns a profit and for that, monocropping is the first expediency. Very few crop varieties are grown in large scale so that they can be harvested with the most efficiency. Genetic varieties are selected and bred for high yields by way of minimal labor, minimal skills, minimal rotations of machinery, streamlined facilities for separation, transportation, and storage. But a neomaniac market has only so much use for vast quantities of undifferentiated stuff, be it corn, wheat, or soy. So the industry must invent the million ways of altering, processing, transforming, freezing, dehydrating, reshaping, and disguising the monocrop. About 90 percent of the money Americans spend on food is on processed food. Some of the fastest growing markets are frozen meals, vending machine sales, and so-called "functional foods" like powerbars.

In the Puritan spirit, John Locke developed a notion of property as an entitlement to that which has been improved by the owner—whether land, materials, or the self. This philosophy finds its correlative in the idea of the value-added product, the entitlement to profit. The value-added imperative drives us to alter the cheapest raw material by processing and packaging. The Fordist principles of assembly, scale, and distribution require that food be standardized and stabilized for shelf life, packaging, and transportation. But these imperatives destroy the pleasurable features of food, rendering flavors and textures bland or worse. It

turns out that the most expedient ways of reinstating these qualities are to add sugars, fats, and salt, the objects of the most reliable human gustatory cravings, probably evolved over eons of relative scarcity. These compensations for a cheap and overprocessed monocrop, are what sells most of both retail processed food and restaurant-service fast food.

I was raised in Georgia, and I can't help noticing the degree to which processed and fast food mimics what we called poor people's food. The cuisine I grew up with: collard greens with hamhocks, fried chicken, fried catfish, fried shrimp, country fried steak, sausage biscuits, biscuits and gravy, buttermilk pie, fried okra, creamed corn, corn bread with molasses or maple-flavored corn syrup—all this was ruled by the additions of salty pork fat, sugar, coatings of meal and flour, carbohydrates that absorbed animal fat in the process of being fried, binders of lard, more salt. The same devices that poor people used to make cheap food go further, taste better, satisfy quicker, stick to the gut longer, are those used by the food industry to make cheap food go further, taste better, satisfy quicker and, by the way, perpetuate a cycle of cravings. You can probably find variations on these imperatives in many immigrant cuisines in America, the comfort food of poor people from a range of parts of the world. Does this make poor people all the more vulnerable to the foods most favored by the profit mandate of consumer capital?

In the morass of conflicting information about nutrition and illness, perhaps the only thing that researchers and health professionals consistently agree on is the correlation between decreased illness and eating lots of minimally processed fruits and vegetables. But unprocessed fruits and vegetables present the least opportunity for profits through the value-added logic of the food system.

So the corporate food system can only create fatter and less well-nourished citizens, especially when combined with sedentary lifestyles, the increasing tendency to eat to relieve stress, and the lack of time to eat differently. In fact, it is so much trouble to eat well that the effort to do so quickly marks one as a querulous deviant in most social contexts.

This raises the question of the overwhelming lack of interest in healthful food on the part of consumers, myself included. If food is so fundamental to daily life, pleasure, and survival, why is it also such a perfect site for the sleight of hand that is commodification, namely, masking the conditions of its origin? How can we be so indifferent to the increasing estrangement of the make-up of our foods and the degradation of their quality? I started to think in the rhythm of the political pundit James Carville's famous campaign slogan: it's the economy, stupid; in this case the economy of the unconscious.

It's obvious that most people are anything but indifferent to food and eating, but it seems that people would like to be. A dear friend of mine was diagnosed with breast cancer in her thirties and wondered how much she should blame herself for consuming hot dogs and diet soda. Talking about the range of conflicting, alarming, seductive information on food, she summed it up for me saying, "I'm really into not thinking about what I eat."

Personally, I never wanted to spend much energy on food either. I lived in New

York and had a cruddy little tenement kitchen. I ate out all the time, walking down the street with a slice, or I ate tortillas wrapped around brick cheese and salsa, standing over the garbage can so I wouldn't have to wash a plate or take the time to sit down. I felt guilty about my dissociation from the life-sustaining activities of feeding, but changing it remained a fantasy. Some years ago when I visited Italy I was relieved to learn that in Pompeii and later in third- and fourth-century Rome everyone but the very rich ate in restaurants. Of course the rich had slaves to cook for them. It's not that I'm so happy to identify with Roman culture but just knowing that this rejection of cooking duties has a long history made it feel more human.

In the art world that is my subculture, the ethos has been indulgence and flagrant permission. Good sausages, steaks, sweets, smokes, and martinis. The health motivation was pusillanimous and puritanical. Concerns for environmental side effects made one an eco-bore. In my aging crowd, this is changing as we sustain the rude bumps of mortality, but in traditional bohemian self-regard, food, like sex, must be a site of permission, a permission perceived as mildly transgressive.

The alimentary and the sexual are two human economies that have always been regulated very closely by cultures. What is allowed to enter the body? How should it be vetted, prepared, or purified; under what circumstances may substances leave the body; how should they be disposed of; what are bodies allowed to mingle with; what bodies are allowed to mingle with what other bodies; what may be produced by their conjunction? With regard to foods, these questions of "purity" and "danger" (to use Mary Douglas's terms), were traditionally answered by fairly complex and often unforgiving sets of rules and expectations.¹ Bodies are good sites for social management because there is a lot of reasonable anxiety about their fragility and the force of their drives. Their maintenance poses a range of satisfactions and risks and may trigger a spectrum of very fierce desires and fears, often summarized by ambivalence.

The extraordinary symbolic multivalence of food and eating extends much further, so that food has probably always been charged with questions of moral significance. In traditional societies these questions, even when served by contradictory answers, have been negotiated for the individual through custom. People didn't have to think about the possible risks of putting foreign matter into the body because necessity and custom dictated what, how, when, and with whom. Historically, the individual has been either freed by the culture from the anxieties caused by food and eating, or she has been enslaved by the culture, depending on how you want to look at it. Either way it was something she didn't have to think about.

Look at it from Homer Simpson's point of view:

Uh, Lisa, the whole reason we have elected officials is so we don't have to think all the time. Just like that rain forest scare a few years back. Our officials saw there was a problem and they [pause] fixed it, didn't they?

Where do we find that part of the culture that does our thinking for us with regard to our ambivalence about eating? Since the early twentieth century, the

government has charged various agencies with inspecting our foods, inspiring confidence in our food system, and advising us on the do's and don't's, the wrongs and rights of eating. Unfortunately, many of the people who staff these agencies earn their credentials through the industry and return to some form of industry

employment when their tour of public service is over.² Likewise, many members of Congress who decide policy for regulatory agencies can expect lucrative positions as industry lobbyists when they move from public life.³ Accordingly, the complicity of watchdog agencies with corporate interests comes as no surprise. In addition, state university systems (including the landgrant institutions charged with agricultural research in the public interest) are increasingly beholden to corporate partnerships.⁴

Sometimes the cahoots are exposed. For example, in a lawsuit filed by the Physicians Committee for Responsible Medicine (PCRM) a U.S. District Court judge ruled recently that the U.S. Department of Agriculture (USDA) and the Department of Health and Human Services (DHHS) had violated federal laws when they selected individuals with known financial ties to food industries to serve as members of the Dietary Guidelines Advisory Committee. This group was in charge of drawing up the latest nutritional guidelines that comprise the USDA's Food Pyramid. In addition to its educational purpose, the pyramid also serves as a basis for all federally funded food programs in the U.S.

But in most cases it is difficult even to analyze the complicity in terms of legal misconduct because the frame of reference is just so deeply ingrained.

Consider the following: Among other biases privileging industry interests over citizens, PCRM criticized the food pyramid's promotion of beef and dairy products as protein and calcium sources. This, they maintain, is racially biased since nonwhite races (70 percent of the population in fact) are more likely to be lactose intolerant and some are more susceptible to diet-related chronic illnesses, including heart disease, stroke, hypertension, obesity, diabetes, and certain types of cancer. Much healthier alternative sources of calcium—collard greens, broccoli, kale, and beans—are omitted from the Food Pyramid.

Everyone has learned to be skeptical of both corporations and the government, but skepticism provides only an illusion of protection from being duped. Without the skills of in-depth critique applied with an overview to make connections between apparently divergent interests, this is very specious protection. Skepticism is also exploited by literally scores of non-profit, presumably public-interest groups like the American Dietetic Association, the American Council on Health and Science, the Advancement of Sound Science Coalition, and the International Food Information Council, to name just a few, which are actually set up and funded by industry. These groups provide expertise in the evaluation of scares about health and environment, mostly dismissing them as hoaxes perpetrated by crazy environmentalists.

The edicts of these organizations gratify the public's skepticism while simultaneously reassuring the public that business as usual is O.K. The problem with skepticism is that it makes people generally cynical but does not amount to

² A typical example is the current U.S. Secretary of Agriculture, Ann Veneman, who served on the board of directors for Calgene, Inc., the first company to try to market genetically engineered food, the Flavr-Savr tomato, to consumers. Calgene was bought by Monsanto, which was bought by Pharmacia. Veneman also served on the International Policy Council on Agriculture, Food, and Trade, a group funded by Cargill, Nestle, Kraft, and Archer Daniels Midland. Often, ex-public servants also go to work for public-interest groups that are funded by industry, rather than working for industry directly.

³ The Center for Responsive Politics has documented the frequent incidence of former U.S. representatives going to work for public relations and lobbying firms with clients in big industry. See also Marion Nestle, *Food Politics* (Berkeley: University of California Press, 2002), 95-110

⁴ Integrity in Science, a project of the Center for Science in the Public Interest, maintains a database of scientists and nonprofit organizations with ties to industry, including (partial) lists of individual university professors whose research projects are fully or partially funded by corporations, as well as university departmental partnerships with private industry. A particularly controversial case is the \$50 million, five-year deal that the Department of Plant and Microbial Biology at the University of California, Berkeley brokered with drug and agribusiness giant Novartis in 1998. In this arrangement Novartis can select the participating faculty, review research results prior to publication, veto faculty participation in other projects, negotiate with faculty for specific projects, and claim first rights to negotiate for new technologies. Laws strengthening intellectual property rights, such as the 1980 Bayh-Dole Act authorizing patenting and commercializing of results from publicly funded research, have created financial incentives for scientists and academic institutions to enter into entrepreneurial partnerships with for-profit industry, spawning over 4,800 university-industry patents between 1980 and 1998 (Nestle, 122)

¹ Mary Douglas, *Purity and Danger* (London: Routledge, 1966). A few of the surviving examples of this social oversight are the Jewish kosher diet, Muslim halal, and some forms of vegetarianism. Ethnographic literature is full of other examples.

systematic critique of conventions of authority and the interests they serve. Nor does skepticism provide the support people need to lead lives against the grain or to demand changes—in the food system for instance.

Still, the evidence mounts that we depend on an increasingly degraded environment in terms of air, water, and food. We don't want to think about it, but we can't count on cultural authorities to think about it for us. Where do we direct our anxieties about purity and danger in the regulation of what goes in and out of our bodies?

The confusion that Streisand confesses typifies a prevalent confusion on many levels. We identify both personal morality and social optimism and justice with the self-control needed for dieting. A more visceral symptom of our confusion is the location of purity and danger exclusively in the realm of the individual. The anxieties that eating visits upon us—fear of contamination, fear of loss of control, fear of transformation to the inhuman, to the monstrous—these must be managed by the individual. Accordingly we look to read them at the level of the individual.

The obese body, as well as other physiognomies of failure, is a scapegoat for the kinds of fears that would be more productively focused on the condition of a natural environment sacrificed to a profit motive. The ascendancy of health problems associated with compromised diets and increased body weight is well documented. The attendant declaration of an epidemic of obesity looks like a displacement all too compatible with the machinations of a predatory economic system.

