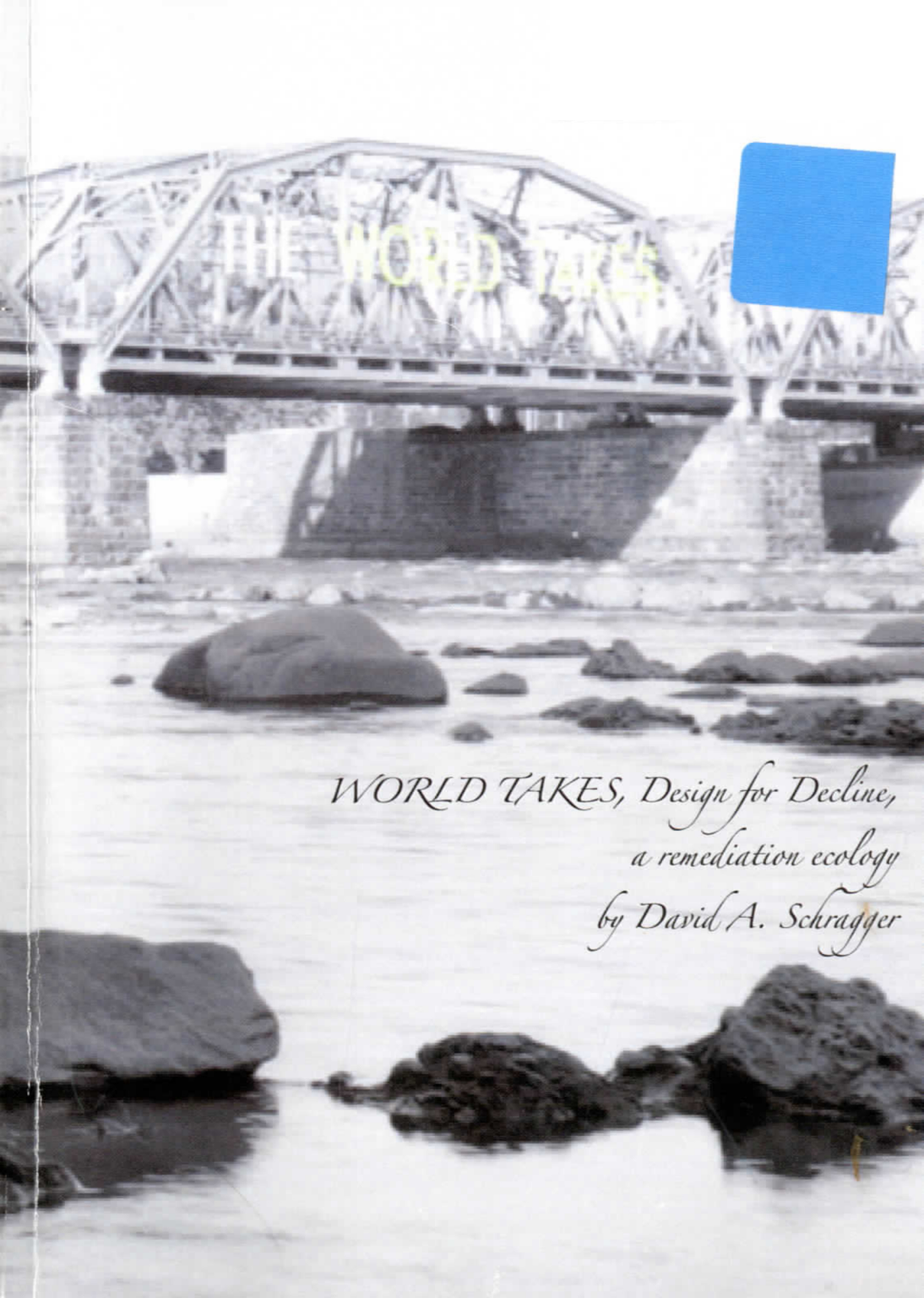
Fall 2009

World Takes: Design for Decline - A Remediation Ecology

David A. Schragger



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a remediation ecology

by David A. Schragger

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advisors:
Mark Linder / Clair Olsen

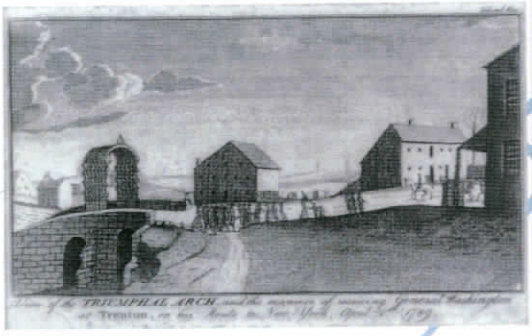
12/15/09

Thesis submitted toward completion of a Bachelor/Master of Architecture degree

Thesis

World Takes is a study of the decline of the small American city of Trenton, New Jersey. Urban formations that were generated by industry and the infrastructural necessities of density are currently being redefined by the dissipation of these forces. The new forces that are shaping the environment are enabled by absence and dereliction. A transgressive ecology is seeking a natural equilibrium within the augmented environment. World Takes is an architectural intervention that attempts to mediate and promote this ecological equilibrium within the post-industrial urban environment.

If capital is no longer the main generator for urban organization, what alternative force will organize urban formations? The current dominant force that is exerted on the urban environment is transgressive nature. This seeks to envelop and dismantle the derelict structures. The intervention is a structural membrane that facilitates the dissolution of the feral structures while promoting these emergent formations within the urban habitat. The establishment of this new urban ecology relieves stresses on the environment and the inhabitants that were created by industrial development.

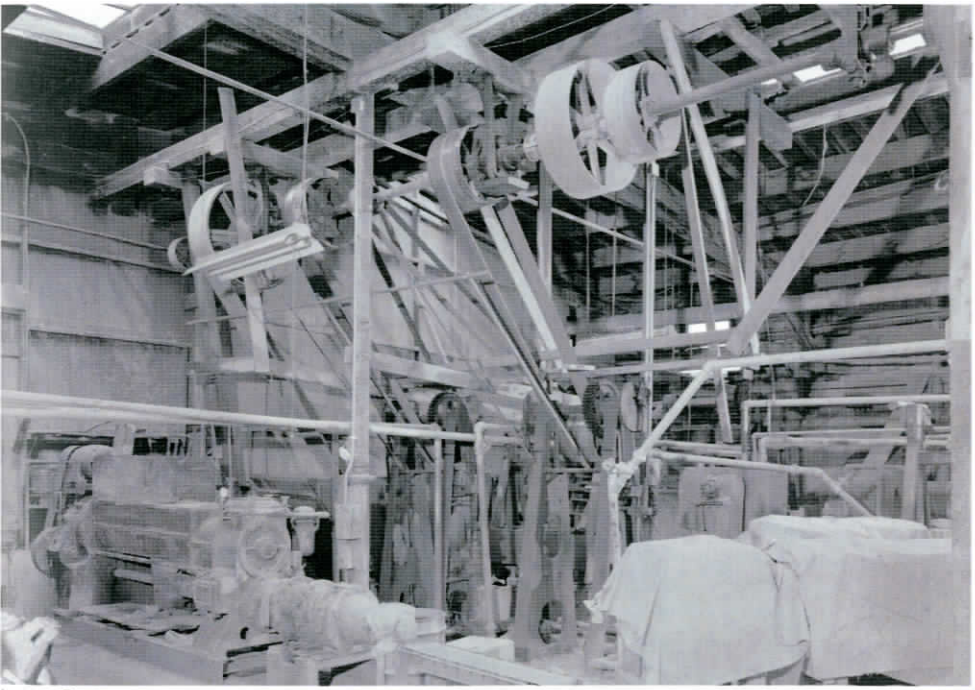


Original Colonial Settlement at the intersection of the Delaware river and the Assuming Creek taking advantage of the natural landscape and trade routs between New York and Philadelphia

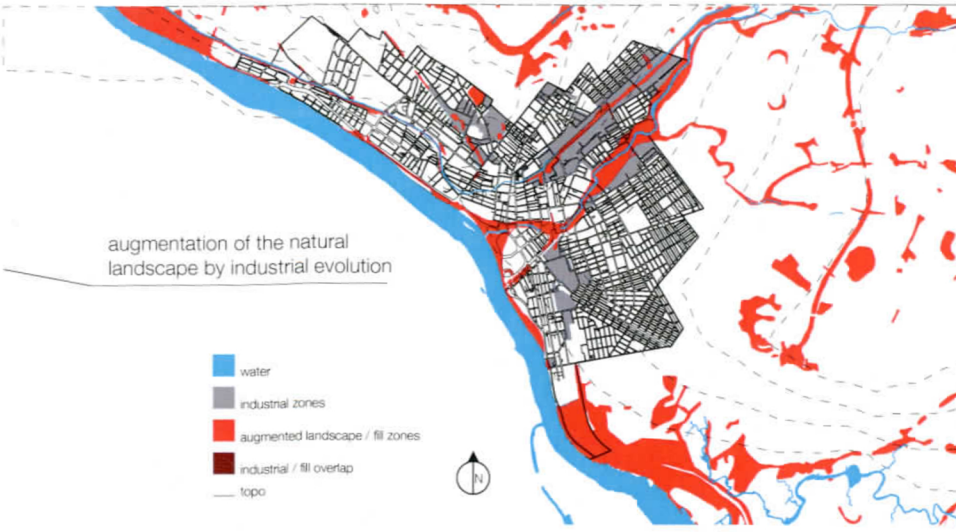
Symmetrical expansion of the settlement on the axis of the creek and river by industrial entitles

Territorial Growth

01 : 1792
02 : 1792 <1831> 1894
03 : 1792 <1844> 1900
04 : 1844
05 : 1856
06 : 1792 <1858> 1894
07 : 1888
09 : 1900
10 : 1894
11 : 1900
12 : 1921



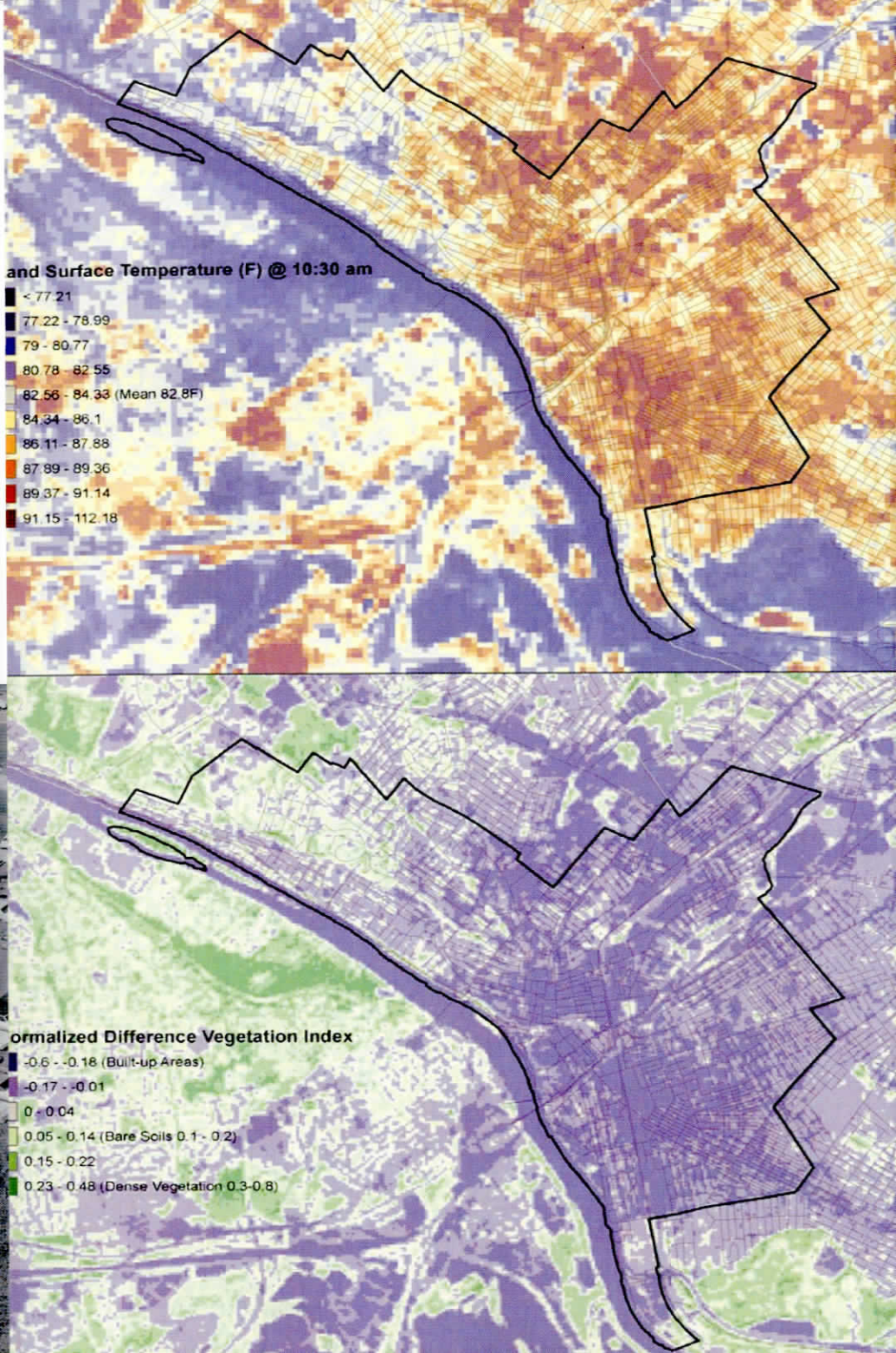
Lenox Pottery



Natural features changed for industrial purposes augmenting the landscape for industry and increased population density

Brownfields of contaminated soil and water

New frequent flood zones created by development


and Surface Temperature (F) @ 10:30 am
< 77.21
77.22 - 78.99
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-0.6 - -0.18 (Built-up Areas)
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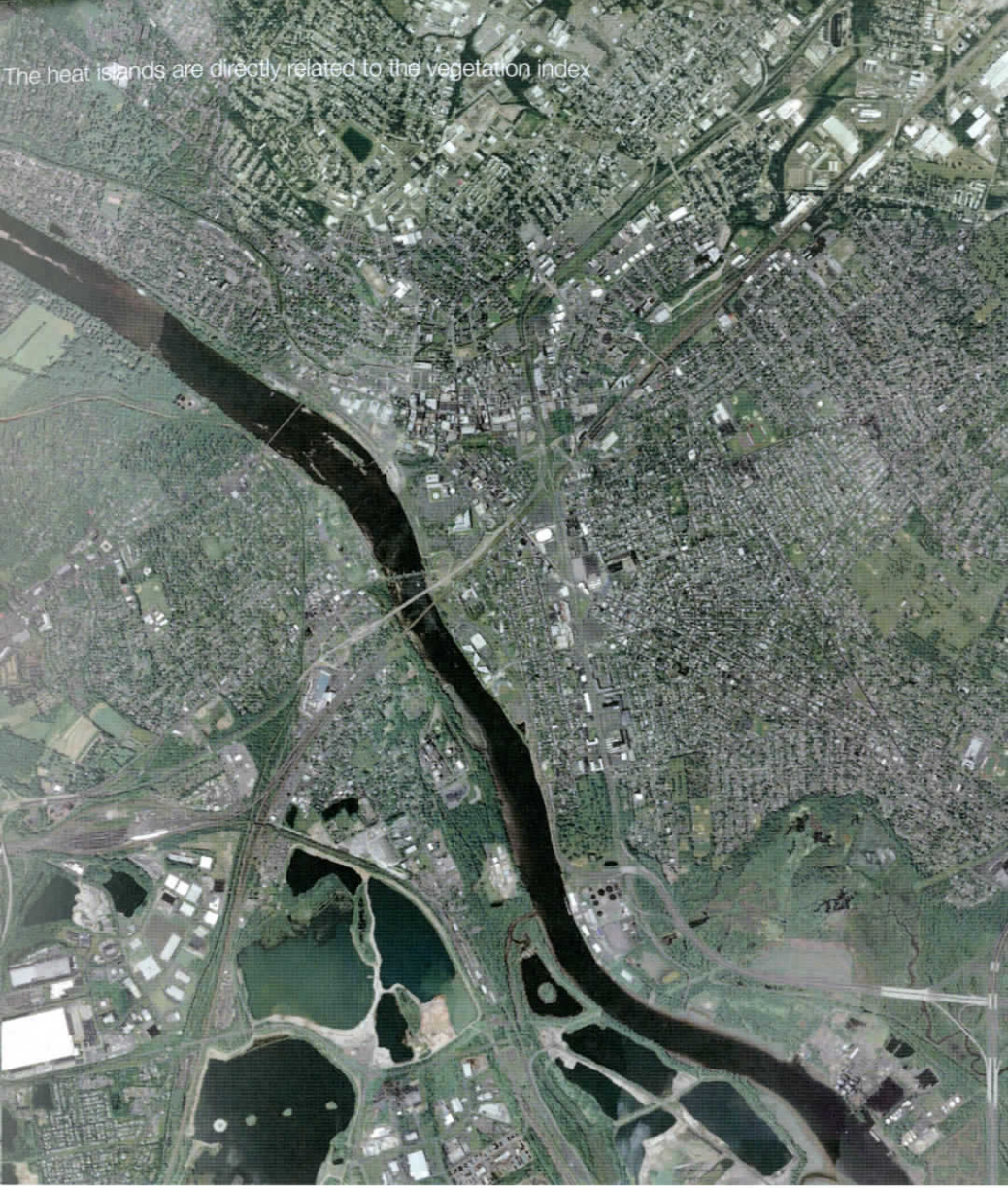
0 - 0.04
0.05 - 0.14 (Bare Soils 0.1 - 0.2)
0.15 - 0.22
0.23 - 0.48 (Dense Vegetation 0.3-0.8)

The heat islands are directly related to the vegetation index

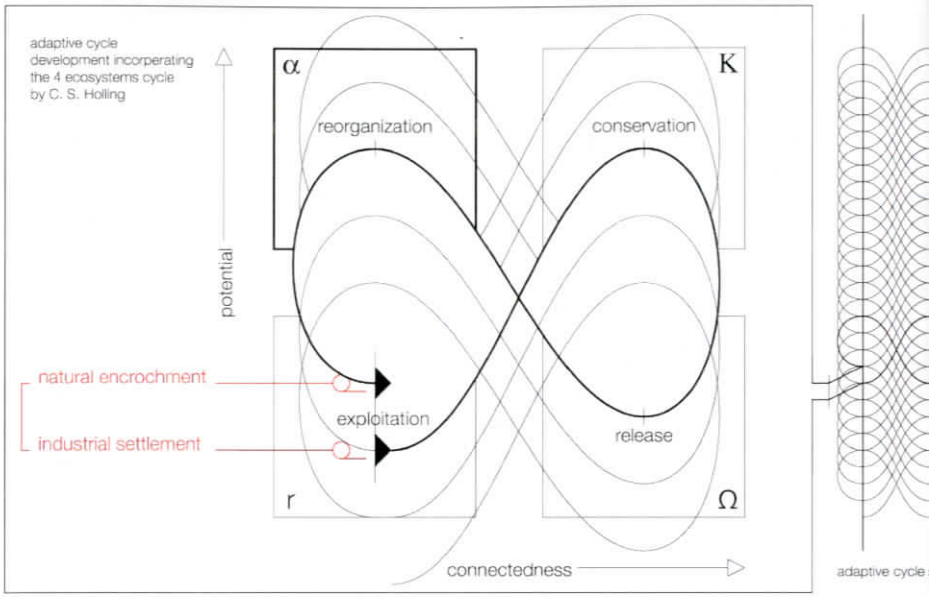


Inhabiting a new density of absence

The environment / scape become a product of all of the forces acting on it.

But what happens if a vacuum becomes the dominate generator of form?


