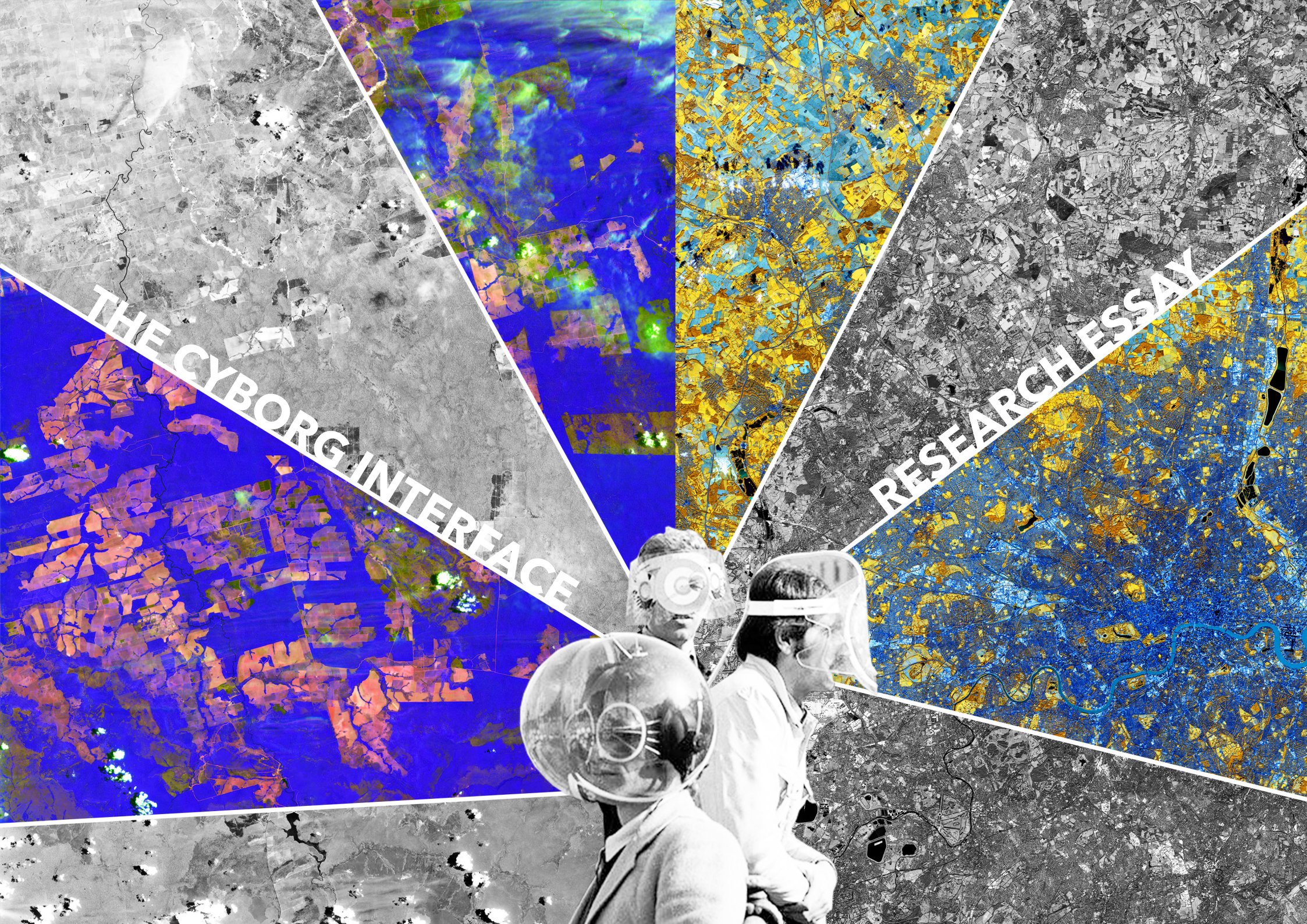# Graduation Portfolio - P4

Isaac Vaarzon Morel
4372689

Main Mentor - Alper Alkan
2nd Mentor - Freek Speksnijder
3rd Mentor - Roberto Cavallo

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THE CYBORG INTERFACE

RESEARCH ESSAY

INTRODUCTION

In contemporary society we are experiencing a division between city and hinterland. Or at least, that is what we think. Metropolitan centres of power have been, most of the time, required to look for resources beyond their geographical boundaries. Ancient Rome was heavily dependent on its grain import from their overseas colonies like Egypt. Many periods of famine have been known to ravage ancient Rome as the cities' import flows were severed by riots or extreme drought ruining the colonies' crops. In the case of London the imperial history of the British Empire plays a role in our understanding of material flows between the city and 'planetary' hinterland. The port of London was the relay in between the western consumer and the production system of the Empire's colonies, reaching far into the 1900's. Spices and other exotic products were imported and displayed in warehouses where they were sold in bulk and transported to specialized wholesale markets in London. The port and linked wholesale markets were and still are nodes of exchange where the material entwinement of city and hinterland is visible.

The dynamic between city and hinterland is evident although in our society, the hinterland is thought to be the city's environment. This suggests a conceptual static dualism. Critical urban theorists Neil Brenner and Nikos Katsikis focus their research on historical geographies in relation to contemporary supply-chain capitalism. They argue that the hinterlands problematique is based on multiple static dualisms. Because of the reality of planetary urbanisation it is unthinkable that city and nature are a dichotomy. As Brenner and Katsikis rightfully ask *"Given the de facto heterogeneity of agglomeration patterns, can a universal notion of 'the' city be maintained?"*, they suggest the entwinement of the two. Rigid analytical constraints within mainstream urban theory limit our view on these static dualisms (Brenner & Kastsikis, 2016). Why can these concepts not be reworked into something that acknowledges this problem? The core of the problem suggests a deep-rooted conceptual imbalance between notions that we cannot grasp when put together. It is the task of the field of architecture and urbanism to recognize this dynamic in design. This essay focuses on finding an approach to integrate a reconceptualized notion of city and hinterland into an architectural construct.

'The City of Ships' (1940) showing the busy docks being worked by varying typesof machinery.

THE CITY AND THE CONCEPT OF NATURE

City and nature have broken apart in our minds much earlier. As most problems find its root in political economical structures of power, so did the dynamic between city and nature. Raymond Williams was a socialist critic around the mid 20th century who focused his writings on the changing meanings of vocabulary in relation to literature and society. Williams describes in *The Country and The City* by poetry and literature through the ages, the view of the English population on the division of classes that heavily coincide with their view on nature as towns grew into cities. The changes that the meanings of 'city' and 'nature' endure are striking and at the same time appalling. Williams traces back to the feudal age that is characterized by power structures that are considered a natural order. From an all providing nature and easy consumption, a paradise, it shifts towards something that needs hard labour. Serfs and peasants work for their lord and provide, or better bless, him with basic needs. As the land he owns turns into wealth, from feudal power structures to that of capitalist agriculture, social relationships are reduced to a moneyed order (Williams, 1973).

This is where Williams warns for evident crises of contemporary values. Critique on contemporary capitalism, a new moneyed order of our own time, often coincides with carrying feelings to an irrecoverable pre-capitalist world. However, many forget the circumstances of such a world. For example, in *"Hungry City"* (2008), Caroline Steel romanticizes the relationships between city and its hinterland during the feudal ages. This is something we really have to be careful about, power structures can not easily be ignored. Williams advises caution, as this kind of critique or fetishization of a past world comes with social values, that if they become active, at once jump to the defence of certain social hierarchies and moral stabilities. In a contemporary application this can be very dangerous (Williams, 1973).

Williams explains a more dramatic shift in poetry called *"The Green Language"*. During this movement there are two notable changes in how we perceive nature. There is the separation of possession, the control over land and its prospect. And on the other hand, there is the separation of spirit, the identification of forces which we need to learn from and not control. These two notions go simultaneously with two principles of Nature. There is the ordering principle of which human activity seeks to rearrange and control. However, there is also the principle of creation, wherein the creative mind takes part and shows truths to our own human nature.

> *"It is not now the will that is to transform nature; it is the lonely creative imagination; the man driven back from the cold world and his own natural perception, and language seeking to find and recreate man. This is the 'green language' of the new poetry"* (Williams, 1973, p.193)

As *"The Green Language"* suggests a more anthropocentric vision of nature, it sheds more light on how we perceive nature in the city/nature dichotomy. Both principles of *"The Green Language"* determine that the concept of nature is fundamentally contradictory. Neil Smith elaborates on Marx' concept of nature. Partly borrowed from Hegel, Marx recognized Nature as two derived principles; *'first* nature' and *'second* nature'. First nature is here seen as a conceptless occurrence, this can be put parallel to Williams' description of *"The Green Language"*, a principle of creation. A tree, without human intervention, does what it does, it lives and dies. Second nature is then on the other hand the world of men. Second nature starts where the tree is turned into planks to craft a chair. It is a manifested reason. Marx' notion of Nature is tied to the labour process.

> *"The world of men as it takes shape in the state, law, society, and the economy, is for him 'second nature', manifested reason, objective Spirit. For Marx, Smith explains, 'society itself (second nature) is precisely because 'men are still not in control of their own productive forces vis-à-vis nature."* (Smith, 1984, p.19)

According to the notion of *first* nature, Nature presents itself in use-values. However, in capitalist society, use-value is handed in for

exchange-value. Through this change, social and societal values become more and more attached to the process of production. Smith therefore argues that the production of nature stands at the centre of our perception of Nature. Smith suggests the material landscape poses itself as a process of the production of nature. The differentiated results of this type of production is what Smith calls the 'material symptoms of uneven development' (Smith, 1984). In order to fully grasp the concept of Nature, the production of Nature as well as its consequences need to be elaborated upon.

PRODUCTION OF NATURE

Neil Smith implies that the metabolism of human beings with nature is the process whereby human beings appropriate the means to fulfil their needs and return other use-values to nature (Smith, 1984):

> "It is an eternal nature-imposed necessity, without which there can be no material exchanges between man and nature, and therefore no life'. But labour effects more than just a simple change in the form of matter; it produces a simultaneous effect on the labourer. 'Labour is, in the first place, a process in which both man and nature participate, and in which man of his own accord starts, regulates, and controls the material re-actions between himself and nature. He opposes himself to nature as one of her own forces, setting in motion arms and legs, the natural forces of his body, in order to appropriate nature's productions in a form adapted to his own wants. By thus acting on the external world and changing it, he at the same time changes his own nature."(Smith, 1984, p.35)

Production of material life, or to say second nature, involves mainly the production of workers, or to quote Smith, the reproduction of labour power. Social relations come into play in this realm of production. As Williams suggested earlier social structures become the precipice of power structures. The most basic is the split of labour between the sexes. Smith elaborates that this is the first fundamental social division of labour, however he also implies that its creation lies in pre-human social organization. Unfortunately, Smith does not elaborate on the fact what this pre-human social organization comprises of. He does however conclude that human society is concurrently natural and social, showing the unity of nature.

This unity of nature then heavily coincides with the production and concept of space. Both nature and society are mostly conceptualized as two different spaces, mainly focused on the material aspects of the concept of space. As established, human society is simultaneously social as well as natural. The concept of space is in its definition a social product.
Smith elaborates on three kinds of spaces, which were the result of Newtonian thinking. Newton made the distinction between absolute space which marked physical, biological and geographical processes as the natural principle of physical space, and relative space, the undefined space of human social relations which was then adopted as 'social space'. Social space thus acts within absolute space yet remains untouched, or in Newton's words, is relative (Smith, 1984).

According to Smith the material basis for the bifurcation of physical and social space lies in the process of second nature out of first nature. This process comes together within geographical space, although inherently different. Although geographical space might seem social it is innately physical. As defined by Smith this particular subset of absolute space comprises of "the physical space of cities, fields, roads, hurricanes and factories." Geographical space is therefore in its definition ambiguous as it tries to identify social relations and processes within absolute natural space. As a result of the development of identification of geographical space, the relationship between natural and social space becomes more problematic, as well as the ambiguity of the meaning of physical space becomes clear. As Smith concludes:

> "The conception of the 'production of space' is meant to provide a means of taking the next step and enabling us to demonstrate rather than simply assert the unity of space and society. (…) Space is no longer an 'accident of matter' but a direct result of material production." (Smith, 1984, p.77)

In conclusion, the production of nature coincides with the concept of space. In terms of the hinterlands problematique society and nature are seen as separate spaces. Smith elaborates and provides insights on this ambiguous boundary we have defined through the last couple centuries. In practice we, as a society, will have to demonstrate the ambiguous relation between natural and social space as its current conceptual framework only allows for a framework tied to the absolute conception of space. The development of second nature out of first nature will have to be addressed as part of our conception of space. As the production of Nature is established as the core of the hinterlands problematique, it is understandable that a theory is needed that transgresses the conventional way of thinking about Nature. This leads to an intriguing concept that has emerged in the last century.

Bike in a Tree. The entwinement of first and second nature.

THE NOTION OF CYBORG

The pioneering cyborg theory of Donna J. Haraway suggests a way out of these dualisms and ambiguous conceptual boundaries. Haraway's intent is essentially to abolish power structures of man-oriented society imposed on women by suggesting a phenomenon that is not bound by the traditional concept of Nature. This theory reworks the notion of nature and provides insights on how architectural apparatus could play a role in this progressive way of thinking.

The theory behind the cybernetic organism goes much deeper than only the rework of Nature. As Nature is reworked, Culture is reworked as well. The cyborg as Haraway puts it, is a hybrid creature. It is constructed of organism- and machine parts. One does not hold power over the other. Creating completeness from parts, including those of polarity and hierarchical power structures. Because the cyborg is neither man nor woman the notion of reproduction of Nature, or in that sense the production of Nature, rewrites itself (Haraway, 1991). Production becomes the assemblage of parts, so to say, building a self-identified nature out of second nature (society and all its social relations and processes, including the political and scientific).

"No objects, spaces, or bodies are sacred in themselves; any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language." (D. Haraway, 1991, p.163)

Matthew Gandy, by means of researching water infrastructure in relation to cultural and histrocial human society, explains that the idea of the cyborg has been used as a means to explore the interface between technology and the body (Gandy, 2005). Haraway explains that apart from the fusion of body and technology, the other essential ingredient is 'machines in their guise', as communication systems, texts, and self-acting, ergonomically designed apparatus. She suggests a network ideological image,

with which she implies a profusion of spaces and identities but also the permeability of boundaries. Weaving is the method of oppositional cyborgs. Through these methods she opposes dualisms that have been persistent in Western society characterised by power structures:

"domination of all constituted as others, whose task is to mirror the self. Chief among these troubling dualisms are self/other, mind/body, culture/nature, total/partial." (Haraway, 1991, p.177)

This weaving is supplemented by immunological thinking wherein the immune system has the ability to regulate itself using only itself, as suggested by Niels Kaj Jerne´s immune theory. Through the interlocking of internal recognitions and responses, the immune system will always be in a state of dynamic internal responding. Therefore, it is immanent that it will always be active, that it would not have to wait for stimuli from an outside entity. Haraway argues that there then could be no exteriority that the immune system had not already mirrored internally. Consequently, ´self´ and ´other´ lose their oppositional quality and transform into delicate plays of partially mirrored readings and responses. To quote Haraway;

"The notion of the internal image is the key to the theory, and it entails the premise that every member of the immune system is capable of interacting with every other member." (Haraway, 1991, p.218)

Although abstract, the notion of the cyborg suggests a way out of things that are either politically complicated, morally defined by society, or just plainly conceptualized as two different entities while ambiguously forming one system.