In March of this year, I gave a paper at a conference on poverty and obesity sponsored by the University of Chicago's Center for Gender Studies. The organizers, Lauren Berlant and Virginia Chang, invited people working on this issue from both scientific and cultural disciplines. The impetus for the conference was very specific: three years ago reports began to surface that for the first time in global history, the number of overweight people in the world rivaled the number of those that are underweight.⁵ Not only in the United States. In the world. Specifically noticeable in the trail of Westernization.

Changes in food systems and patterns of work and leisure, and therefore in diets and physical activity, are causing weight-gain, obesity, diabetes, high blood pressure, cardiovascular disease including stroke, and increasingly cancer, even in the poorest countries. Malnutrition early in life, followed by inappropriate diets and physical inactivity in childhood and adult life, increases vulnerability to chronic diseases.

Obesity, itself a disease, also predicts more serious diseases. Current rates of weight-gain and obesity—most of all in children, young adults, and women—project rapidly increasing disability and premature death from nutrition-related chronic diseases for most developing countries. Phenomenal social and economic changes, on a scale and at a speed unprecedented in history, have resulted in an epidemic of nutrition-related diseases that must be contained.⁶

Why was an artist invited to this conference? From what has become my own discipline-free zone or discipline free-for-all, I spend a lot of time educating myself in the subject of my choice, which for the last three years or so has

Technical Report Series, 894 (1998); M. Pena and). Bacallao, eds., "Obesity and Poverty: A New Public Health Challenge," PAHO Scientific Publication 576 (2000).

⁶ International Union of Nutritional Sciences Committee on the Nutrition Transition, "The Bellagio Declaration" Public Health Nutrition 5 (IA, 2001): 279-80.

been the corporate control of our food system. This is my excess, This is my permission. What qualifies artists to take their autodidacticism to the arenas of experts in other fields? We need, in addition to the admittedly important information gathered by the experts, other structures for valid interpretations of knowledge.

When you look at trends in fine-art photography you can detect, among other things, a logic that seeks to distinguish the professional or fine-art photographer from the amateur. This is necessary because everyone has a camera and our world is littered with pictures. Just now, for instance, the trend is toward huge, high-production, intricately staged images that are exorbitant to arrange and produce. That's the look that looks like art. You can't get it without bucks.

In a world as littered with facts and opinions as it is with images, in a world in which we have more data than theories, and where anyone with a little persistence can get her hands on more information than she could ever digest, there have to be ways to distinguish the professional from the amateur in terms of knowledge and authority. We expect training and education. A degree. Board certification. A curriculum vitae. Peer review. Exclusionary conventions in rhetoric and citation. Organizations waving acronyms of neutrality.

The hope of all this institutional qualification is that knowledge can be disinterested and therefore trustworthy. But expertise is always gained and shared under tendentious conditions. The marketplace solution to all things in our culture has thoroughly determined the relative prominence, packaging, and distribution of information. In grocery stores big food manufacturers pay premium prices for the most and the best shelf space. You might start up a fabulous little product but good luck getting it in front of a shopper. Information works the same way, and, at times, art does too. It may not be produced, and certainly won't be promoted, unless someone can make money off of it. If you want to understand what you know and why you know it, follow the money, as they say.

Money, clout, and chutzpah are still the most securely qualified institutions of authority. The critic Dave Hickey, one of the keynote speakers at the SPE conference, disparages the ascendancy of the academy and the current state of art as a manifestation of "institutional culture." According to him, the adjudication of art's value in the gallery and the market is the real thing; anything else is just "the instrumentalization of institutional authority," by which, presumably, he means the academy, critical theory, museums. But of course, the normativity of the market precludes our choices as much as any other force—in art, as in knowledge, as in health, as in most things out there for sale.

Finally the individual who has found some reason to care about something is the one burdened with ascertaining the credibility and relative importance of whatever informs a given decision. A person who wants to feel some autonomy has a lot of work to do. Could the desire to know be afforded the dignity of a muse?

Gustave Flaubert's last novel, *Bouvard and Pecuchet* (1881), is one of the first works to define the very modern condition of easy knowledge. This marks the

⁵ A number of international organizations have published information and urgent policy recommendations regarding the rise of diseases associated with obesity in populations already struggling with high rates of malnutrition and poverty. In addition to diabetes, high blood pressure, cardiovascular disease, the obese often suffer from malnutrition as much as the underfed, because they are still not eating enough nutritious food. See Gary Gardner and Brian Halweil, "Underfed and Overfed: The Global Epidemic of Malnutrition," *Worldwatch* Paper 150 (September 1999). See also D.J. Hoffman, "Obesity in Developing Countries: Causes and Implications," *Food, Nutrition and Agriculture* 28 (2001); Reynaldo Martorell, "Health and Nutrition Emerging and Reemerging Issues in Developing Countries: Obesity" 2020 Focus 5, Brief 7 of 11, (February 2001); Working Group on Obesity, World Health Organization, "Obesity: Preventing and Managing the Global Epidemic." WHO

moment when “dilettantism” became downwardly mobile. From an aristocratic delight in the arts associated with connoisseurship, the term came to express the ludicrous attempts of the middle class to fill their expanding leisure time. The bumbling do-it-yourselfers of the novel get as much sympathy from the author as any of Flaubert’s characters, as they grow bored or discouraged and repeatedly fail to master the abundance of knowledge.

In *The New Yorker*, Peter Schjeldahl titled his pan of the 2002 Whitney Biennial “Do It Yourself.”⁷ The review renews complaints that today’s artists don’t know what they are supposed to be, have abandoned the honorable mandate of invention through form, are not committed to anything beyond their own narcissism. For some time artists have wrestled with the disempowered knowledge-field of aesthetics, unrelated to the official function of representing the church or state. In many ways what the artist is allowed to know reflects what the citizen is allowed to know. The rest is mystification.

In the 1990s artists were allowed to be experts on who they were, their identities, specifically their experience of social identificatory regimes according to race, ethnicity, gender, class, sexuality. At its best, this was a welcome politicization or invigoration of the traditional artist’s territory of the self and the traditional imperative or permission for an artist to express himself. At its worst, this resulted in selves balkanized according to a quasi-essentialist logic entrenching the organization of subjectivity around historically determined factors, and finally feeding the commodification of identity itself. As so much advertising attests, the object of our labors is the freedom to express ourselves through consumption. In a system of mystification, self-expression fills our bellies, makes us sleepy; knowledge of how our world works remains under the table.

Whether by form, by tired signifiers defined as political (as though the fact of the social nature of humans could be isolated), or via the by-products of sanctioned narcissism, artists are often called the mirrors of our culture. No surprise that such a mirror should be asked to deliver wonder without knowledge, transgression without impact, wisdom without authority, reflection without connection.

The really alarming thing about the uncontested integration of transgenics into foods is what it means for the further concentration of control over every step of the food system by multinational corporations. But here food provides a case study for an even more comprehensive phenomenon. Biotechnology is a symptom of the long-coming shift of capital’s territory from the sphere of production—as in the industrial process—to the sphere of reproduction, as in the activities of everyday life, including but not limited to sex, eating, birthing, knowledge, thought, play, service, identity, imagination, etc. Eating and the transmission of knowledge are just two essential examples of the shift from exploiting a nonrenewable resource base to colonizing the constantly renewed resource base, namely, biological and cultural processes.

The transgressive permissions paraded at Vegas are pretty well rehearsed. We are invited into these temptations as workers, contributing our life energy to perpetuate the system of our ultimate distraction. The really threatening violations

are rarely stated explicitly and permission to commit them is nowhere advertised. What cannot be permitted is the linkage of desire to knowledge and the assumption of authority in that knowledge by any citizen or artist.

8

*A city garbage truck
completely sheathed in
mirrors to remind viewers
that it's their garbage...*

MIERLE LADERMAN UKELES:

As the artist-in-residence for New York City's Department of Sanitation since 1978, Ukeles has been a force in raising awareness about the garbage, the systems and people handling garbage, and expanding the role of artists.

THE SOCIAL MIRROR

In 1977, Mierle Laderman Ukeles became the unsalaried, official artist-in-residence for the New York City Department of Sanitation, for whom she has produced over 25 large-scale works of art. For *The Social Mirror*, a 20-foot long mirror was hung on the side of a garbage truck, enabling people to experience their reflected image, stressing each person's role in producing garbage.

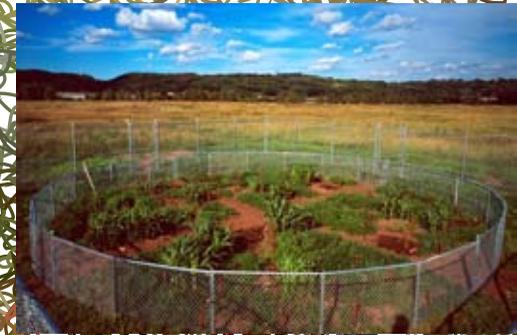
Location
New York City
Date
1983



9

*A garden with plants that
extracts heavy metals from
contaminated soil...*

REVIVAL



MEL CHIN:

Sculptor Mel Chin explores ways that art can provoke greater social awareness and responsibility. His interest in the environment has led him to collaborate with scientists and government agencies to create work that transcends traditional sculpture.

FIELD

In 1990, Mel Chin began a lengthy residency at the Walker Art Center to create an installation titled *Revival Field: Projection & Procedure*. He worked with scientists to design gardens of hyperaccumulators—plants that can draw heavy metals from contaminated soil. The site of an old landfill near downtown St. Paul, Minnesota, was selected. The contaminated earth was enclosed with a chain-link fence and divided by paths that form an X. The project's boundaries were marked by a square. Chin conceived of these overlays as a target, a metaphorical reference to the work's pinpoint cleanup. The divisions were also functional, separating different varieties of plants from each other for study.

Location
St. Paul, Minnesota
Date
1990

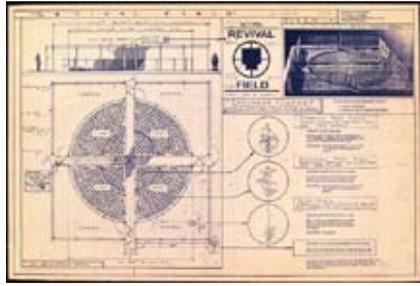
FROM FRAGILE ECOLOGIES

Revival Field consists of a 60-square-foot section of landfill contaminated by such heavy metals as cadmium that have seeped out of used batteries. The planting field is plotted in the shape of a circle, a geometric form traditionally perceived in both science and art as symbolic of nature's purity. Cosmologically, it corresponds to the cycle of time and refers to the four corners of the earth. Whether or not Chin consciously intended these connections, there is a purposeful serenity to the design that provokes comparison with Eastern religious art forms like the Tibetan mandala.

The contaminated earth is fenced in with chain link and subdivided by intersecting paths that form an X. The project's boundaries are circumscribed by a square. Chin conceives these visual overlays as a target, a metaphorical reference to the work pinpointed for clean-up. The divisions are also functional, separating different varieties of plants from each other for study. In the circular field, the intersecting paths create four fields where six types of plants and two pH and two fertilizer tests can occur in each quadrant. The land area between the square and circle function as a control plot where plants will be seeded with local grasses. The design for Revival Field facilitates the chemical analysis of each section.

Chaney and Chin selected six types of plants, known as "hyperaccumulators," that extract zinc and cadmium through their roots into their leaves and then store these elements in their biomass. Among the varieties tested are a hybrid variety of sweet corn (*Zea mays*) and bladder campion (*Silene cucubalis*), which were planted by Chin and a team of five artists and volunteers. They prepared the soil wearing special suits, face masks, and gloves. Prior to their work, they were required to attend forty hours of Hazardous Materials Incident Response Training. Revival Field dramatizes the variety of work





unrelated to art that is necessary to implement ecological art.