Abandoned Properties



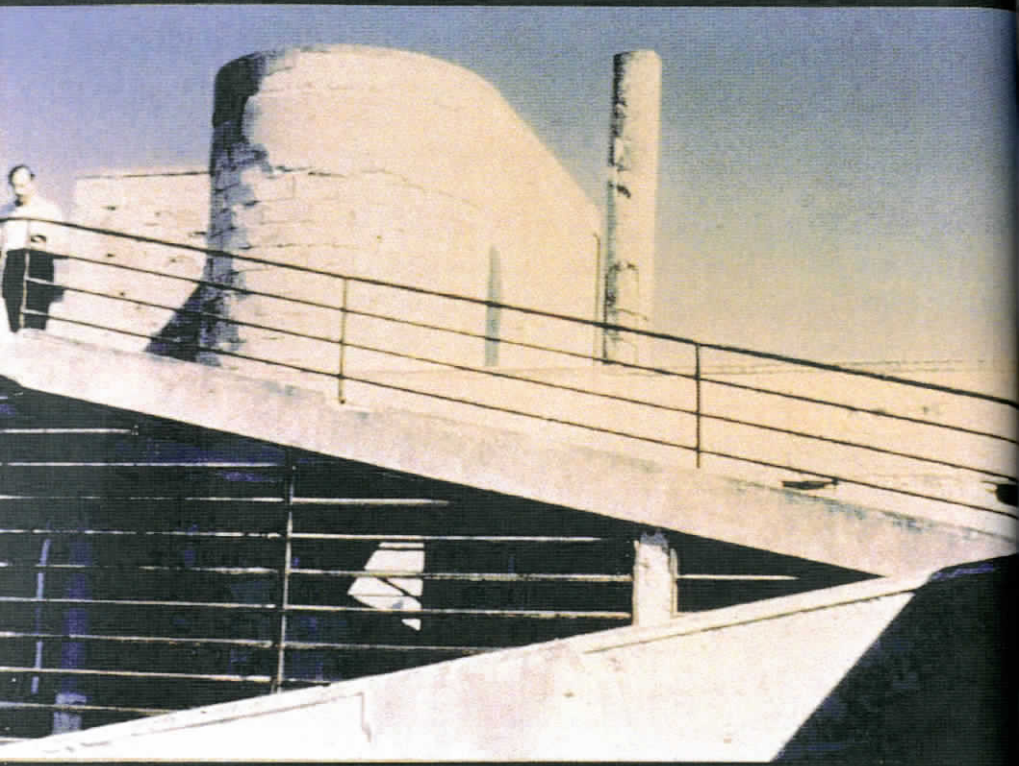
C.S. Holling's diagram of the 4 ecosystems cycle choreographs the energy transition from an agricultu ecology to an industrial ecology. Our current position is past the reorganization moment experiencing rise of an emergent organic ecology.

Emergence of a dormant Ecology

In the current ecosystem, development has given way to natural encroachment through th derelict and abandoned areas of the city

In and vacuum a dominate force will emerge through fractures taking advantages of weak points of a system exploiting them to seek an equilibrium

The most architectural thing about this building is the state of decay in which it is.



Architecture only survives where it negates the form that society expects of it. Where it negates itself by transgressing the limits that history has set for it.

Bernard Tschumi

nox Ceramic factory, Oak st. Trenton, NJ

Angkor Wat, Cambodia

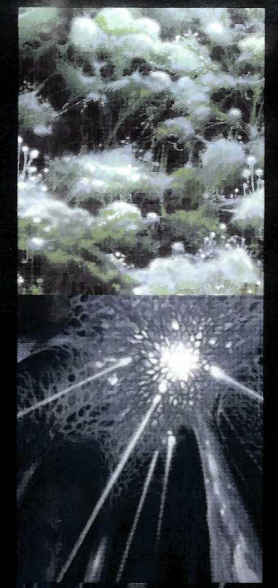
Chernobyl, Pripiat, Ukraine

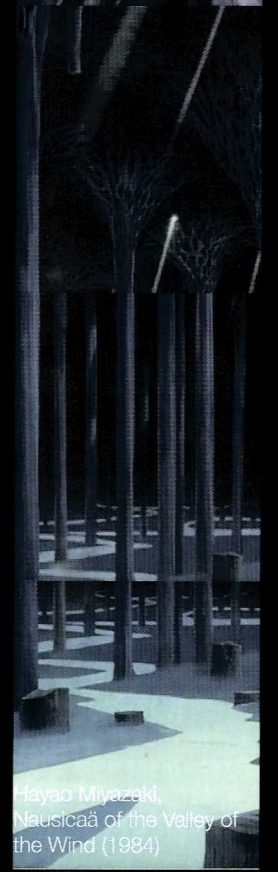
Squint Opera : Flooded London (2008)

Guillermo del Toro, Hellboy II: The Golden Army (2008)

History Channel : Life After People (2007)

Andrei Tarkovsky, Stalker (1979)



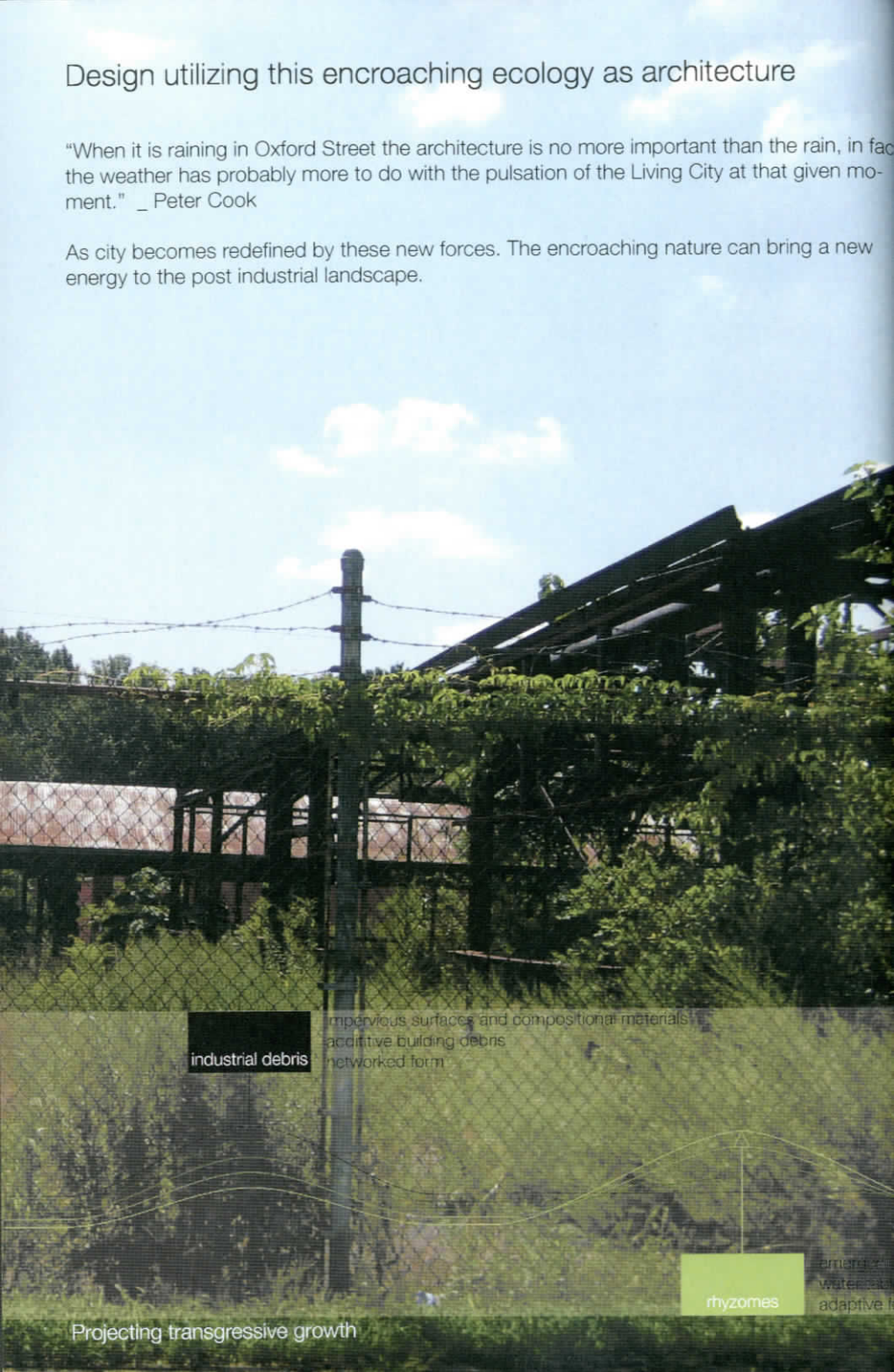


Hayao Miyazaki, Nausicaä of the Valley of the Wind (1984)

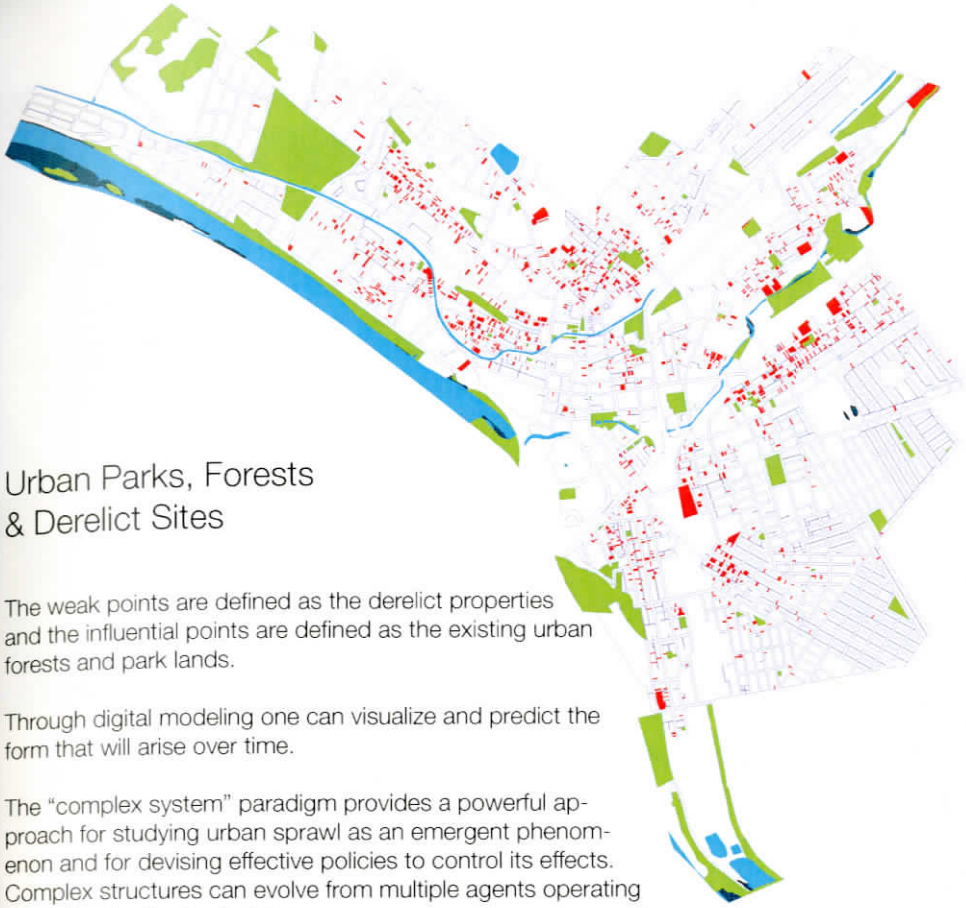
Design utilizing this encroaching ecology as architecture

"When it is raining in Oxford Street the architecture is no more important than the rain, in fac the weather has probably more to do with the pulsation of the Living City at that given mo- ment." _ Peter Cook

As city becomes redefined by these new forces. The encroaching nature can bring a new energy to the post industrial landscape.



Projecting transgressive growth



Urban Parks, Forests & Derelict Sites

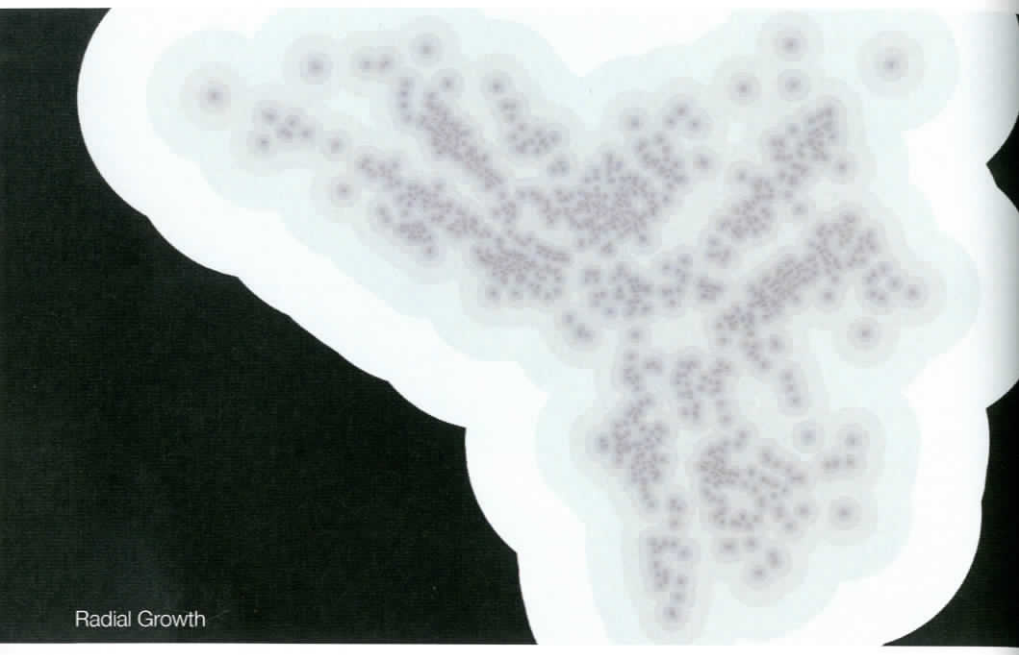
The weak points are defined as the derelict properties and the influential points are defined as the existing urban forests and park lands.

Through digital modeling one can visualize and predict the form that will arise over time.

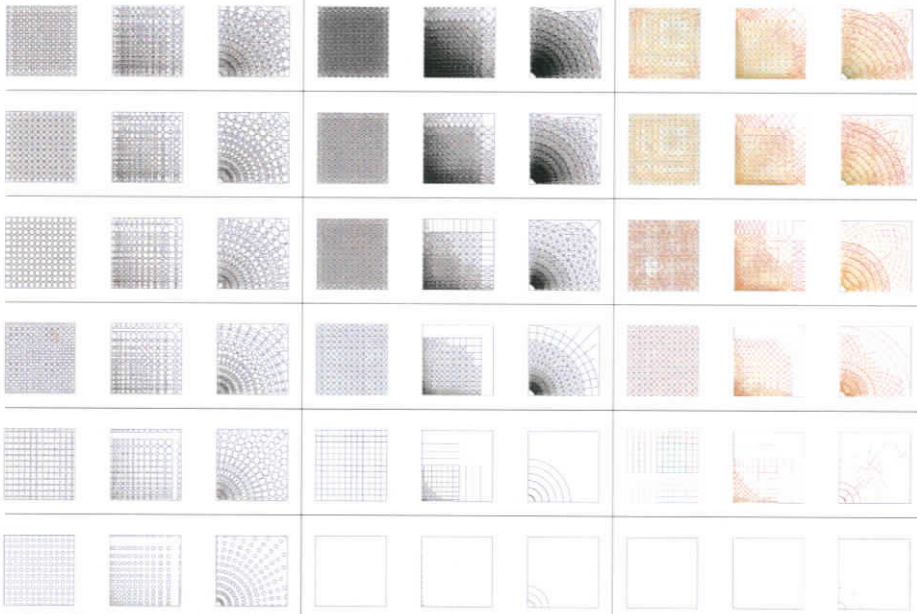
The "complex system" paradigm provides a powerful approach for studying urban sprawl as an emergent phenomenon and for devising effective policies to control its effects. Complex structures can evolve from multiple agents operating according to simple decision.
_ Marina Alberti

"Map is the metastream, The geographical map is now a changing graph, which has turned into an active architecture."
_ Marle-Ange Brayer

Projecting Growth



Radial Growth



Point Radial expansion

Circles created through a field of points by a radial distance. The greater the radial tolerance the more connections created.

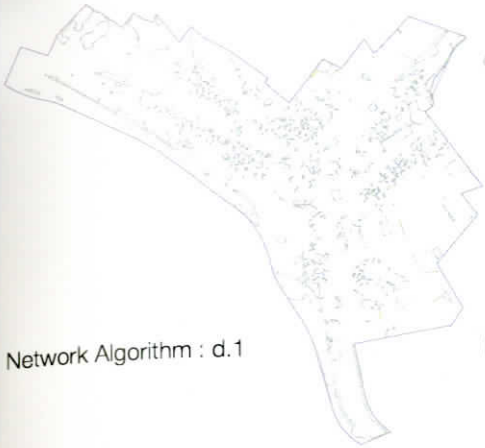
Point Radial Distance

Lines are created with in a field of points through a max radial distance. The greater the radial tolerance the more connections allowed.

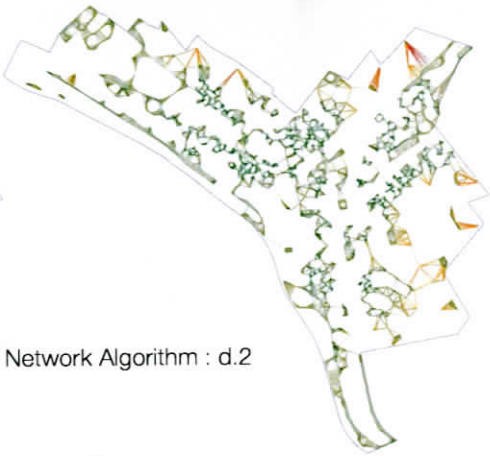
Network

Connectivity networks are about point neighbours. They can be used to map to the nearest neighbours in a large cloud. At this point, networks are still 2D entities. Connections between points can be limited to a certain amount per point, or to a certain length of the connection or both. _Rhino Labs

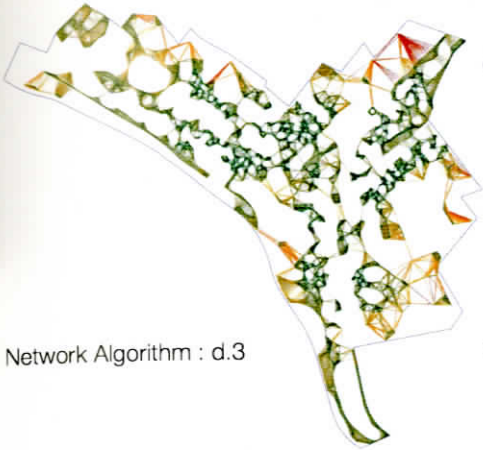
The colors are legitimations of distance. (green = near / red = far



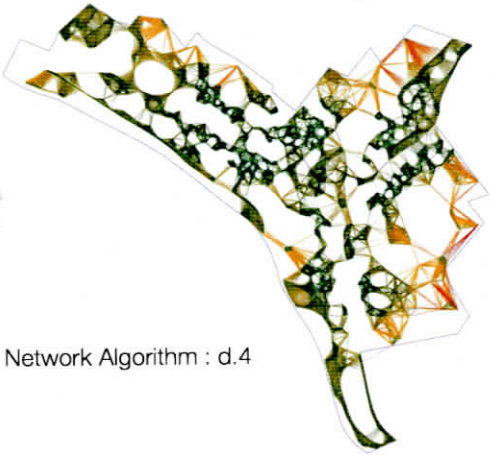
Network Algorithm : d.1



Network Algorithm : d.2



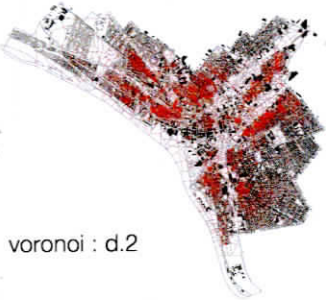
Network Algorithm : d.3



Network Algorithm : d.4

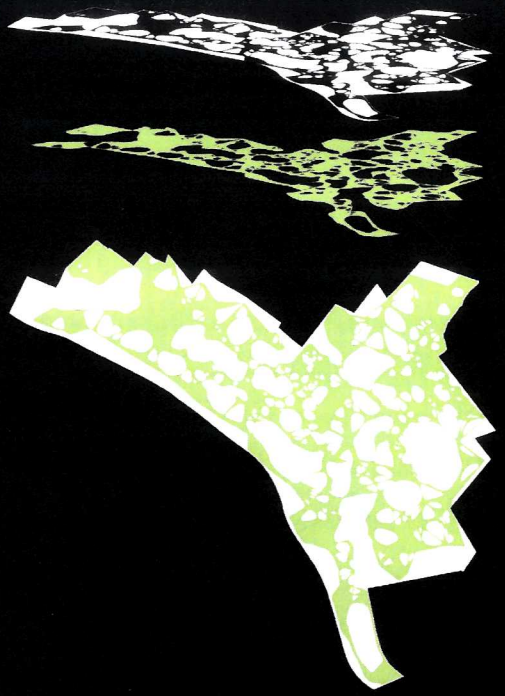
Weighted spatial analysis of derelict properties and urban forests

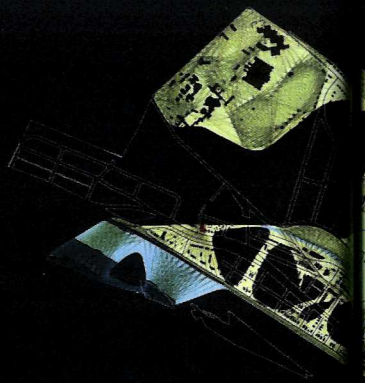
voronoi : d.1



voronoi : d.2

voronoi : d.3





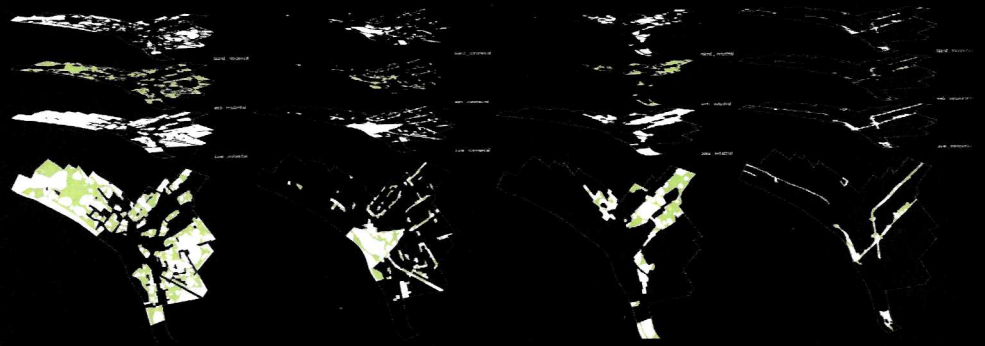
The new projected city exits as a heterogeneous nested environment.