CYBORG URBANIZATION AND URBAN METABOLISM

The cyborg can be translated into architectural or urban terms to understand what this would mean in contemporary society, what its complication are, but also how it could elaborate on how we perceive city and architecture as relational constructs.

Gandy elaborates on the notion of the cyborg on urban scale. He explains that a comparison can be made between the cyborg playing a role as the material interface between body and city and the physical infrastructures that link the human body to technological networks. In this way, the city can be conceptualized and visualized as a system of interconnected life-support systems. Therefore, many envelopes become the exoskeleton of what we perceive as our body in relation to the city as it provides us with contemporary basic needs. The technological networks span from sewage pipes, and electrical wires within the ground to the elevated powerlines in the sky. In this sense the city can be conceptualized as a single entity that holds machinic properties and is thus a prosthetic extension of the city. However, this has been challenged by 'a hybridized conception of space as a system of technological devices that enhances human productive and imaginative capabilities.' (Gandy, 2005).

> *"The organicist city of the modern era was founded on a clear separation between mind and body that enabled the city to be conceptualized as a coherent entity to be acted upon, disciplined, regulated and shaped according to human will. The emergence of the neo-organicist city, in contrast is founded on the blurring of boundaries rather than their repeated delineation." (Gandy, 2005, p.29)*

Gandy elaborates on one principal dimension to contemporary neo-organicist urban thought. It is about the convergence of ideas surrounding the 'thinking space' of the city and the indeterminacy of spatial forms. When the relation between body and city is further conceptualized as a thinking machine, then the analytical focus shifts towards the identification of those critical networks that sustain the relationship between the body and the city (Gandy, 2005). Maria Kaika elaborates on this by stating that the city and home only appear to function autonomously because of the fetishization of the flow of natural elements and social relations, and being visually severed in the case of the hidden city, technology networks. Her work is focused on establishing a conceptual framework that aims to define city and nature as socio-evironmental hybrids. She uses the example of the water systems, inherently linked to cities, that flow in between the natural, the urban, and the domestic sphere. It uncovers that nature and city are not separated space envelopes, but rather, as she coins, hybrids. These systems are neither completely human-made nor natural. She concludes that they are the outcomes of the same socio-spatial process of the urbanization of nature (Kaika, 2005). These hybrid spaces also become politicized as they form complex systems within the ambiguity of relative and absolute space.

> *"In sum, the world is a historical geographical process of perpetual metabolism in which 'social' and 'natural' processes combine in a historical geographical 'production process of socio-nature' whose outcome (historical nature) embodies chemical, physical, social, economic, political and cultural processes in highly contradictory but inseparable manners." (Kaika, 2005, p.23)*

The post-industrial city has been transformed through the last decades by a process of deterritorialization by rapid development of informatics. Communication technologies have been increasingly defying place-bound identities. Gandy suggests that the territorial and administrative structures associated with the industrial city have been displaced by an increased plurality and simultaneity of different spatial forms. Through instant deportation made possible by intense technological development urban space has lost its 'geopolitical reality' according to Paul Virilio.

> *"The cyborg city is, in other words, close to an interpretative analytical framework that can connect analysis with the cultural and ideological realm of everyday life and include those 'unconventional' urban landscapes that have emerged outside the core metropolitan regions of the world economy and where incongruities and displacements are an even more pervasive feature of the urban experience." (Gandy, 2005, p.36)*

The city when the ideological cyborgization of urbanism is applied becomes a relational construct, it becomes a polymorphous web that weaves body, technology and social practices. This new, but already existing landscape requires recognition and should reveal

itself as the interface of these conceptually separated entities. How does such a relational construct manifest itself in architectural terms?

ARCHITECTURAL CYBORG SPACE

As previously mentioned, the cyborg operates through different spatial forms. It operates on the level of the body in relation to its environment, through relative and absolute space. It can be argued that architecture plays the role of an interface between these two defined entities. Georges Teyssot argues that the cyborg has unfolded the way our bodies truly dwell in society. His research focuses on topo-analyzing spaces. He urgently suggests that society ought to no longer base itself on the metaphysical and traditional dichotomies, because digital technologies have gradually been blurring these traditional distinctions. Architecture should therefore no longer be defining an environment exclusively for 'natural' bodies. He vouches for architecture defining and imagining an environment for bodies projected outside themselves, by means of their technologically extended senses (Teyssot, 2005).

The state of the body becomes an arrangement seeking communication between interior and exterior. The body then crosses through surfaces which delimit our surroundings. In that sense the surfaces that comprise the interface (etymologically the interface can be understood as a thing between surfaces) can be visualized as communication devices. Haraway states that the world is subdivided by boundaries pervious to information, as information allows for universal translation. Immunology theory is therefore a *natural* example of a communication device. She suggests that communication sciences and biology, are constructions of natural-technical objects of knowledge in which the difference between machine and organism is thoroughly blurred; mind, body, and tool are on very intimate terms (Haraway, 1991). If architecture plays the role of interface, it can be reconceptualized as a communication device, a construct that responses and mimics separate entities through its surfaces as it is permeable to information. Architecture

then simultaneously acts as an intelligible environment and becomes responsive.

During the late seventies many new forms of architecture were explored and the rise of new materials gave way to new types of space. Nicholas Negroponte sought a new way how architecture would have to behave in an environment that was increasingly becoming machine, and consequently intelligible. His work focused on interactions between humans and intelligent machines. In his book *Soft Architecture Machines* Negroponte makes a distinction between three types of approaches towards a responding architecture; flexible, manipulative, and responsive environments. The main difference is the way architecture is processed by the user. A manipulative environment is a very static environment in which the user provides physical transformation to the environments' objects for example. The manipulative environment is a passive one, one that is moved as opposed to one that moves. What an intelligent environment strives for is its responsiveness to the user, it is taking an active role, initiating changes as a result of computation. Responsiveness suggests that it must have purpose and intentions and able to compute or create models of the user and operate within them in the particular context. It is therefore not a regulatory control system, rather an intelligent system (Negroponte, 1975). Negroponte addresses multiple types of responses which are not relevant to this case as it features very particular futuristic visions, however the overall theory about responsive architecture provides insights for architecture as cyborg.

Negroponte also elaborates on responsive materials and makes a distinction between softs and cyclics. Soft materials, for example inflatables, present themselves as the most natural material for responsive architecture as they feature motor reflexes by simple controls. Negroponte argues that the response is in that case architectural, however the system hardly comprises intelligent behaviour. Furthermore, he points to an approach that is at that time not yet explored, the property of memory. He proposes the example

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of cellular pneumatic structures that integrate pressure-sensing devices in every cell, by which they become memory themselves. In this way the structure can respond locally to body movements and interactions. As Negroponte says, *'we could directly push and pull upon memory.'*

There is also the distinction between *soft* and *hard* architecture. Hard architecture is defined by Negroponte as architecture consisting of more permanent materials, like stone, wood, and concrete that are by definition in their material properties not capable of morphing to different shapes as they are the medium themselves, while soft architecture consists of, for example, inflatables that uses a dynamic medium, like air or water. The concept of memory as suggested by Negroponte can however be implemented into hard architecture. This is however much more difficult as, for example, concrete surfaces require large mechanical systems to motor them.

Cyclics are considered to be part of architectural responses in a coarser time grain. Negroponte makes the assumption that we can develop a continuous construction and destruction process. In this case architectural transformations could be taking place on a day-to-day basis, providing an impermanence and thus responsiveness to architectural structures (Negroponte, 1975).

The notion of the cyborg instigates, when implemented into architecture, some type of interface that acts as a relational construct. It provides an environment that responds and mimics its internal dynamics between body and environment, which is simultaneously projected onto entities trying to communicate. It can then be concluded that architecture becomes a construct that blurs its own boundaries to arrange interactions with its surroundings on different spatial terms. An architectural construct can then behave as a communication device, searching for an ambiguous common ground where different entities meet. By definition this requires some kind of responsive environment that can adapt or respond to continuously transforming systems.

THE CYBORG, THE CITY AND HINTERLAND

The city/hinterlands dichotomy is fundamentally flawed through its defined concepts as two opposing separate entities. The cyborg approach is not meant as the ideal solution, but to break up conventional thinking. It is meant to add to the discourse of how architecture and urbanism could complement each other as one relational construct in order to undertake action within the hinterlands problematique.

The pivotal question in the hinterlands problematique is how we define the urban phenomenon. Brenner and Katsikis vouch for the relaxation of static dualisms that occupy mainstream urban theory; city/countryside, urban/rural, interior/exterior, society/nature. It is then vital to find a way to relax these dichotomies. In terms of the hinterlands problematique it lies in the way we view and perceive nature, how we define its conceptual ground. As we have to cope with planetary urbanization processes, we have to redefine the concept of Nature. Smith points out that the concept of Nature is tied to the process of *second* nature out of *first* nature. It can be concluded that the contemporary world lives exclusively in *second* nature, the city has become second nature. We, as society, have to look at a way how to make nature out of *second* nature.

The cyborg is a hybrid creature that rewrites the production of Nature. As it is not defined by something created out of *first* nature, production becomes the assemblage of parts, building a *self-identified* nature out of *second* nature. It is permeable and responsive to information, the universal language of the cyborg, and thus seeks to communicate. By blurring conceptual and physical, boundaries it weaves through differential space. The cyborgization of architecture and urbanism can then be visualized as an interface, a relational construct that weaves itself through physical, but also relative space. It provides an architectural environment able to respond and mimic its internal dynamic, while simultaneously being permeable to information from 'outside', surrounding environment. In this way the notion of exteriority and interiority fall apart as they

become one. *Self* and *other* lose their oppositional qualities.

The city and hinterlands require an approach that distinguishes the two, although ambiguously recognizing them as one concept or phenomenon. Architecture and urbanism ought to become a relational construct that weaves through systems that engage within differential space. Forming a hybrid space is then essential as it neither denies nor agrees that the city belongs to the hinterlands or vice versa.

We have long entered the era of the cyborg, it is time to acknowledge our nature and handle its consequences.

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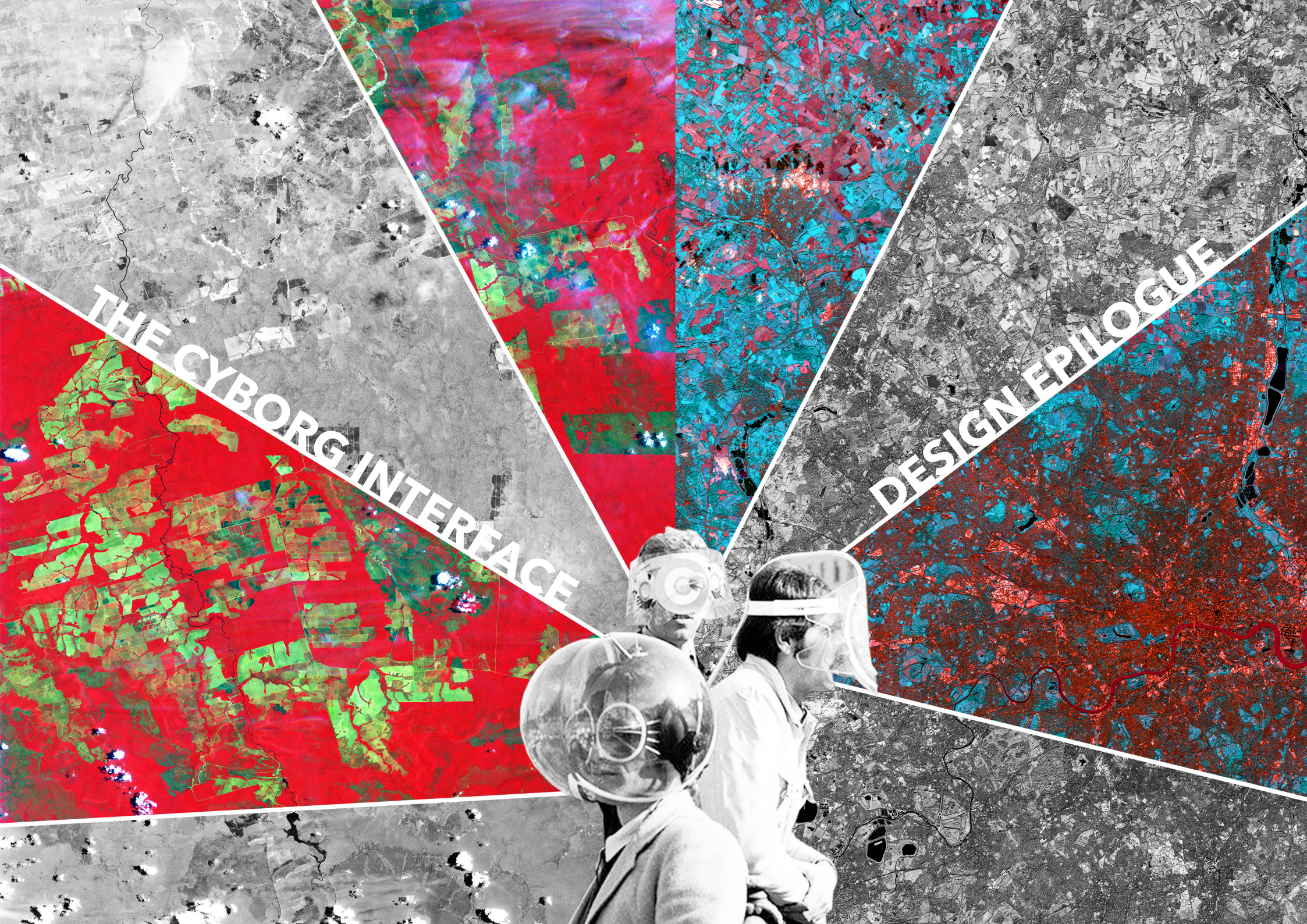
THE CYBORG INTERFACE

DESIGN EPILOGUE

PROJECT DESCRIPTION

The conclusion of both the research analysis and the research essay combined provide a framework to rework the separated opposing concepts of city and hinterlands. The rework of these concepts are defined as the ''hinterSCAPE'', borrowed from Koolhaas' term SCAPE. The city is then understood as a continuous, topologically formed field structure. Infrastructure, architecture, and landscape merge to become one complex.

The intention of this graduation project is ultimately to demonstrate a symbiosis between systems and mankind through urban metabolism. Although the project has utopian elements it tries to make abstract theory tangible in the form of a multiscalar megastructure. The aim of the project is to integrate daily life with urban systems, it aims to recognize the relations between man and machine by means of an interface.

The megastructure stretches throughout the Lea Valley tapping into urban systems. Because of the valley's fragmented historical nature the structure aims to function as a bridge between suburban areas that have been completely separated by infrastructure and production processes and systems. The megastructure provides a linear development which interacts with existing infrastructure and systems along its length. The intention of the megastructure is both social as technical, creating a techno-social environment bridging the several layers of infrastructural systems of London. The heterogeneous nature of London is mainly defined by its pre-condition of infrastructure (railway, road freight and normal freight). The project is divided into several sectors that are defined by how they adapt and interact with their specific ground conditions; earth/water/air. The structure touches down in urban parks, crosses crucial water systems and is elevated above industrial parks. The program is defined by the nature of the sectors, however can be dismantled and reassembled according to the needs of the surrounding environment. The different types of programs interlock within the structure, making use of each other's systems and aim to transfer the knowhow of innovative production, integrating the social with

the technical. The structure consists of a machinic layer at 15 meters high that adapts within these sectors. It functions as a highway of goods logistics, pedestrian circulation and provides space for active technical systems.