Perennial and annual seeds and seedlings were imported from mine sites in Belgium and England where they adapted over centuries to high levels of toxicity. After planting, the city trucked in water tanks to ensure sufficient nourishment through the summer months. In October 1991, Chin and his assistants harvested the plants, which were cut and dried like hay, ashed under controlled conditions, and then analyzed by Dr. Chaney. Two more plantings are scheduled, but in future sites the process of planting and harvesting will continue until the soil has been detoxified. Ashing increases the concentration of the metal to the level of commercial ore. Ideally, this recycled ore could pay for the cost of the landremediation process.

Hundreds of such toxic sites exist and could be cleansed by "green remediation." This method is clearly less hazardous than removing toxic soil and disposing it elsewhere. Revival Field is thus an important prototype that may be expanded in number and scope.

Plans are currently in progress to create another Revival Field in Holland for the World Horticultural Exposition that takes place every ten years. Exposure to an international community will further underline the significance of the work and highlight the fact that Chaney and Chin's project transcends the issue of land reclamation. It tellingly documents the potential of plants to affect our lives in ways still unknown to us. The loss of species everywhere due to habitat devastation emerges once again as an important issue. The preservation of biodiversity is an underlying theme of this work.

An unexpected side issue developed during the process of fund raising for this project. Chin applied to the National Endowment for the Arts and received \$10,000 from a special fund, "Artists' Projects: New Forms." However, the former director, John E.

Frohnmeier, rescinded the grant awarded by the artist's panel on the grounds that it was not "art." Although he eventually reversed himself, Frohnmeier's attitude demonstrates a conservative tide that threatens artist-activism, which has a long history in art. Chin's own description of intent in the written proposal for Revival Field remains the most articulate explanation of his "art."

Conceptually, this work is envisioned as a sculpture involving the reduction process, a traditional method when carving wood or stone. Here the material being approached is unseen and the tools will be biochemistry and agriculture. The work, in its most complete incar-

nation (after the fences are removed and the toxic-laden weeds harvested) will offer minimal visual and formal effects. For a time, an intended invisible aesthetic will exist that can be measured scientifically by the quality of a revitalized earth. Eventually that aesthetic will be revealed in the return of growth to the soil.

In Chin's view, art and nature become inseparable. This is as it should be since the processes, life forms, and physical configurations of the planet are the ultimate works of art. Accordingly, the most valuable art will assist both nature and people to achieve once again an optimal state of balance.

Working with toxic waste can be a daunting proposition. It involves applications for permits, delicate negotiations with public officials, and most importantly, the danger of exposure. The fact that an artist has been able to surmount all of these obstacles opens up yet another dimension to ecological art.



⑩

An indoor composting system to produce soil from household organic waste...



N55:

Working with art as a part of everyday life, N55 is a collective based in Copenhagen, Denmark. N55 holds that material objects ought to be shared and saved from the constraints of private ownership. For each of their projects, a manual is produced that describes the project's parameters.

Location
Anywhere

Date
1990

SOIL FACTORY

A person living in a city produces about 200 lbs of

organic household waste per year. By composting this material in the *Soil Factory*— designed for indoor use—it can be transformed into soil. Vermicomposting is a simple and cheap way of composting. The decomposition is done partly by worms, partly by other organisms and microbial processing. The worms' digestive tracts perform efficient microbial and chemical transformation, and their activities provide the mechanical work also necessary for the composting process: mixing, draining and aeration. Eventually, the organic waste of a small household (3–4 persons) is effectively transformed into a highly fertile substance.

MANUAL FOR SOIL FACTORY**SYSTEM COMPONENTS**

The *Soil Factory* consists of three main modules: First, the top module, through which the system is ventilated and supplied with raw material and bedding. It keeps out light and reduces odour inconveniences. A thermometer, a fly trap and a container for bedding is mounted on the inside. Second, the middle module, consisting of three tanks containing the worms, the raw material and the resulting product. Third, the bottom module, which collects excess fluid.

The composting process is initiated by putting approximately 1000 worms and some organic material into the upper tank of the middle module. When this tank is full, it is exchanged with the next empty tank in the column. The three tanks are all perforated in the bottom to allow excess water to pass through to the bottom module. This is done in such a way that the worms will also be able to move upwards in the system.

As the worms process the material, they will move to the top layers where there is access to fresh raw material. When the tanks are full, they should be allowed to rest for some time in order to complete microbial and worm processing and to allow the worm cocoons, which are placed in the deep layers, to be hatched.

After approximately 6 months, the material in the lowest tank is transformed into a black, soft substance mostly consisting of worm castings, a large part of which is humus.

Some of the material will be the product of bacterial consumption, and there will also be occasional residues, which have not been degraded. This substance can then be mixed with sand, peat, gravel etc. for ventilation and volume and in order to lower the concentration of nutrients. One has now produced good nutritious soil. The drained water in the bottom module is also highly nutritious for plants.

BIOLOGICAL PROCESSES

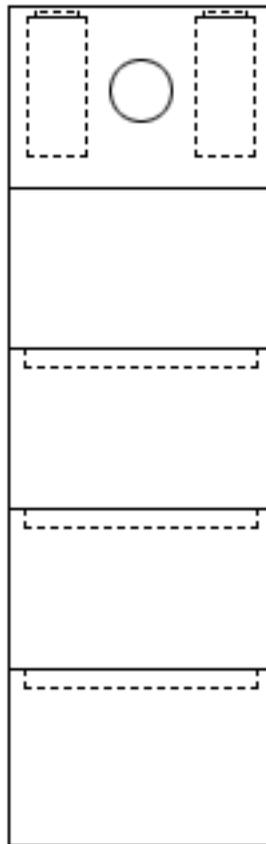
Shortly after adding raw material, moulds and fungi appear on the surface and pre-process the material before bacteria and worms take over. Apart from these, beetles, mites, flies, nematodes, snails, springtails, woodlice and other species may be present in the composting modules. The number of species present depends on many factors, such as the age, humidity, temperature and composition of the material and the access to the composting modules. Anaerobic bacteria may thrive in the material if it gets too dense and therefore is not thoroughly ventilated. Pathogenic bacteria normally will not survive in the compost as the environment simply favours the growth of other bacteria, which out the pathogens.

The composting process is finished when the raw material has been processed into worm castings and the microbial activity has stagnated.

WORMS

Many different types of worms can be used in composting processes. *Eisenia Foetida*, which is the worm used in this system, is among the soil-surface-dwelling or compost-





Top module:
Ventilation, thermometer,
fly trap, bedding container,
light/odor control

Middle module:
Tank 1:
Raw material, worms,
plastic covering

Tank 2

Tank 3

Bottom module:
Excess fluid

preferring species. These species prefer to live at or near the soil surface or in compost heaps, since they like to eat material which is high in organic matter.

The worms are hermaphrodites, producing both sperm and eggs, but are dependent on each other for reproduction. They reproduce by joining mucus from their clitella, exchanging sperm. The mucus hardens into a cocoon where sperm and eggs are deposited, whereupon the worm backs out of the hardening cocoon. After being released from the worm, the cocoon closes at both ends, and 2–10 eggs are fertilized.

Approximately 2–3 baby worms are hatched after 3 weeks. After 9 weeks, the new worms are fertile, and under optimal conditions they will produce 2–3 cocoons per week for 6–12 months. The full-grown worms weigh approx 0.5 grams and consume approximately half their weight of material each day. The average lifespan of the worms in a functioning vermicomposting system is 3–4 years.

VENTILATION

Vermicomposting is an aerobic combustion process which is dependent on constant access to oxygen. A lack of oxygen may result in anaerobic processes, which produce inconvenient smells. The worms make tunnels in the material providing oxygen supply

and allowing CO₂ to escape. This is also important for the bacterial processes. If the material gets too dense, or the tank is too deep, these tunnels collapse. The surface of the material should be exposed to air, but loosely covered by e.g. a black plastic sheet. This is to protect the worms from UV-radiation, in which they can not survive more than a few minutes.

TEMPERATURE

The worms thrive and breed optimally in a temperature between 15–25 degrees Celsius. They can survive temperatures between 0–40 degrees. The proportion of worms/bacteria is decisive to the temperature, and a large bacterial population may cause temperatures lethal to worms. This is normally not a problem, as worms dig through dense areas and create ventilation ducts in the material, whereby the temperature is reduced. Good living conditions for worms will normally keep bacterial populations down.

HUMIDITY

The vermicomposting process depends on a good humidity balance. If the material becomes too wet, the worms may drown, but the worms need moisture in order for the air exchange to take place through their skin. Therefore the compost must not dry out. The water contained in normal kitchen waste, together with some dry bedding, ought to ensure a good moisture balance. If the compost should become too dry, some water can be added. As long as water is condensed on the inside of the covering plastic sheet, the compost is moist enough.

PH

The worms thrive at a neutral pH value of 6–7. If the pH gets too low, a calcareous product could be carefully added.

RAW MATERIAL

All kinds of organic waste can be added to the *Soil Factory*, although one must make sure that the material is not toxic or corrosive etc. Fruit, vegetables, coffee grounds, teabags, egg shells, bread, dairy products, paper, cardboard, coffee filters etc., are all suitable. Fish, shellfish and meat may cause severe odour inconveniences. Plastic and metals must be avoided, as it is normally not degraded in the compost and may be toxic. One must also be careful adding sauce or soup, which may disturb the humidity balance.

The material could be cut or ground before it is put into the *Soil Factory*, as this eases the transformation process.

C/N PROPORTION

The Carbon/Nitrogen proportion is essential to the composting process. If the amount of carbon is high in relation to the amount of nitrogen the process slows down. If the share of nitrogen gets too high, there is a risk of ammonia appearing in the compost. Bacteria and worms thrive optimally at a C/N proportion of 25:1. Kitchen waste normally has the proportion of C/N 15:1 and therefore one should add material containing carbon.



BEDDING

The bedding, which is added together with the raw material, contributes by optimising the C/N relationship. It also regulates humidity and helps ventilate the compost by preventing it from becoming too dense. The bedding must be rich in carbon, toxin free and fit to absorb moisture. Shredded paper, cardboard and newspaper, leaf mould, peat moss and sawdust can be used. One must make sure that the sawdust comes from untreated wood, as otherwise it may contain toxic substances.

PROBLEMS

Common problems in indoor composting are fruit flies and inconvenient smells. Both problems result from an unbalanced process: erroneous humidity control, lack of bedding, the wrong bedding, or an overload of raw material which may cause anaerobic processes to take place.

INSTALLATION

Installation of the system is easy and requires no use of tools.

MAINTENANCE

Fresh raw material should be added every week. 1000 worms consume approx .25 kg of raw material each day. The worms can be left alone for up to three weeks, but in order to keep up the population they should be fed on a regular basis. The volume of the kitchen waste is greatly reduced by the process. One composting tank is normally filled up after 2 months. When all three tanks are full, the process in the lower tank is completed, and the tank can be emptied.

11

Water retention and purification systems for rain runoff from city rooftops...

BUSTER SIMPSON:

Buster Simpson has been creating a unique and varied body of ecological art since the 1970s. He has interpreted environmental issues such as water pollution and proposed solutions to counter its damaging effects. Many of his designs and ideas are elegantly simple, cost effective, and easily implemented on a large scale in cities around the country.

VERTICAL LANDSCAPES

Location
Seattle, Washington

Date
1978–present

In 1978, Buster Simpson conceived *Downspout—Plant Life Monitoring System* at the Pike Place Public Market in downtown Seattle, Washington. He grew ferns in

plumbing pipes attached to the side of a building. These “vertical landscapes” functioned as a water-retention system for rain runoff from city rooftops. They also improved the water, which had become increasingly acidic from industrial pollutants, before it entered the storm-sewer system. After rain was trapped in the elbows of the pipe, Simpson sweetened it with limestone to neutralize its acidity. While enhancing water quality, *Downspout* provided an ideal habitat for plants and a cost-effective means to solve the problems of storm-water overflow. In 1999, Simpson created another vertical landscape to 81 Vine Street in Seattle’s neighborhood Belltown.