One is maintained by current practices.

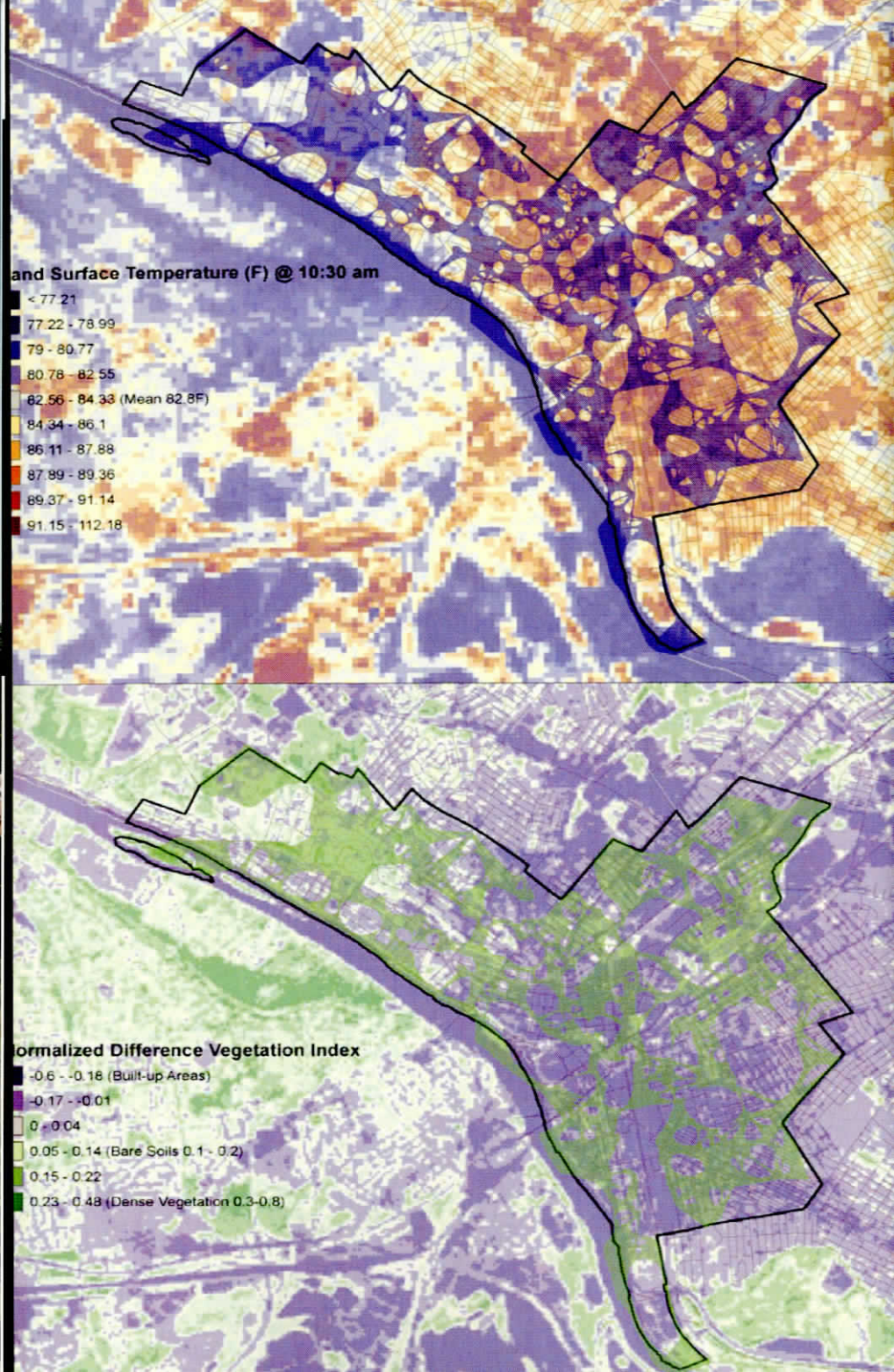
The other is transformed by the proliferation of derelict properties and the encroaching ecosystem.

"If capital is no longer the driving force of urban organizations, what alternative forms will collective dwelling take?
...
If capital and the state-based economy disappear, cities may cease to be a viable form of dwelling, requiring new spatial, geopolitical, cultural and economic organizations."

_Laurent-Paul Robert &
Dr Vesna Petresin Robert



The old city becomes re defined by this new force leaving pockets of activity still connected by old routs. The new city emerges with territories transformed by the rising ecosystem.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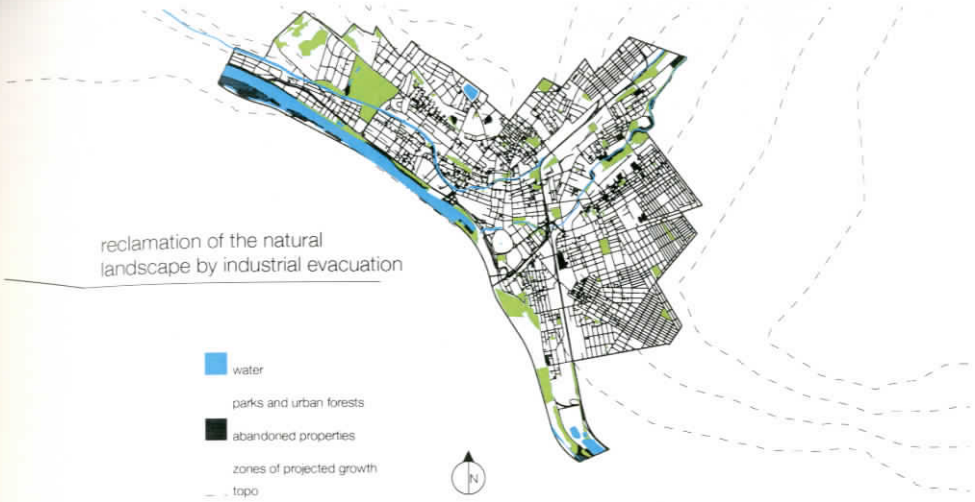
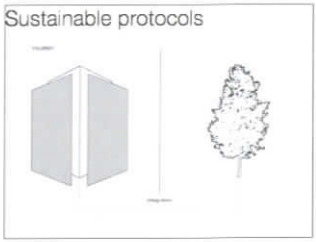
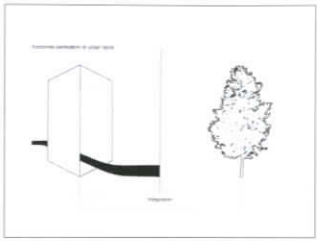
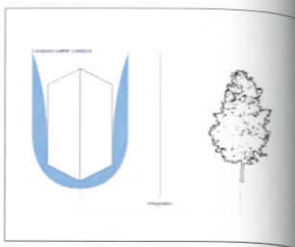


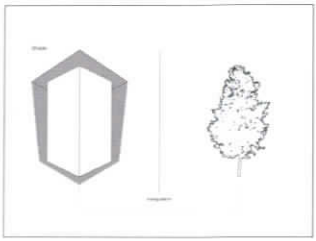
Increased vegetation diminishes heat islands and reestablishes the water table minimizing stress on the inhabitants

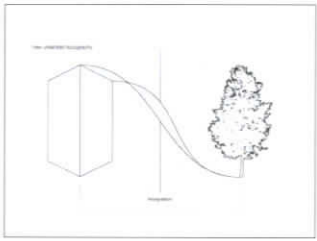
Sustainable protocols

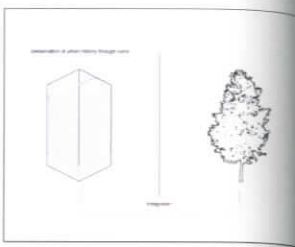


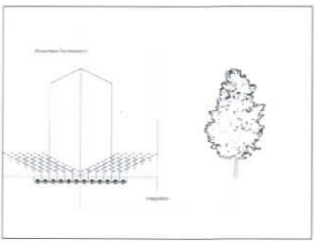


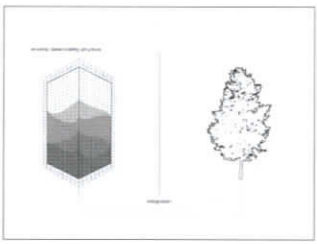












Benefits of Urban Forests

Facilitating this new ecosystems gives us the opportunity to remediate the post industrial urban environment.

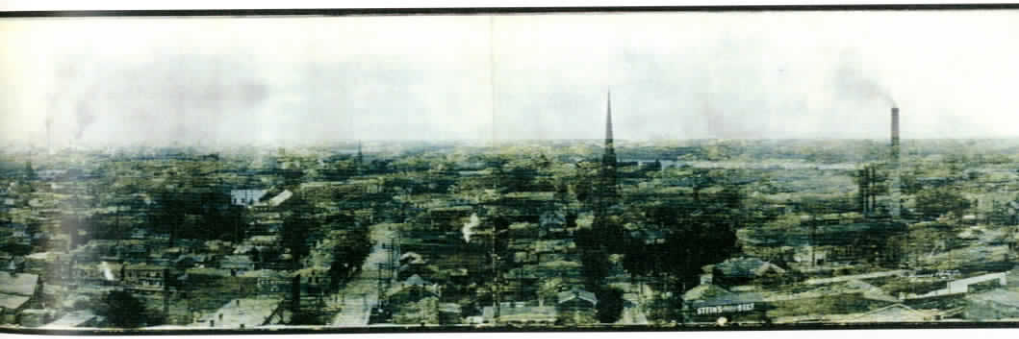
{+} effects
_ create an equilibrium of the urban environment through the filtration of air and sunlight.
_ provide shelter for animals – nesting sites
_ recreation area for people – socialized spaces
_ relieve stress through environment
_ moderate local climate, barrier for wind and storm water
_ shading structures for energy conservation
_ cool heat islands
_ humidity control
_ reduce ozone
_ enhancement of property values
_ improved wildlife habitat
_ reduction of air pollution particulates and toxic molecules

{-} effects
_biogenic volatile organic compounds

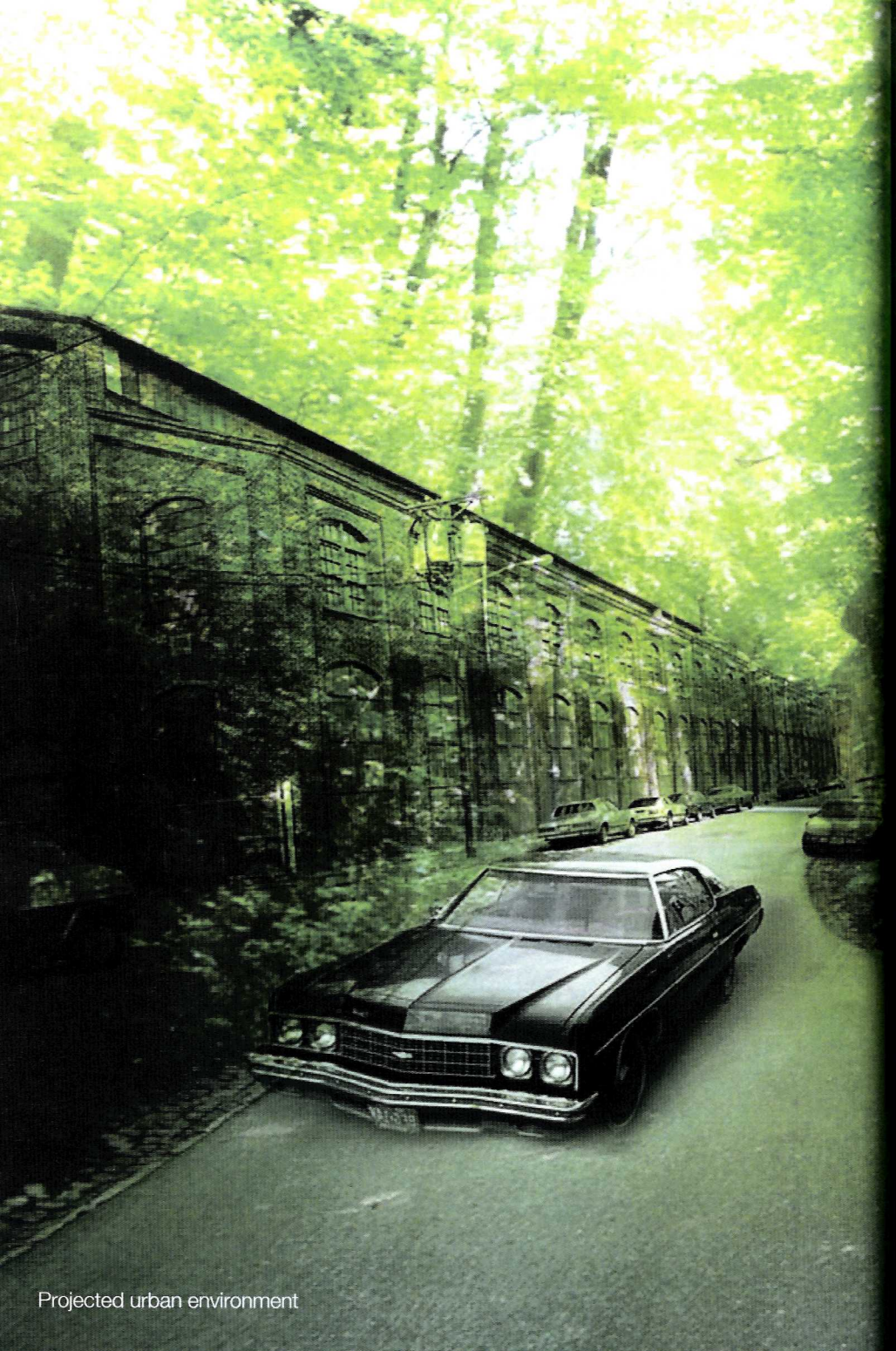
Carbon banking and Air Particulates

The introduction of vegetation into an environment can be a way to generate revenue. Carbon finance through offsetting carbon dioxide emissions through the photosynthesis of a density of plants.

Vegetation also acts to remove particulates from the air. They have the ability to tram and adsorb toxic partials and sealing them within their bodies or metabolizing them.

