Economy=Ecology: A Scenario for Chicago's Lake Calumet

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THE ULTIMATE POST-INDUSTRIAL LANDSCAPE?

Last June, The Chicago Reader, a local weekly, ran a photograph of a warning posted in an apparently empty wetland. It read:

> 'Danger—Flammable Vapors.' The image sat over a headline,'"Your Mayor Could Clean Up this Mess," alluding to the complex politics and economics at work in an area of Chicago known as Lake Calumet.

Inevitably referred to as 'an ecological disaster,' this approximately 20 square mile area 15 miles south of the city's downtown, resists remediation, despite the availability of federal Superfund dollars and over ten years of skillful grassroots activism by residents of the neighborhoods bordering the site. While some remediation has been carried out, significant contamination from PCBs, lead, chromium, arsenic, and volatile organic compounds remains and continues to affect both the local groundwater and Lake Michigan, the city's source of drinking water.

The Reader's suggested solution is a typical one for a city ruled by a mayor who is unlikely to see

any significant political opposition in the near or far future. Richard M. Daley, the city's mayor, has been in office continually since 1989. His administration of the city, a mix of the traditional American political machine politics, and a JFK School brand of political professionalism, is marked by a particular attention to green—namely, his famous planting schemes, bribes, and the St. Patrick's Day parade.

In many ways Lake Calumet is the ultimate post-industrial landscape. It is urban, an artificial topography publicly produced to serve as the infrastructure for the industrial economy that once fueled the city's growth. But that moment has long passed, and the city is left with a landscape where the only remnants of its once super-productive dune and swale ecology sit side-by-side with its most toxic industrial ruins. It is a site where economic questions collide with ecological concerns with such force that everything seems to be held in a magical state of suspension. Rusting coke ovens are framed by dense thickets of prairie grasses. And it's a place where, during a perfect summer

day, a cop stops to tell a bicyclist to'"clear out now. We find a lot of dead bodies around here."

TWO HISTORIES: SLOW ECOLOGIES AND FAST TECHNOLOGIES

Lake Calumet is both landscape and infrastructure. It is the location of the "most important harbor complex in the Great Lakes and the industrial heart of the Chicago Metropolitan area." [Meyer and Wade, 186] Close to100 million years ago glaciers scoured out valleys called sags, one of which became known as the 'Calumet Sag.' Eventually, this long depressed land form was transformed by engineers into the Calumet Sag channel, establishing a connection between the American continent's east/west waterways.

Starting around 1400, indigenous nomads—first the Miami, and then Potowatamis—established a series of trails on the glacial ridges which formed the sags. The Potowatamis, who managed to co-exist with European traders and merchants through the 1830's, built a burial ground at the mouth of the river that drained the Calumet area into Lake Michigan. A swampy, grassy area, this North American savanna held little attraction for the European eye. In 1823, shortly after the new United States of America had established a military installation at the mouth of a the river 10 miles north of the Calumet, a European traveler would write of the region, "The appearance of the country near Chicago offers but few features upon which the eye ... can dwell with pleasure." [Meyer and Wade, 3] That same year, however, perhaps in a typical display of the difference between the Anglo culture of the new nation and the habits of perception of the old world, Henry R. Schoolcraft predicted that the place will become "a depot for the inland commerce, between the northern and southern sections of the union, and a great thoroughfare for strangers, merchants, and travelers." [Meyer and Wade, 3]

Close to forty years after the city had been incorporated around a real estate boom created by the construction of a canal linking the Chicago River to the Mississippi river basin, commercial water traffic had grown to such an extent that a second port needed to be established at Chicago. In 1869, after the close of the Civil War, federal funds were appropriated for the improvement of a small harbor near the site of the old Indian burial grounds, 15 miles south of the city's central business district. Like much of the city's development during the 19th century, "The growth of the Calumet Harbor area was quick and unplanned, the result of the decisions of many people and corporations." [Meyer and Wade, 186]