DOUGLAS FOX

The Worm That Earned

The wriggly little workers' taste for waste is turning muck into gold.

Heaped up in the corner of the shed is an elephant-sized mound of brown, crumbly powder. Hesitating slightly, I thrust my fingers in, scoop up a handful and take a cautious sniff. To my surprise, it's as pleasant-smelling as a bag of peat from your local garden centre, the sort of thing you'd happily dust from a freshly-picked carrot before taking a bite. Who'd suspect that just weeks ago this stuff was flushed down the toilet?

Here at the Redlands Shire water plant, 30 kilometres south of Brisbane, Queensland, 40 tonnes of sewage sludge arrive every day. And every day, 40 tonnes of hungry worms set to work, devouring every last lump, converting it into top-grade soil conditioner.

These wrigglers are farmed by a small Sydney-based outfit called Vermitech. The company has succeeded in doing what has stumped many others: it has expanded worm composting from a backyard hobby to a profitable, large-scale business. Its compost is already being used on fruit and vegetables shipped to supermarkets across Australia, and new studies appear to show that "vermicompost" is endowed with qualities that are surprising even the most ardent worm fans. Magazine

Worm-based sewage recycling is nothing new. People have been doing it on a small scale for years using manure worms—smaller, wrigglier, cousins of the earthworm. The idea is to mix these worms with sewage sludge—the solids left over after raw sewage has been through the treatment plant. As the worms chomp on the sludge and break it down in their gut, they digest the harmful bacteria it contains and turn it into a much less objectionable mixture that can be spread on flower beds or crops.

There's certainly no shortage of worm food. New York City, for example, creates almost a million tonnes of sewage sludge each year. It's difficult to dispose of, and

environmental regulations mean it can no longer be dumped at sea or buried in landfills. Drying the sludge into pellets or sterilising it with quicklime is expensive, and you've still got to get rid of the final product. Feeding it to the worms seems like the perfect solution.

In practice it's not that simple. Sewage sludge contains bucket-loads of pathogens such as "Salmonella" and faecal coliform bacteria that must be destroyed before the waste can be used on food crops. One answer is to combine worm treatment with traditional composting. You mix the sludge with plant debris and incubate it in heaps up to 15 metres high. As bacteria digest the sludge, they produce heat, warming the pile to 70 degrees C and killing the pathogens. Once cooled, the mix can be fed to the worms to make a clean product that's welcome on the fields.

Unfortunately, precomposting makes the whole process time-consuming and too expensive to be profitable. It's also inherently unnatural, says Mike Lotzof, CEO of Vermitech. "When you go out into the forest," he says, "you don't see 15-metre compost heaps steaming away, you see very small amounts of material deposited at different times." So Vermitech is trying to do things the way nature does, but with a level of automation far beyond the shovels and wheelbarrows of traditional vermicomposters.

Vermitech's worm beds are roughly 1 metre across, 1 metre deep and 70 metres long. "A single bed is a replication of the earth," says Lotzof, "We have a surface and we have a subterranean area that's been designed for the worms' biology." Each day, a thin layer of sludge is spread on top of the bed, and an equal amount of processed product is scraped from the bottom. The worms stay in the top third, feeding on the fresh sludge and laying eggs. It takes about 40 days for material to move through the bed, giving eggs time to hatch and mature so that the young worms aren't harvested out the bottom.

As the worms swallow the sludge, their powerful gizzards grind it into small pieces, releasing nutrients and allowing soil microbes to proliferate. The worms then digest most of those microbes, along with the dangerous pathogens, and absorb them. Any pathogens that might survive are simply outcompeted by benign soil microbes that flourish in the worm casts.

Wandering through the rows of worm beds, I'm surprised at how odour-free the place is, even in the steamy Queensland air. Lotzof explains that before they spread the sludge on the beds, they add a secret deodorant that binds any smelly, volatile chemicals. Then they aerate the sludge so thoroughly that it has little opportunity to turn anaerobic and smelly.

Vermitech has had to implement strict quality control processes—conditions in the worm bed are carefully monitored and samples are regularly shipped to an independent lab and tested for pathogens. The worm treatment produces a 100 to 1000-fold reduction in levels of faecal coliforms, as well as cutting numbers of Salmonella, gut viruses and parasitic worm eggs. The end product is so good that the New South Wales and Queensland environmental protection agencies allow its use on food crops.

As well as disposing of sewage sludge, vermicompost seems to have benefits

for farmers too. The day after my visit to Redlands, Steve Capeness, a Vermitech horticulturalist, drives me from farm to farm on the land north of Brisbane. It's a low-lying region of tea tree and eucalyptus swamps, punctuated by the sheer spires of exposed lava cores—like fossilised teeth—the remains of long vanished volcanoes. In the past, flood waters deposited silt across the region, creating a rich loam that supports a large vegetable and pineapple industry.

Decades of intense agriculture have taken their toll, however and farmers say the soil is giving out in places. They tell me about small, loosely controlled trials of vermicompost. [The farmers using the compost aren't seeing superplants, but they do believe they're getting consistently higher yields, less plant disease and bigger profits.](#)

Peter Stephens, a plant pathologist with the Queensland Horticultural Institute in Stanthorpe, is conducting more rigorous studies on Vermitech's behalf. He's found that carrots fed as little as 2 tonnes of vermicompost per hectare weigh more than twice as much as untreated carrots 66 days after planting. Stephens doubts this is due to the extra nutrients vermicompost provides. "Two tonnes per hectare is virtually nothing," he says. "I think it could be due to plant hormones." Indeed, the soil microbes that flourish in the casts extruded by worms produce a variety of hormones such as indoleacetic acid, gibberellins and kinetins, and other compounds such as humates, which are known to modulate plant growth.

Clive Edwards, a soil ecotoxicologist at Ohio State University in Columbus who originally developed some of the methods now used by Vermitech, is also investigating plant hormones. He has found that vermicompost hormone extracts consistently produce the same level of increased growth as the vermicomposts themselves.

Edwards believes that the plant hormones and the soil microbes which produce them may be the crucial difference between vermicomposts and traditional, worm-free composts. "Whenever we do a trial," says Edwards, "we always put at least one traditional compost in there as a comparison, and every time we've had much, much better results with vermicompost." He suspects the high temperatures that occur during traditional composting kill the beneficial soil microbes. "We've done studies on the microbial communities in the two materials," Edwards says, "and there's no comparison. We get a much more diverse microbial community in vermicompost than we do in traditional compost."

Controlled trials also suggest that vermicomposts may suppress plant disease. A recent study by Stephens, for example, found that the severity of the fungal disease clubroot was significantly reduced in broccoli plants treated with one of Vermitech's products. Edwards has seen similar results for other diseases in studies using vermicomposts. No one is sure of the exact mechanism, but Edwards believes the beneficial soil microbes that flourish in worm casts may be outcompeting the plant-pathogenic ones.

While much of the benefit from traditional composts stems from the nutrients they provide, vermicomposts serve instead to inoculate the soil. "What we're doing is growing bacteria, lots of bacteria," says Capeness. In other words, a little

goes a long way. Farmers spread as much as 10 tonnes of traditional composts per hectare. But vermicomposts are often used at rates as low as 1 tonne per hectare—so little that you might not even spot it as you walk across a field.

This avoids one of the serious drawbacks associated with recycled sewage sludge: it contains significant levels of heavy metals such as cadmium. Environmental agencies impose strict limits on how much of these metals can be deposited on land. Using one-tenth as much compost as normal means you take 10 times as long to hit that limit—several centuries in some cases.

The Redlands plant processes about 15,000 tonnes of sludge per year, and Vermitech hopes to open a larger plant in Sydney towards the beginning of 2002. This could reduce the cost of the city's sludge management by up to 25 per cent per tonne compared with current methods, Lotzof claims.

Vermicomposting is also being investigated in the US. In small-scale studies, Bruce Eastman, manager of the Orange County Environmental Protection Division in Orlando, Florida, has attained pathogen destruction similar to Vermitech's. He's now organising a larger study with help from the US Environmental Protection Agency. "They've indicated to me that they would be willing to accept vermicomposting as an alternative stabilising methodology (for sludge) once we've come up with the standard operating procedures," Eastman says.

Meanwhile other companies, such as Sunburst Nominees at Mount Gambier, South Australia, are developing ways to harness hungry worms to digest municipal waste—things like paper, cardboard and textiles. And in the long term, vermicomposters will have to become even more sophisticated, says David Murphy, a consultant to the vermicomposting industry based in Maryborough, Victoria. To be successful, he says, they will have to be able to alter their product as required, tweaking it to match different soil conditions such as pH, for example.

Back on the farm, the Sun is sinking and I'm talking with a farmer. He's disappointed with many of the soil products that salesmen try to foist off on him. "And then," he adds, "they come along and try to sell you human waste." But this time he's not complaining. The stuff actually works.

MIERLE LADERMAN UKELES

Leftovers

It's About Time for Fresh Kills

When I got a call that the debris from the World Trade Center was going to be shipped to the Fresh Kills Landfill for sorting and burial, I said, "Oh no. No, no, no, no. The City would never do that. They would never mingle human remains in a place where they put garbage; that would collapse a taboo in our whole culture. That crosses a line."

So I was wrong. Fresh Kills, the largest garbage landfill in the world, closed "forever" in March 2001 after being open for about 50 years. It was re-opened on 13 September 2001. The sifting and sorting of the World Trade Center debris is being carried out at Section 1/9, one of the four mounds at the landfill, by the FBI and the New York City Police Department. The material is considered criminal evidence. The authorities explained that there was no comparable place at the required scale, and Fresh Kills was the only site that was sufficiently secure. Actually, that's been true for many years. The Department of Sanitation weighed and counted every pound of garbage that came in by barge, controlled at every stage from the moment it was picked up from in front of your apartment in Kew Gardens. They could pretty much track its path: which truck on what shift, dumped at which transfer station onto what barge, and finally put to rest at which section of the landfill. No one outside of this system could get into the site unless OK'd by the guards. What's stunning about Sanitation is that even though the marine disposal system had been unused between March and September of 2001—except that the fleet of barges had been hand-cleaned all summer on the insides, every nook and cranny washed—the Department was able to mobilize 22 barges and put several marine transfer stations back into operation within days. So an orderly system for moving the debris was organized and implemented almost immediately.

What will happen to all this debris? There will definitely be some kind of me-

memorial for the catastrophe: for the people; for the attack on US soil; for the towers that we feel have been torn out of us. This will be at Ground Zero. But what about the dust at the Fresh Kills Landfill? It's not about the body parts that are found. They'll remove the identifiable fingers and toes, run DNA tests, and return them to families. It's the flying dust that is full of thousands of unfound, incinerated human beings. This will be their graveyard.

I've been waiting to get to work here for 24 years. Even though I've been absorbing the place all these years and creating various art works and texts about it, I've been waiting for a master design team to be organized to begin permanent work here. I never imagined I'd be working on a cemetery. But let me back up a bit.

In 1976, the art critic David Bourdon reviewed a performance work of mine in New York City with 300 maintenance workers in a skyscraper, and suggested that, if maintenance can be art, perhaps the Sanitation Department could call its work performance art and replace some of its lost manpower—cut in the fiscal crisis of the mid-70s—with a grant from the NEA. Reading this, I thought, “the Sanitation Department, hmmm,” and sent a copy of the review to the Commissioner of Sanitation. I got a call from the Commissioner's assistant asking if I would like “to make art with 10,000 people.”