Around this machinic layer the envelope acts as a communication device, the interface, comprised of several layers. It is an architecture without content. The project focuses on the sequence of threshold spaces within its structure as well as in its surroundings. It is therefore disconnected from its content, yet engages with the entities on either side.
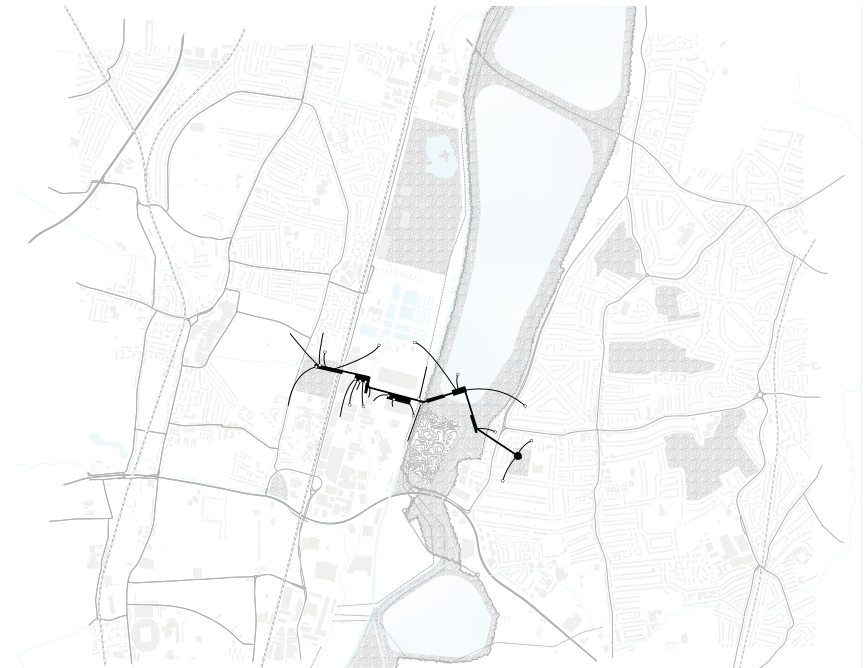
TRANSLATION RESEARCH TO DESIGN

The theoretical background and research analysis showed that city and hinterlands can not be separated from eachother. As beforementioned, the two concepts form a static dualism that has to be breached and reworked into one whole, where architecture and urbanism should form a relational construct. By means of topological mapping and investigating London in terms of food waste, its regional as well as territorial influence is shown. London has become a region of its own where second nature has become its first nature, the hinterSCAPE. The first step in translating this abstract theoretical research towards design was to find precedents that met the notion of the cyborg in terms of organizational systems and especially blurring the boundaries between the machinic and anthropocentric. The precedents were used to form discussions throughout the design process. The set of precedents can be found in *Appendix 1*. Finding precedents became an important part of the design process. I used it as an instrument at first and finally as inspiration to form my own opinion about architecture in a broader sense but also in terms of designing a systemic architecture. Often, reading articles and finding precedents coincided.