Two years later, in 1871, the first cargo vessels arrived in the new port, and the infamous fire that decimated the central city that year left the area unscathed. By 1875, Brown Steel and Iron, the first steel plant at Lake Calumet, opened alongside a small residential settlement called"'Irondale,' founded as housing for steelworkers. [Pacyga, Skerrett] By 1881, George Pullman had built his sleeper car factory on the banks of Lake Calumet. The first product of the new factory was not railroad cars, however. Determined to''protect' his workers and their families from urban vices, Pullman put his assembly line to work manufacturing the materials used to build his utopian workers' community, known as Pullman, just south of the sleeper car works. The factory town, housing only skilled laborers of Northern European ancestry, finished in 13 months, became an important attraction for visitors to the 1893 World's Columbian Exposition. [Cronon]

"Well equipped with the prerequisites for heavy industry, (Lake Calumet) quickly became one of the most important industrial centers in the world. The Calumet Harbor and River provided all-water access to ore, limestone, and coal across the lakes; the eastern trunk line railroads passed through the area around the south end of Lake Michigan; and there was abundant water for the insatiable thirst of the modern factory. And, just as importantly, most of the land lay undeveloped for miles around. Soon iron, steel, and chemical plants lined the river between Lake Michigan and Lake Calumet." 234

By 1916, the Calumet River carried five times the volume of shipping as the Chicago River. Through the 30's and 40's, shipping, industry, and the worker communities surrounding Calumet prospered. At the end of World War II, despite a remarkable slow down in growth in the city at large—once the world's fastest growing city at the turn of the 19th century, the city's population began to decline by 1950—the Calumet area continued to expand. In 1955, the Calumet Sag channel was been enlarged to a scale that significantly exceeded the new Suez Canal, in anticipation of the

opening of the St. Lawrence Seaway, which would bring ocean-going ships to Lake Michigan.

When the first trans-Atlantic vessel docked at the Calumet Harbor in 1959, the region was the site of some of the most intensive industrial production and exchange in the world. During his visit to the US that year, Nikita Krushchev, the Soviet Premier, when asked about his impressions of America, would describe his fascination with the huge array of steel mills crowded around Lake Calumet, calling the gritty landscape the most beautiful moment of the trip. In less than a century, a complex ecology had evolved into a new type of economic niche, industrial technology extending Chicago's ecological footprint almost around the globe. If the city was not to be the world's largest metropolis, it promised to be one of its most extensive; if the city could not claim the densest concentration of humanity, perhaps it would become a critical node in an incredibly expansive and intensive global production network.

POSSIBLE ECOLOGIES AND IMPOSSIBLE ECONOMIES

Lake Calumet's recent history has a close fit with models ecologists use to describe eco-system development. The increasing complexity of the area's economy created by its extension into the global market reached a limit in the 1970s. Advances in management systems generated by new uses of information for quality and cost control realized in cultures with less management/labor conflict, and the aging of the area's century old production facilities, conspired to make the region's 'keystone' industry, steel, increasingly less competitive in the global market place. By 1985, most of the region's steel plants had been shut down, and one in three local workers was without a job. When the last steel plant closed in the early 90's, the region went from being the city's largest employer to the site of its highest unemployment rates.

The problem with remediation at Lake Calumet, if you talk to the manufacturers who still operate facilities in the area (they include waste management services, chemical processors, a Ford plant, and various industrial service providers) is created by insurance rates and property values. If the city accepts Federal Superfund dollars for a comprehensive clean-up, they believe economic valuation of their property will fall away to nothing, and the remnant industries in the area will be lost. [Lydersen] EPA officials (the administrators of the Superfund) refuse to address these concerns because they contend that local economic issues are not relevant to the remediation process. And in the meantime, the city's mayor appeases both sides of the issue: promising the largely minority communities surrounding the site a new environmental center, and continuing to refuse approval of the Superfund designation.

It seems that Calumet is just one more example of an urban industrial site where the solution to short term economic problems conflicts with long term environmental issues, and local minority communities pay the price for this standoff. Normative, technocratic approaches to urbanism and planning tend to present this as a kind of market failure, a problem that is out of reach for those concerned with the physical qualities of cities. Typically, we are left with just two alternatives: a naive faith that the invisible hand of the market will eventually devise a solution, or an equally risky hope that some technological or technocratic fix will arrive to save the day. We [author's design office], instead, have been speculating about a kind of convergence between the economic and the ecological that could emerge from the life of post-industrial cities. Our work relies upon what Wigley calls the "the curious role played by architecture in ecological thought" [Wigley, 39] and the equally curious role economics plays in ecology. Out of necessity, we are left to speculate about a form of urbanism where the relations between environment, human collectivities, and economic flows become a source of materials and opportunities rather than resistance and stasis, where urban design and archi-

tecture mediate between ecological and economic systems.