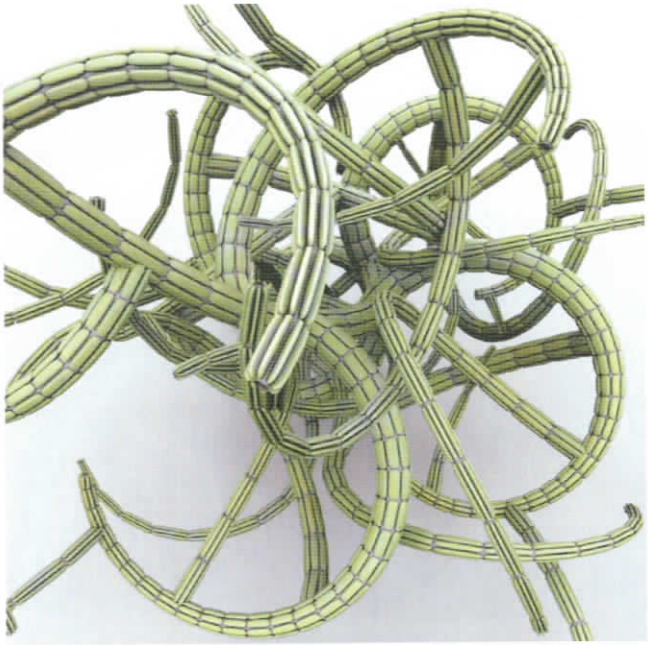


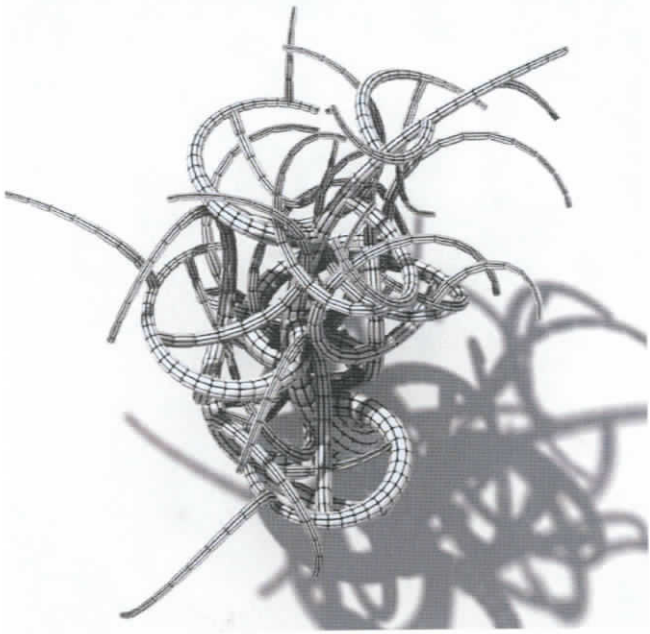

WEBSTER
CIGARS
DO NOT

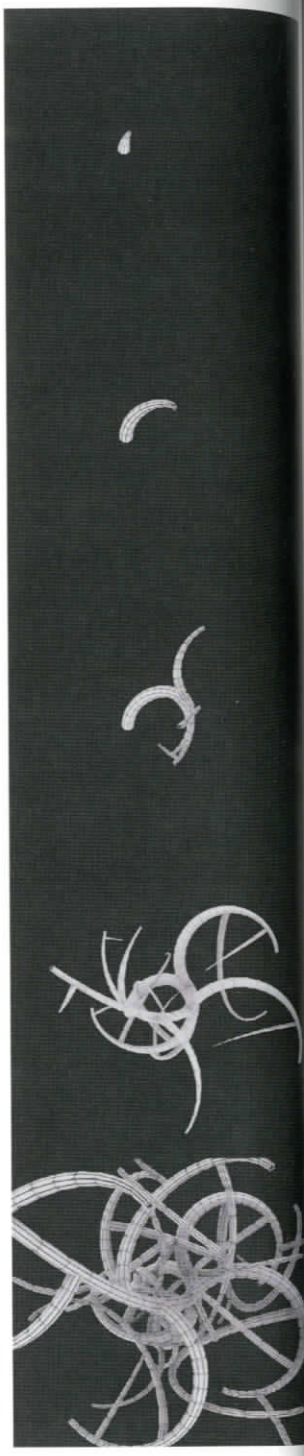


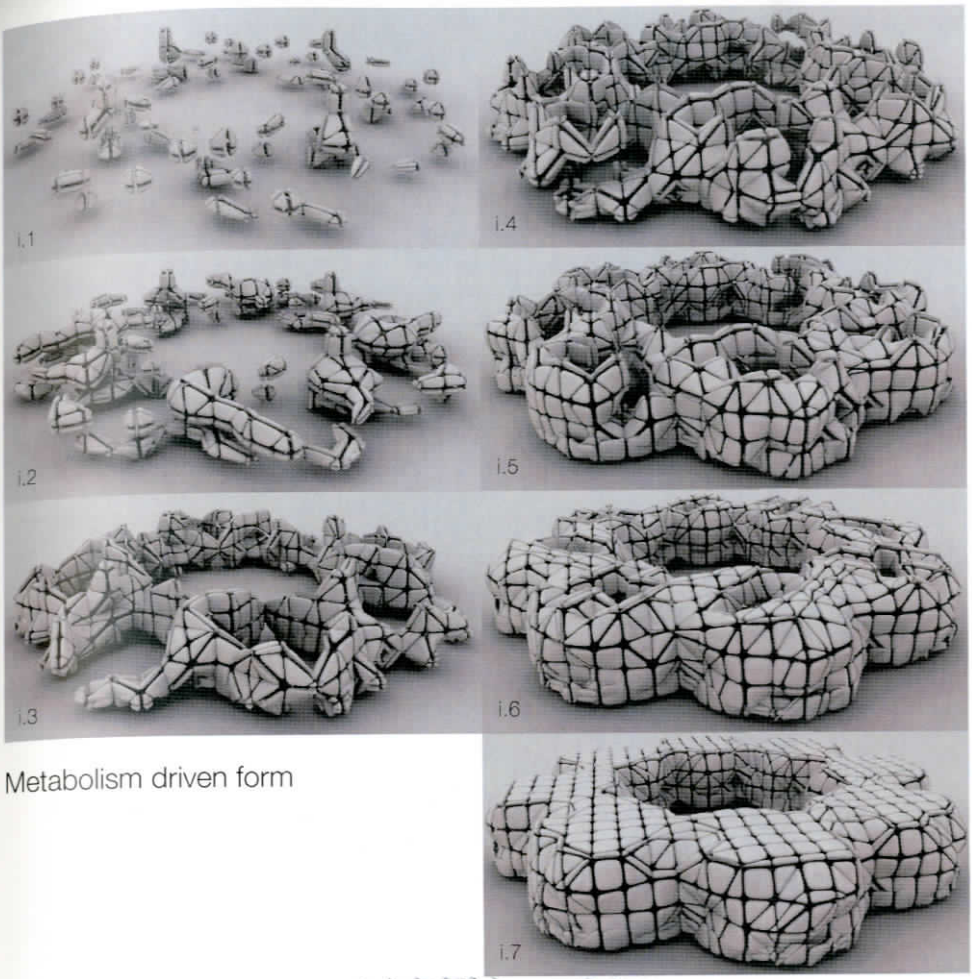
Projected urban environment

Projected urban environment

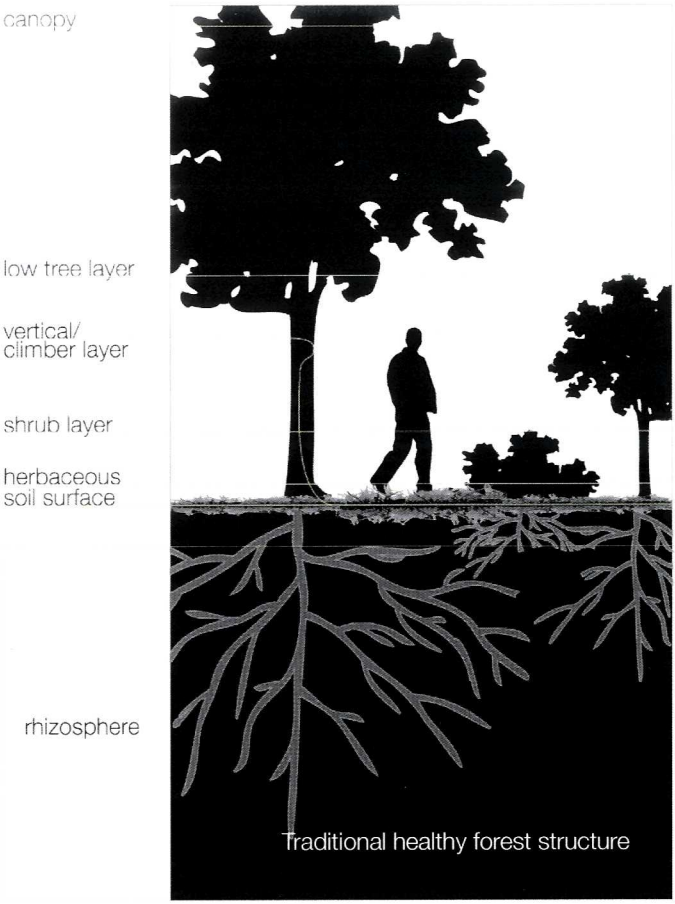




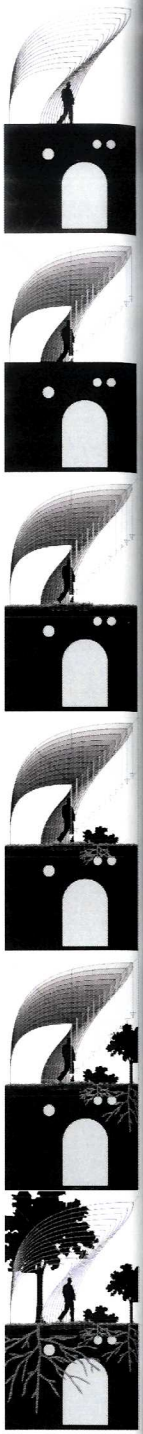




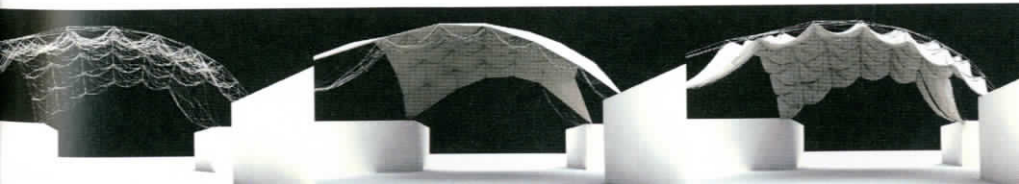
Metabolism driven form

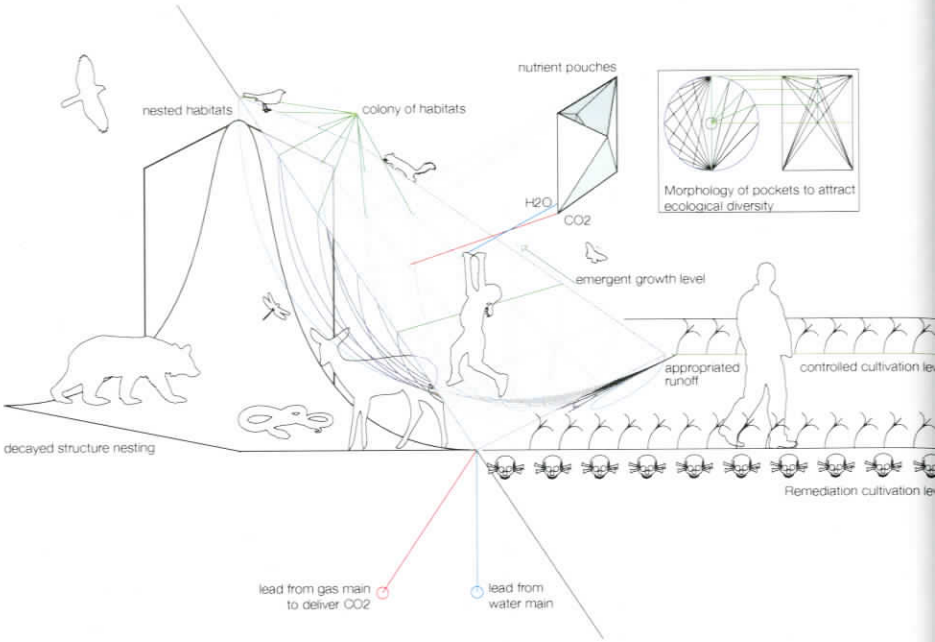


This new ecosystem can be encouraged by providing them an armature. One that facilitates growth and effects the structures on the existing landscape



1" = 100 '-0"

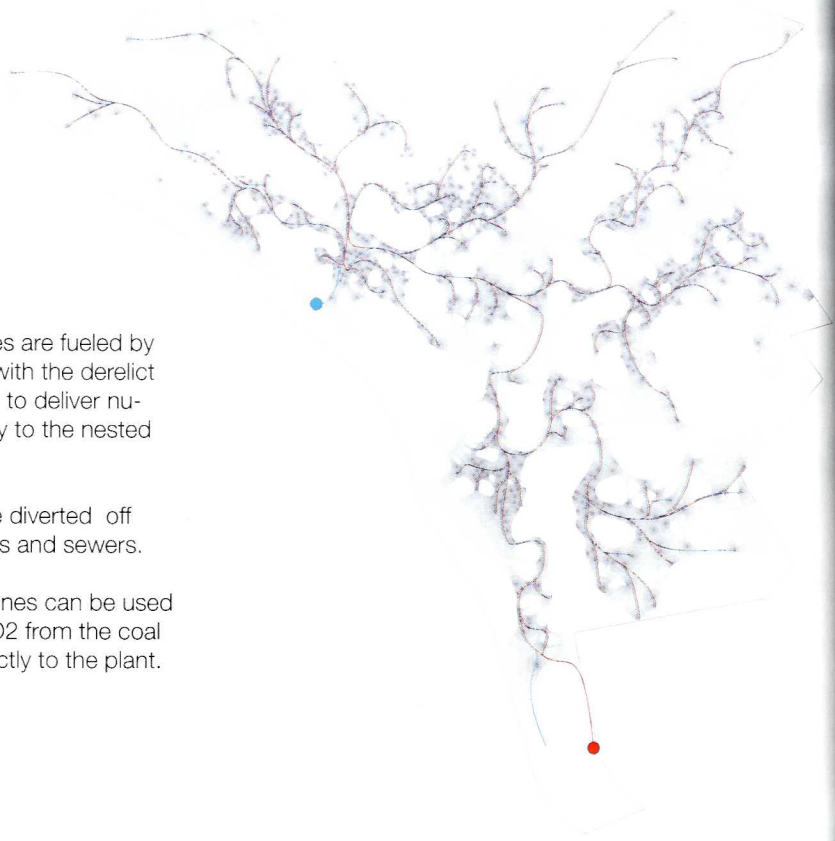




Surface morphology protocols


Networking structures to create new colonies of growth
Connected canopies

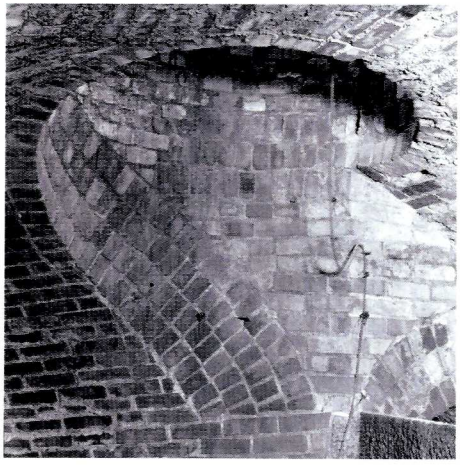
Derelict Infrastructure Integration

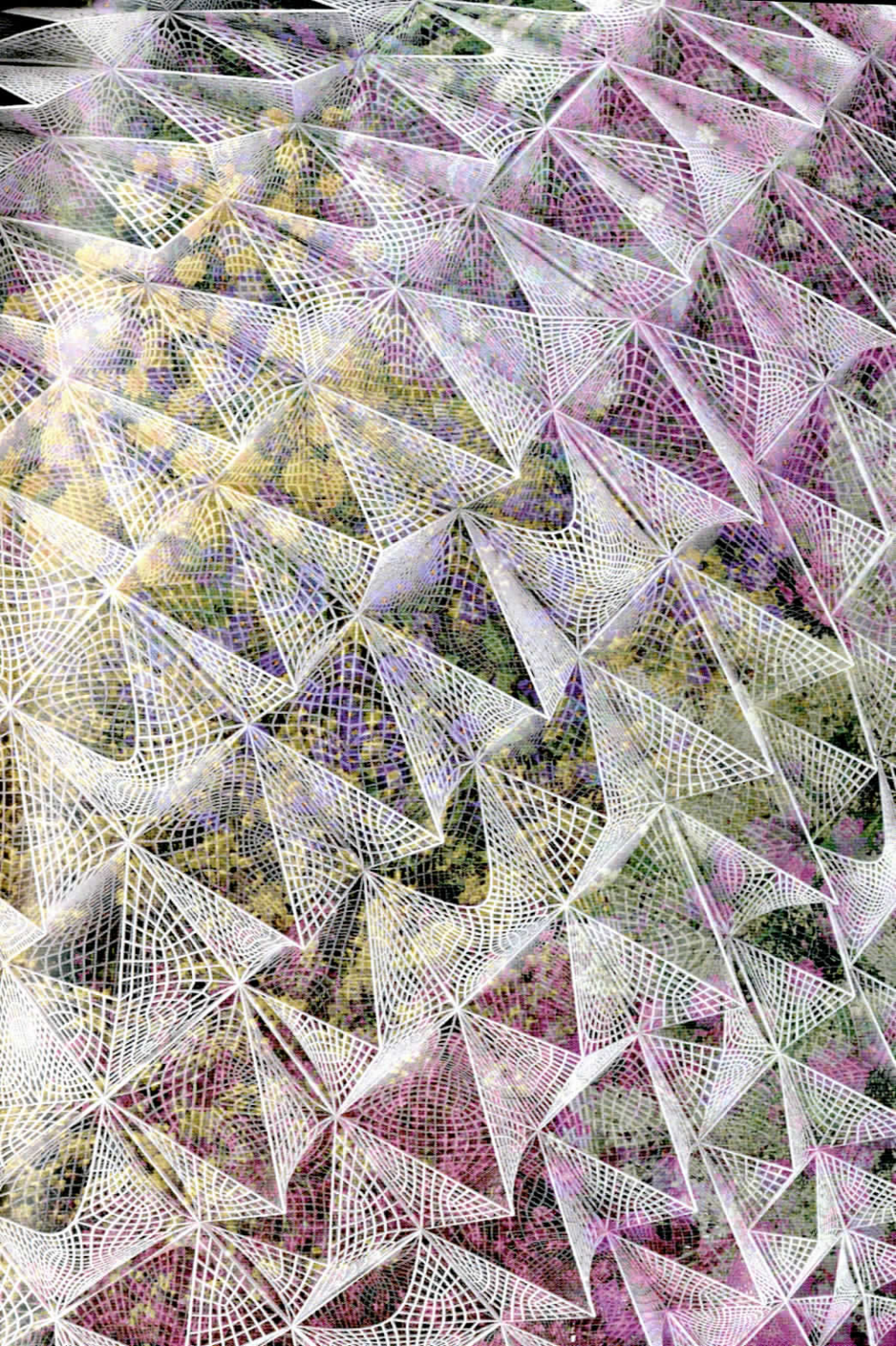


The armatures are fueled by an interface with the derelict infrastructure to deliver nutrients directly to the nested plants.

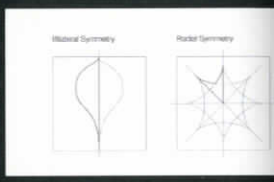
Water can be diverted off existing mains and sewers.

Derelict gas lines can be used to reroute CO2 from the coal fire plant directly to the plant.





Synthetic organism construct



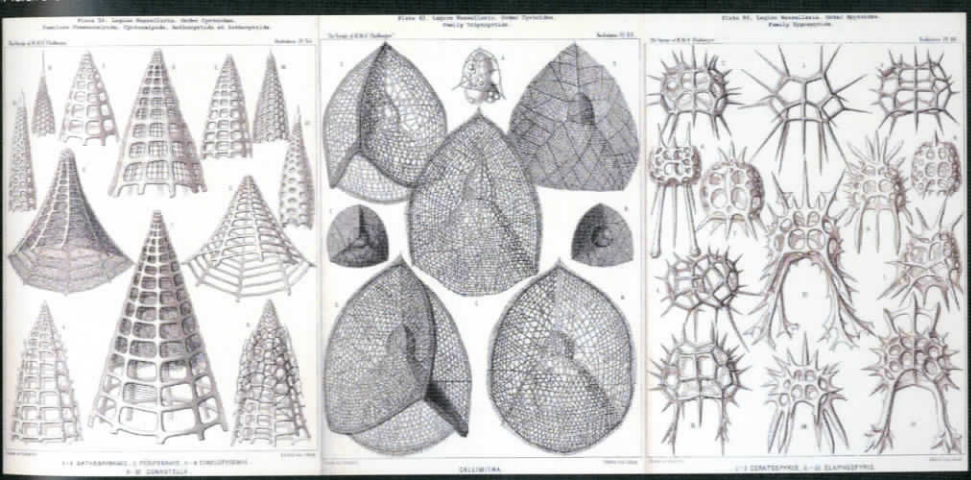
The armatures create nested colonies of organism

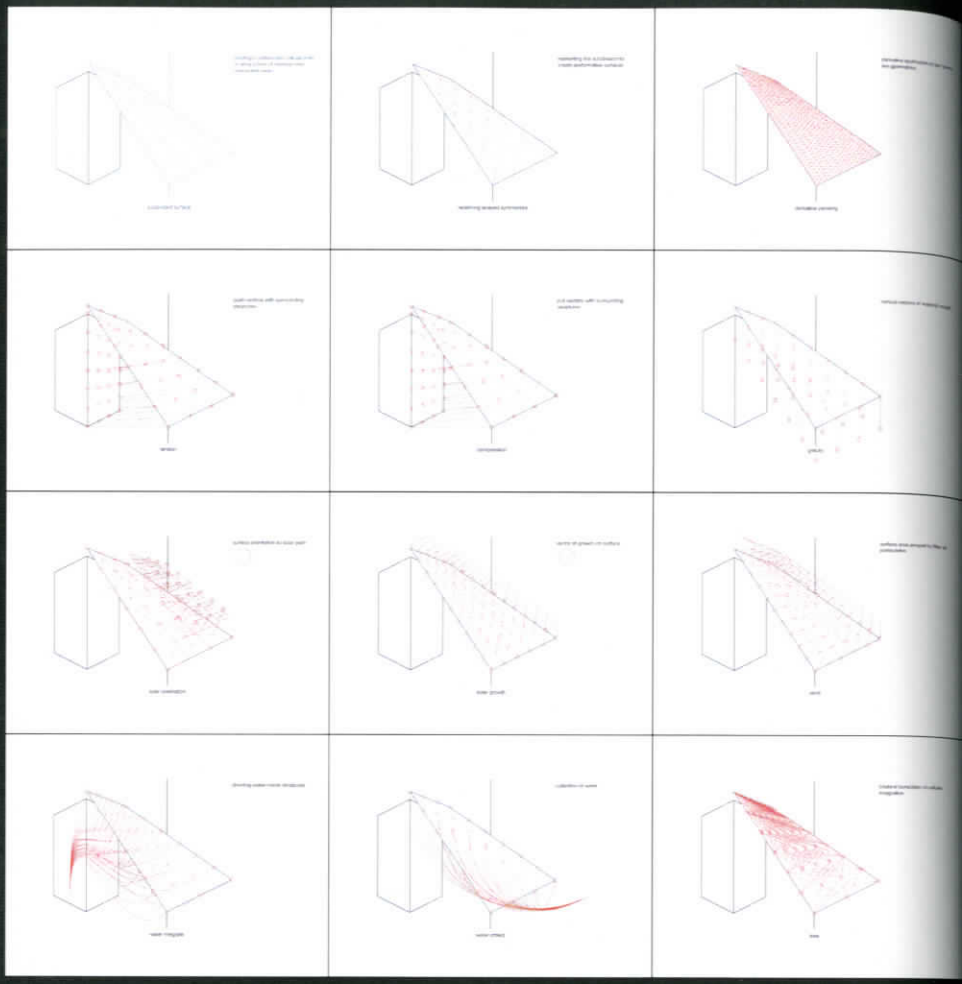
The armatures itself is designed as a colony of interacting parts

"modern mind has become more and more calculating. The calculative exactness of practical life which the money economy has brought about corresponds to the ideal of natural science: to transform the world into an arithmetic problem, to fix every part of the world by mathematical formulas."