The research required a critical reading afterwards to translate it into a design statement. As I simultaneously had been looking at the territorial influence of London, I had defined the architectural principles of the project by means of theoretical research. It proved difficult to combine the tangible with the intangible. The theoretical research was based on the notion that architecture would eventually have intelligence embedded inside of it. Architecture would be this computing device that would respond to its users and surroundings. Unfortunately, although I am a fan of science fiction, I do not believe this will be the case. This type of intelligent environment suggests a particular autonomy integrated within architecture. The research analysis suggests that there already is autonomy embedded in the hidden city of London, while the whole problem is having that autonomy.

My intention with this graduation project is not to show how intelligent environments can suggest a new way of life. It is about how we can integrate current daily life with acknowledging the hidden systems that we are already dependent on and actually co-exist with. This includes recognizing innovative systems such as vertical farming or recycling as systems needed to overcome our unsustainable expansion of cities and ways of life. Man and machine have to be provided a common ground. I think therefore that architecture could play a role in providing a system that is responsive in terms of having adaptive properties, in either its physical structure or its content, becoming responsive by adapting to changing needs.
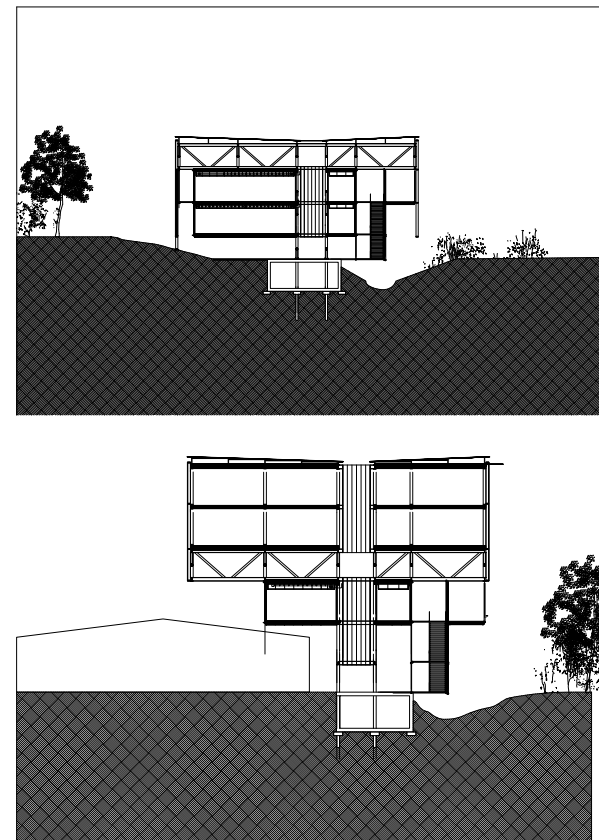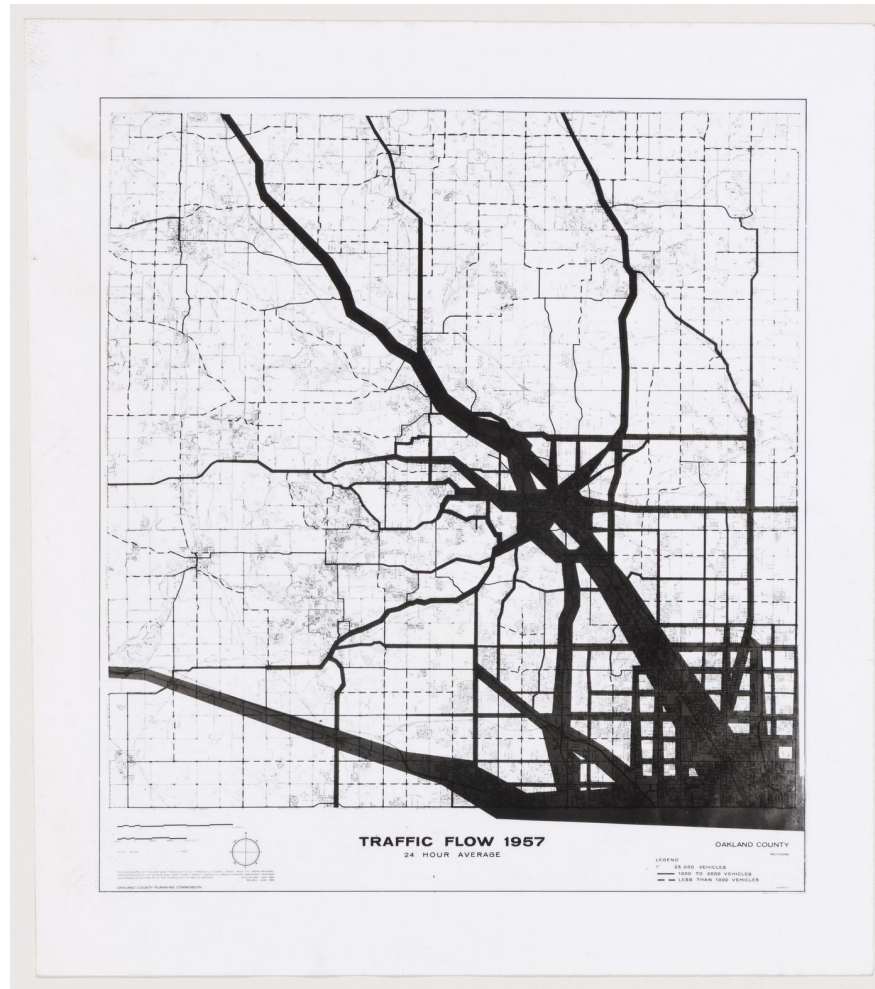
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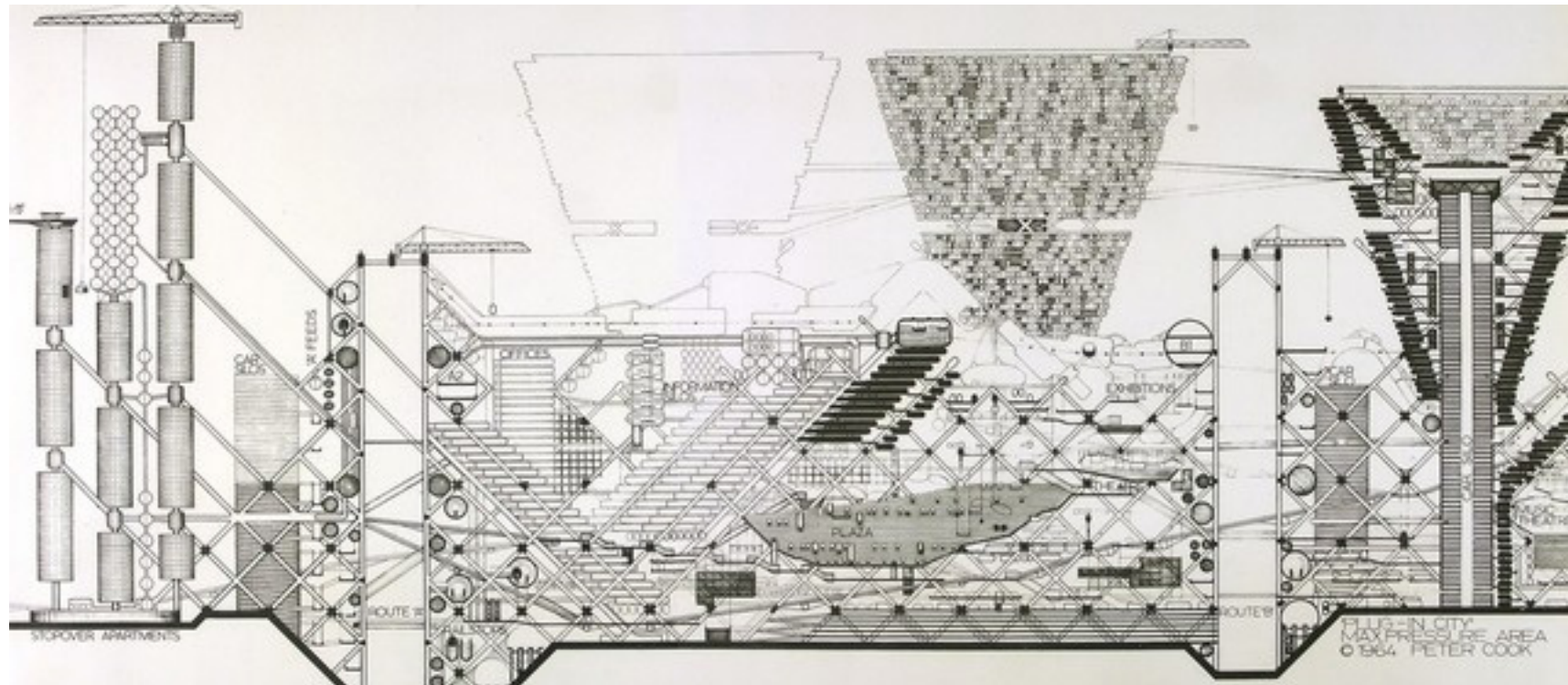
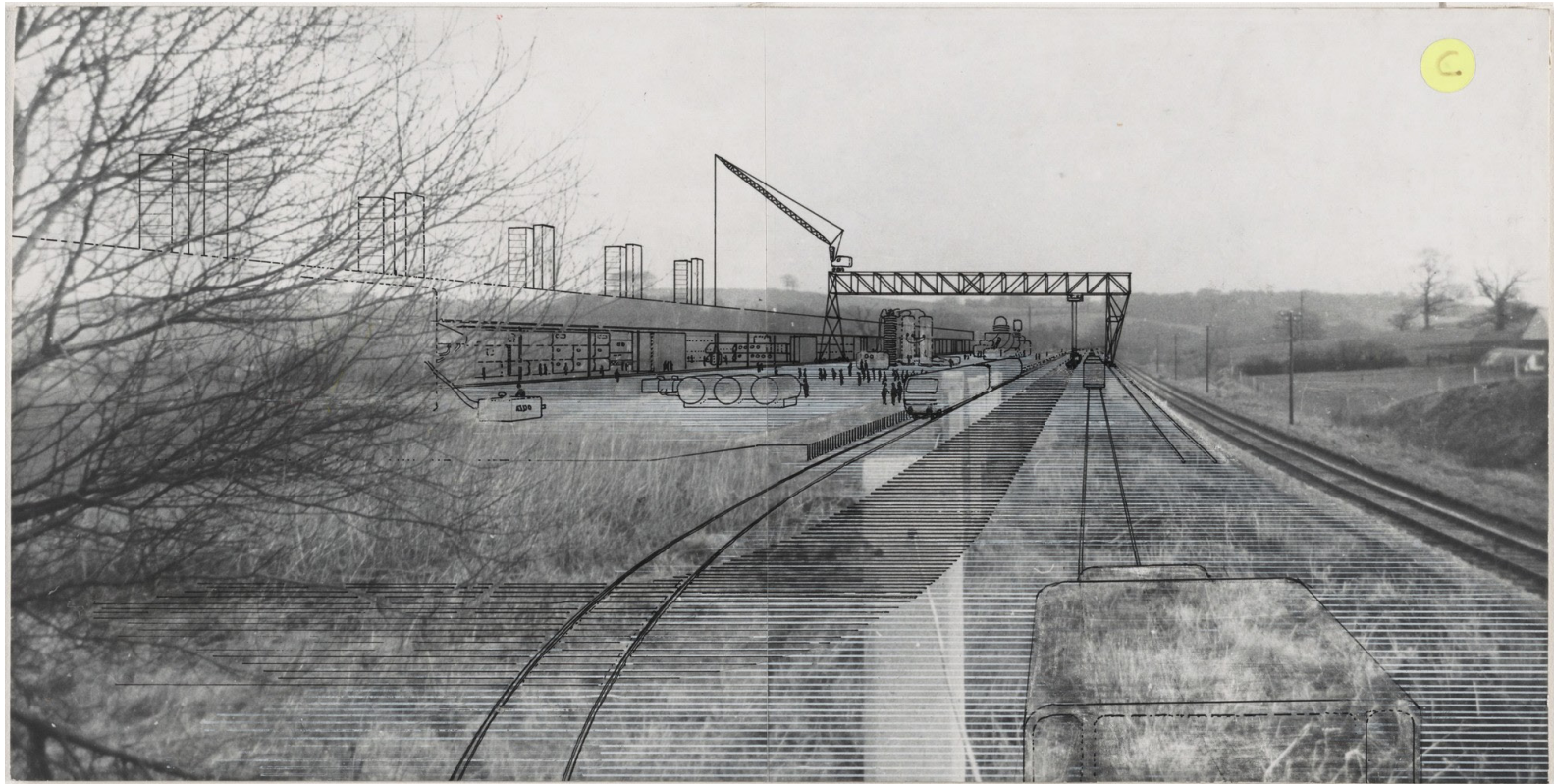*Plug-in City* / P. Cook / 1964
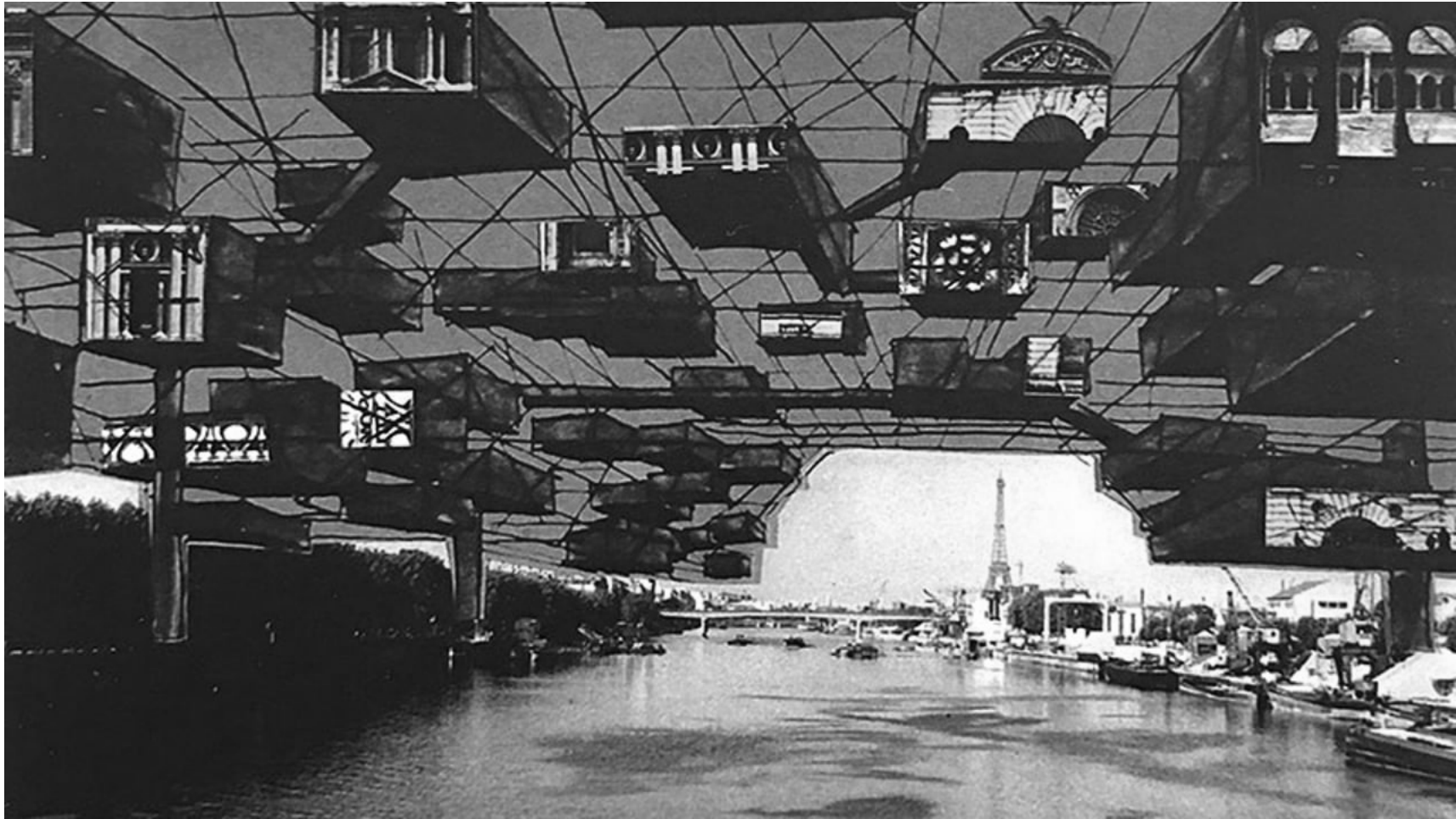
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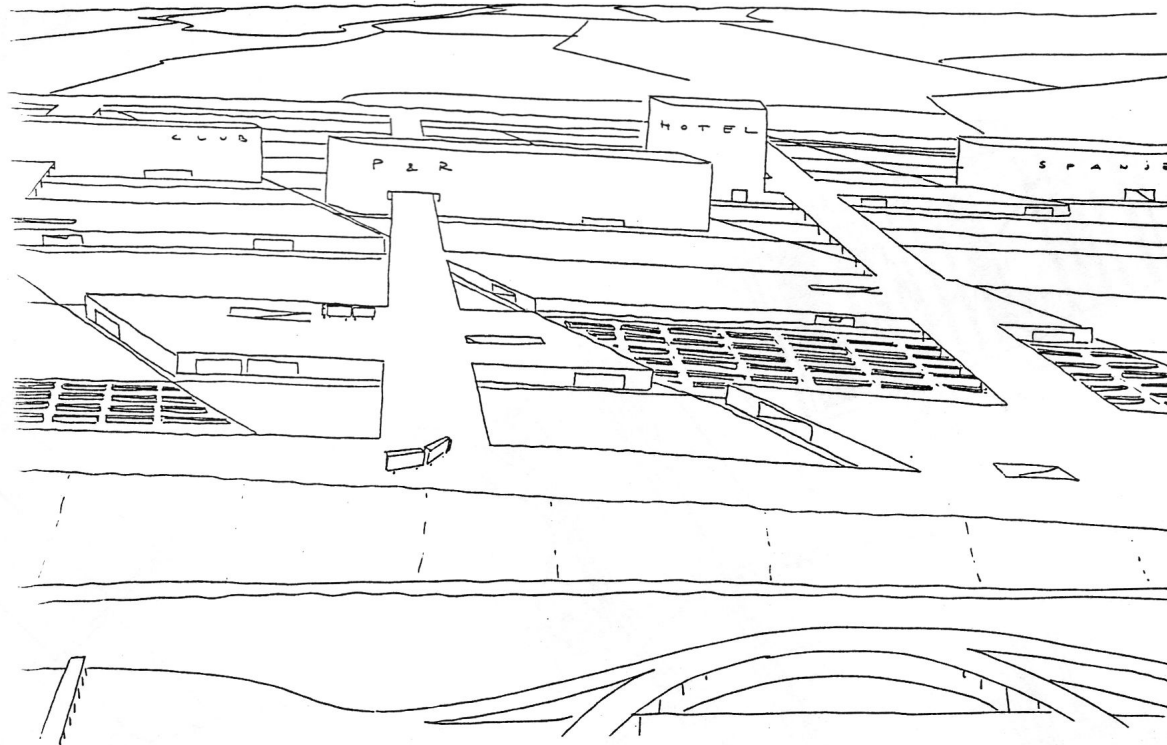
Transferia / OMA / 1991
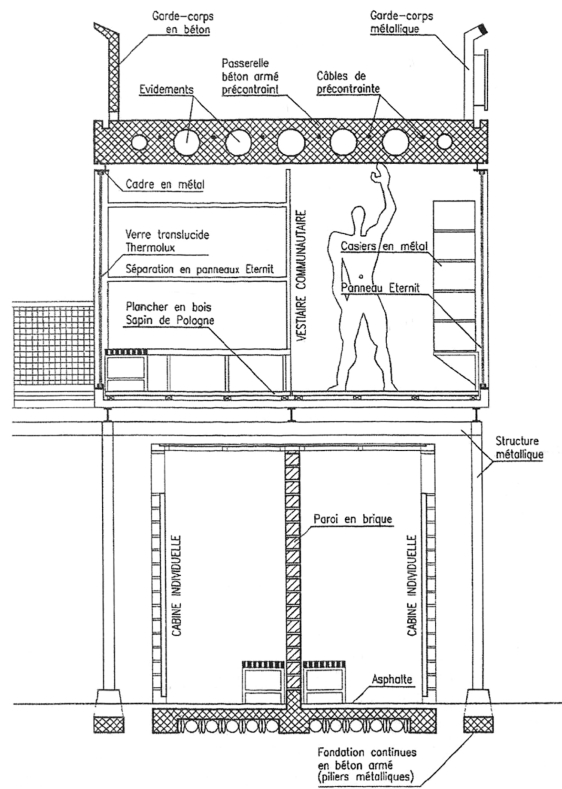
Il Bagno di Bellinzona / A. Galfetti / 1970
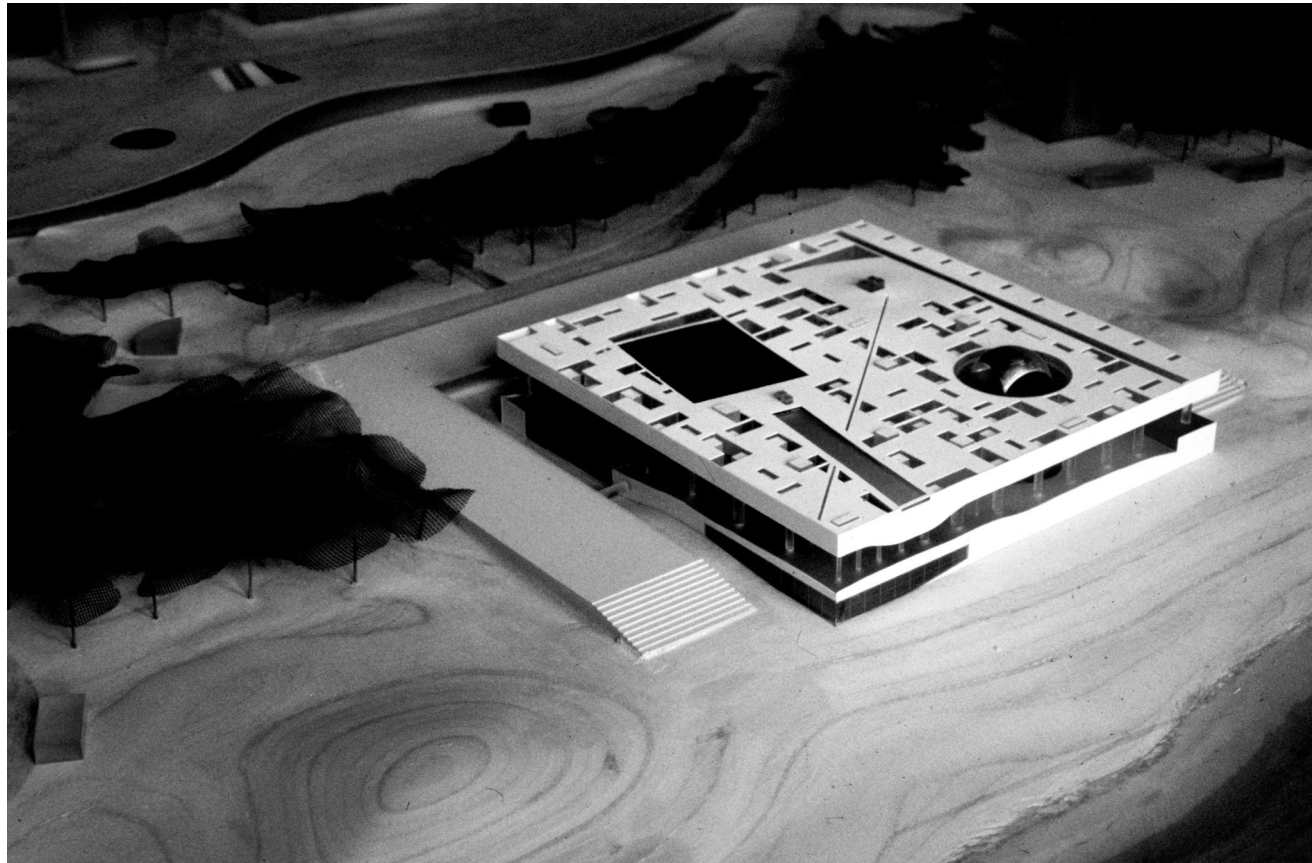
Agadir Convention Centre / OMA / 1990