The dismal science appears early on in architectural theory. Vitruvius speaks of distribuio or oikos-nemein in his descriptions of design and construction. Likewise, questions of the relation between architecture and the processes of life have an equally long history in our culture's discourse on the built environment. For example, Vitruvius believes that the laws of architecture follow the laws of the 'cosmos' and Alberti, in an attempt to explain how beauty is attained in architecture, equates the laws of nature with the laws of beauty, and in turn, with the laws of architecture. The extensive and complex history of the role of the natural, organic, wild, and biological in design and urbanist discourse is in strong contrast to the rather limited role played by economic theory, and is especially curious given the obvious relation between oikos-nemein [house-law, or economy] and oikos-logos [house-knowledge, or ecology].

Contemporary discourse on sustainability in urbanism and architecture relies upon a variety of strategies for theorizing a relation between architecture, urban design and the environment. At the risk of over-generalization, these strategies tends to range across three broad heuristics: the use of the natural or biological as a model, the use of the natural or biological as a metaphor, and the use of the natural or biological as analog. Typically, metaphorical approaches are at the greatest distance from actual biological processes, relying upon the''organic' or ecological for form and iconic or symbolic content; Sullivan's writings and buildings are a compelling example, Latz's work at the Landscape Park Duisburg-Nord is another. Approaches that rely upon nature or biology as a model for design performance and process are fairly commonplace and range widely in their intentions and results. James Wines' affection for the earth as the 'ultimate machine' [Wines, 9], leads to an understanding of the biological as a new source of forms and content for design. On the other hand, for Viollet-le-Duc and Wright, the organic and the anatomical become explanatory or contextual devices. For practices which rely upon an understanding of the biological as an analog for design process and performance, the attention opens toward the relation between design work and biological systems, rather than issues largely internal to design disciplines. Yeang's systems approach to ecological design yields an emphasis on "the interdependencies and interconnectedness in the biosphere and its ecosystem. Here the crucial property of ecological design is the connectedness between all activities, whether manmade or natural." [Yeang, 12] D.I.R.T. Studio's proposal for a World Trade Center memorial engages social systems with biological processes in a similar vein, using the cycles of seasonal change in the landscape to activate new civic forms of mourning and renewal.

In classical thought, the analogy appears as a mode of combinatorial invention, distinct from linear computational problem-solving. [Stafford, 1999]. The analog, as a heuristic, finds a resemblance of relations, directing a focus on types, qualities and effects of forms of interconnection. These analogical approaches to design offer particularly resilient and fertile methodological frameworks because they direct attention to the potential for convergence between various systems and processes. And, in particular, they offer a means of constructing elisions between economics, ecology, and their shared term, the oikos or household, the human environment.

When Ernst Haechel, a German zoologist, first described the new science of ecology in 1873, he characterized this form of knowledge as an understanding of the 'economy of animals and plants.'[Wigley, 42] [OED] Long a marginal field, in contrast to modern chemistry and physics, ecology began to emerge as a systematic source of knowledge with the development of systems analysis and digital information processes in the middle of the 20th century. Now, as the design of urban environments begins to benefit from the informational and computational power of digital technologies, it becomes possible to think of urban design as''applied ecology.' [Yeang] However, the execution of an applied ecology requires an equally hardy''applied economy' because the analog between ecology and design operates through the economies which structure the flows of value and resources in a given context.