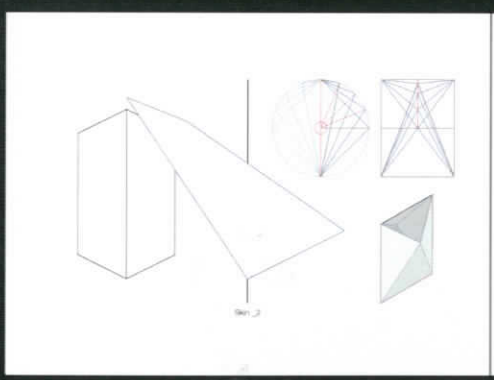
_ G. Simmel

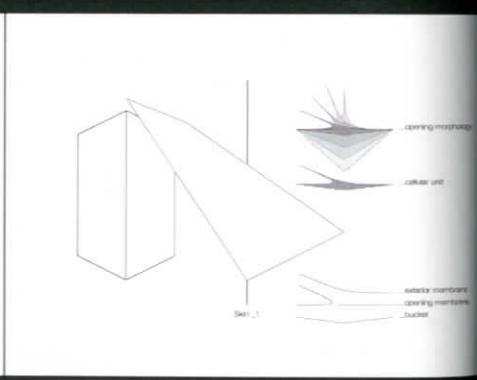
Radiolarians



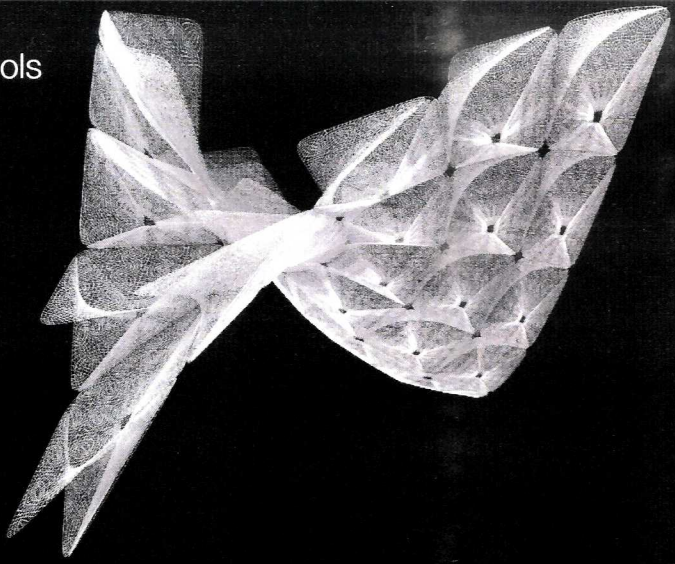


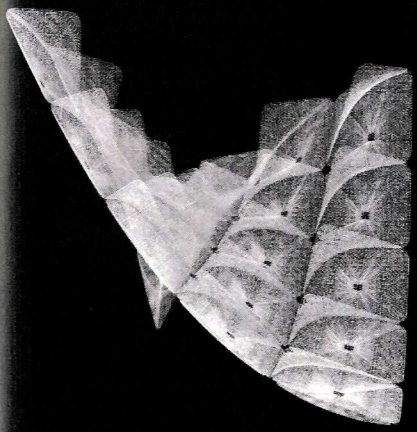
Relationships are based on circulation and surface area