Fun Palace / C. Price / 1964

Sendai Mediatheque / Toyo Ito / 2001

Blur Building / Diller Scofidio + Renfro / 2002

Tower of the Wind / Toyo Ito / 1986

Villa Rosa / C. Himmelbau / 1968

USAF Aircraft Hangar / K. Wachsmann / 1951

Pillow / ANT Farm / 1970

Dream Cloud on the Beach / ANT Farm / 1969

DESIGN EPILOGUE

location

During the phase of topological mapping, many cases were studied and investigated, however the research covered mostly their own situatio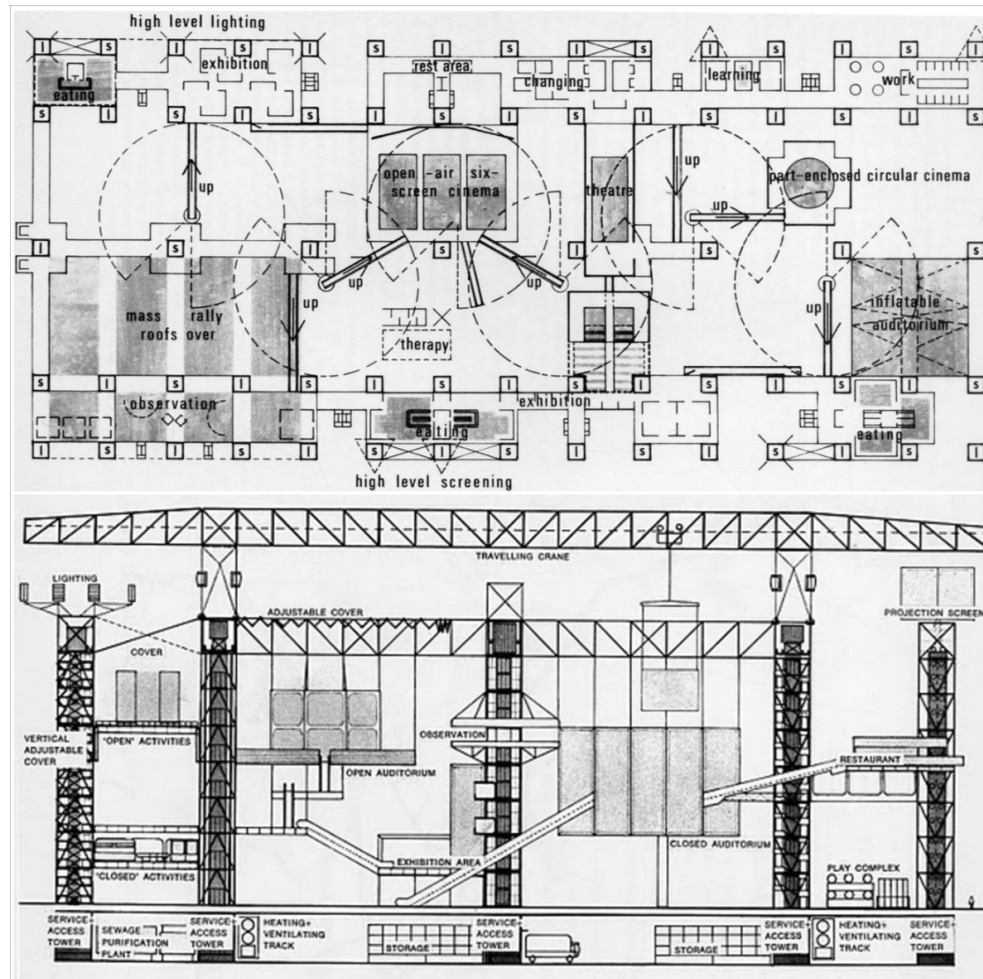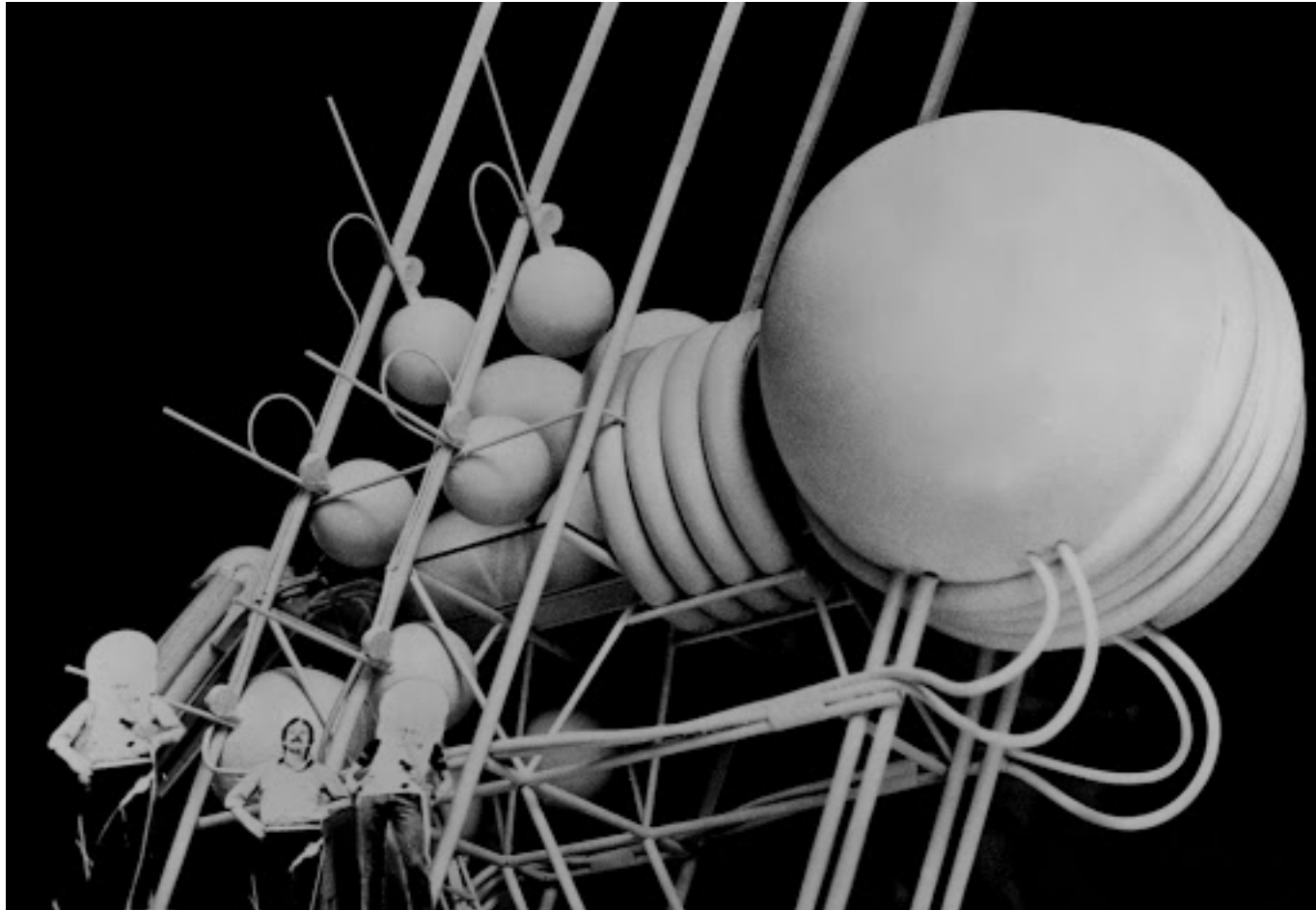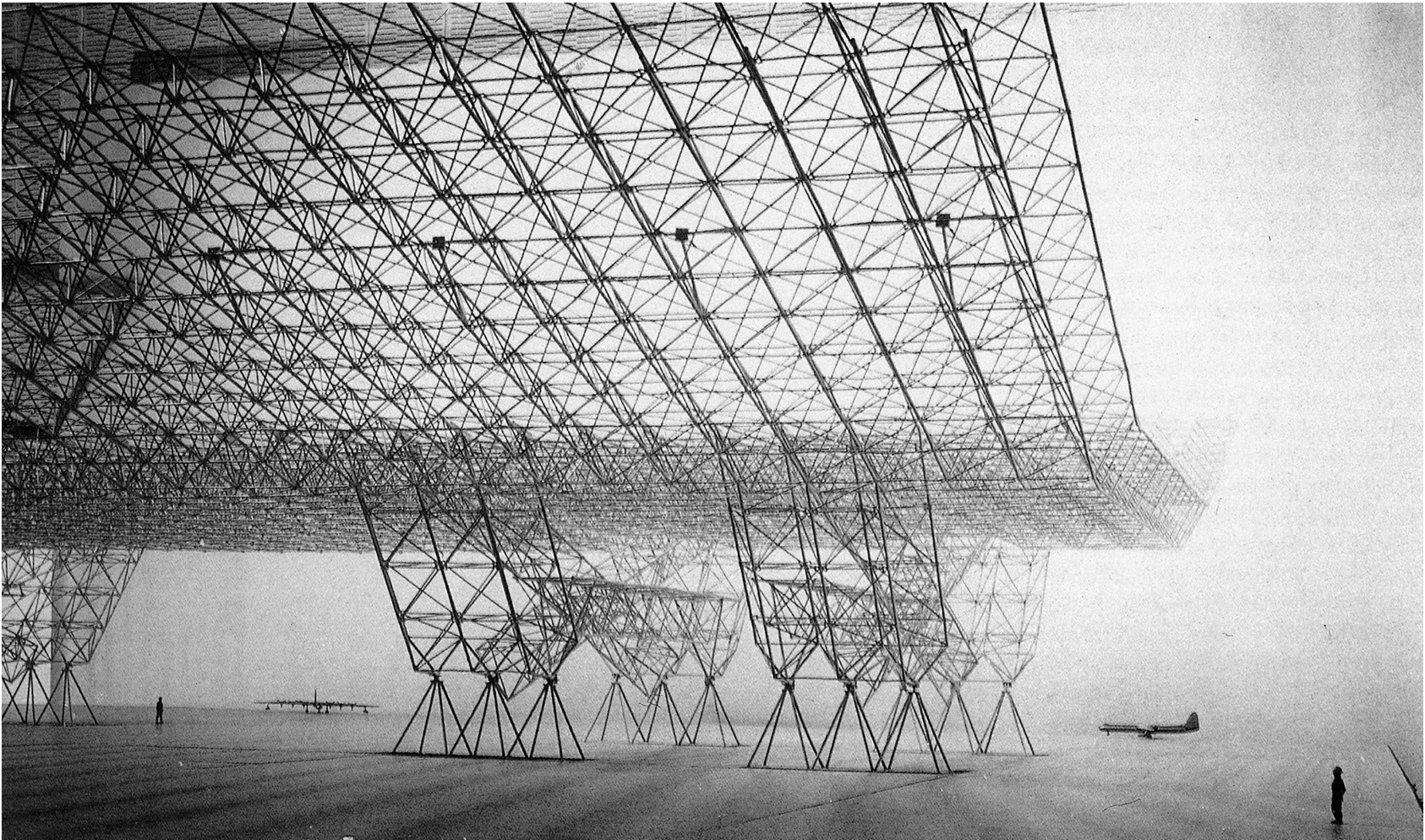n and how they were related to one another without looking at the situations in between. In its representation the topological drawing sought to diminish the amount of research by illustrating in-between situations as 'folds'. Infrastructure space became folded relations. This complicated the search for a project location. Only after viewing the territorial scale of London, it became clear that the Lea Valley, already an ancient distribution corridor, provided a theoretical substantiated base for the project, by combining it with the theory of N. Smith. The water reservoirs of London are post-war infrastructural works that have become embedded in ecological systems as well as that the southern reservoirs are being appropriated as a natural landscape. The northern reservoirs took my interest because of the segmented strips of activity; suburbs, industrial parks, the reservoir, and all types of infrastructure. At the start I wanted to make a visible direct connection to the hinterlands, a line that spanned several kilometers and following the existing infrastructure. However, the existing infrastructure is part of the larger system that currently occupies and determines the rules in the city/hinterlands paradigm. The project should break with this and solve what the existing infrastructure cannot. Therefore, the line turned 90 degrees, also embedding itself into the site by spanning from one suburb to the other that is heavily separated by the industrial/production zone of the Lea river. In that way the megastructure taps into the current infrastructure while providing one of his own as a linear development.
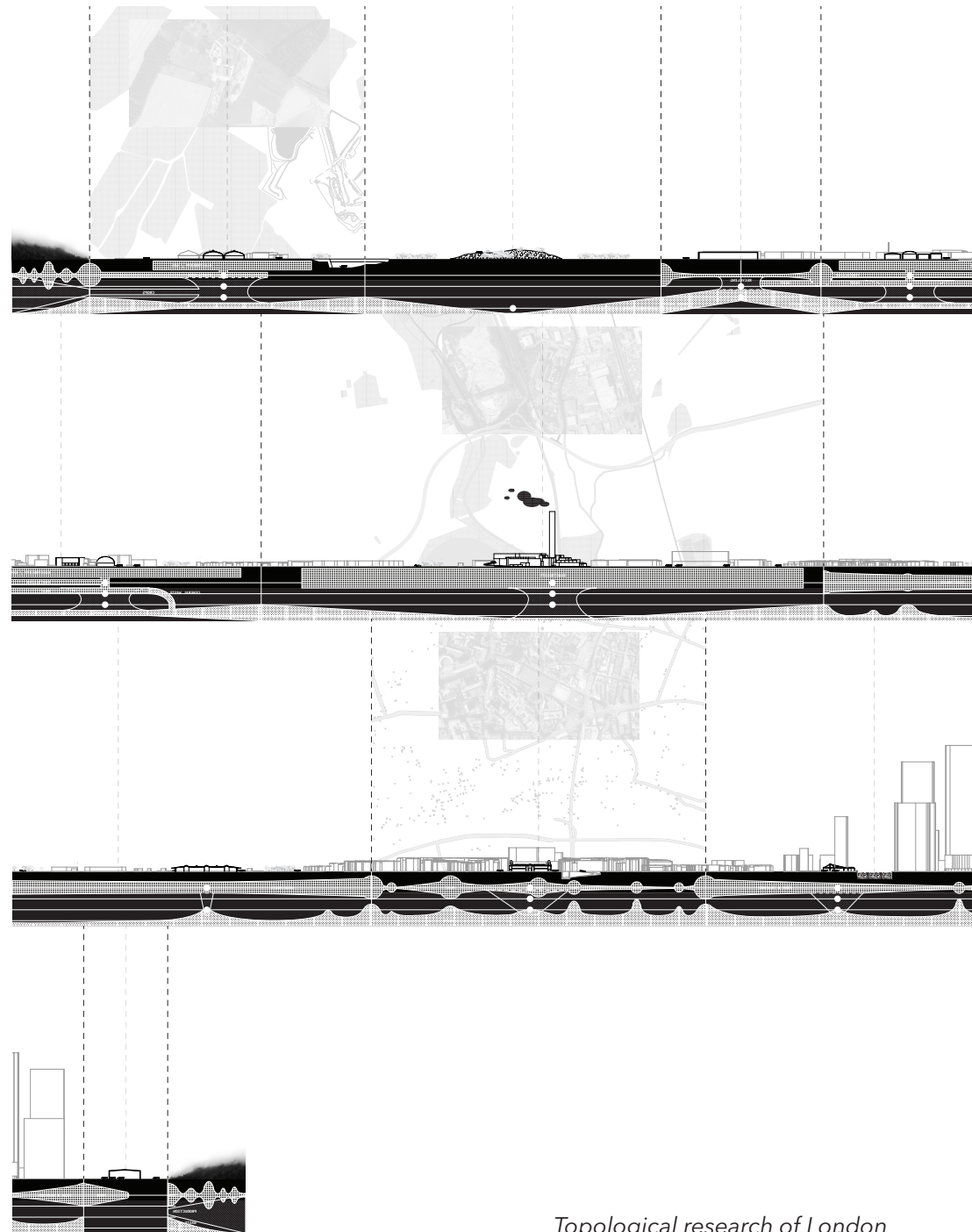
DESIGN EPILOGUE

linear development

The idea of the megastructure was applied because of the futuristic but tangible goal of cyborg architecture and urbanism. I became fascinated by utopian projects that in their essence had interesting ideas but stayed abstract. Currently popular architectural firms are still designing new cities or districts from scratch with futuristic visions of drones flying around while still using the same mainstream ideas about infrastructure and ethics. The cyborg theory being applied to urbanism and architecture inspired me to visualize a near future that could actually be build apart from being very costly. In the past many types of linear development were proposed, and they still are being proposed. For instance the NEOM project by Saudi Arabia. In Appendix 2 multiple cases are illustrated. The problem with most of these projects is that it is envisioned as a city on its own. Again, it engages with its own autonomy. Most of these cases are built around embedded infrastructure that although with fine intentions works as a political device. Suburbs and industrial districts as Arturo Soria y Mata envisioned become estranged from its center. An autonomous line is therefore in my opinion always at a disadvantage except when it is forced through topography. However, when a continuous line interacts with its environment and does not provide its own autonomy I think it can work. It then uses an already established structure, and adds to these instances rather than secluding alternate systems. Its own internal logistics, its own infrastructure can then tap into systems that are already there. This is also the idea behind the steps I took in my project. The megastructure provides a new type of infrastructure on top of the already existing infrastructure. Although it seems autonomous it interacts rather than remaining exclusive. The line is then broken up in infinite amounts of segments/interactions that have no hierarchy, it becomes topological.