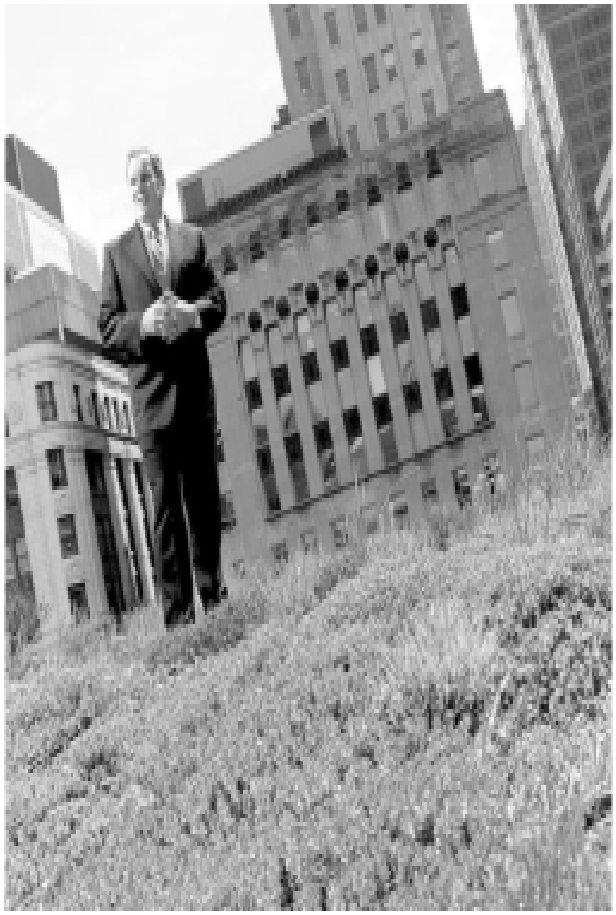
Contemporary cities have many characteristics of complex systems: most interactions are non-linear; there are multiple decision-makers, time-scales, layers of organization, and exchanges across space [Pulselli, Bastianoni, Tiezzi]. Even in a city like Chicago, which has been run by a

small group of Irish-American men for the most of the last 70 years, hierarchical command and control organizations survive at a very high cost. Reductive, technocratic problem-solving, that simplifies in order to optimize, works against the vitality and potential embedded in urban environments. Unfortunately, until quite recently, most economic theory relied upon reductive analytic frameworks that disengaged small scale interactions (micro-economics) from large scale interactions (macro-economics), and split short-term effects from long-term effects. It was no accident that Jane Jacobs relied upon the systems analysis research at the Princeton Institute for Advanced Studies to develop her insights about the virtues of complexity in The Death and Life of Great American Cities, rather than mainstream economic or planning theory.

Similarly, systems theorists that study sustainable environments find that command and control relationships fail to produce the consumption patterns necessary to long tem viability. [Pulselli, Bastianoni, Tiezzi] As a number of urban theorists and historians have observed, industrial "cities are unstable ecosystems far from equilibrium" [DeLanda 28] plagued by the risks of oversimplified, homogeneous resource webs (think of Lake Calumet and steel production). A 'soft' model of urban planning [Pulselli, Bastianoni, Tiezzi, 111], designed to produce intelligence about the multitude of interacting feedback loops in urban environments, could produce the sort of non-planned adaptive processes that reconfigure forms of consumption and produce more self-sustaining and self-regulating environments. This is hardly a fantastic notion. A look at historical instances of radical changes in consumption patterns, such as the rise of suburban life in post-war America, is instructive. As Easterling demonstrates in her book, Organization space: landscapes, highways, and houses in America, suburban subdivision development was designed to produce a particular pattern of consumption. Generic 'soft' formats for the design of residential fabric depended upon a particular system of financing, ownership and construction. Considerations such as the interactions between the life of the mortgage and the durability and design of the construction system were critical to the vitality of suburban development.

A SCENARIO FOR LAKE CALUMET, BROUGHT TO YOU BY OUR JANITOR WITH A VISION

"'I like to say he's a janitor with a vision,' says Barry Burton, a zoo horticulturalist from Detroit who came to Chicago's Department of Planning and Development in 1998... 'It starts with him noticing the trees are all gone and having them replanted. Suddenly life springs up, and there are cafés and people where there were none before. Then it becomes, let's not just make it attractive but a healthier place. Trees reduce the heat-island effect and clean the air. Landscaping is labor intensive, so we provide a lot of jobs. That has turned into a model of economic development based on green technologies, attracting renewable-energy companies, and creating a sustainable landscaping industry.'" [Chamberlain]