“I'll be right over,” I said. After learning where my garbage went, I proposed three different works. The first was TOUCH SANITATION, an 11-month-long performance work in which I faced each of the 8,500 sanitation workers, shook hands with each one and said, “Thank you for keeping New York City alive.” The work involved walking thousands of curb miles with them in every sanitation district all over NYC. The second was a work ballet with trucks and sweepers that asked, “Can work be art?” The third was for urban earthworks for NYC landfills that were located in every borough except for Manhattan. In 1978, I received two grants from the NEA: One was devoted to planning my own urban earthworks for NYC landfills; the other was for Re-Raw Recovery, a project exploring the feasibility of a design competition to open these spaces to all kinds of creators. I felt that the classical American earthworks that I loved had an unfortunate un-public aspect about them, since they were in isolated places and available only to a few who could afford the trip. For the rest of us, there were only the pictures. Almost all of these works are/were on private land. In New York City there were huge tracts of public land on municipal landfills; weird, yes, but land that the public actually owned and could make a claim on, land that you could take a subway or bus to, available to all. Soon after, with the advent of a spate of environmental regulations, the landfills were, with the exception of Fresh Kills, declared inactive hazardous waste sites requiring immediate attention—and rendered off-limits for art.

Fresh Kills was kept open for several factors. In contrast to other truck-fed city landfills, the waste at Fresh Kills was delivered by City-owned barges receiving material from City trucks dumping their payloads at the City's own transfer stations. It was felt that the waste it received had always been more controlled, with almost no opportunity for criminal dumping of toxic materials. Secondly, Fresh Kills was always viewed as being in a unique category as a municipal waste-dis-

posal resource because of its incomparable 2,200-acre size. Therefore, the City decided to invest hundreds of millions of dollars in upgrading the landfill to the same level of environmental protection as a new landfill, a feat never accomplished at any other site in the US. But throughout the upgrading period, art was still off-limits.

In 1989, I was awarded a Percent for Art commission by the New York City Department of Cultural Affairs. My contract, registered in 1992, said I was the Artist of the Fresh Kills Landfill, appointed to design elements of the landfill and to contribute to its overall closure and end-use design. The year of closure was not identified at that time and it was thought that the landfill would stay open for at least twenty years. I was asked to wait for the selection of a multi-disciplinary design team. A few attempts were made to form such a team, but they didn't last. In 1996, the Governor, the Mayor, and the Borough President unified to announce suddenly that the landfill would close in five years, at the end of 2001. Soon after the announcement, the City Planning Department and the Municipal Art Society organized an international design competition to propose a conceptual master plan for the end-use design for Fresh Kills.¹ In order to align my work with these two major changes—closure and competition—a Change Order was registered in December of 2001 for my contract. I will be able to proceed to design my own works, and I will “link” with the winning team of the competition to integrate my work with theirs and to contribute with them to the overall end-use design. I am almost finished with the first phase, my overall reconnaissance of and research into this overwhelming site. A public component of this phase is my six-channel video work, Penetration and Transparency, made with video-makers Kathy Brew and Roberto Guerra.

I feel as if I've been caught in a zone of trauma since 13 September. My expectation all these years was to work, alone and with the design team, in a very dense political atmosphere, focusing on the transformation of the site, healing the effects of garbage via a rolling series of what I call “Morphing Challenges”.² Layer One is the garbage; Layer Two is the Sanitation Department's pioneering closure design, orchestrated by Phillip Gleason (Director of Landfill Engineering) and currently being implemented at the highest level of engineering and environmental standards; Layer Three will be the design to transform the site and turn it, over many years, into a public place, a local, citywide, and even international asset, safe and full of meaning. Now, after the 13 September decision to reopen the landfill for the World Trade Center debris, an undreamt-of Layer Four is required. What is the meaning of this place now?

The entire site cannot be turned into a memorial. It is important to remember the proportion of the World Trade Center debris here: It occupies one section of one mound, which is one of four mounds. The other three mounds are unaffected. It is also important to remember that this garbage landfill has been a 50-year burden to the people of Staten Island, who have received the garbage from the whole city, originally promised to be open for 3 years, not 50. Something was “taken” from Staten Island and should be returned.

¹ The official title is “Fresh Kills Landfill to Landscape Conceptual Design & Planning Approach Competition & Master Plan Services.”

² This is the phrase I used in Appendix E of the Competition Design Brief, “Statement of Perspective”.

So what is the correct proportion of space and overall attention for the World Trade Center debris and remains? And what is its relation to and impact on the rest of the site? The completely new question at Fresh Kills concerns the nature of the memorial or the graveyard or whatever it will be. Is it for the particular individu-

³ “Flying dust” comes from the Rosh Hashana (Jewish New Year) prayer: “As for man, he is from dust and will return to dust; he earns his bread at the risk of his life; he is like a broken shard, the grass that withers, the flower that fades, a fleeting shadow, a passing cloud, the wind that blows, the flying dust, and as a fleeting dream.”

als who died? A person and a person and a person, turned to “flying dust?”³ Will there be a marker with the person’s name, some details, objects, messages? Many will say no, it should be a general memorial, a meditation place, a place for gathering and pondering. For all. Un-programmed.

To me, what’s wrong with creating a general, un-individuated memorial for some particular place within Fresh Kills is this: To call something “garbage” means that the possessor of the object has lost desire for it. Desire has passed, and with it goes value. The value of the object evaporates. We are quite expert at this; in consumerist society, we’re trained to lose desire as fast as possible and to buy again, more and more. To call something “garbage” means stripping the materials of their inherent characteristics. So that even though differences are obvious, hard becomes the same as soft, wet as dry, heavy as light, moldy old sour cream as a shoe, wet leaves as old barbells— they become the same things. The entire culture colludes in this un-naming. Then we can call it all “garbage”—of no value whatsoever. To put it away, actually paying to put it away, as soon as possible. Thus forgotten. And then paying tremendously to remediate its effects on the land, the air, and the water.

So that’s why, in this 50-year-old social sculpture we have all produced, of four mountains made from 150 million cubic yards of the un-differentiated, un-named, no-value garbage, whose every iota of material identity has been banished, the memorial, graveyard—or whatever it is—needs to be created out of an utterly opposite kind of social contract. The shattered taboo that enabled this unholy shotgun marriage needs to be restored; a chasm-change in attitude is required, one of very deliberate differentiating, of naming, of attentive reverence for each mote of dust from each lost individual. Thus remembered. This must become a place that returns identity to, not strips identity from, each perished person.

Hasn’t it been art that can transform the meaning of material, re-invent identity, and re-name the lost? This part of the overall Fresh Kills site must become a double place: the unnamed healed and the named re-named. Otherwise the doubling being done here tumbles necessity into obscenity.

I’ve done a lot of other work over the years, but basically I’ve been waiting for 24 years to get to work on this. Garbage is hard enough. The scale of 2,200 acres, equivalent to 2.5 Central Parks, is mind-bending. Now this unimaginable new Layer Four. I’m ready to get to work on this now.

BOB HOLMES

Imagine Earth Without People

Humans are undoubtedly the most dominant species the Earth has ever known. In just a few thousand years we have swallowed up more than a third of the planet’s land for our cities, farmland and pastures. By some estimates, we now commandeer 40 per cent of all its productivity. And we’re leaving quite a mess behind: ploughed-up prairies, razed forests, drained aquifers, nuclear waste, chemical pollution, invasive species, mass extinctions and now the looming spectre of climate change. If they could, the other species we share Earth with would surely vote us off the planet.

Now just suppose they got their wish. Imagine that all the people on Earth—all 6.5 billion of us and counting—could be spirited away tomorrow, transported to a re-education camp in a far-off galaxy. (Let’s not invoke the mother of all plagues to wipe us out, if only to avoid complications from all the corpses). Left once more to its own devices, Nature would begin to reclaim the planet, as fields and pastures reverted to prairies and forest, the air and water cleansed themselves of pollutants, and roads and cities crumbled back to dust.

“The sad truth is, once the humans get out of the picture, the outlook starts to get a lot better,” says John Orrock, a conservation biologist at the National Center for Ecological Analysis and Synthesis in Santa Barbara, California. But would the footprint of humanity ever fade away completely, or have we so altered the Earth that even a million years from now a visitor would know that an industrial society once ruled the planet?

If tomorrow dawns without humans, even from orbit the change will be evident almost immediately, as the blaze of artificial light that brightens the night begins to wink out. Indeed, there are few better ways to grasp just how utterly we dominate the surface of the Earth than to look at the distribution of artificial illumination. By some estimates, 85 per cent of the night sky above the European

Union is light-polluted; in the US it is 62 per cent and in Japan 98.5 per cent. In some countries, including Germany, Austria, Belgium and the Netherlands, there is no longer any night sky untainted by light pollution.

“Pretty quickly—24, maybe 48 hours—you’d start to see blackouts because of the lack of fuel added to power stations,” says Gordon Masterton, president of the UK’s Institution of Civil Engineers in London. Renewable sources such as wind turbines and solar will keep a few automatic lights burning, but lack of maintenance of the distribution grid will scuttle these in weeks or months. The loss of electricity will also quickly silence water pumps, sewage treatment plants and all the other machinery of modern society.

The same lack of maintenance will spell an early demise for buildings, roads, bridges and other structures. Though modern buildings are typically engineered to last 60 years, bridges 120 years and dams 250, these lifespans assume someone will keep them clean, fix minor leaks and correct problems with foundations. Without people to do these seemingly minor chores, things go downhill quickly.

The best illustration of this is the city of Pripyat near Chernobyl in Ukraine, which was abandoned after the nuclear disaster 20 years ago and remains deserted. “From a distance, you would still believe that Pripyat is a living city, but the buildings are slowly decaying,” says Ronald Chesser, an environmental biologist at Texas Tech University in Lubbock who has worked extensively in the exclusion zone around Chernobyl. “The most pervasive thing you see are plants whose root systems get into the concrete and behind the bricks and into doorframes and so forth, and are rapidly breaking up the structure. You wouldn’t think, as you walk around your house every day, that we have a big impact on keeping that from happening, but clearly we do. It’s really sobering to see how the plant community invades every nook and cranny of a city.”

With no one to make repairs, every storm, flood and frosty night gnaws away at abandoned buildings, and within a few decades roofs will begin to fall in and buildings collapse. This has already begun to happen in Pripyat. Wood-framed houses and other smaller structures, which are built to laxer standards, will be the first to go. Next down may be the glassy, soaring structures that tend to win acclaim these days. “The elegant suspension bridges, the lightweight forms, these are the kinds of structures that would be more vulnerable,” says Masterton. “There’s less reserve of strength built into the design, unlike solid masonry buildings and those using arches and vaults.”

But even though buildings will crumble, their ruins—especially those made of stone or concrete—are likely to last thousands of years. “We still have records of civilisations that are 3000 years old,” notes Masterton. “For many thousands of years there would still be some signs of the civilisations that we created. It’s going to take a long time for a concrete road to disappear. It might be severely crumbling in many places, but it’ll take a long time to become invisible.”

The lack of maintenance will have especially dramatic effects at the 430 or so nuclear power plants now operating worldwide. Nuclear waste already consigned to long-term storage in air-cooled metal and concrete casks should be fine, since

the containers are designed to survive thousands of years of neglect, by which time their radioactivity—mostly in the form of caesium-137 and strontium-90—will have dropped a thousandfold, says Rodney Ewing, a geologist at the University of Michigan who specialises in radioactive waste management. Active reactors will not fare so well. As cooling water evaporates or leaks away, reactor cores are likely to catch fire or melt down, releasing large amounts of radiation. The effects of such releases, however, may be less dire than most people suppose.

The area around Chernobyl has revealed just how fast nature can bounce back. “I really expected to see a nuclear desert there,” says Chesser. “I was quite surprised. When you enter into the exclusion zone, it’s a very thriving ecosystem.”

The first few years after people evacuated the zone, rats and house mice flourished, and packs of feral dogs roamed the area despite efforts to exterminate them. But the heyday of these vermin proved to be short-lived, and already the native fauna has begun to take over. Wild boar are 10 to 15 times as common within the Chernobyl exclusion zone as outside it, and big predators are making a spectacular comeback. “I’ve never seen a wolf in the Ukraine outside the exclusion zone. I’ve seen many of them inside,” says Chesser.