APPENDIX 2
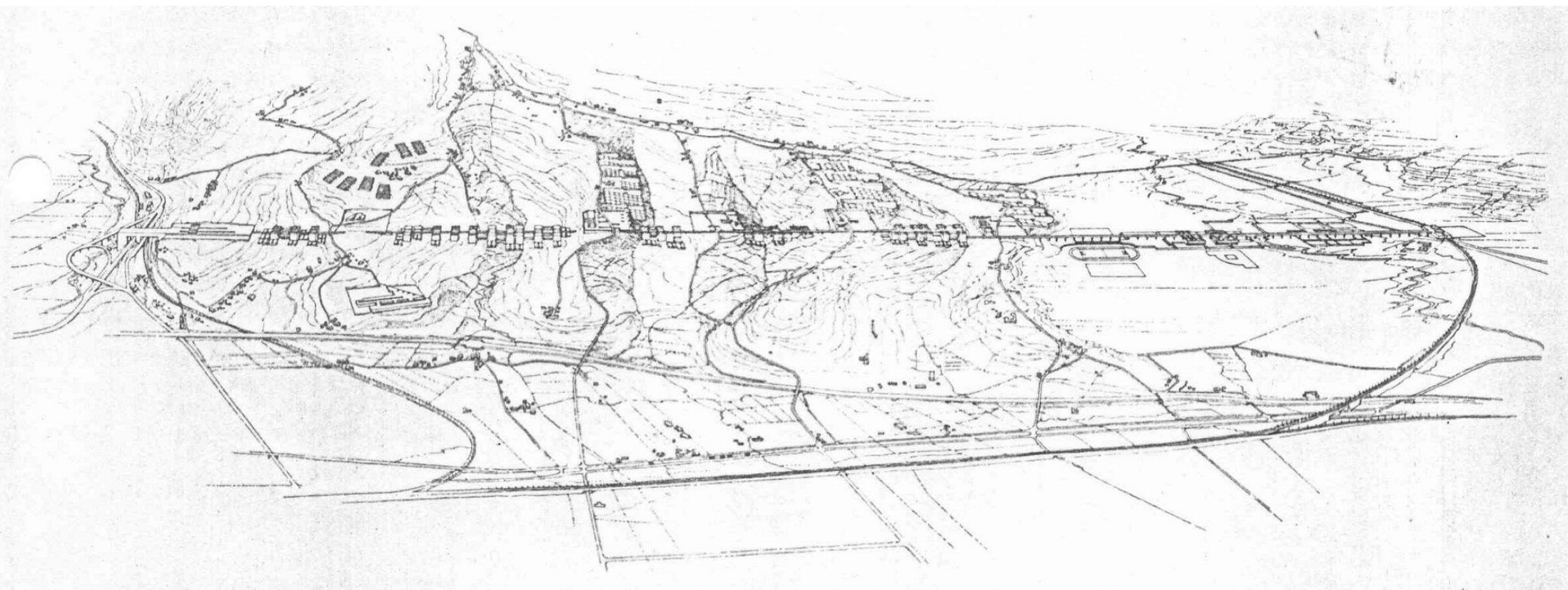
Calabria University / V. Gregotti / 1972

La Ciudad Lineal de Arturo Soria
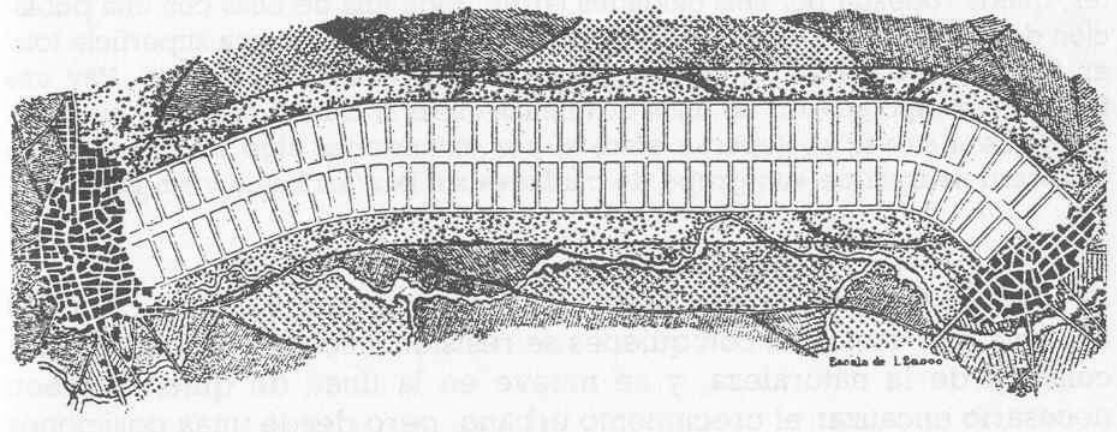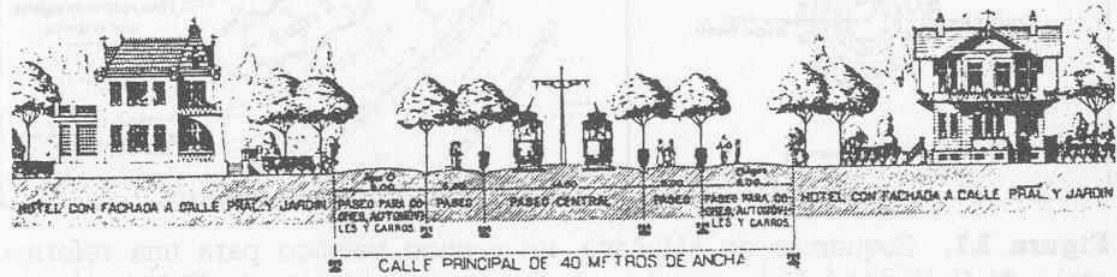
Ciudad Lineal / A. Soria y Mata / 1892
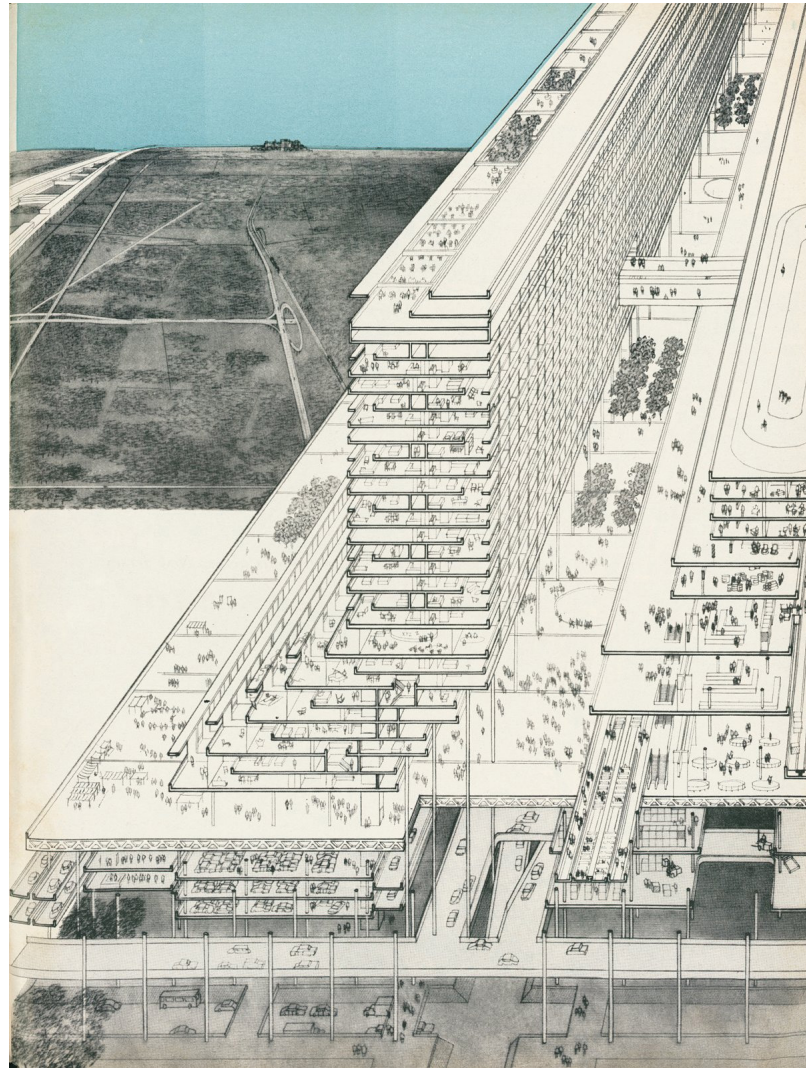
Linear City / P. Eisenmann & M. Graves / 1965
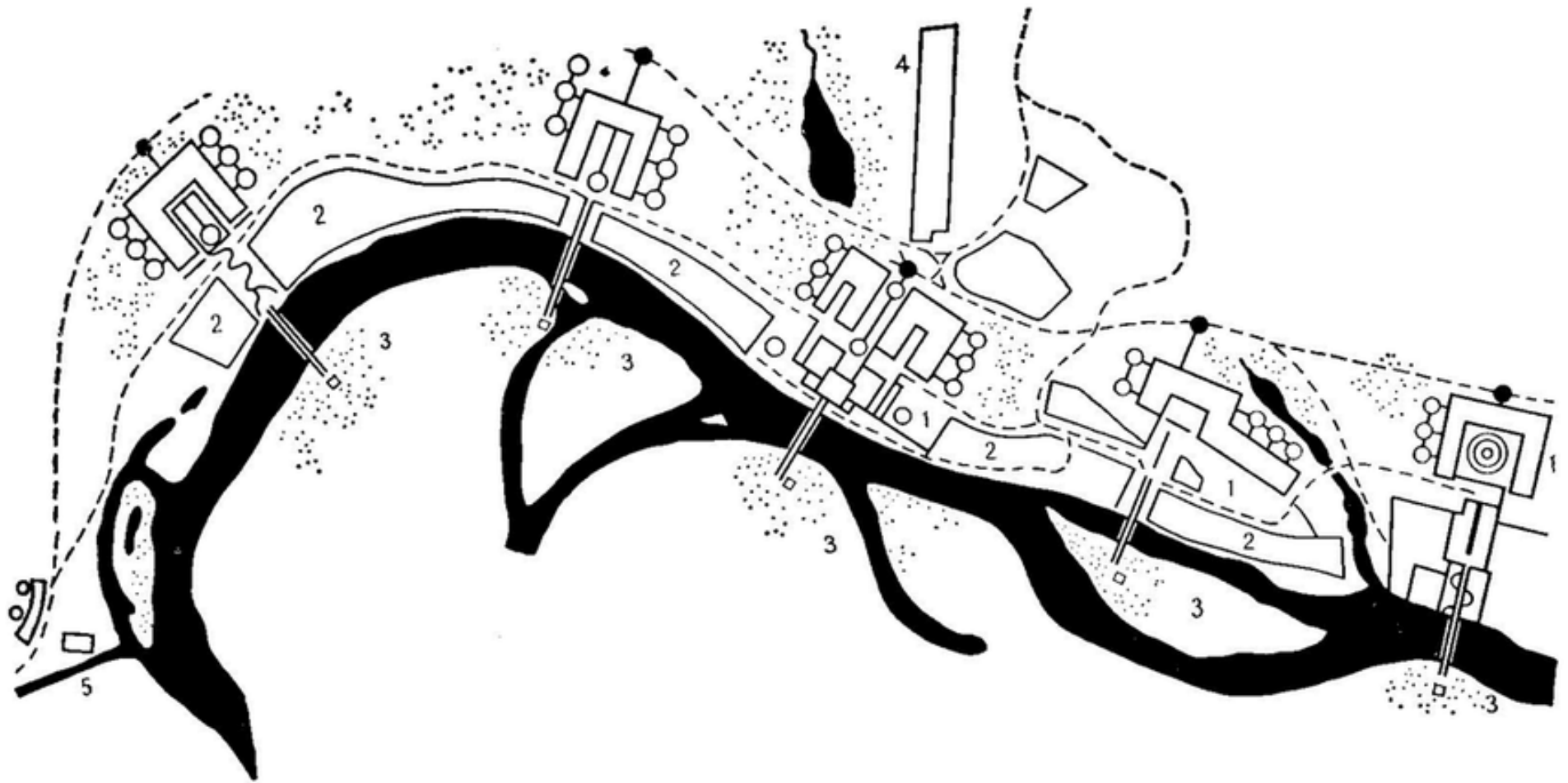
Great Stalingrad / A. & L. Vesnin / 1930
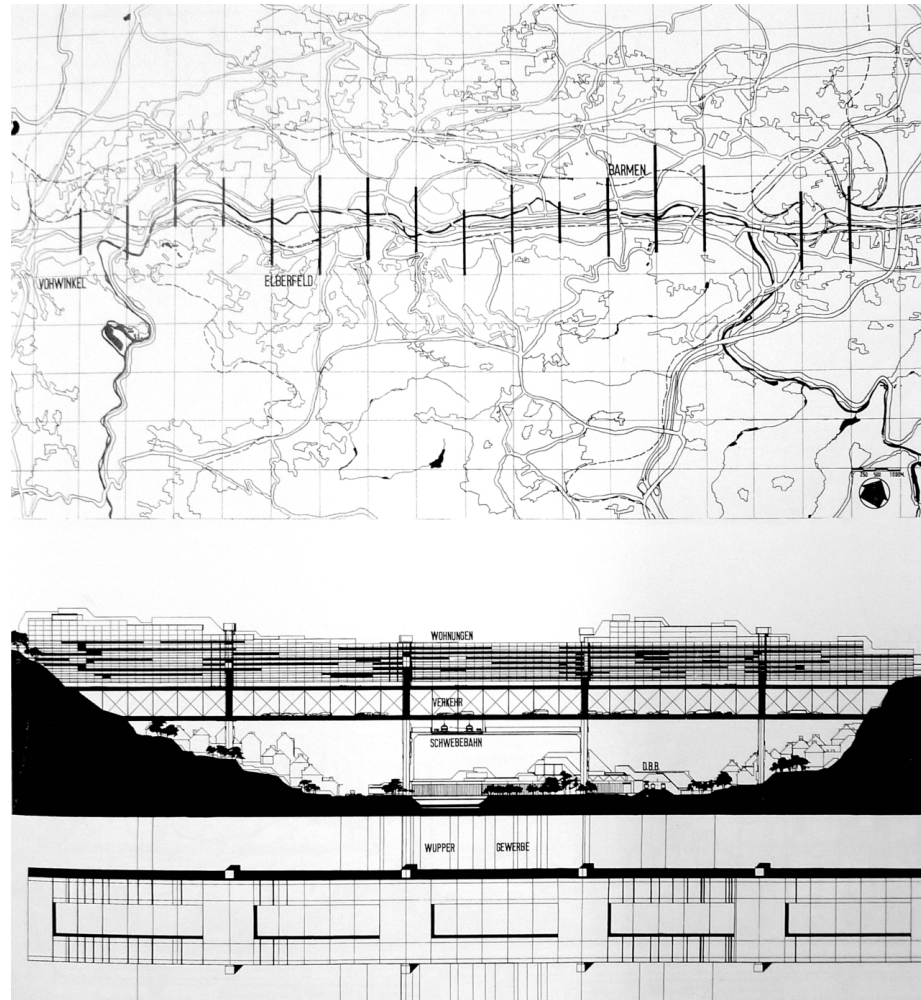
Continuous City / A. Boutwell & M. Mitchell / 1969
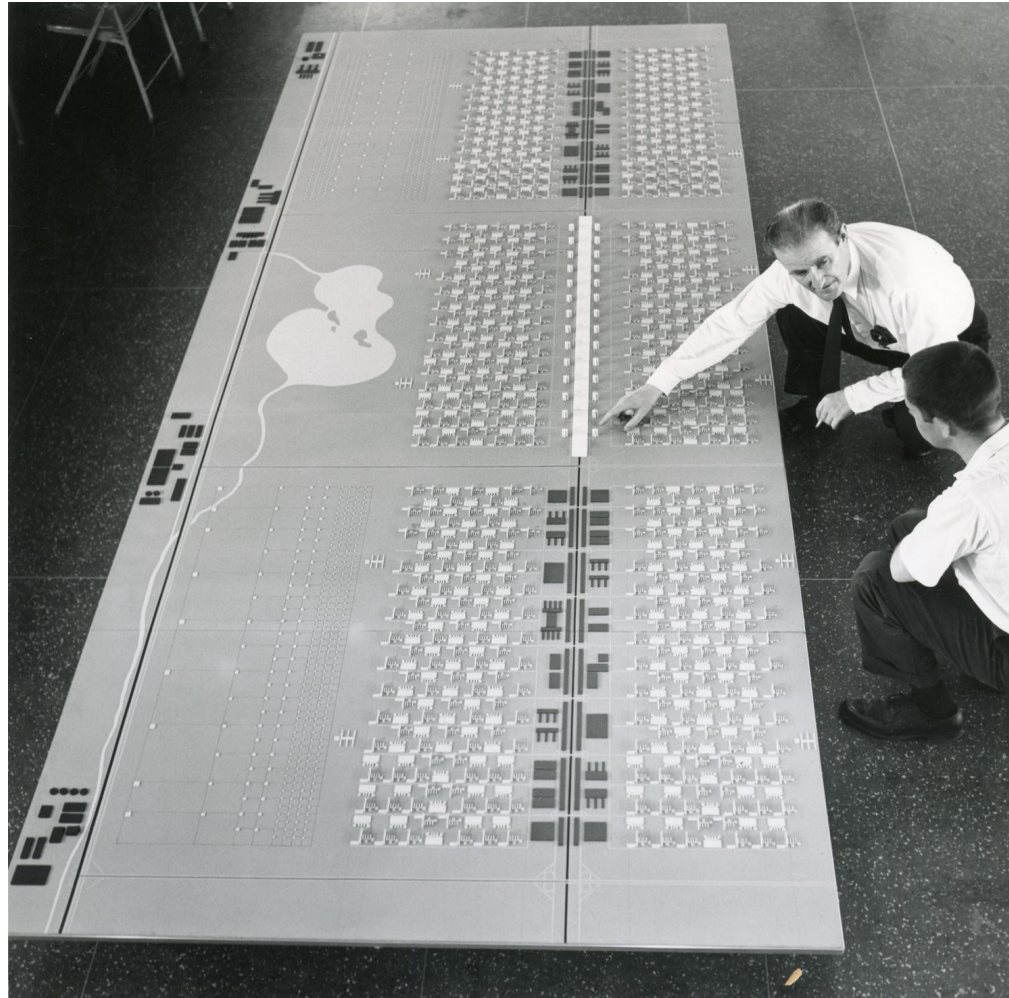
Metro-Linear: The Regional Metropolis / R. Malcomson / 1957