Lake Calumet is a fertile site for the convergence of ecology and economy. The two big issues for the region—dealing with hazardous wastes, and returning the land to productivity—need an intelli-

gence that combines an obsession attention to the minutia of everyday city life with the speculative force of a vision that moves without hesitation between large and small events. As part of an exhibit on future visions of Chicago, we [author's design firm] have proposed a scenario for simultaneously remediating the brownfields at Lake Calumet, and constructing a new, sustainable economy in the area. Presented as a short film, we proposed the scenario as a theoretical experiment that becomes an argument for design's role as a mediator between economies and ecologies, and helps reframe or reprogram our understanding of the possibilities for post-industrial urban environments.

Our narrative starts with Chicago's 'janitor-with-a-vision,' Mayor Daley, and uses the janitor's job, clean-up and trash collection, as the catalyst for the construction and restoration of Calumet's landscape and infrastructure. The story starts with a question. What would happen if we began to think of our trash as a resource? Our answer works through an idealized, semi-plausible scenario for redesigning the city's consumption patterns that generates new economies through the reuse and decomposition of waste.

This revaluation of waste occurs through the deployment of biological processes—namely bio-and phytoremediation processes—that cost less than 20% of conventional 'remove and contain' remediation practices. [Carman] A revival of 19th century American homesteading policies, reinvented as an''eco-steading' program, becomes a new means of managing the city's waste products. Much as in a healthy ecosystem, a species of 'decomposers' evolves to reprocess waste into valuable resources. Presented as a purely local phenomenon, the city institutes the eco-steads in the largest expanse of vacant land in Chicago, the Lake Calumet region.

An adaptive process, the eco-steads start as parasitical occupations of abandoned industrial infrastructure, including both built structures and the engineered waterways in the area. The reoccupation of both water and structure complement each other. The water-based industrial infrastructure [barges and port facilities] become launching platforms for landscape remediation, as barges bring phytoremediating plant materials (poplars, various prairie grasses, sunflowers, and other plants with the capacity to harvest toxins from contaminated soils) from restored prairies south of the industrial zone. The new water transport relieves highway and road congestion, complements dune and swale restoration, and integrates emerging residential and commercial development with the rest of the city.

The occupation of structures, particularly large scale structures, occurs as they are 'reprogrammed' as bio-remediation facilities. Some of the new programs include smelting processes that recover the metals harvested through phytoremediation, organic waste composting facilities, inorganic waste sorting and processing facilities, bio-domes which contain non-native photo-remediation plantings, and enterprises that develop and research biological remediation processes. All programs are processes constructed as ecologies and economies: All new post industrial infrastructure evolves out of remediation of existing infrastructure, and all new residential and economic development evolves out of existing communities and resources. Monoculture is impossible; old and new infrastructure, old and new communities are mixed. Residential zones begin to grow from existing neighborhoods, as the scale of the Victorian workers' village of Pullman extends across the site, integrating local residential communities with the landscape. Finally, all local remediation efforts evolve into global remediation networks, linking the eco-steads to local and global processes of exchange.

NEW ECOLOGIES, NEW ECONOMIES, AND HOPEFUL MONSTERS

Our speculations build from many existing examples and proposals that construct new ecological relationships through urban design—community reforestation programs in Detroit, projects by Field Operations for the Freshkills site in New York, as well as projects by Michael Sorkin, Peter Latz, and D.I.R.T. Studio. We also look to research on the 'new' economy of post-industrial production, through which markets are understood as directed networks, where reciprocity and reliance over time brings more sustainable rewards than short-term optimization. [Barabasi] This conception of the new economy reflects a "fundamental shift in business thinking—and behavior—today: the economy is not a mechanism, businesses are not machines. They are co-evolving, unpredictable organisms with

a constantly shifting business ecosystem that no one controls." [Dyson quoted by de Geus, 1997]

We also have a sly nostalgia for hopeful monsters, of all varieties. As Pulselli puts it, "If we do not hazard a project, if we cannot imagine 'hopeful monsters' to drop in the river of human evolution, we won't get anywhere." [Pulselli, Bastianoni, Tiezzi]

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