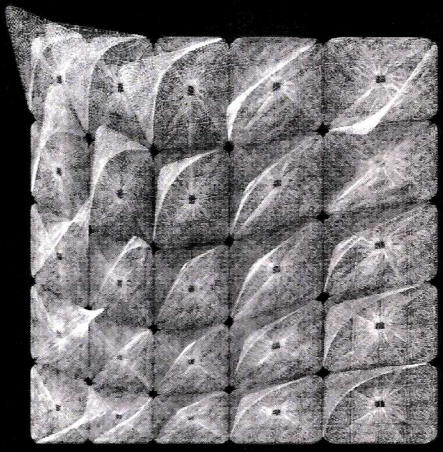


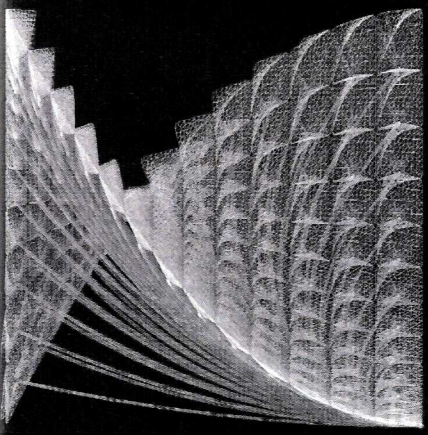


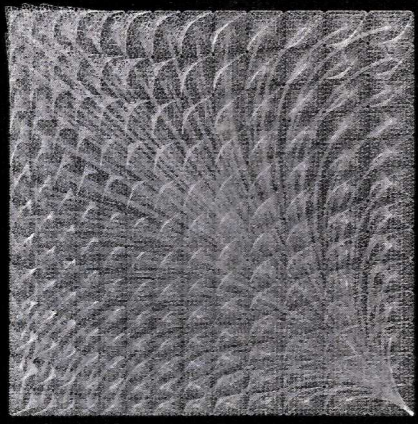
Application of Protocols
to a surface

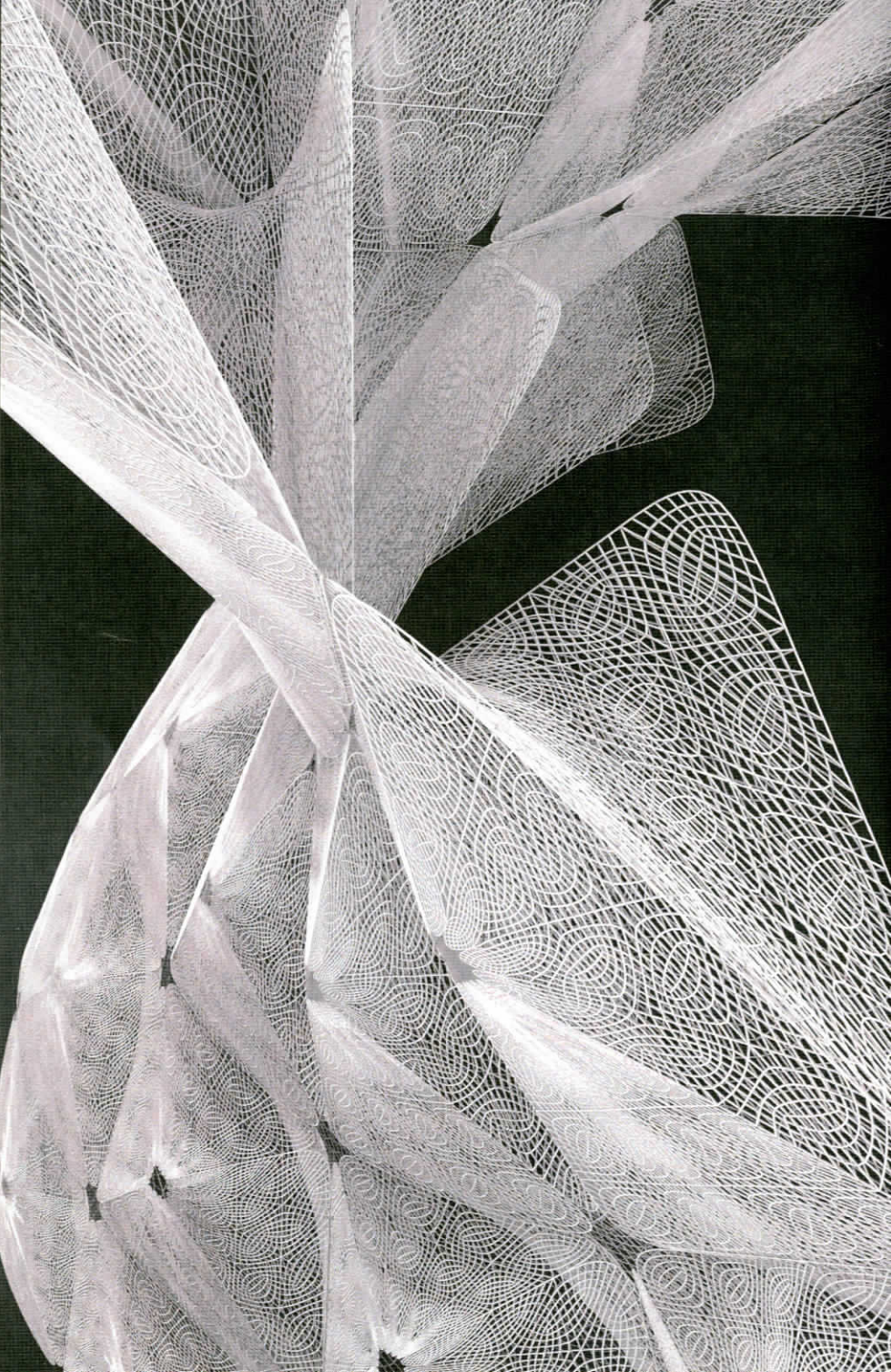


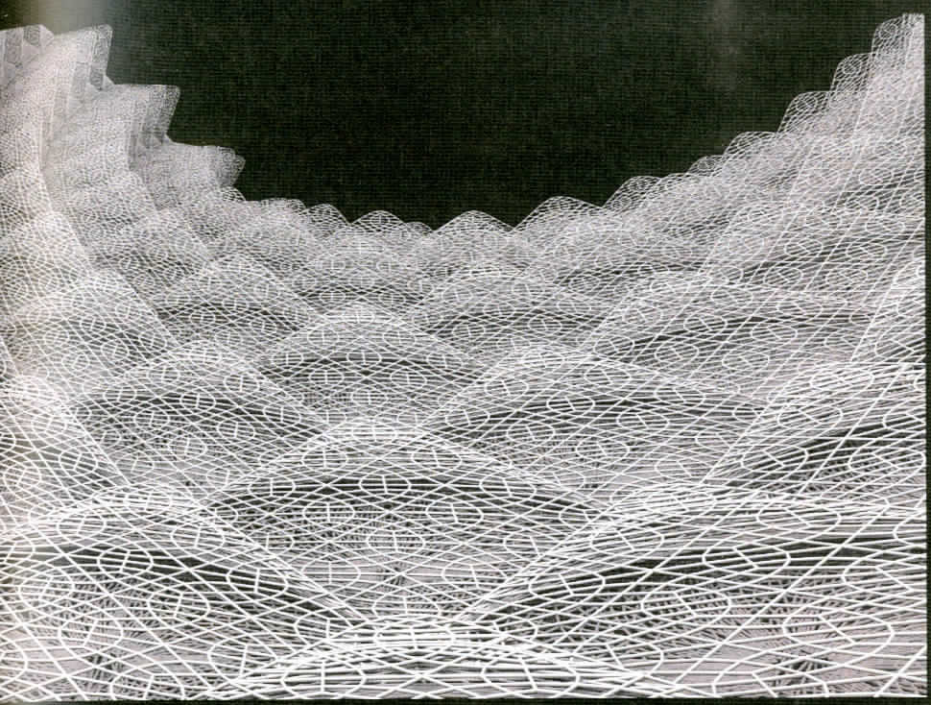




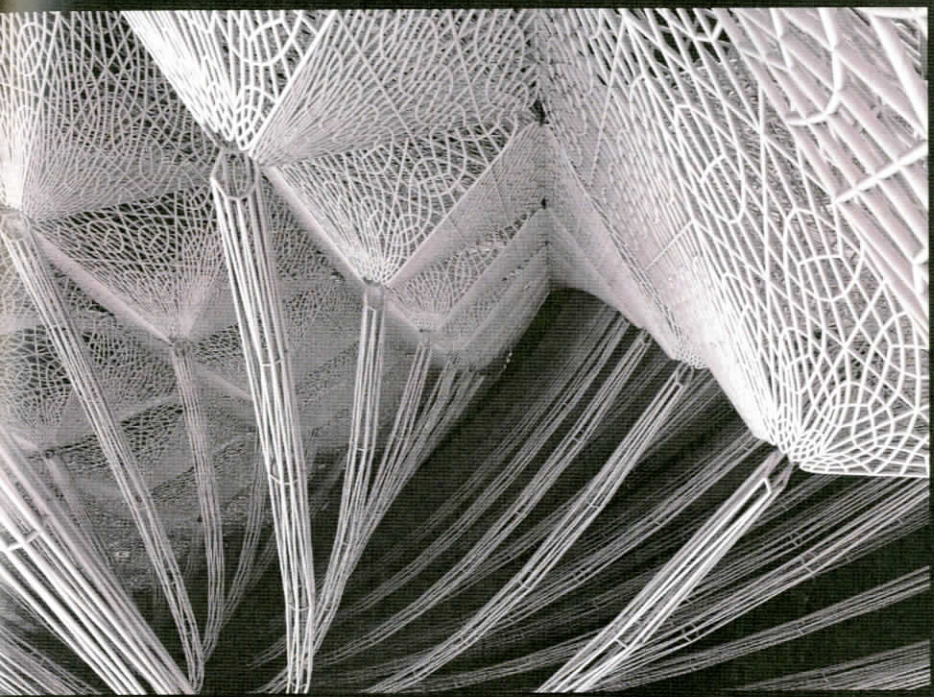




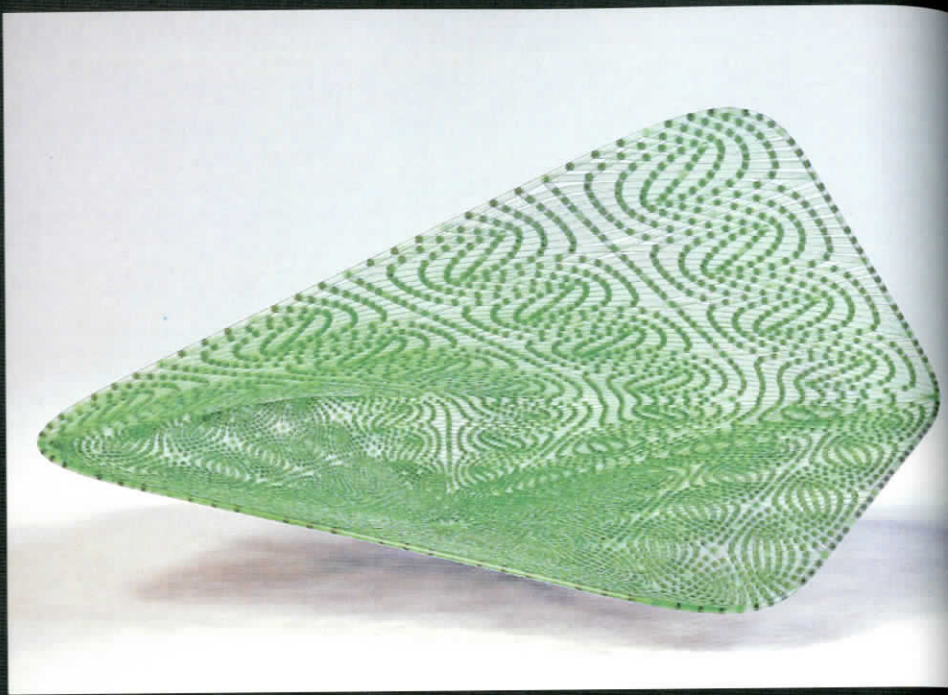




iew of array

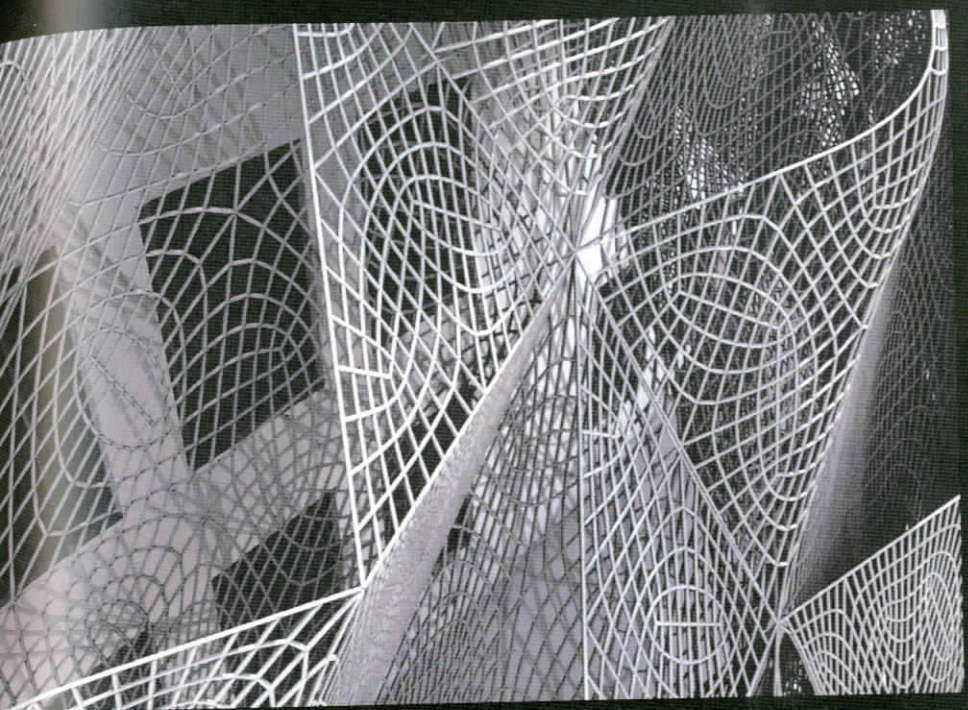


om view of array

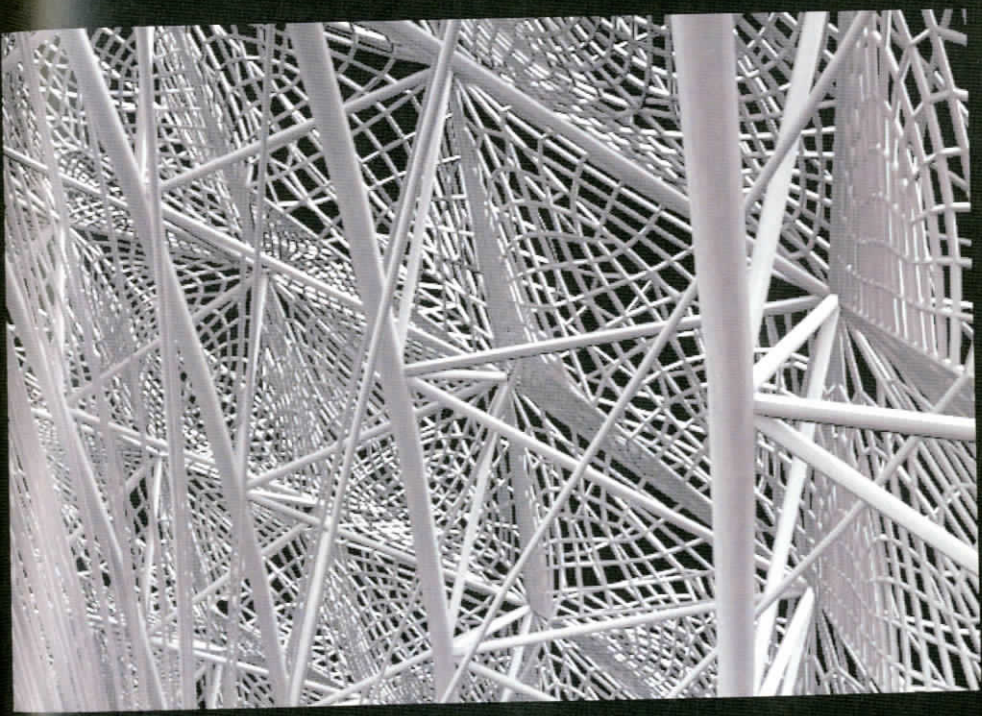


nutrient pouch and H20 & CO2 manifold

drainage conduit

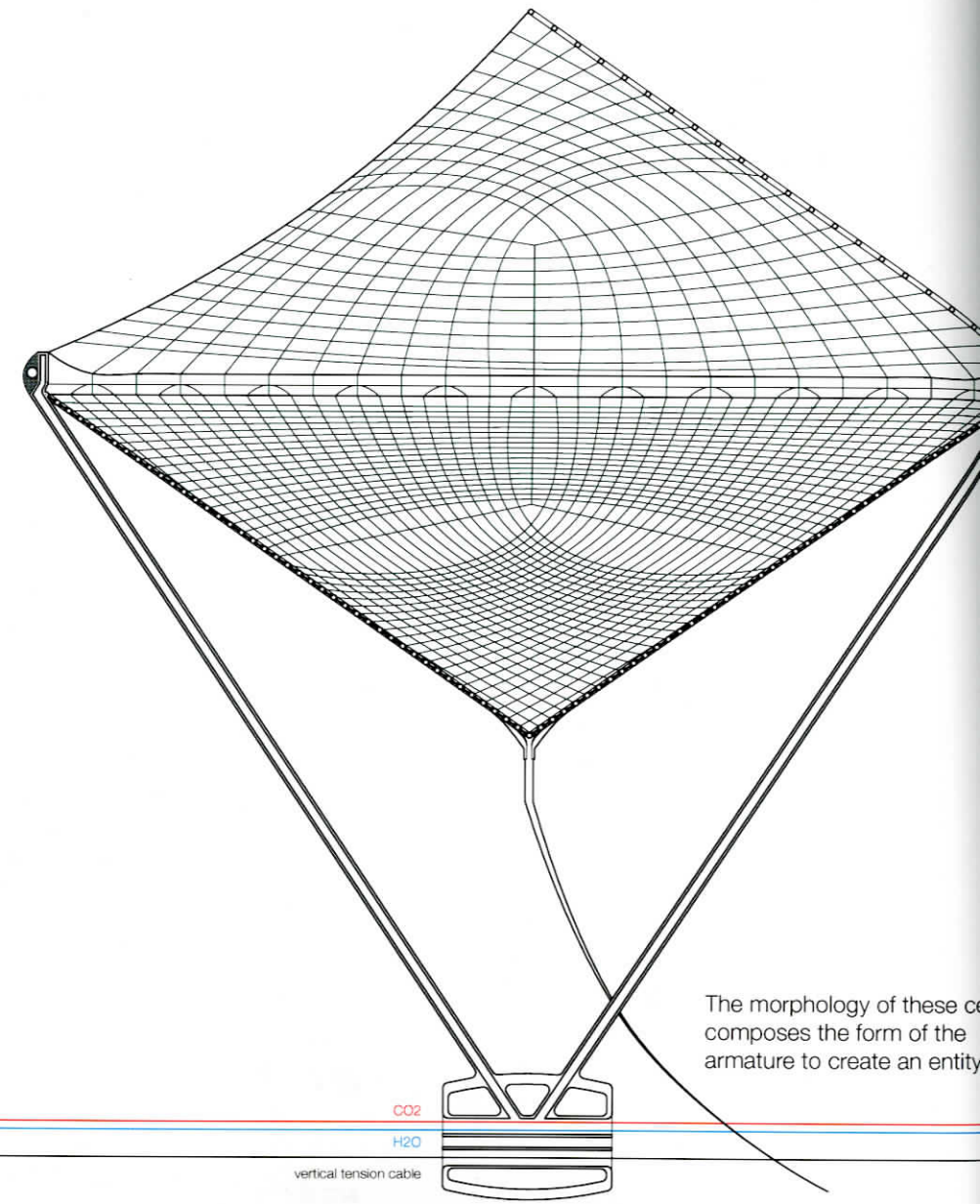


array of pouches to compose the surface

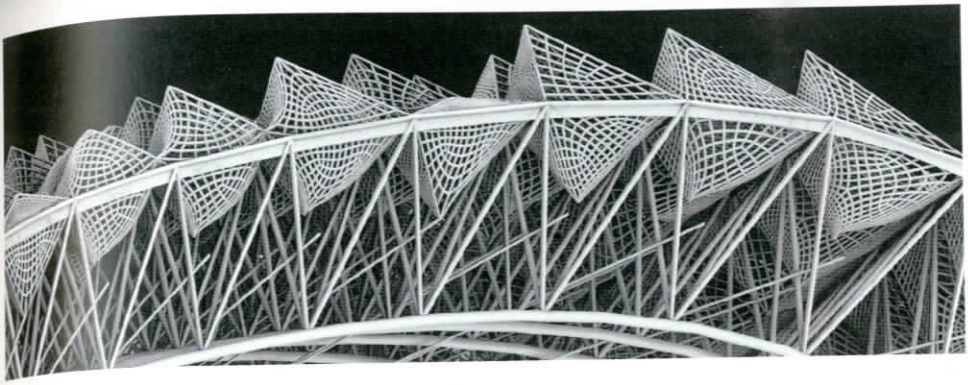


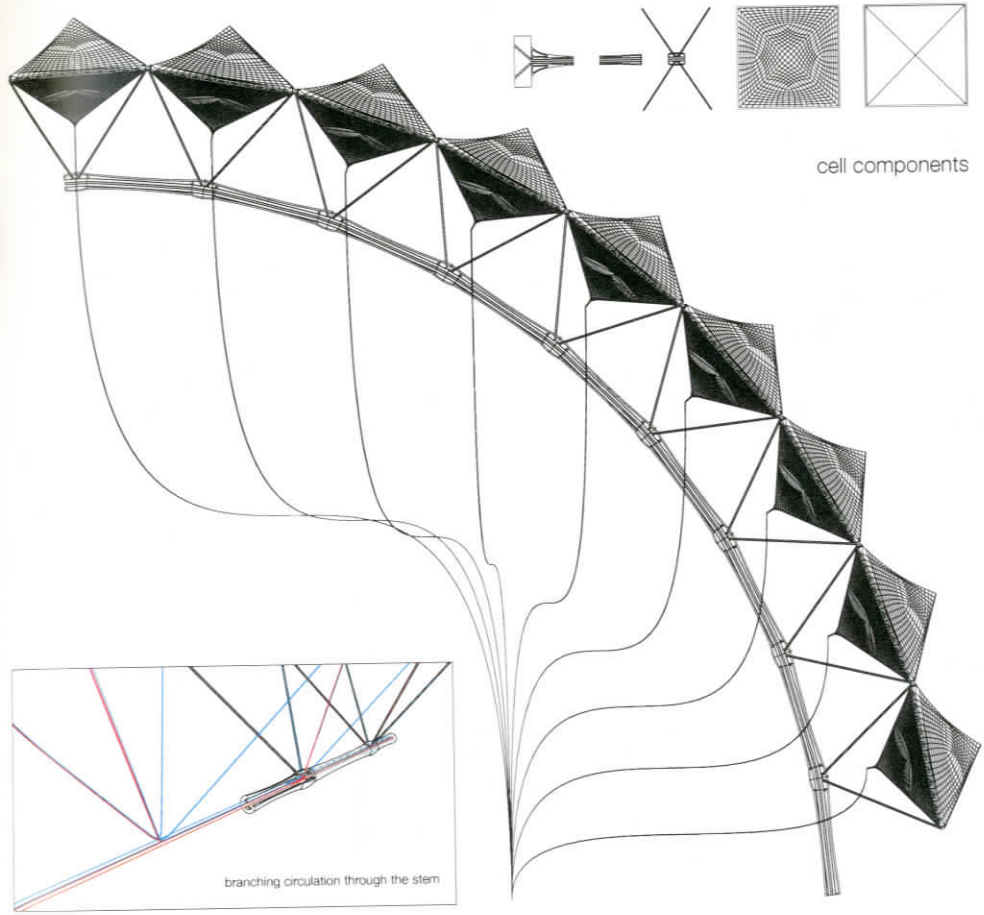
structural frame

Cell



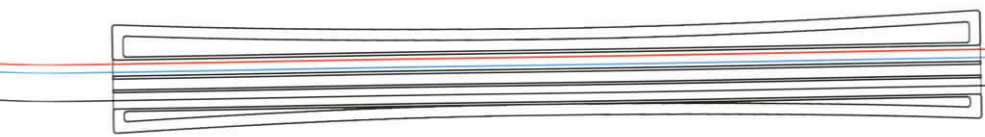
The morphology of these ce
composes the form of the
armature to create an entity





cell components

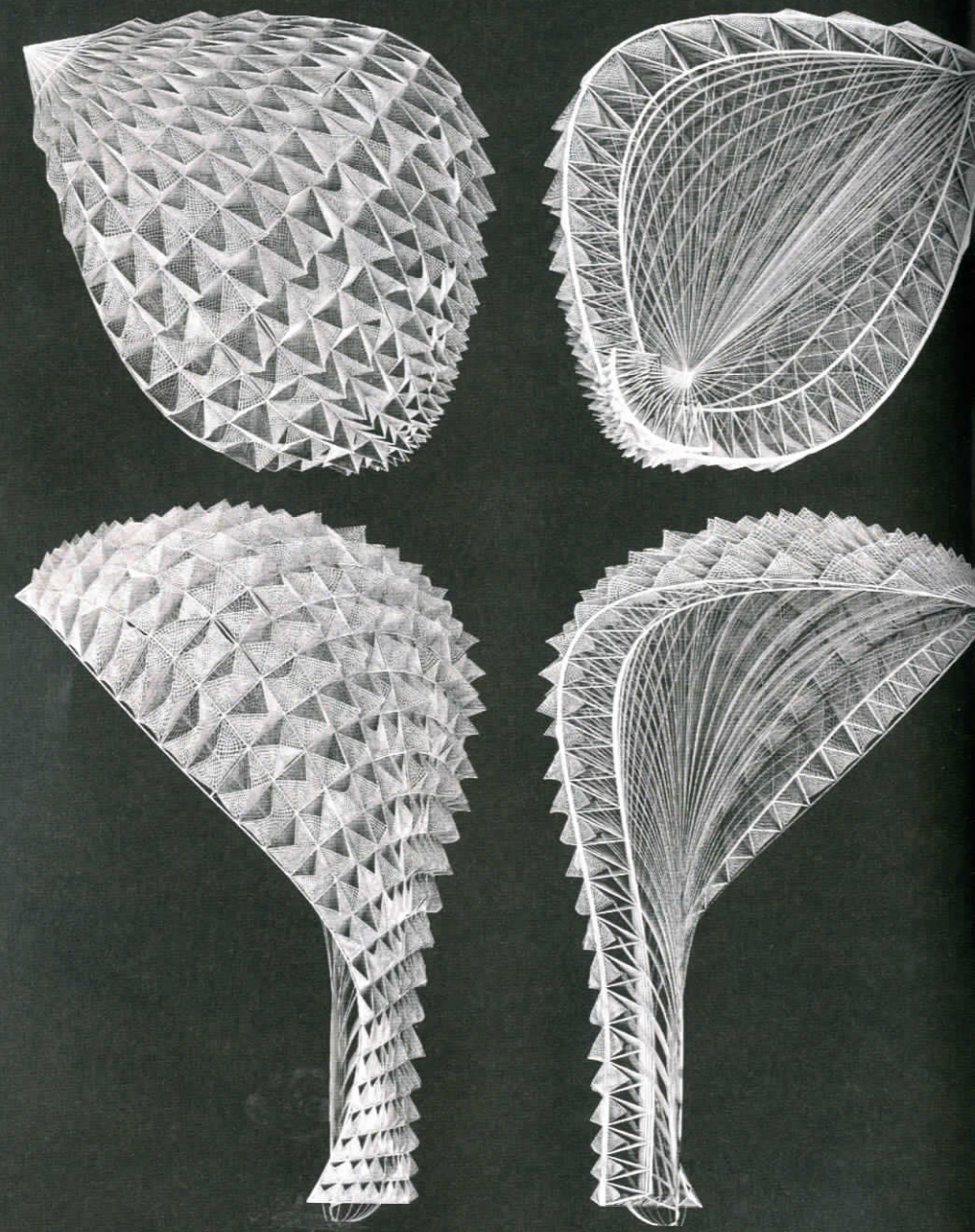
branching circulation through the stem

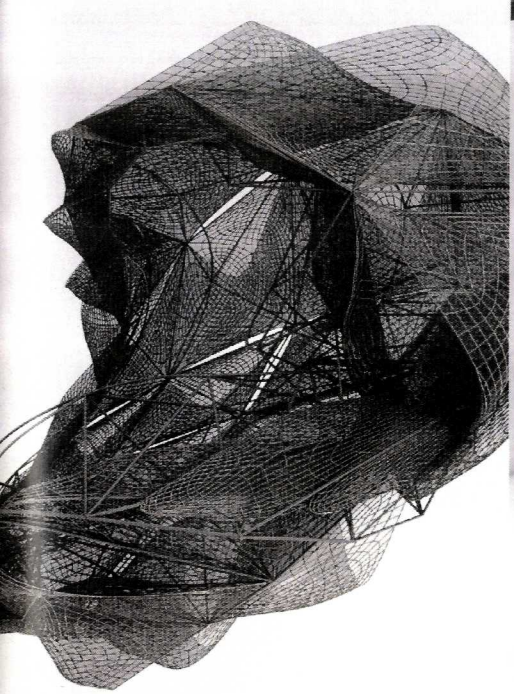


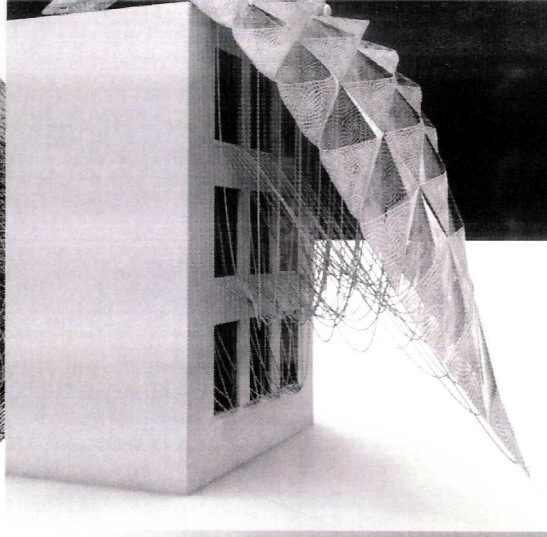
The armature becomes a colony of its inhabitants

"More technically, the idea is that despite the fact that at any one time an evolved form is rea
in individual organisms, the population not the individual is the matrix for the production of for