Decentralized City / L.K. Hilbersheimer / 1944

PEDESTRIAN LAYER

SERVICE LAYER

SPINE LAYER

TRANSPORT
CONTROLLED
BY AI

NEXT
GENERATION
FREIGHT

ULTRA-HIGH-SPEED TRANSIT

Neom: The Line / Saudi Government / present day ->

program

From the start I have been struggling with the program. The cyborg theory and the research analysis did not really point out one particular aspect, as well as my own intentions did not. Because I used the lens of food waste to search for the relations between London and its own hinterlands it did point towards food production in the city. To be honest, I have developed a prejudice when it comes to the topic of urban food production. Popular architecture firms have basically capitalized the topic and in my opinion it is not anymore about what good it can bring but more about the spectacle of being green, just like greenwashing architecture just for the sake of being 'sustainable'. I have tried to deviate from this topic many times, yet it always came back to me as an important part of the project's narrative. The phrase, kill your darlings, in this case does not apply. I tried to kill the devil, but it raised itself from the dead. Apparently sometimes you have to accept an alternative fate of the project in the design process.

Furthermore, I have looked at various projects that did not use a 'function' as program, but were more based on textures and space. For example, OMA's proposal of Parc de la Villette is based on the notion that a randomized program pattern creates very specific situations. I tried this at first to find a representation to the megastructure. If I were to define the program through textures and space rather than function, the structure would create situations of specificity within the urban fabric. At first, I envisioned that the textures that were the medium or result of production processes would constitute the architectural landscape of the megastructure. For example, the use of recycled concrete aggregate to filter water would become a part of the landscape and at its edges it would engage with the next texture/program. The program than assumed it would stretch over the whole of the 2.5 km line.

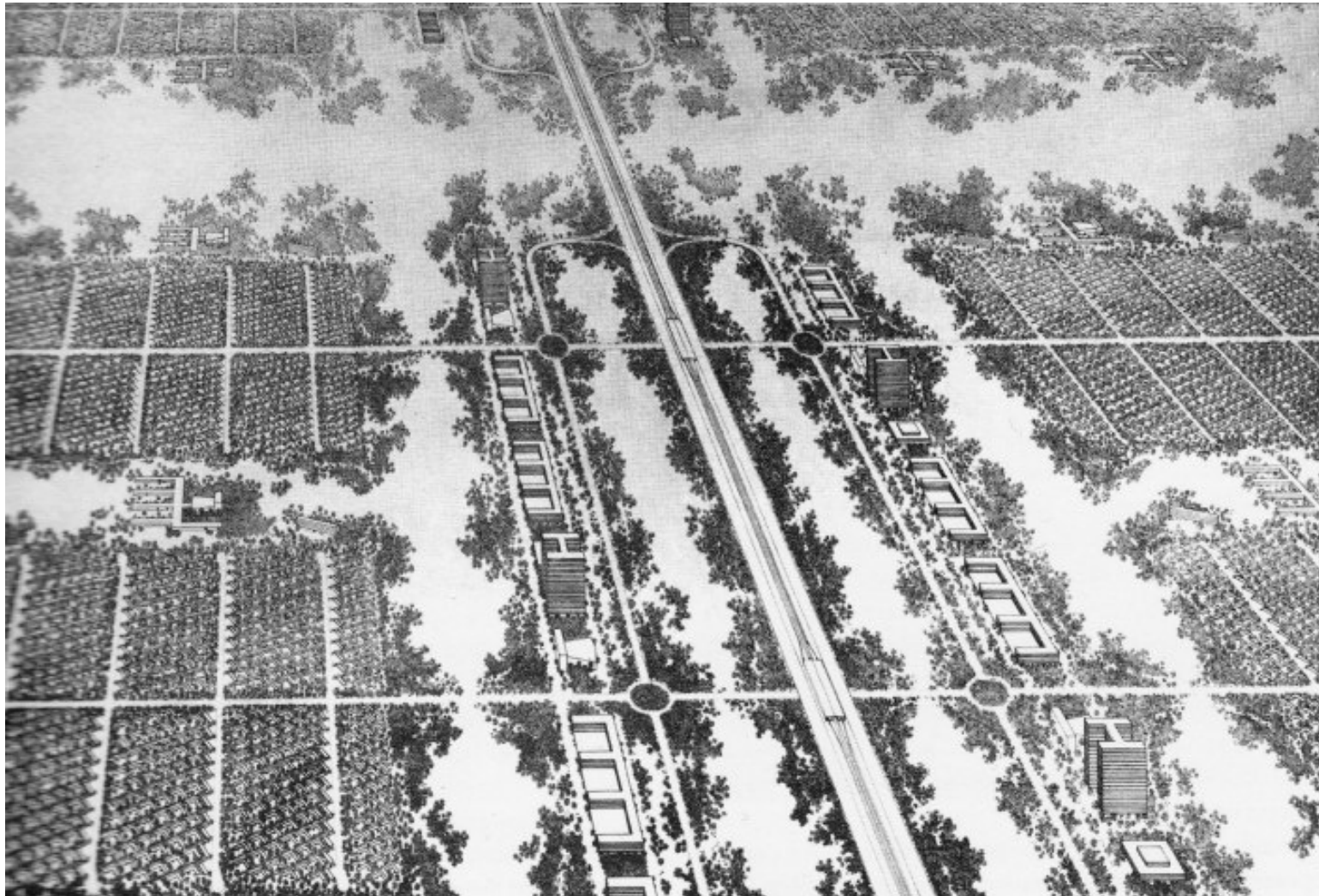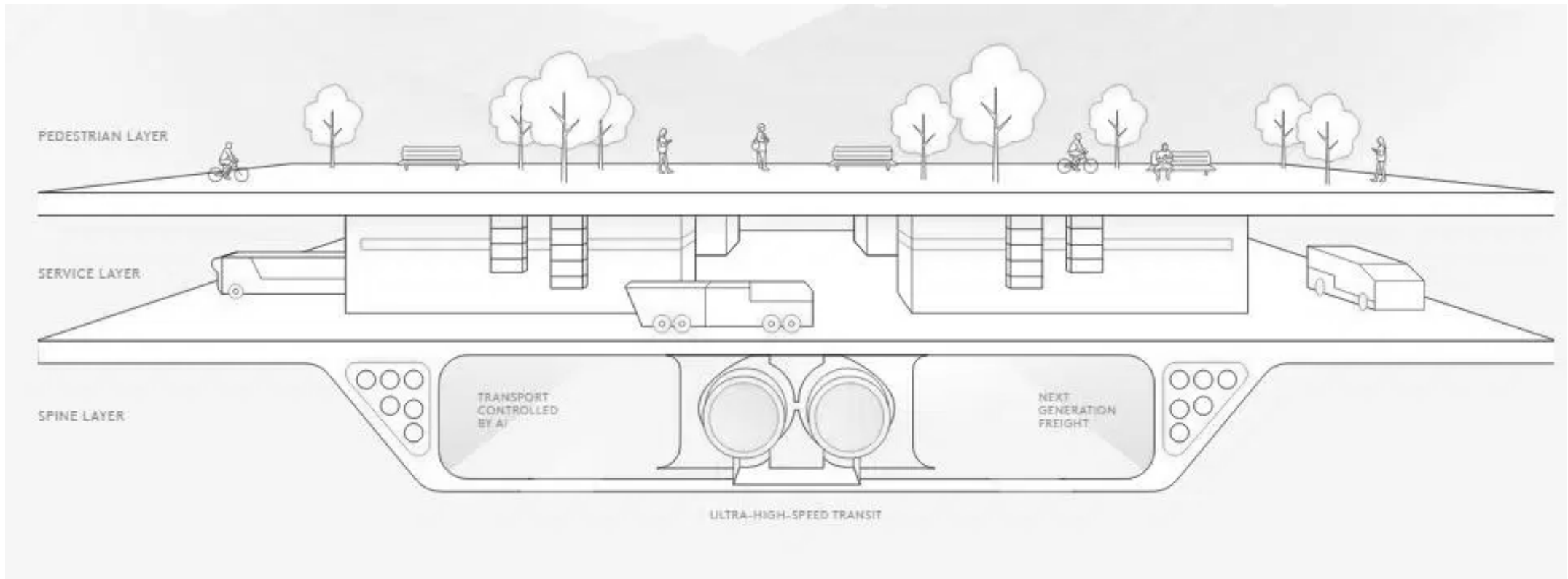After a while I became fascinated by Constant Nieuwenhuys' New Babylon project. I already had come across the project in various articles, yet never really paid attention to it. This moment was crucial to transform the megastructure from an infinite line of processes to a specific sector based prosthetic infrastructure. The idea of Constant was that labor has completely been automated and that a new type of infrastructure of sectors is established where the creative human being can dedicate himself to creative development. I explicitly write 'a type of infrastructure' as I do not see the compilation of sectors as a city but more of an infrastructural component of existing cities, partly also because the maps are drawn on top of existing cities. This also adds to the narrative of the project. The linear development is in this way broken up in site specific sectors that correspond and intermingle with existing infrastructure and systems. The notion of sectors also expands the way the megastructure can be represented. The difficult part was to identify with what to do with the space in between sectors that clashed at specific boundaries of the site. This proved immensely difficult as I could not grasp the scope of the project. At first, I tried to design these specific points as movable bridges where the structure is able to change direction. Although adding to the narrative it seemed excessive and highly unlikely that this would later define the critical points of the project. In the end, in my opinion, I was unable to cover this part and envisioned the structure as a contiguous line that in abstract language interacts with the specific boundaries of infrastructure on site.

44
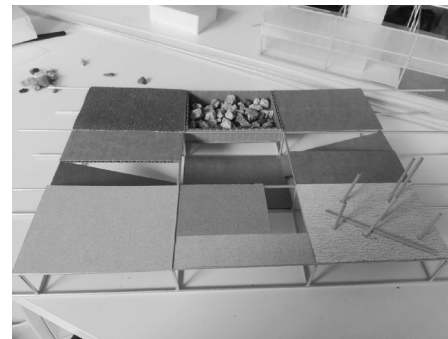
DESIGN EPILOGUE

interface

The structure became more defined in the slow process of trial
and error. Because I was unable to add a certain specificity to
the project in terms of the critical nodes that interacted with the
existing boundaries of infrastructure, I tried it in a different way. I,
previously, had not elaborated much on what I meant with the role
of the interface. At first, I thought the program was the interface, an
entity producing an environment that interacted with the outside
environment as well as internally between other programs. After
thinking a lot about how these programs would interlock it did not
prove to be effective. As reading is a large part of my process, I
started reading up on what an interface means in abstract theoretical
terms. This pointed me towards an architecture without content,
although a bit late in the process.
What are the elements of an interface? And how to design them?
Are there any rules to this or is it merely a set of surfaces that
interact? Thinking about this let me to the thought of transition
spaces, so not specifically thresholds, particular physical elements
that guide you through a sequence of different spaces (a banal
example is the doorsill), but transition spaces which implies a
certain depth of the envelope. Further reading pointed towards a
multilayered envelope that adapts to the underlying program. An
automated datacenter, 'dark datacenter', does not need sun shading
or large windows. In that sense, the structure is able to adapt itself in
a low-tech matter and also touches a social aspect of the experience
of space. By looking at references, Appendix 3, I became fascinated
by the performative qualities of light (transparency, reflection,
refraction). Reading about threshold spaces pointed towards subtle
plays between shadow and light. In the end, the project took a
peculiar poetic route inside of a techno-social spectacle.

APPENDIX 3
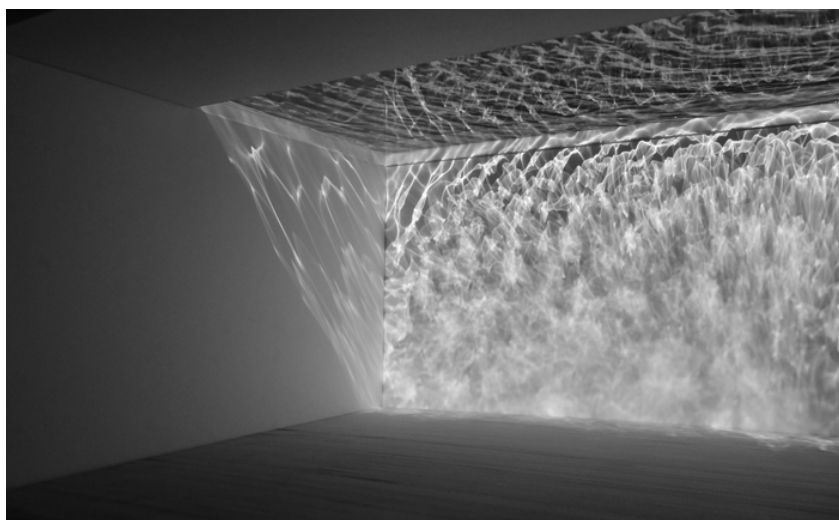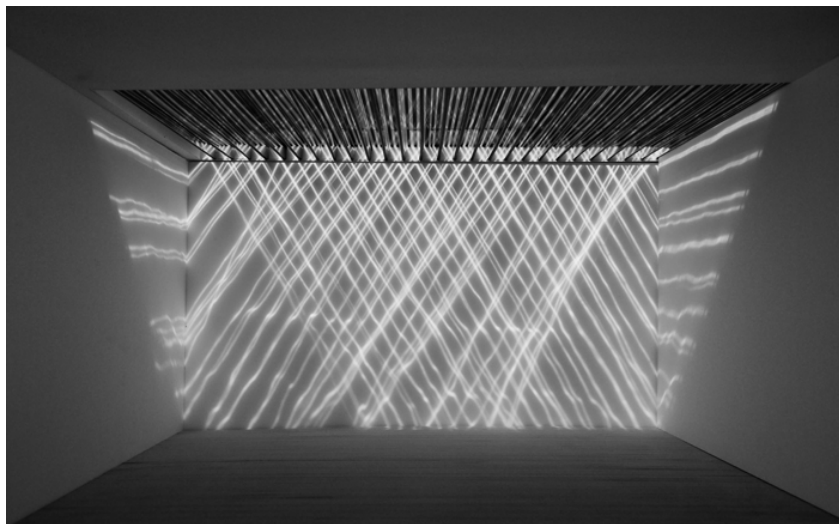
Light Room Experiments / Philippe Bompas