The same should be true for most other ecosystems once people disappear, though recovery rates will vary. Warmer, moister regions, where ecosystem processes tend to run more quickly in any case, will bounce back more quickly than cooler, more arid ones. Not surprisingly, areas still rich in native species will recover faster than more severely altered systems. In the boreal forests of northern Alberta, Canada, for example, human impact mostly consists of access roads, pipelines, and other narrow strips cut through the forest. In the absence of human activity, the forest will close over 80 per cent of these within 50 years, and all but 5 per cent within 200, according to simulations by Brad Stelfox, an independent land-use ecologist based in Bragg Creek, Alberta.

In contrast, places where native forests have been replaced by plantations of a single tree species may take several generations of trees—several centuries—to work their way back to a natural state. The vast expanses of rice, wheat and maize that cover the world’s grain belts may also take quite some time to revert to mostly native species.

At the extreme, some ecosystems may never return to the way they were before humans interfered, because they have become locked into a new “stable state” that resists returning to the original. In Hawaii, for example, introduced grasses now generate frequent wildfires that would prevent native forests from re-establishing themselves even if given free rein, says David Wilcove, a conservation biologist at Princeton University.

Feral descendants of domestic animals and plants, too, are likely to become permanent additions in many ecosystems, just as wild horses and feral pigs already have in some places. Highly domesticated species such as cattle, dogs and wheat, the products of centuries of artificial selection and inbreeding, will probably evolve back towards hardier, less specialised forms through random breeding. “If man disappears tomorrow, do you expect to see herds of poodles roaming the

plains?” asks Chesser. Almost certainly not—but hardy mongrels will probably do just fine. Even cattle and other livestock, bred for meat or milk rather than hardiness, are likely to persist, though in much fewer numbers than today.

What about genetically modified crops? In August, Jay Reichman and colleagues at the US Environmental Protection Agency’s labs in Corvallis, Oregon, reported that a GM version of a perennial called creeping bentgrass had established itself in the wild after escaping from an experimental plot in Oregon. Like most GM crops, however, the bentgrass is engineered to be resistant to a pesticide, which comes at a metabolic cost to the organism, so in the absence of spraying it will be at a disadvantage and will probably die out too.

Nor will our absence mean a reprieve for every species teetering on the brink of extinction. Biologists estimate that habitat loss is pivotal in about 85 per cent of cases where US species become endangered, so most such species will benefit once habitats begin to rebound. However, species in the direst straits may have already passed some critical threshold below which they lack the genetic diversity or the ecological critical mass they need to recover. These “dead species walking”—cheetahs and California condors, for example—are likely to slip away regardless.

Other causes of species becoming endangered may be harder to reverse than habitat loss. For example, about half of all endangered species are in trouble at least partly because of predation or competition from invasive introduced species. Some of these introduced species—house sparrows, for example, which are native to Eurasia but now dominate many cities in North America—will dwindle away once the gardens and bird feeders of suburban civilisation vanish. Others though, such as rabbits in Australia and cheat grass in the American west, do not need human help and will likely be around for the long haul and continue to edge out imperilled native species.

Ironically, a few endangered species—those charismatic enough to have attracted serious help from conservationists—will actually fare worse with people no longer around to protect them. Kirtland’s warbler—one of the rarest birds in North America, once down to just a few hundred birds—suffers not only because of habitat loss near its Great Lakes breeding grounds but also thanks to brown-headed cowbirds, which lay their eggs in the warblers’ nests and trick them into raising cowbird chicks instead of their own. Thanks to an aggressive programme to trap cowbirds, warbler numbers have rebounded, but once people disappear, the warblers could be in trouble, says Wilcove.

On the whole, though, a humanless Earth will likely be a safer place for threatened biodiversity. “I would expect the number of species that benefit to significantly exceed the number that suffer, at least globally,” Wilcove says.

In the oceans, too, fish populations will gradually recover from drastic overfishing. The last time fishing more or less stopped—during the second world war, when few fishing vessels ventured far from port—cod populations in the North Sea skyrocketed. Today, however, populations of cod and other economically important fish have slumped much further than they did in the 1930s, and recovery may take significantly longer than five or so years.

The problem is that there are now so few cod and other large predatory fish that they can no longer keep populations of smaller fish such as gurnards in check. Instead, the smaller fish turn the tables and outcompete or eat tiny juvenile cod, thus keeping their erstwhile predators in check. The problem will only get worse in the first few years after fishing ceases, as populations of smaller, faster-breeding fish flourish like weeds in an abandoned field. Eventually, though, in the absence of fishing, enough large predators will reach maturity to restore the normal balance. Such a transition might take anywhere from a few years to a few decades, says Daniel Pauly, a fisheries biologist at the University of British Columbia in Vancouver.

With trawlers no longer churning up nutrients from the ocean floor, near-shore ecosystems will return to a relatively nutrient-poor state. This will be most apparent as a drop in the frequency of harmful algal blooms such as the red tides that often plague coastal areas today. Meanwhile, the tall, graceful corals and other bottom-dwelling organisms on deep-water reefs will gradually begin to regrow, restoring complex three-dimensional structure to ocean-floor habitats that are now largely flattened, featureless wastelands.

Long before any of this, however—in fact, the instant humans vanish from the Earth—pollutants will cease spewing from automobile tailpipes and the smokestacks and waste outlets of our factories. What happens next will depend on the chemistry of each particular pollutant. A few, such as oxides of nitrogen and sulphur and ozone (the ground-level pollutant, not the protective layer high in the stratosphere), will wash out of the atmosphere in a matter of a few weeks. Others, such as chlorofluorocarbons, dioxins and the pesticide DDT, take longer to break down. Some will last a few decades.

The excess nitrates and phosphates that can turn lakes and rivers into algae-choked soups will also clear away within a few decades, at least for surface waters. A little excess nitrate may persist for much longer within groundwater, where it is less subject to microbial conversion into atmospheric nitrogen. “Groundwater is the long-term memory in the system,” says Kenneth Potter, a hydrologist at the University of Wisconsin at Madison.

Carbon dioxide, the biggest worry in today’s world because of its leading role in global warming, will have a more complex fate. Most of the CO₂ emitted from burning fossil fuels is eventually absorbed into the ocean. This happens relatively quickly for surface waters—just a few decades—but the ocean depths will take about a thousand years to soak up their full share. Even when that equilibrium has been reached, though, about 15 per cent of the CO₂ from burning fossil fuels will remain in the atmosphere, leaving its concentration at about 300 parts per million compared with pre-industrial levels of 280 ppm. “There will be CO₂ left in the atmosphere, continuing to influence the climate, more than 1000 years after humans stop emitting it,” says Susan Solomon, an atmospheric chemist with the US National Oceanic and Atmospheric Administration (NOAA) in Boulder, Colorado. Eventually calcium ions released from sea-bottom sediments will allow the sea to mop up the remaining excess over the next 20,000 years or so.

Even if CO₂ emissions stop tomorrow, though, global warming will continue for another century, boosting average temperatures by a further few tenths of a degree. Atmospheric scientists call this “committed warming”, and it happens because the oceans take so long to warm up compared with the atmosphere. In essence, the oceans are acting as a giant air conditioner, keeping the atmosphere cooler than it would otherwise be for the present level of CO₂. Most policy-makers fail to take this committed warming into account, says Gerald Meehl, a climate modeller at the National Center for Atmospheric Research, also in Boulder. “They think if it gets bad enough we’ll just put the brakes on, but we can’t just stop and expect everything to be OK, because we’re already committed to this warming.”

That extra warming we have already ordered lends some uncertainty to the fate of another important greenhouse gas, methane, which produces about 20 per cent of our current global warming. Methane’s chemical lifetime in the atmosphere is only about 10 years, so its concentration could rapidly return to pre-industrial levels if emissions cease. The wild card, though, is that there are massive reserves of methane in the form of methane hydrates on the sea floor and frozen into permafrost. Further temperature rises may destabilise these reserves and dump much of the methane into the atmosphere. “We may stop emitting methane ourselves, but we may already have triggered climate change to the point where methane may be released through other processes that we have no control over,” says Pieter Tans, an atmospheric scientist at NOAA in Boulder.

No one knows how close the Earth is to that threshold. “We don’t notice it yet in our global measurement network, but there is local evidence that there is some destabilisation going on of permafrost soils, and methane is being released,” says Tans. Solomon, on the other hand, sees little evidence that a sharp global threshold is near.

[All things considered, it will only take a few tens of thousands of years at most before almost every trace of our present dominance has vanished completely. Alien visitors coming to Earth 100,000 years hence will find no obvious signs that an advanced civilisation ever lived here.](#)

Yet if the aliens had good enough scientific tools they could still find a few hints of our presence. For a start, the fossil record would show a mass extinction centred on the present day, including the sudden disappearance of large mammals across North America at the end of the last ice age. A little digging might also turn up intriguing signs of a long-lost intelligent civilisation, such as dense concentrations of skeletons of a large bipedal ape, clearly deliberately buried, some with gold teeth or grave goods such as jewellery.

And if the visitors chanced across one of today’s landfills, they might still find fragments of glass and plastic—and maybe even paper—to bear witness to our presence. “I would virtually guarantee that there would be some,” says William Rathje, an archaeologist at Stanford University in California who has excavated many landfills. “The preservation of things is really pretty amazing. We think of artefacts as being so impermanent, but in certain cases things are going to last a long time.”

Ocean sediment cores will show a brief period during which massive amounts of heavy metals such as mercury were deposited, a relic of our fleeting industrial society. The same sediment band will also show a concentration of radioactive isotopes left by reactor meltdowns after our disappearance. The atmosphere will bear traces of a few gases that don’t occur in nature, especially perfluorocarbons such as CF₄, which have a half-life of tens of thousands of years. Finally a brief, century-long pulse of radio waves will forever radiate out across the galaxy and beyond, proof—for anything that cares and is able to listen—that we once had something to say and a way to say it.

But these will be flimsy souvenirs, almost pathetic reminders of a civilisation that once thought itself the pinnacle of achievement. Within a few million years, erosion and possibly another ice age or two will have obliterated most of even these faint traces. If another intelligent species ever evolves on the Earth—and that is by no means certain, given how long life flourished before we came along—it may well have no inkling that we were ever here save for a few peculiar fossils and ossified relics. The humbling—and perversely comforting—reality is that the Earth will forget us remarkably quickly.

12

*Civil disobedience to
reclaim public spaces from
private interests....*

NILS NORMAN:

Nils Norman's work is informed by urban politics and ideas on alternative economic systems that can work within the city. It merges urbanist utopic alternatives with a pungent but humorous critique of the history and role of public art.

BREAKING INTO BATTERY PARK CITY CURFEW



Location
Battery Park City, New York

Date
1998

Battery Park City is a planned community at the southwestern tip of Manhattan in New York City. In his piece, *Breaking into*

Battery Park City After Curfew, Nilsen protests regulation to close down public space—the Rockefeller Park—after dusk. The meaning of this simple action is compounded when one takes into consideration that the final Battery Park City design was meant to include 1,400 low income housing units, a fact that was ignored by the developers. Since parks often function as a sleeping quarters for the homeless, the city's rule of restricting access to them at night is yet another we-don't-want-you-here message to the population of limited means.

13

Metered parking spots are transformed into temporary public parks...

PARKCO



REBAR GROUP:

REBAR is a collaborative group of creators, designers and activists based in San Francisco. Rebar's work is situated in the domains of environmental installation, urbanism and absurdity.

(ING) DAY

Location
San Francisco, California
Date
September 2006

On September 21, 2006, the San Francisco based art collective rebar performed

Park(ing) Day, a “temporal distributed network of public open space” in the form of five *Parks* installed around downtown San Francisco, deployed in sequence by a parade of bicycles and assorted human-powered vehicles. In addition to calling attention to the need for broader discourse regarding public space in urban contexts, rebar sought to test public response to the *Parks* in a variety of socioeconomic situations. The *Parks* were generally met with a varying mix of surprise, approval, joy and incredulity.