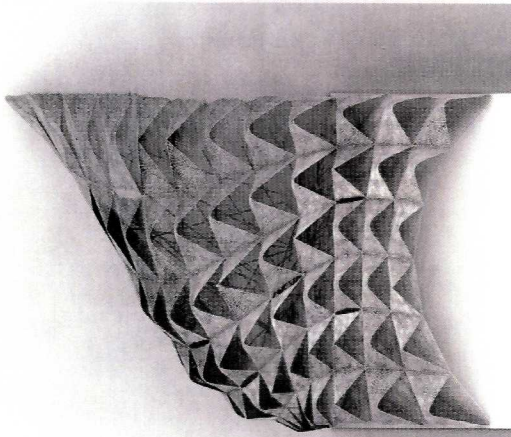
_ Manuel De Landa



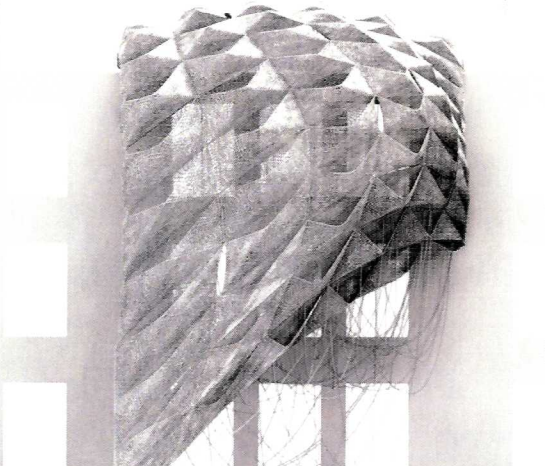


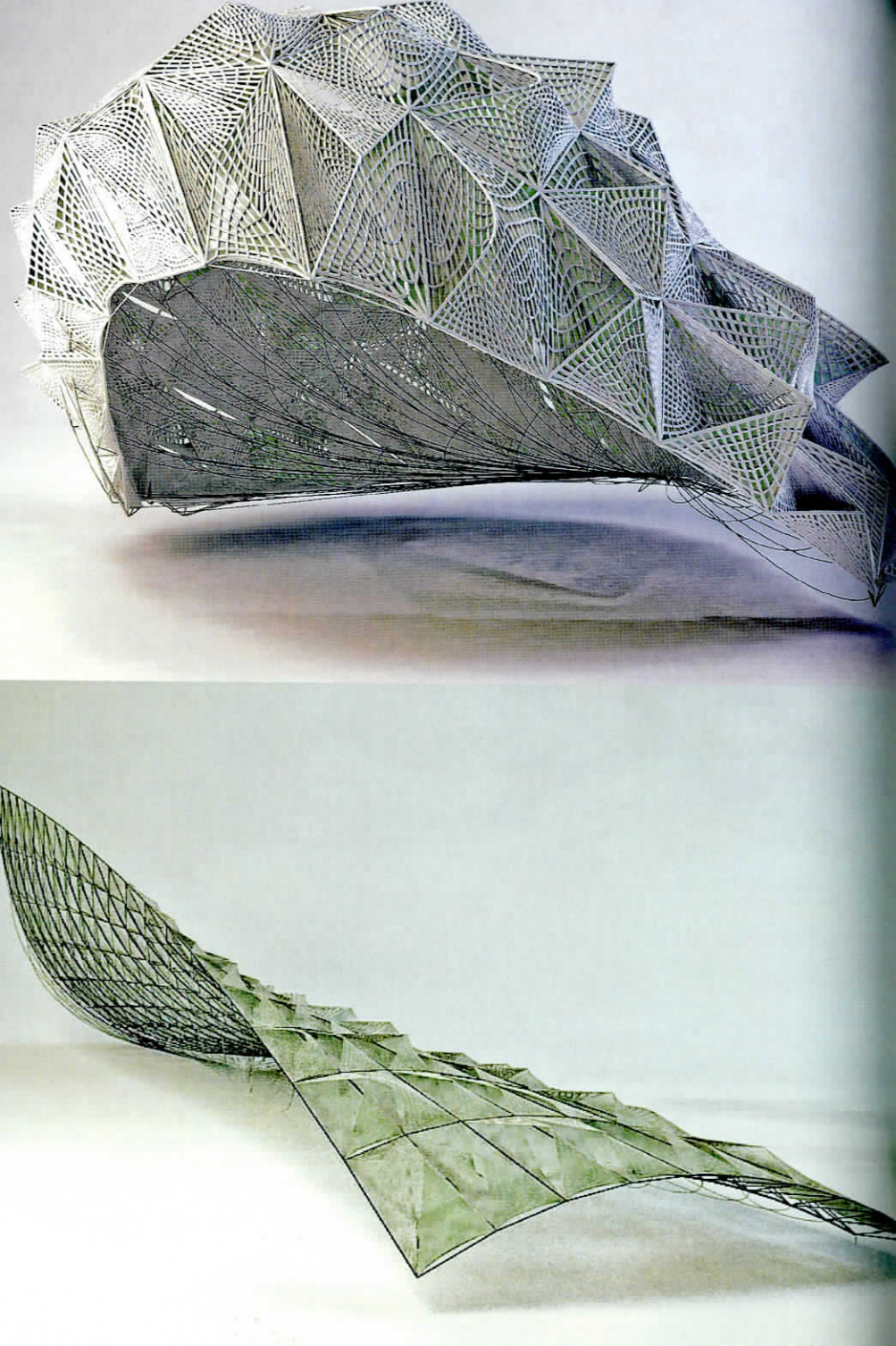


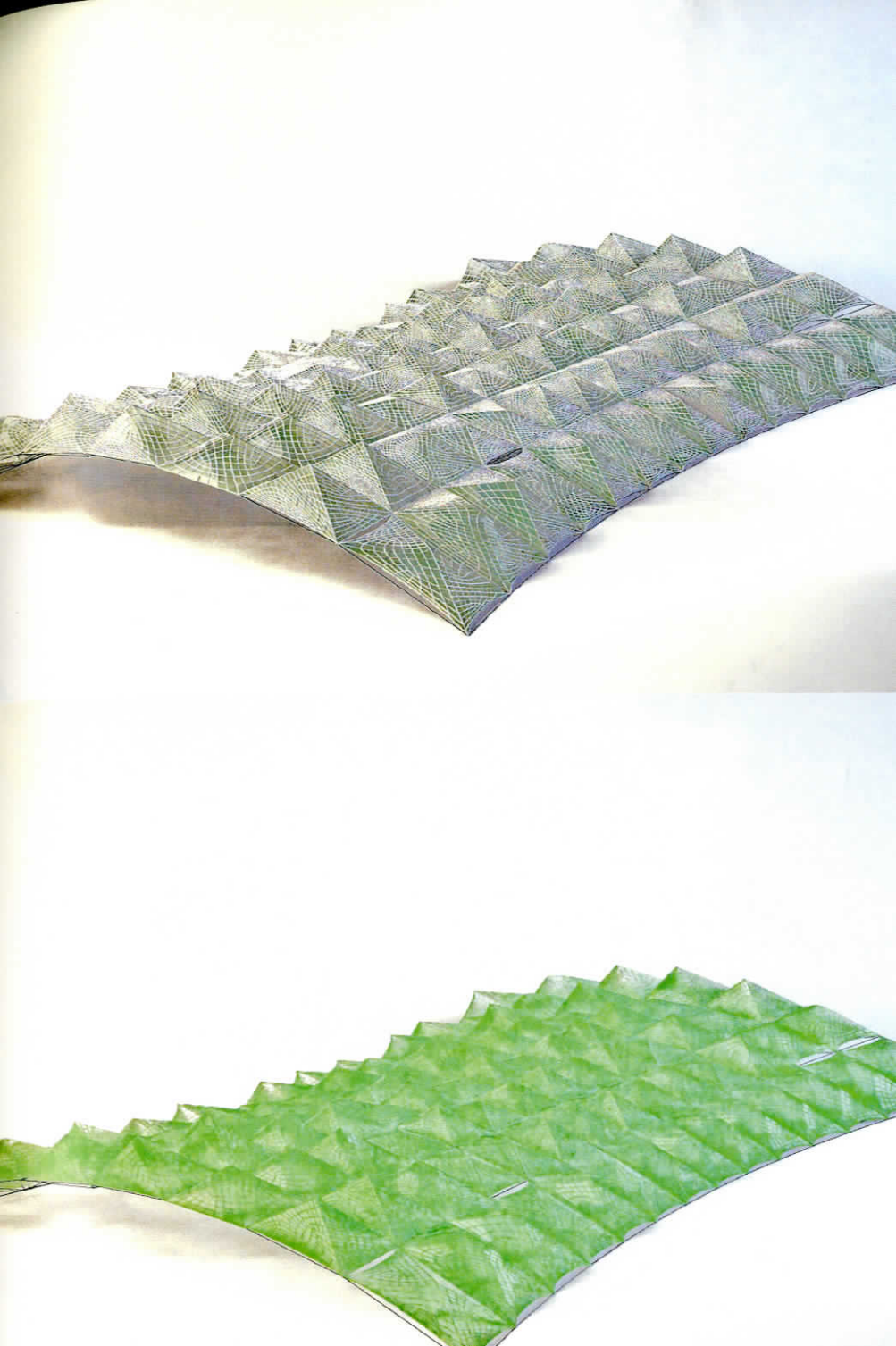
Morphology of protocols



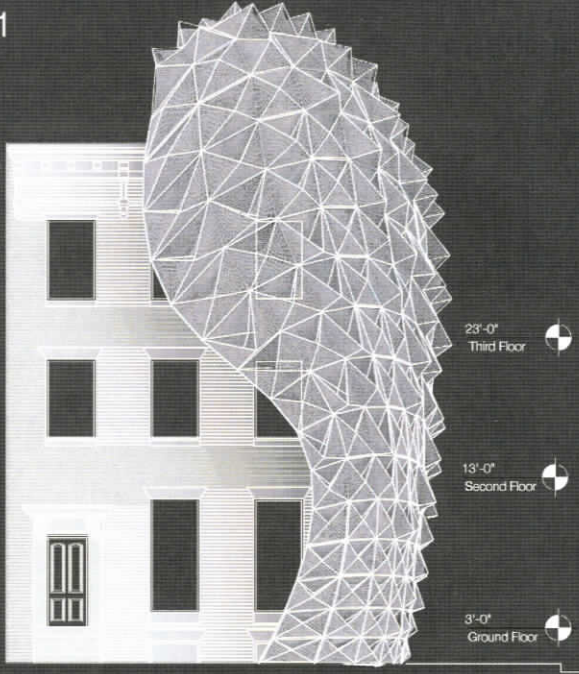
integration with existing structures



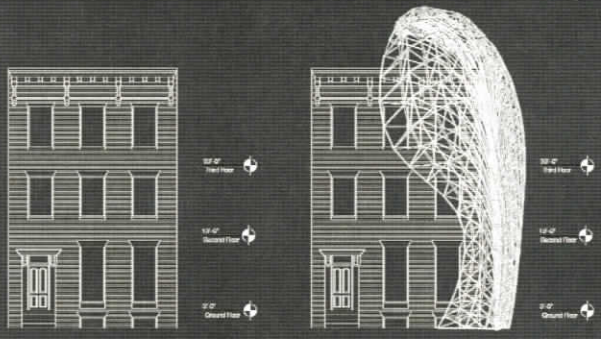




Structure p.1

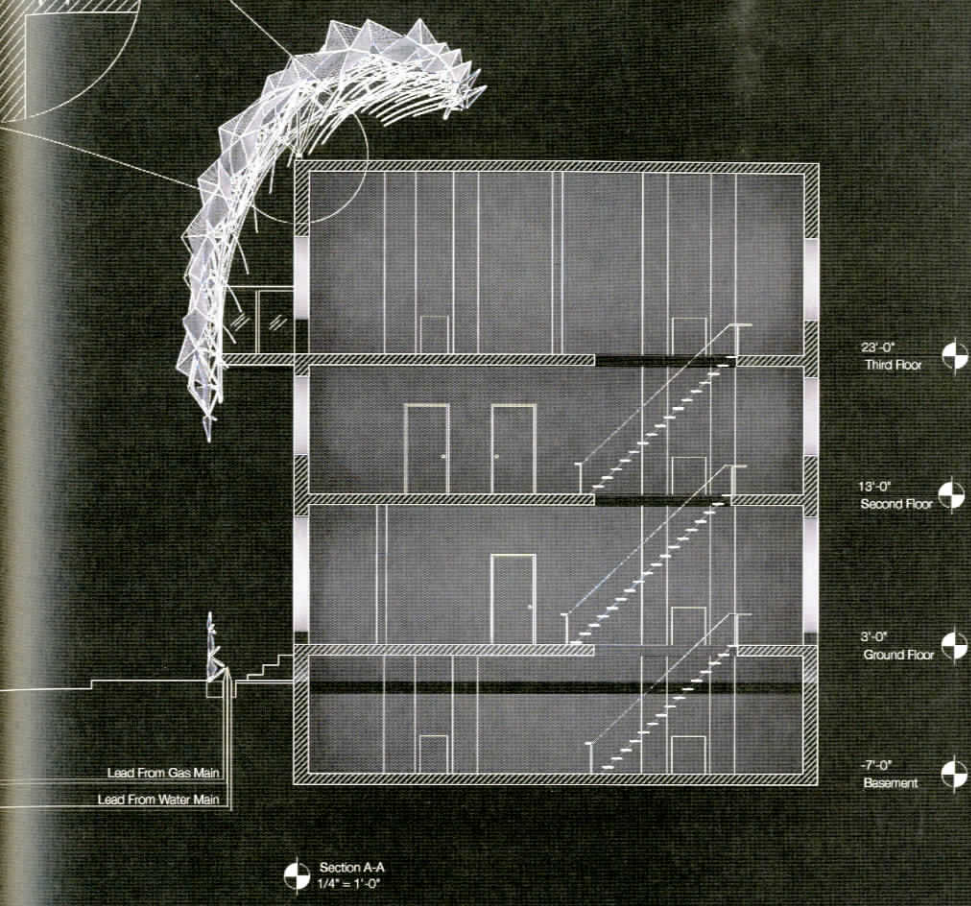


Front Elevation
1/4" = 1'-0"

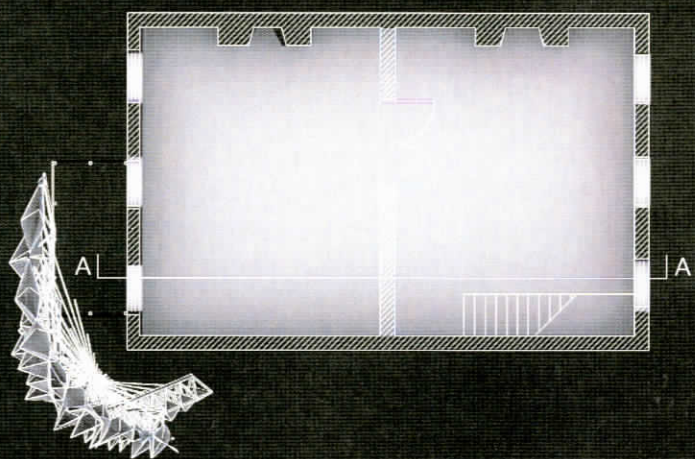


Front Elevation
1/4" = 1'-0"

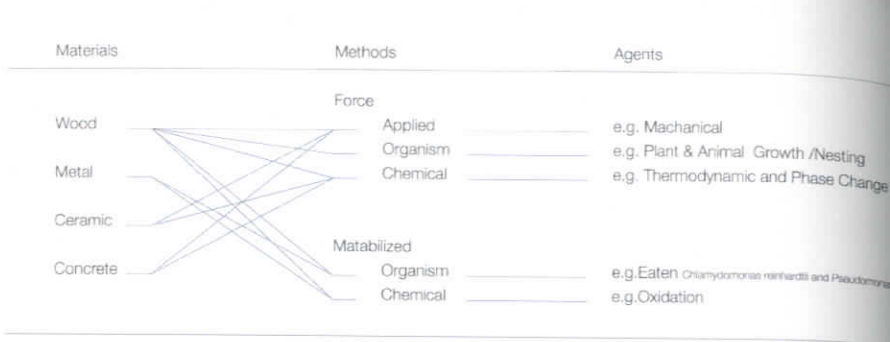
Front Elevation
1/4" = 1'-0"

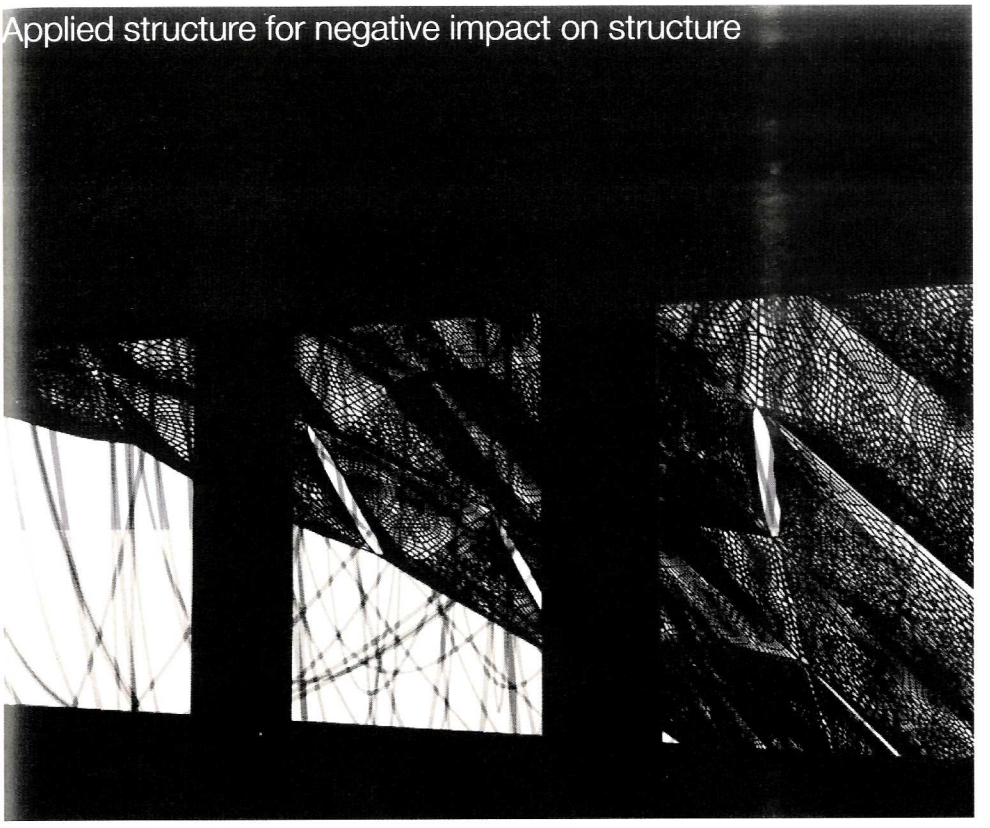


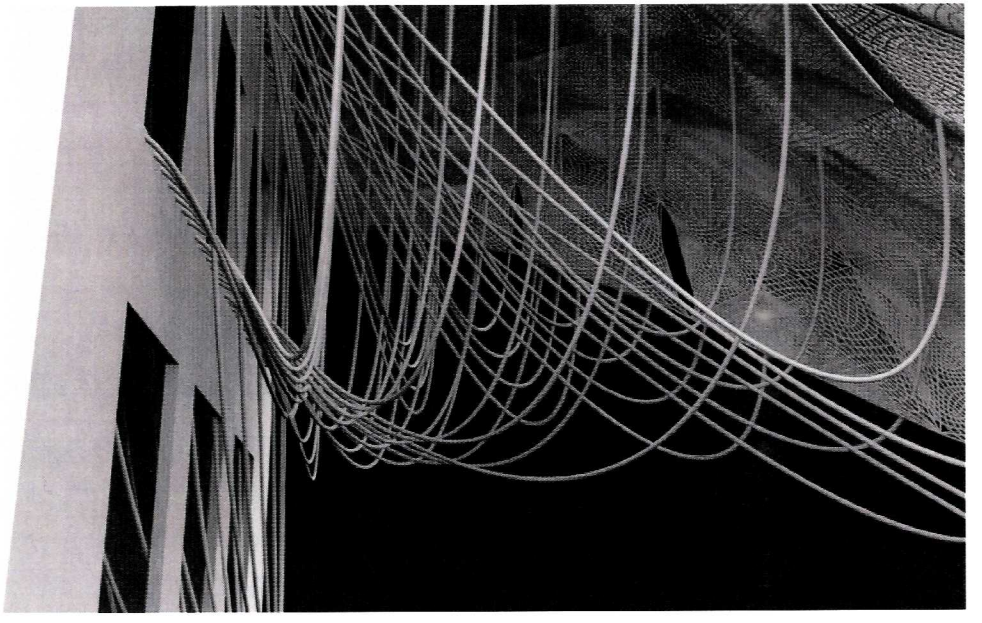
Section A-A
1/4" = 1'-0"

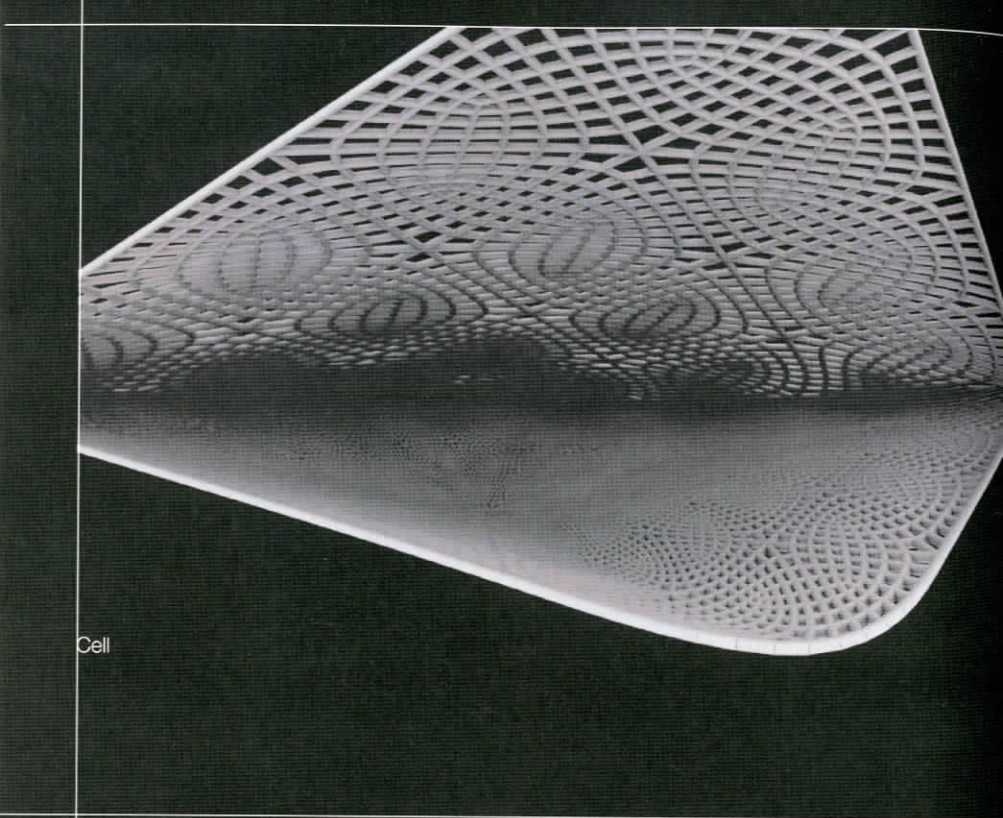


Floor Plan @ Third Floor
1/4" = 1'-0"

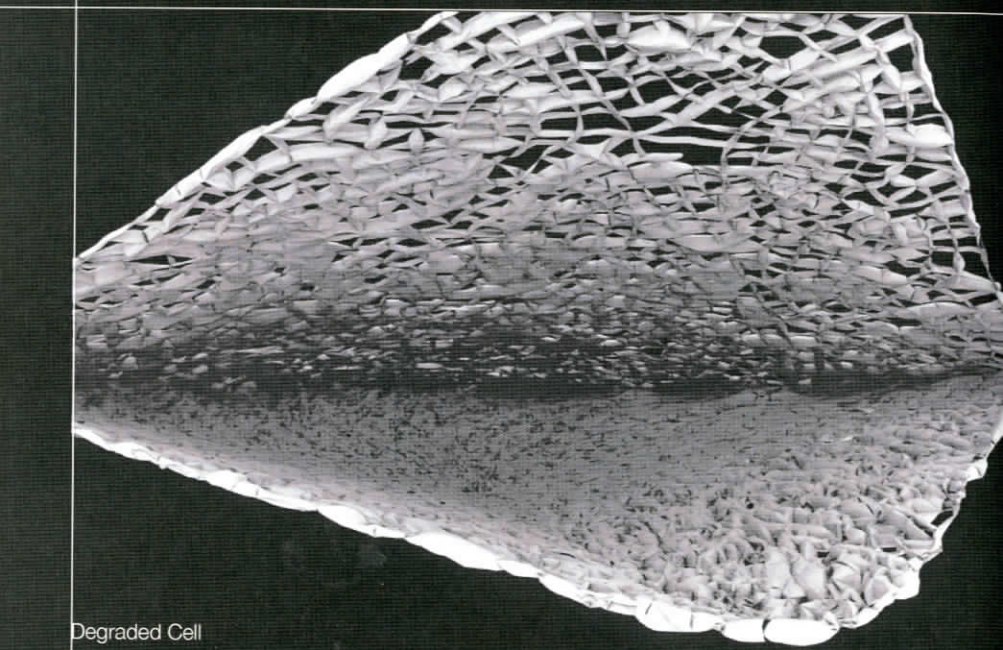

Materials
Methods
Agents
Wood
Metal
Ceramic
Concrete
Force
Applied
e.g. Machanical
Organism
e.g. Plant & Animal Growth /Nesting
Chemical
e.g. Thermodynamic and Phase Change
Matabilized
Organism
e.g.Eaten Chlamydomonas reinhardtii and Pseudomonas
Chemical
e.g.Oxidation


Applied structure for negative impact on structure





Cell



Degraded Cell

Structure n.1

A finished building is really unfinished, the first frame of a descent to destruction.

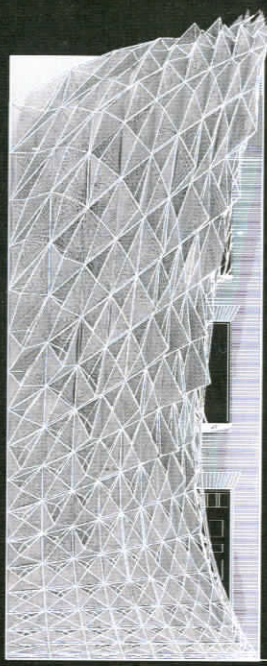
Architects must embrace the decay of their buildings, at least mentally. They should forget about perfection, the complete realization of their design, and understand that the only truly finished building is a heap of rubble.

_Lebbeus Woods

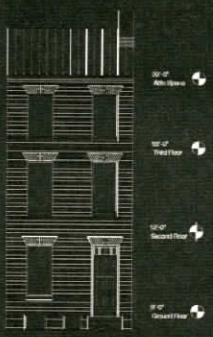

Structure n.2

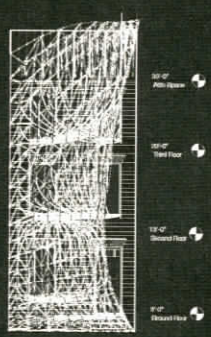
Structure n.3

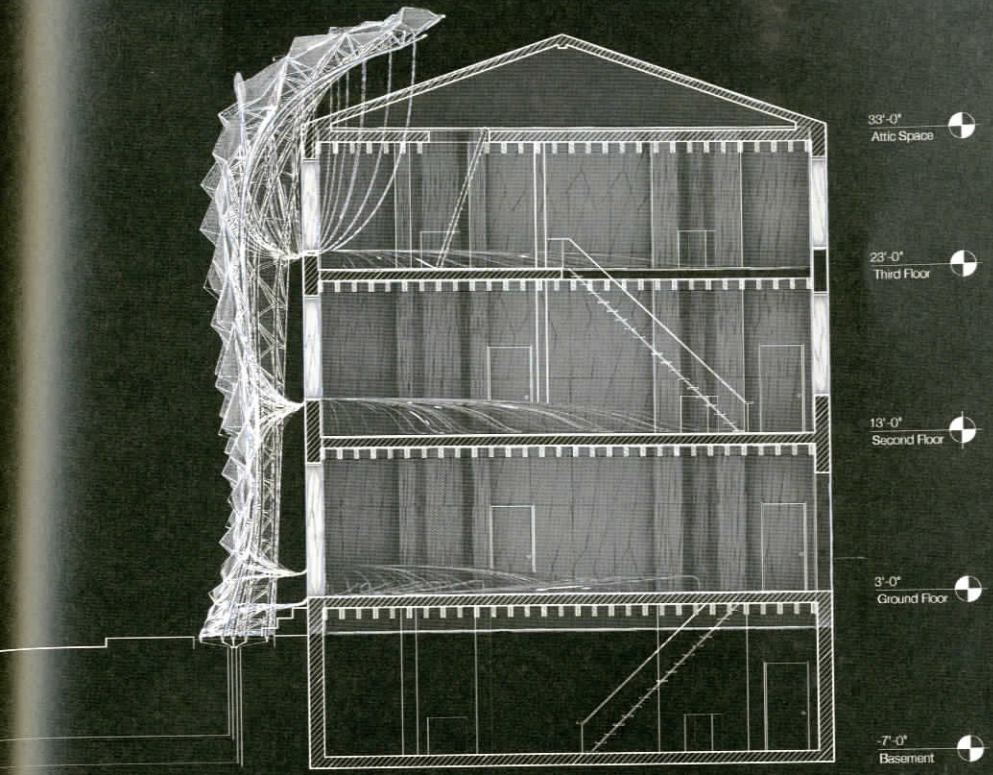
Structure n.1



Front Elevation
1/4" = 1'-0"