JOHN KING, SAN FRANCISCO CHRONICLE

Any day of the week, the 500 block of Mission Street offers two good public spaces in which to kick back and relax: 101 Second St.'s jewel-box-like enclosed corner atrium, and a cozy, bamboo-lined plaza at 560 Mission St.

Thursday afternoon, when the sun was high and the winds were calm, another choice appeared briefly like a mirage: a 20-foot-long and 10-foot-wide patch of sod with two wooden benches and a potted European hornbeam that filled a parking space in front of an empty lot.

And what the green spot lacked in design nuance it made up for in novelty—two hours later it was gone, wheeled away by bicyclists pedaling off with their portable landscape to transform another patch of asphalt.

“We want to get the public to rethink the way streets are used,” explained John Bela of Rebar, which bills itself as “a collaborative group of creators, designers and activists.” “Why not interpret a parking space as something that can be leased short term and used as a legitimate extension of open space?”

All of which made for good fun and a mild case of sunburn. But it also makes a point about what constitutes good public space in a city. Size doesn't matter; the important thing is to craft something that people can cherish—and more often than not, the snug spots are the ones that work best.

Rebar is a free-form art collective with provocative notions about design's role in society. The members also have day jobs, since you don't pay the rent by unrolling sod in a parking space near First and Mission streets for two hours, as they did in November as an exercise in guerrilla greenery.

This year, instead of hit-and-run high jinks, there was a full day of choreographed events. Not only did Rebar cart its miniature landscape to five locations—helped by young volunteers clad in black logoed Rebar T-shirts—Supervisor Ross Mirkarimi and Mayor Gavin Newsom donated their city parking spaces to the cause. There was financial support from the Trust for Public Land, and several design firms chimed in with park-ettes of their own.

Around the corner from where I caught up with Rebar, for instance, BAR Architects converted two spaces outside their Howard Street office into a “bioswale”—a collage of fluffy sod, redwood mulch, gallon pots of drought-tolerant shrubs and paving stones plucked at random from the firm's stash of material samples. One of the new employees, Will Spurzem, read about the plan on a blog and easily persuaded leaders of the 85-member firm to join in.

Nearby at Second and Folsom streets, landscape architect Elizabeth Boultz unrolled the most theatrical concept I saw: Equinoctial Point Park, “a celebration of night and day” (what, you didn't know the autumn equinox was last week?).

The space was sliced at a diagonal; one side featured sod and a yellow bench and artificial sunflowers, while the other had a black bench, dark pebbles (actually doormats from Bed Bath & Beyond) and a line of potato vines—a member of the nightshade family.

“I heard about the idea and I was all over it,” laughed Boultz, who saw a flyer at the UC Extension office, where she teaches a landscape architecture course. “I had anxiety

about it all last night, but I haven't been hassled at all. And I haven't put any quarters in the meter, either. People who stop to look do it instead.”

The flyer for the event strikes a pose of rhetorical provocation, saying the goal is to “reprogram the urban surface.” What was really going on, though, was environmental performance art.

And that's OK—because the sod-in demonstrated a more lasting truth about what can make urban parks thrive.

Too often, success in open space is measured in acreage: the bigger the park or plaza, the better. Officials and interest groups want something they can boast about, or stand in front of on opening day.

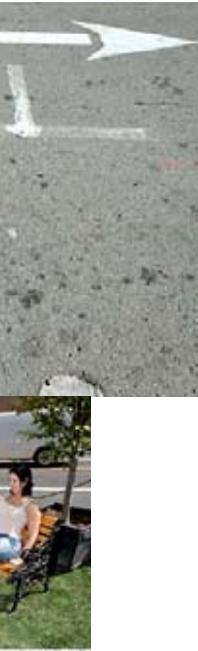
But what we really need—especially in dense downtowns—are bits of the landscape that we can make our own. The places we remember are the ones we return to whenever we can, or the ones that we recommend to friends who are looking for a place to rendezvous. They're also the ones that feel like common ground, secure and attractive but also a place where the unexpected can occur.

In other words, what counts isn't landscape design so much as the initial intent. If the creators genuinely want a place where people want to be—as opposed to something that looks good from a window, or something that keeps something else from getting built—the rest will fall into place.

A patch of well-tended grass helps. Comfortable benches, along with a few chairs you can maneuver at will.

Add some shade from a tree and the sound of running water and a location with plenty of passers-by. Voila. It's human-scaled urbanity in the middle of the big bad city.

That's all it takes. Parking meters are optional.



PARK(ING) DAYS AROUND THE WORLD



Manhattan



Milwaukee



London



London



Manchester



Cleveland, Ohio

14

*Reclaim the roofs as a place
for neighbors to meet...*

Location
Berlin, Germany
Date
2005–present



(ROOF GARDENS FOR ALL)

DACHGÄRTEN FÜR ALLE



Instead of “reclaim the streets,” the motto for the non-profit organization *Dachgärten Für Alle*, which operates in Berlin, Germany, is “reclaim the roof!” The idea goes back to the time right after wall came down in 1989, when

many people in East Berlin were able to access the roofs of their multi-family apartment buildings. Nowadays, the top floors are transformed into luxury apartments and only the people who can afford the steep rents can enjoy the roof. The great thing about roof-tops, however, is that they provide a place away from the noise and tightness of the street. Here, neighbors can get to know each other, celebrate together,



solve problems among each other and establish a tight-knit community. Rooftop gardens also provide additional green space, produce oxygen, and filter water. They are even good for tourism—the view from the Fehrsehturm (radio tower) would be far more beautiful if it included many green rooftops.

So far, *Dachgärten Für Alle* has mainly existed as a concept. People are encouraged to petition their landlords to implement rooftop gardens. However, they are already a reality in cyberspace: People were asked to create roof-top gardens in the popular online reality game The Sims.





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Transforming anonymous street intersections into lively neighborhood squares...

CITY REPAIR :

City Repair, a non-profit organisation that originated in Portland, Oregon, helps people to reclaim their urban spaces to create community-oriented place.

INTERSECTION REPAIR

In Portland, as with cities across the nation, many neighborhood streets are desolate and anonymous, torn apart by speeding traffic. There is little to inspire conversation, creativity, democracy, community gatherings, reflections of local culture, a sense of safety, or even local economic vitality. *Intersection Repair* reclaims the crossing of pathways—the historical place of gathering—and turns it back to the community. Intersection Repair projects are guided by the direct participation and leadership of a neighborhood to determine a shared vision for a neighborhood gathering place, to create the designs and functions, to collect the materials needed, and finally to build, manage, and celebrate each other and the neighborhood.



Location
Portland, Oregon
Date
2001–present



FROM MAKING THEIR OWN PLANS

Town commons have traditionally been the geographical glue that binds a community together. In 1785, the Continental Congress passed the National Land Ordinance, which established a continental grid plan over all lands west of the Ohio River and practically guaranteed that public squares would be absent from new American cities. Much of the source and nature of our social isolation and urban tragedies result from this; we have few commons to facilitate collective understanding, vision, or responsibility.

Public gathering places are essential components for building vibrant neighborhood communities. Without these places, where does the daily practice of community happen? Often, throughout the nation, it simply does not. Intersection Repair is a process for reclaiming our identity as neighbors and returning public squares—the heart of community—to our neighborhoods, one by one.

Intersection Repair projects happen with support and facilitation assistance from City Repair. The initial neighborhood “sparks” reach out to their neighbors and invite everyone to learn more about the possibilities of building a neighborhood center. The initial steps are critical and should include: hosting social gatherings, encouraging conversation in a general way about the neighborhood, and simply spending time in public places. These are the moments when individuals feel personally welcomed and engaged to share their talents and opinions in this neighborhood effort. “Social capital” is built, and the neighborhood as a whole takes ownership of the concept of re-building shared public places.

The designs for the public square are created by the neighborhood through a series of community workshops. The process usually begins with an assessment of the current neighborhood needs and assets, culture and history, common interests, local climate, ecology, and topography. The neighborhood then formulates a vision and a set of strategies to meet their goals. With scores of people involved in the decision-making, it usually requires compromise and creative solutions to find a suitable design. The strongest and most interesting concepts result from the process of addressing each person’s concerns, opinions, and ideas.

While the projects are physical, the essence of an Intersection Repair is unseen to the eye. Behind the community kiosks, benches, and street murals lies an awakened neighborhood that has come together and created conversations. This placemaking is as much about psychological ownership and reclamation of relationships as it is about a place. Placemaking reminds us that we still share common interests and the power to manifest them.

The projects evolve in phases, naturally unfolding from time people spend together

in their own neighborhood. Many groups start with something small and do-able so that the community can accomplish it together and engender a common basis for potential next steps. Each phase of the project is punctuated by moments of celebration and reflection.

Each neighbor is encouraged to contribute their ideas, desires and resources and cultivate their own interests in this participatory process. People also develop partnerships with neighborhood associations, government agencies, local businesses, schools, and organizations that are all working toward similar goals of healthy, livable communities. Intersection Repair simply becomes a mechanism for working together.

Funding for these projects comes from a variety of sources. Once people feel that they are part of an exciting neighborhood process, their spirit of resourcefulness and generosity is engaged. Many neighborhoods find ample materials in their backyards or garages, and local businesses are often pleased to donate materials, food, or funds. Neighborhood groups also write grants, host creative fundraising events, and seek resourceful partnerships. Overall, the projects cost a fraction of the value they generate.





The Portland City Council and Department of Transportation support Intersection Repair because it improves neighborhood livability and engages citizens in participatory democracy without spending a single tax dollar. Projects are permitted in communities who prove widespread support for the designs. Therefore, the community has decision-making power over what they want in their neighborhood as long as they work together. The process is continuously evolving as neighborhoods generate new ideas for their public places.

Intersection Repairs touch upon issues that transcend political, cultural, and economic lines. These foundations allow us to determine our own destiny together as a community. Many people find personal meaning in these projects as they are deeply transformational and a lot of fun! Each project plants invaluable seeds for the future.



RYAN MCGREAL

The High Cost of Free Parking

Humble “free” parking is largely responsible for the catastrophic failures of postwar North American cities

There is no righteous ire like the ire of people who believe they deserve something for nothing.

In that light, don’t expect many motorists to appreciate Donald Shoup’s new book, *The High Cost of Free Parking*.

An UCLA professor in the Department of Urban Planning, Shoup dissects the economic, social, and environmental impacts of current parking regulations and proposes a new approach that can help free cities from the pernicious effects of auto dependency.

Originally limited to the curbside, parking was destined to become a scarce resource. Cars take up a lot of space, the total area of curbside parking is limited, and certain areas, like workplaces and commercial districts, experience peaks in demand when large numbers of people arrive at once.

Planners concluded that the solution was physical: create enough additional parking to offset the projected increase in demand. What seemed like good public policy at the time has been a slow-motion time bomb for cities. Too much parking is much worse, in the long run, than not enough parking.

When planners calculate how many parking spaces to provide, they assume parking is free. Obviously, demand for a “free” service will be much higher than demand for a service that must be purchased. If people don’t have to pay for parking, they are much more likely to drive.

There’s just one problem: parking isn’t free. In fact, according to Shoup, “the cost of all parking spaces in the U.S. exceeds the value of all cars and may even exceed the value of all roads.” Parking costs billions of dollars a year.

Shoup is an economist, and it shows in the perspective he brings to bear. “Economists do not define the demand for food as the peak quantity of food consumed

at free buffets.” Nevertheless, planners define the demand for parking as the peak quantity of spaces used when parking is free.

Developers simply pass the cost of “free” parking to property owners, who pass it to tenants, who pass it to all customers in the form of higher prices. “Off-street parking requirements encourage everyone to drive wherever they go because they know they can usually park free when they get there.”