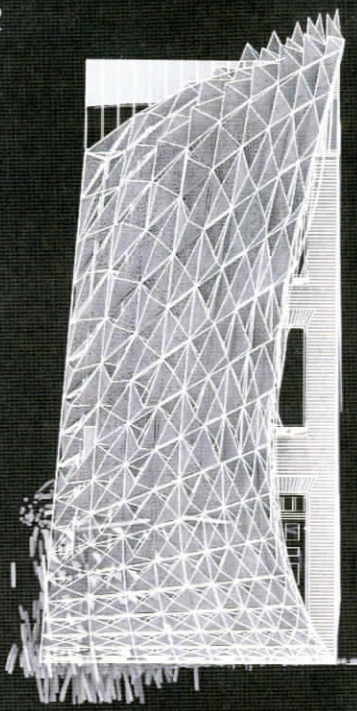




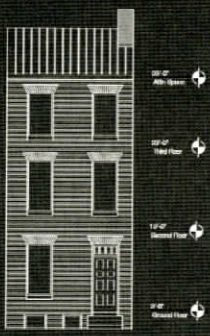
Section A-A
1/4" = 1'-0"

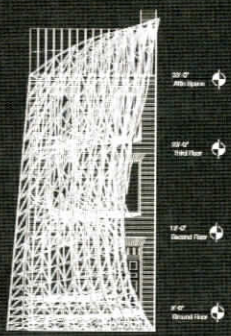
Floor Plan @ Third Floor
1/4" = 1'-0"

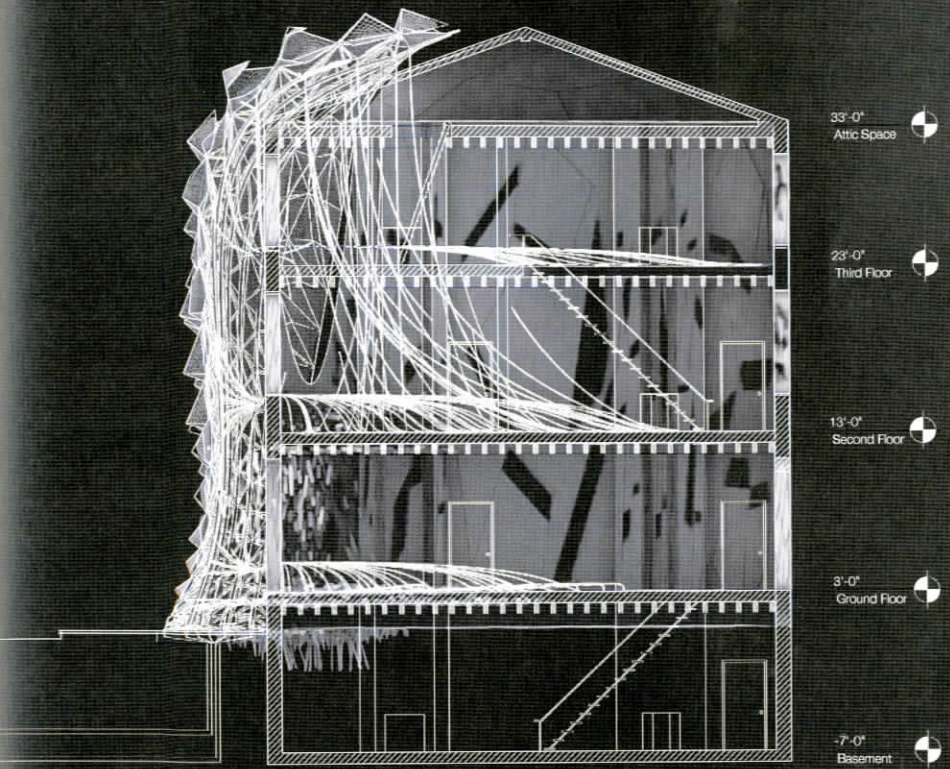
Structure n.2



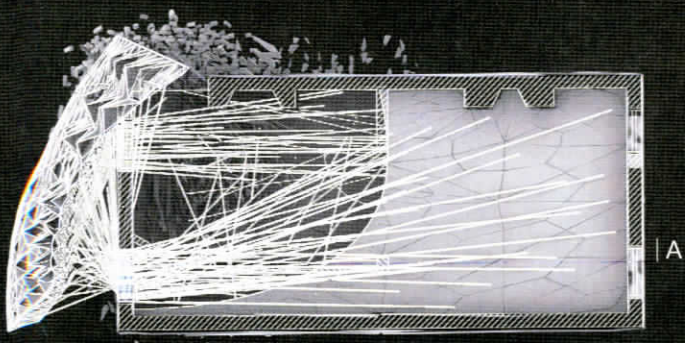
Front Elevation
1/4" = 1'-0"





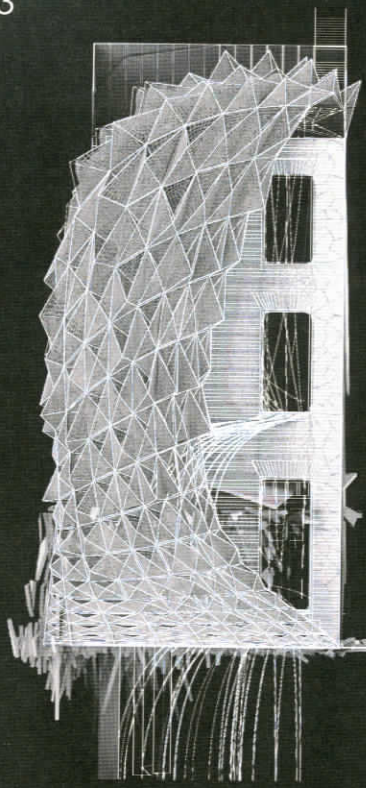


Section A-A
1/4" = 1'-0"

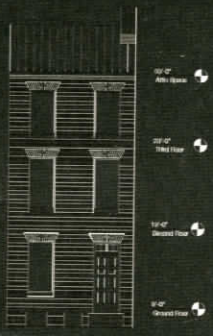


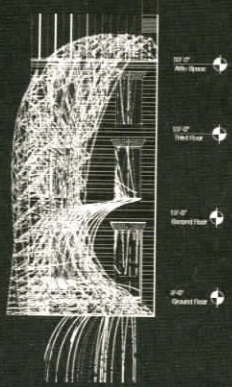
Floor Plan @ Third Floor
1/4" = 1'-0"

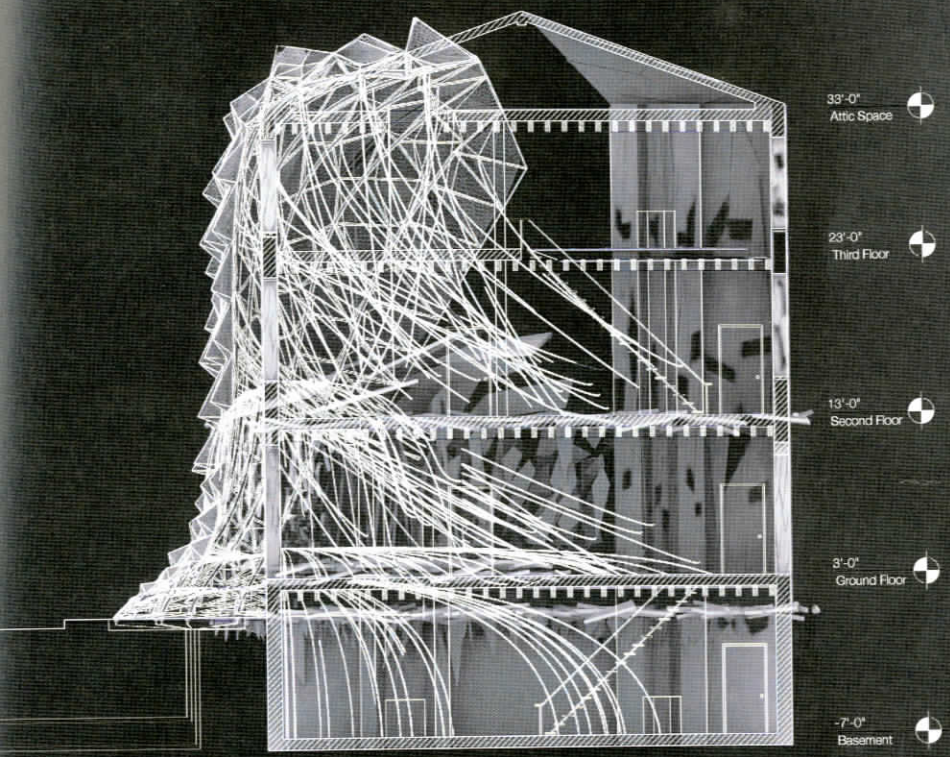
Structure n.3



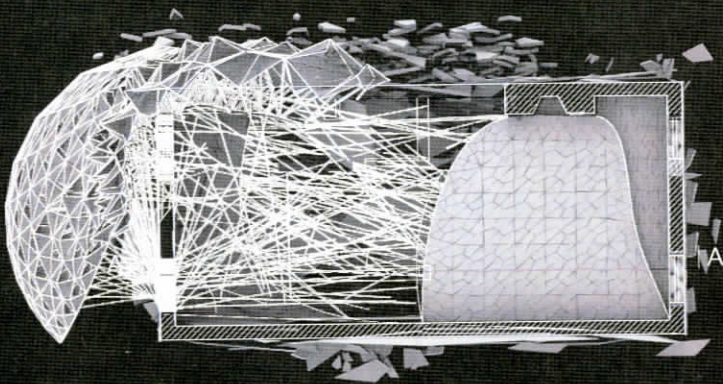
Front Elevation
1/4" = 1'-0"





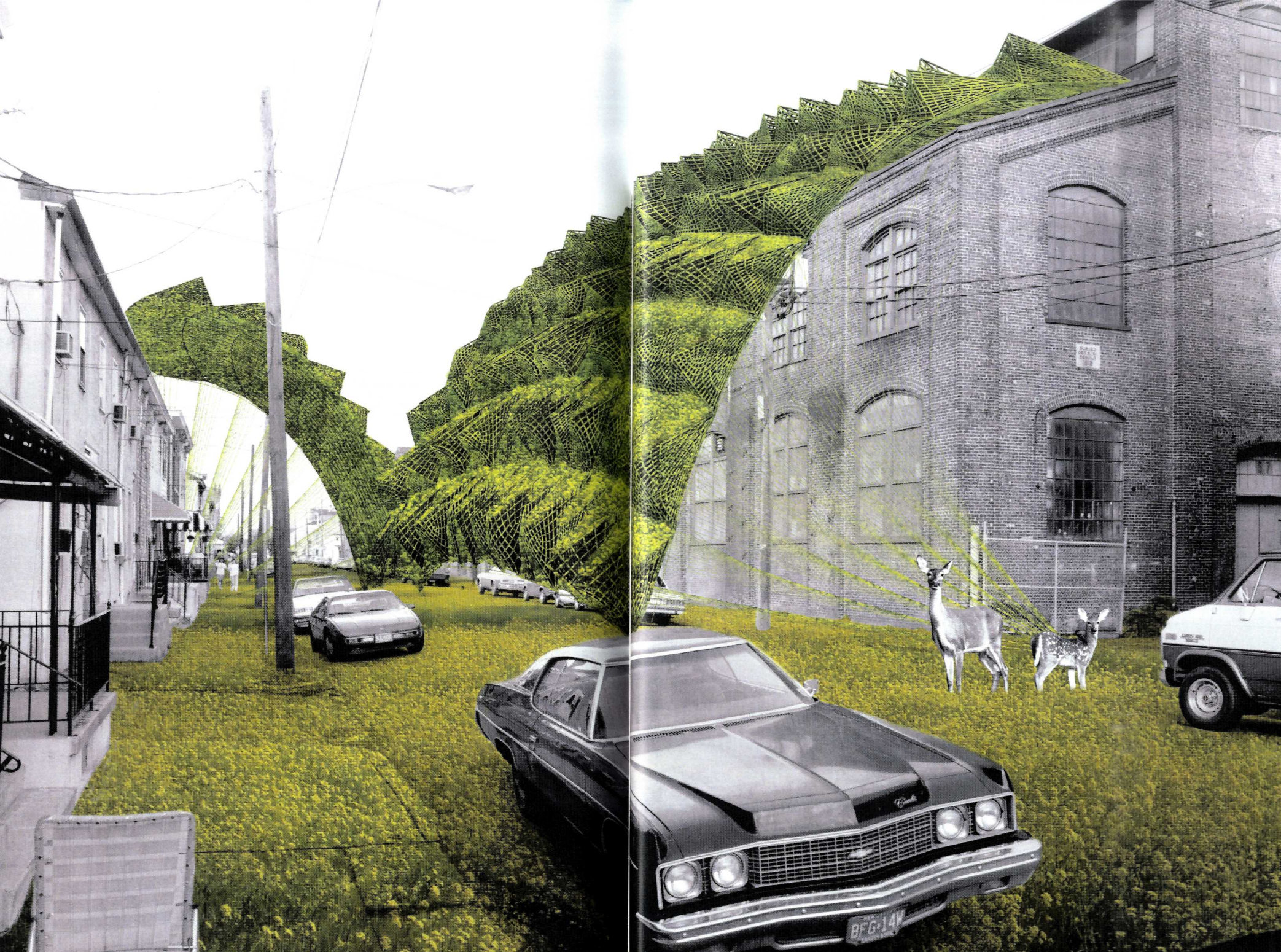


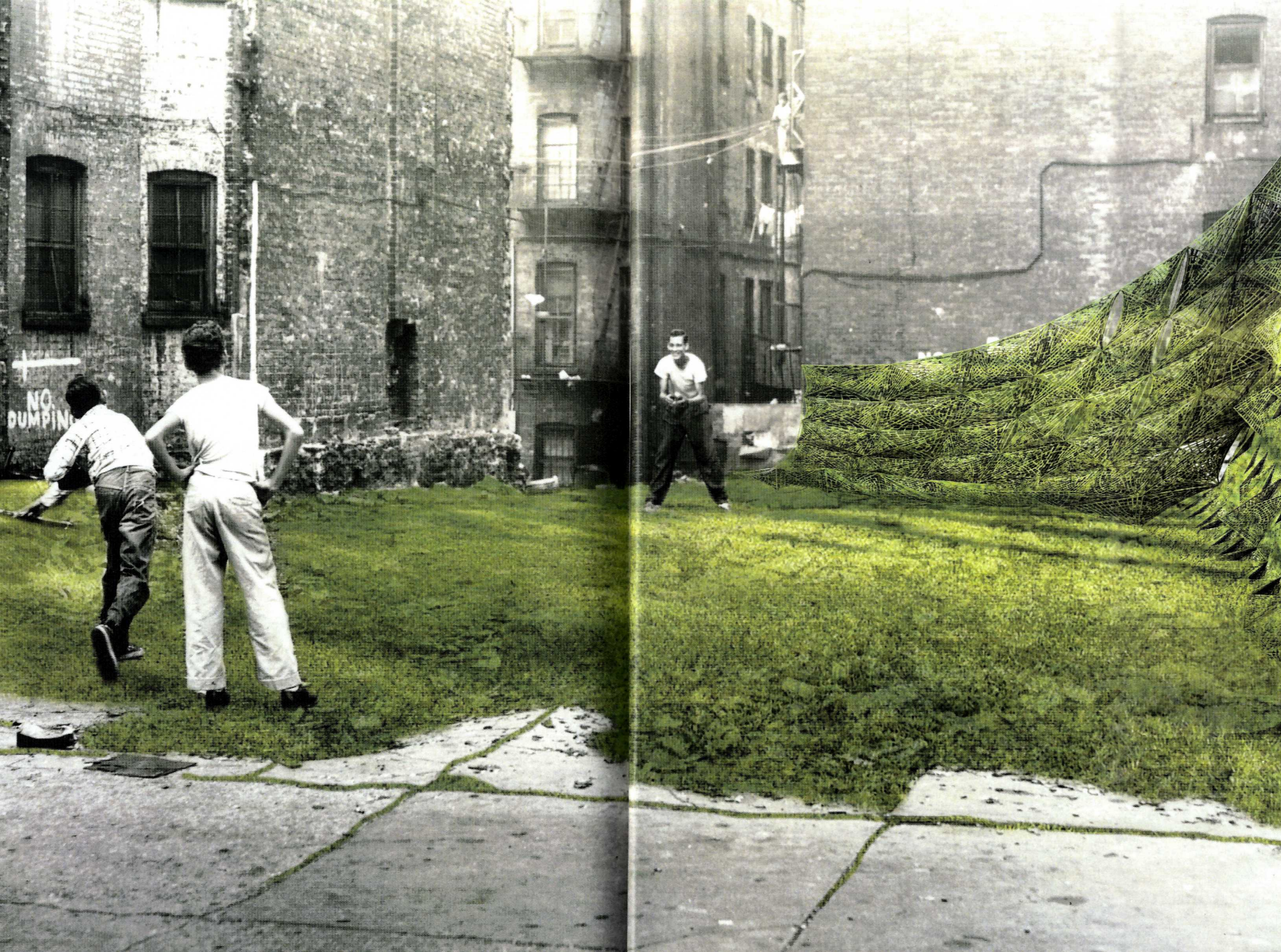
Section A-A
1/4" = 1'-0"



Floor Plan @ Third Floor
1/4" = 1'-0"

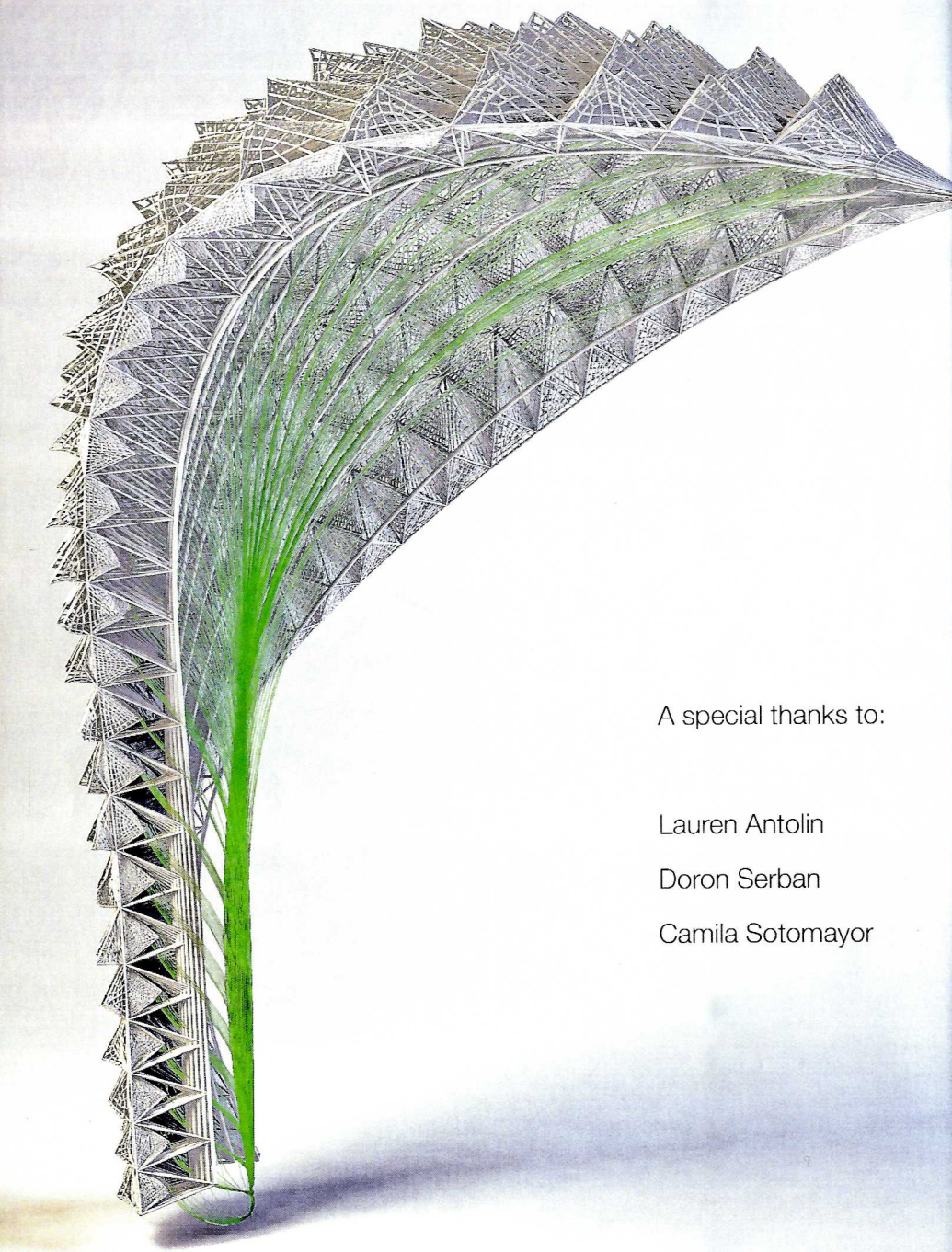

Hoagie Hamlet
DO NOT
ENTER
CIGARS
TICKETS
LOTTERY TICKETS
PLAY
PICK-IT
HERE
CIGARETTES
CARTON




NO
DUMPIN

"To linger! If we could but linger again in those places whose beauties never wane; surely we would then be able to endure many difficult hours with a lighter heart, and carry on, thus strengthened, in the eternal struggle of this existence."

-C. Sitte



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