Huge expanses of asphalt push buildings far back from the street and away from each other. “Free” parking increases demand for driving lanes, which further separates destinations, making it difficult to get anywhere without a car. This further increases demand for more lanes and more parking in an insidious positive feedback loop.

Markets normally use price signals as negative feedback to contain demand. When demand goes up, the price goes up, and the higher price lowers demand. However, for price signals to work, the people using a good or service must be the ones paying for it.

By breaking the relationship between use and payment, “free” parking eliminates the negative feedback that keeps the system in balance. As a result, everyone decides to drive everywhere, and the car crowds out other forms of transportation.

Even paid parking is often underpriced. In Hamilton, for example, motorists can park for 50 cents an hour at most curbside meters. Assuming about 60 square feet for a parking spot, that’s six dollars per square foot per month—an order of magnitude lower than the equivalent monthly cost for a square foot of building space.

The tantalizing promise of underpriced parking leads motorists to cruise around the block until a spot opens up. In studies Shoup cites that analyzed traffic congestion, 30 percent of cars on the road were trying to find a parking spot.

Of all the transport systems available, including public transit, shipping, and rail, cars are unique in that terminal costs (doing something with your vehicle when the trip is finished) are offset to the rest of the economy. This “provide[s] a huge subsidy to motorists, and thus increase[s] the demand for cars, parking spaces, and vehicle travel.”

Only walking, which has effectively no terminal costs, is comparable. All things being equal, most people would rather drive than walk. The problem is that all things aren’t really equal; parking requirements just make it seem that way.

Worse still, “free” parking provides the biggest per-mile subsidy to the shortest trips, meaning drivers have a major incentive to drive to destinations they would otherwise be able to reach with ease by foot or bicycle. A huge proportion of traffic congestion is made up these short trips.

Shoup concludes cities should eliminate zoning requirements for off-street parking, end free municipal parking, and charge whatever price will maintain about 15 percent vacancy—the optimal rate to ensure easy entry and exit. To balance variable demand against a fixed supply, he recommends setting different prices according to time of day and day of week.

Anticipating the righteous ire of those drivers accustomed to free parking, Shoup notes that the biggest barrier to eliminating this subsidy is political, not technical, and proper implementation is critical.

The best way to implement market priced parking is for cities to remit all of the revenues from parking to what he calls “parking benefit districts”, akin to business improvement areas. This way, decisions on how to collect and how to spend are made by the citizens most affected.

The benefits are potentially tremendous: with less parking, there is more room for both people and businesses, and the right balance between supply and demand means less congestion from cruising, less noise, and less air pollution. Reduced parking requirements also ease entry for investors who might otherwise build elsewhere. As the area becomes more appealing to pedestrians, it attracts both visitors and investors.

For Hamilton in particular, this kind of arrangement can provide the momentum and investment to restore and revitalize our beautiful downtown neighbourhoods that preceded cars and are already designed with pedestrians in mind.

DAVID WOMACK

Who Owns History?

Brewster Kahle aims to archive the entire Internet for the public domain. But not everyone wants us to remember.

The history of the Internet is located between an auto-body shop and a set of new condos at the corner of 6th and Mission in San Francisco. The building, which one of the tenants describes as “an old sweatshop,” does have a front door, but Brewster Kahle, founder of the Internet Archive, prefers to use the freight elevator that opens off the alley. One hundred and fifty or so PCs sit nested in cables in a large loft on the second floor. These machines contain 10 billion web pages full of the promises of politicians, satellite images of Siberia, chats on knitting, chemical formulas for homemade explosives, and every other type of information—both profound and profane—human beings might conceivably produce, stretching back to 1996.

Nineteen ninety-six was when Brewster Kahle set out to do the preposterous—to archive the entire Internet not just once, but over and over again. He has now created the largest and most complete archive of the Internet in existence. Taken together, these machines hold well over a hundred terabytes of data—four times more information than is contained in the Library of Congress. Kahle is currently archiving every public website approximately once every two months. Until October 2001, when Kahle made the archives free and open to the public via an application he named “the Wayback machine,” these machines hummed away in relative obscurity. Now, the machines and the information they contain are at the forefront of a debate that is determining the future of the web’s history.

Seven million three hundred thousand new web pages are published every day, adding up to 250 megabytes of information produced a year for every man, woman, and child on earth.¹ However, though information is now being created at an unprecedented pace, it is forgotten almost as quickly. Web pages, on average, exist for only about 100 days.² Unlike mass-consumable printed mate-

¹ Peter Lyman and Hal R. Varian, “How Much Information,” 2000. Retrieved on 9 January 2003 from www.sims.berkeley.edu/how-much-info.

² L. A. Lorek, “Site Lets Surfers Explore Net’s Past,” *San Antonio Express News*, 16 June 2002.

rial, web pages—even large, “dense” ones—often disappear without a trace. They “go dark.” The templates and databases are discarded, dismantled, or over-written. Without the Archive, millions of pages of information would have disappeared completely. As the pace of information accelerates, we have fewer resources to understand the present and are remembering less and less about the past. Without this information we have no means to learn from our success and failures. “Paradoxically,” Kahle has written, “with the explosion of the internet we live in a digital dark age.”

Archiving the Internet is, conceptually at least, remarkably straightforward. Search engines such as Google, Yahoo, and Lycos rely on programs called “spiders” to gather information to feed their search engines. The spider is a program that visits remote sites and automatically downloads their contents for indexing, creating a kind of snapshot of each page of the site. When you do a web search, it is the index, rather than the great wide web itself, that is being referenced. Search engines are interested in only the latest information; as new information becomes available, old entries are overwritten. The Archive collects these old snapshots. Kahle’s genius was to recognize the value of this information and then to build a container large enough to hold it.

Few other people could have tackled this project and even fewer would have chosen to. After graduating from MIT in 1982, Kahle founded several companies that did groundbreaking work in information storage and retrieval. It was the sale of a company called WAIS (Wide Area Information Server) Inc. in 1995 that provided the initial capital to start the Archive. Since then Kahle has brought in notable partners such as the Library of Congress, the National Science Foundation, and the Smithsonian. While these partnerships provide some cover in the legal battles that are beginning to threaten both the project and Kahle personally, the ten million-dollar annual budget continues to come primarily out of Kahle’s pocket. The payoff, Kahle insists, is personal. “My definition of a life well lived,” he told me, “is to be of service to others.” Kahle loses money on every megabyte. While the business model may seem distinctly dot-com, the goal hearkens back to the Renaissance. Kahle’s aim, he says, is “universal access to human knowledge.”

Human knowledge seems a strange way to describe the information in the Archive. On September 9th, the President made the following remarks about terrorism, “We know we can’t make the world risk-free but we can reduce the risks we face, and we have to take the fight to the terrorists ... rallying a world coalition with zero tolerance [and] by improving security in our airports and our airplanes.” The year was 1996 and the president was Bill Clinton as quoted on Whitehouse.gov. Or, go back to October of 2000 and read Enron.com on respect: “We treat others as we would like to be treated ourselves. Ruthlessness, callousness and arrogance do not belong here.” Or, perhaps a statement of shareholder value from WorldCom from the same period, “WorldCom has a strong track record of creating shareholder value ... The opportunities for future growth are superb.” If your tastes run towards the macabre, you can travel back to 1997 and read the statement on suicide by the members of Heaven’s Gate before they hitched a last ride on Hale

Bopp: “The true meaning of ‘suicide’ is to turn against the Next Level when it is being offered.”

“Isn’t it the coolest thing around?” says Christopher A. Lee, chairman of the Electronic Records Section of the Society of American Archivists. Lee points out that, in addition to making governments and corporations accountable for past statements, the archive is a valuable record of a society in transition. Millions of individuals who have posted personal homepages to the web have created an unprecedented resource for historians of the future. “A lot of social historians would say a website that says, ‘Here’s a picture of me, here’s a little bit about my cat’

tells us so many important things about how people were using the Internet at a particular point in time.”³ The Internet Archive has allowed researchers to analyze the Web in unprecedented ways.⁴ The Archive is not just a collection of pages and sites; it also captures the links between them. When you go to an archived site from 1996 and click on a link, the link brings up another site—from 1996. The user can move laterally across the web, from archived site to archived site, experiencing a unique 360-degree perspective of a moment in time. With a few clicks of the mouse, the historian can achieve an effect that would have taken thousands of hours of research before the archive.

Kahle believes that the Archive is particularly important in the wake of the dot-com bust. “Archiving technology transitions is very important because, initially at least, technology is often disappointing,” he says. “But by looking at the disappointments, you get an idea of what people wanted from the technology in the first place. What were their dreams for the technology? From this perspective, the failures can be just as interesting as the successes.”

But not everyone wants us to remember. “Brewster is taking an extraordinary personal risk, because this is potentially a criminal offense,” says Lawrence Lessig, a Stanford University professor of law who recently argued the groundbreaking intellectual property case, *Eldred v. Ashcroft*, before the US Supreme Court. Kahle has found an unlikely enemy in the institutions whose business it is to inform the public. The New York Times, Wall Street Journal, and other major news and entertainment organizations have had their sites removed from the archive. This is because they sell what Kahle wants to give away for free. The New York Times charges \$2.95 for access to each article in its online archives—articles that, initially, were free on the site. This business model assumes that only the latest version of the site is available to the public. And, although the articles themselves may be preserved in the Times’ private archive, the context in which the article appeared is lost. It is impossible to see, for instance, what the New York Times website looked like on 11 September 2001.

Another assault on the Archives comes from the Church of Scientology. Unlike the media organizations, the Church is not seeking to exclude its own sites from the Archive, but rather the sites of its critics. The Church insisted that the Archive remove pages that quoted from Church materials, claiming that such pages violate its copyright. Because of the way the Archive stores information, it is impossible to go in and remove single pages or sections of text. Fearing one of the Church’s

infamous legal assaults, the Archive has been forced to remove entire sites against the will of the owners because of a single questionable paragraph. In an email to the Archive, the owner of one site says he was “puzzled and disturbed” to try to access his site on the archive only to get a message that said that the site had been removed at the “owners’ request.”

The government, too, has removed historically significant information from the public domain. Following September 11th, there was a massive effort to purge information that might be in any way construed to be of value to terrorists. The entire Nuclear Regulatory Commission domain was removed from the Archive, including safety reports on American nuclear power plants. Sites that contained information on water supplies and chemical formulas were also removed from the Archives. In an effort to deprive terrorists of information, the government has deprived current and future citizens of an understanding of how the government communicated on important issues in difficult times. Perhaps the hole in history is an indication of its own.

The most democratic publishing vehicle in history, the Internet, is also the most fragile. Not only do websites depend on the collaboration of intricate and rapidly aging systems but they also depend on the whim of the author, the sensitivities of the subject, and the censor’s nervous cursor. [The same qualities that have enabled the web to host a billion voices also threaten their survival: websites are easy to put up, take down, and change.](#) The question is whether there will be any public record of these changes, or whether we, like the ever-changing web itself, must be trapped in the present and accept as true and inevitable whatever appears upon our flickering screens for lack of any comparison. In 1984 George Orwell predicted this dilemma with disturbing accuracy: “Within twenty years at the most,” he reflected, “the huge and simple question, ‘Was life better before the Revolution than it is now?’ would have ceased once and for all to be answerable.”

³ John Schwartz, “New Economy: A Library of Web Pages that Warms the Cockles of the Wired Heart and Beats the Library of Congress for Sheer Volume,” *The New York Times*, 29 October 2001.

⁴ “A University of Maryland professor has been using the archive to index Hungarian texts, while researchers from Xerox’s Palo Alto research center have used it to find out whether the dominance of English on the Web is killing off less widely used languages. Thanks to the archive, we now know that there are 1.5 million Hungarian language pages on the web. Xerox researchers also found 201 other languages represented on the web and thriving in the digital universe.” Douglas F. Gray, “Archiving the Net All the Wayback to 1996,” *Infoworld Daily News* at www.infoworld.com.