Alfred Lerner Hall Student Centre / Bernard Tschumi Architects

Cartier Foundation for Contemporary Art / Atelier Jean Nouvel
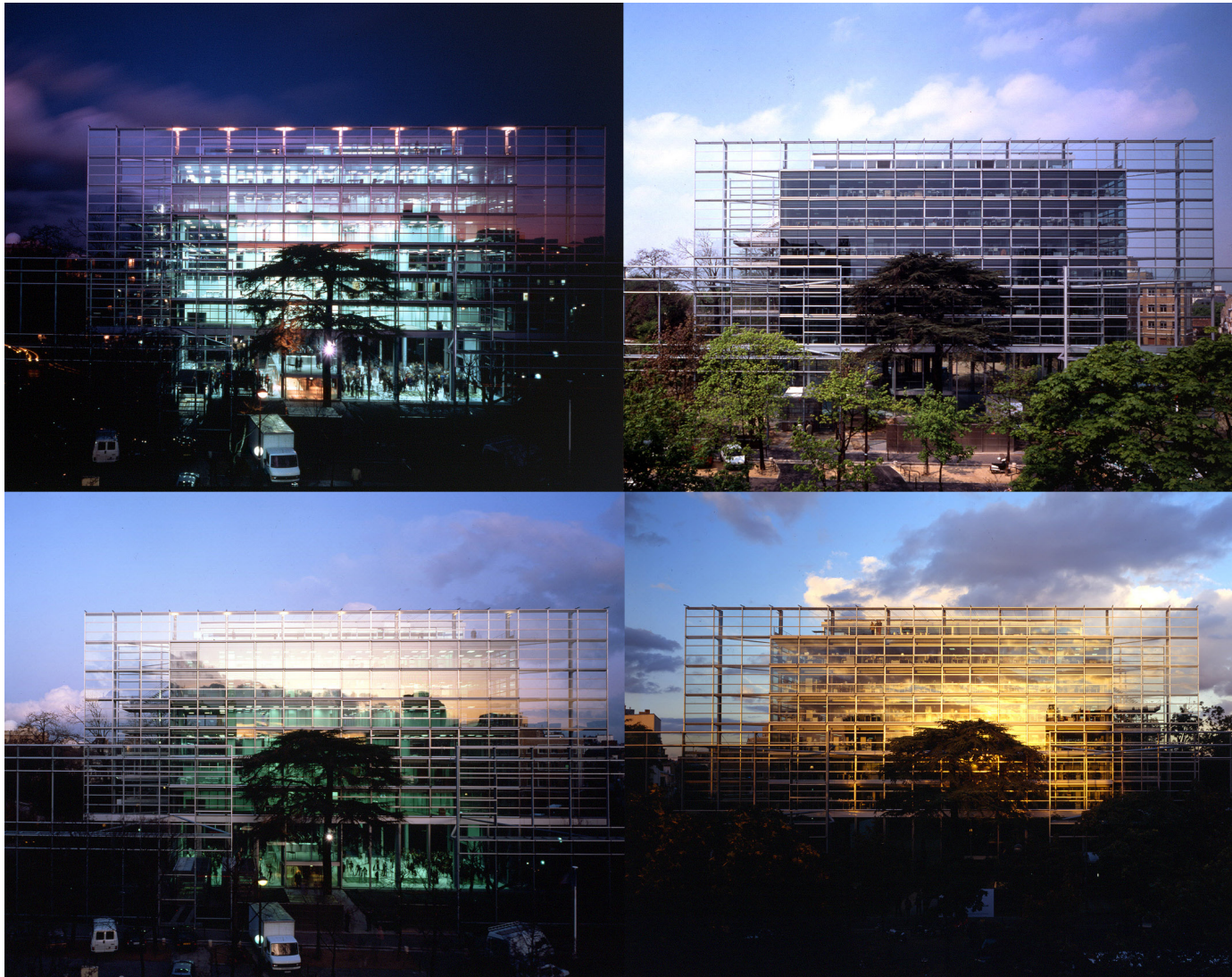
Cartier Foundation for Contemporary Art / Atelier Jean Nouvel
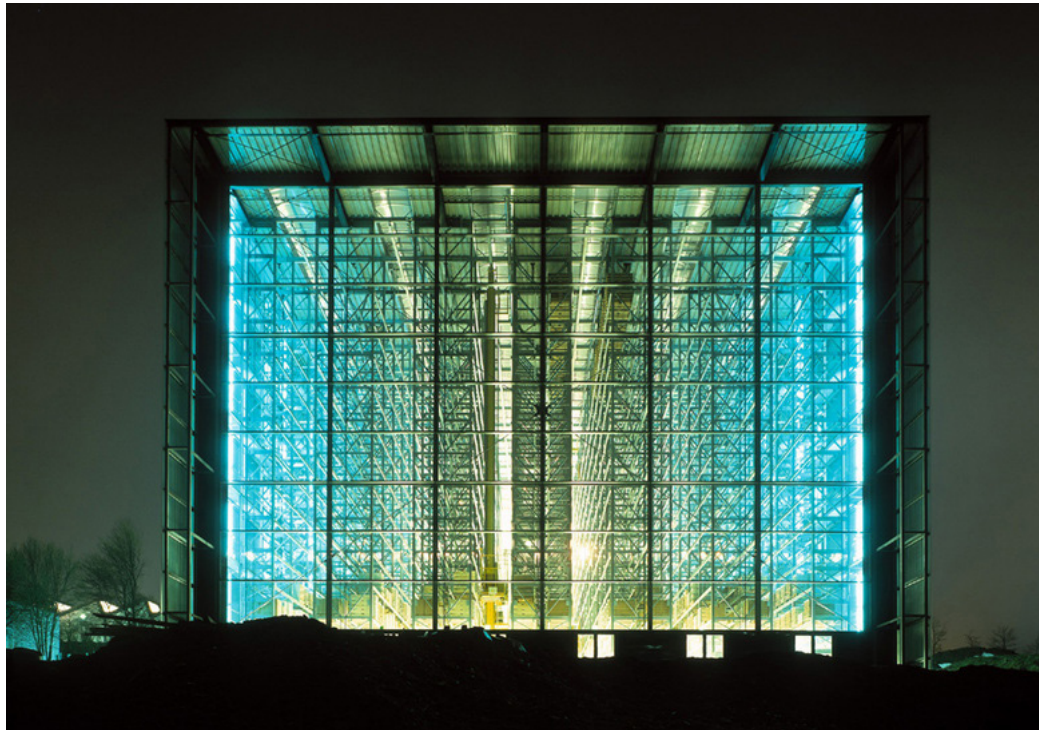
ERCO P3 / Schneider and Schumacher (Architect) Belzner Holmes (Lighting)

Nuit des Docks / Yann Kersale

Garage Museum of Contemporary Art / OMA

PERSONAL REFLECTION

To conclude I would like to elaborate on the design process on a personal level. There were many issues and dilemmas at play. To be honest I find this the most unproductive semester of my Masters, which is unfortunately (and hopefully) the last one. This is for a large part because of the epidemic and my own particular home situation that just could not coexist along with the graduation project.

My main mentor asked me somewhere after P1, what kind of architecture I wanted to design in the end, to just think about it. I told him that I am more of a subtle gesture guy, I ended up with a megastructure of almost two kilometers long.

Although I am grateful that my intuition and prejudice were eventually superseded by the conclusion of my research, it is a process entirely new and strange to me. I have learned about a lot of theories and concepts that I think should be more addressed in the Masters than currently is the case. I think in my case, the project elaborates on the notion that visionary theories can actually be tangible, or that we at least have to aim for it becoming tangible. Innovation is not all about green roofs and heat pumps, it becomes a spectacle in that regard, using innovative design for the sake of innovation. I think it is important, also in academic regard, not to lose our grasp on the many theories and ideas that break with this spectacle. When I can call myself an architect in two years, I want to keep on learning from these kinds of theories and perhaps provide some of my own some day through design or design research.

In terms of my design process I tried to regard the current corona situation as a normal analogue situation, making use of modelmaking and representation of drawings where I could. In the end I could only muster together the modelmaking part. I hope I can continue with using these analogue representational instruments as I think this is very important for future projects how you translate the design for others as well as for yourself. Representation, in my opinion, asks of the designer to think about the intentions and goals of the project. It is about the narrative being told and how to engage with others. It is difficult to design such instruments but whenever you succeed it proves very productive.

Furthermore, reading about theories helped me a lot in justifying particular choices and played a large part in the design process. The design process was mainly based on the notion of reading on the concept, find reference projects/precedents, and eventually draw. Looking back, the step in between finding precedents and acquiring inspiration, to eventually sketch or draw proved difficult. Naturally, this difficult step requires the translation of research to design. I started sketching quite late, and when I sketched, I eventually kept sketching the same situation over and over which did not accelerate the process. This was mainly during the grotesque time I needed to eventually agree that the program did not define the project at all. It requires critical thinking that I, in my opinion, neglected for too long, because I had been overthinking a lot of things losing the scope of the project.

With the faculty closed I lost a lot interaction in terms of exchanging ideas and receiving feedback. Although once a week your mentors provide you feedback, I have always relied on talking with others about my project as well as providing my thoughts on theirs. The design process was difficult because I could talk with no one at home about all the problems I faced. In future practice, I think it will be important to choose a place where there is a social environment of constructive feedback rather than working all alone, becoming a bit mad in the process.

To conclude on a personal note, the last few weeks have proven difficult in terms of the final steps but steadily manageable. I have moved to another place, which relieved me of personal pressure, and have become productive again. I want to personally thank David Bowie for performing the song China Girl live on A Reality Tour, which I have been listening to on repeat for the last 168 hours.
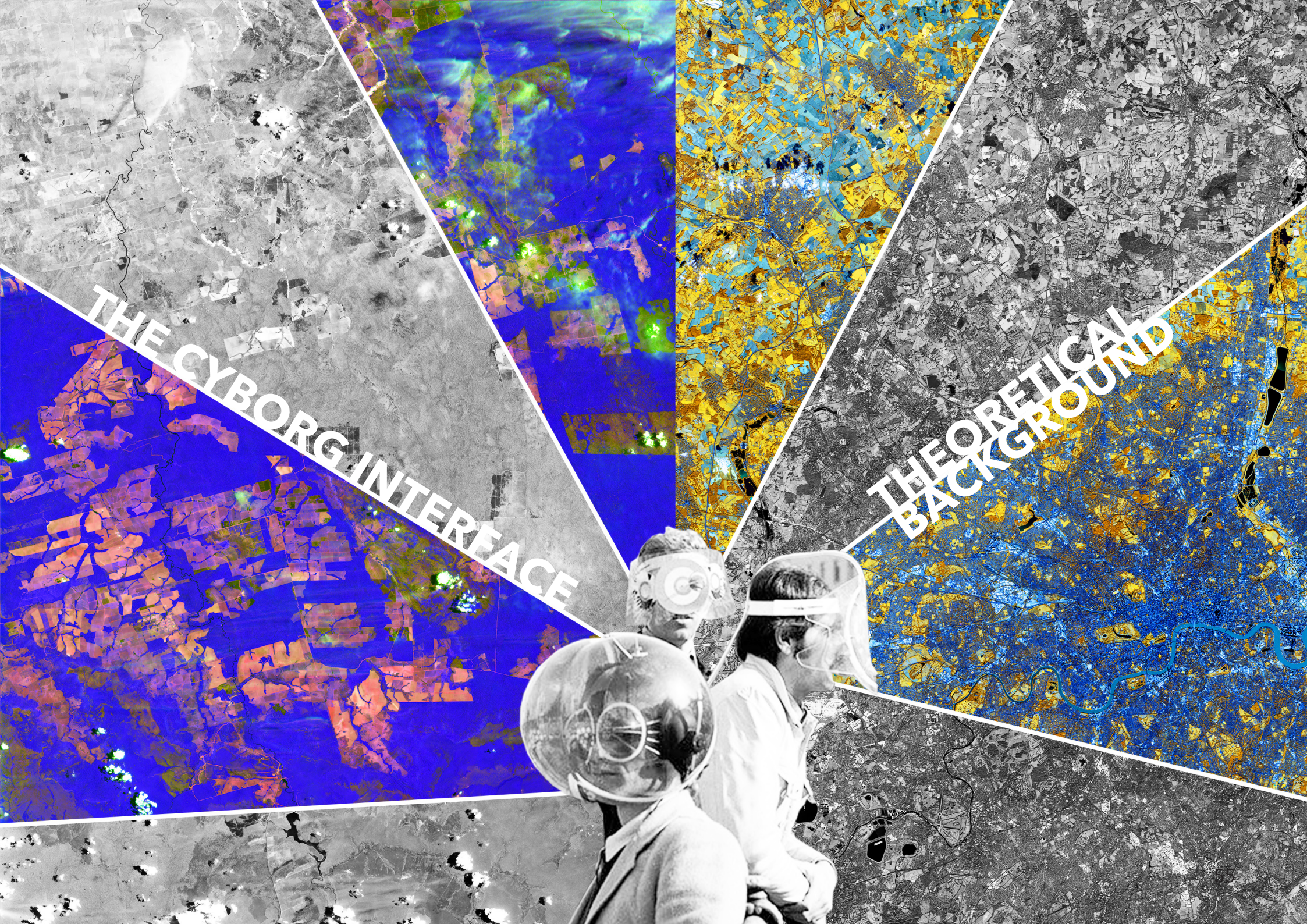
THE CYBORG INTERFACE

THEORETICAL BACKGROUND

The theoretical background consists of a compilation of summaries directly retyped from books, essays and articles. These summaries were used for inspiration, discussion, forming opinions and intentions along the project. Not every piece of literature made the list.

Disclaimer* I do not necessarily agree with everything. The texts are used to pose questions about the project and myself as designer.

CONTENT

Angélil, M. & Klingmann, A. (1999). Hybrid Morphologies - Infrastructure, Architecture, Landscape

SITE VS NON-SITE

"The Crystal Land" describes specific characteristics of the physical environment traversed during their journey. Consisting of unrelated fragments of built, natural, and altered landscapes a unified image of the existing terrain emerges, despite the inherent differences among the fragments themselves. Urban infrastructures, such as freeways and power lines, as well as the single family houses and shopping centers of suburban neighborhoods, are together with the landscape seen as one system.
This landscape, according to Smithson, has not grown organically but exhibits properties of mineralogical structures that depend equally on natural and synthetic processes. In its geology, the city consists of a stratification of layers forming a consolidated entity.
Smithson introduces a system of juxtaposition Site vs Non-Site. Site stands for the material reality of a pre-existing situation, as for example, the familiar landscape of New Jersey. A Non-Site, on the other hand, is an abstract representation or reinterpretation of the site in the form of a text, map or sculpture.
Site and Non-Site demarcate a space that, according to Smithson, can be traversed – a space, fundamentally determining the so-called reality of space.

SCAPE

SCAPE is a term introduced by Koolhaas, implies a reading of the urban territory as landscape. The binomial and dialectic nouns townscape and landscape are not considered separate entities but are conjoined to form a singular expression. The city is understood as a continuous, topologically formed field structure, its modulated surface covering vast extensions of urban regions.
Koolhaas speaks of a city of "exacerbated difference" that does not follow the ideal of a harmonic order but is marked, through juxtaposition of opposites, by a permanent hybridity – a hybridity constituting the city's primary connective principle.
New form of urban fabric, there are three elements: roads, buildings

and nature. They coexist in flexible relationships, seemingly without reason, in spectacular organizational diversity. Instead of accentuating their differences and treating them as separate entities, the possibility of their convergence is proposed.
The method deployed is that of a hybridization of terminologies, identified by Koolhaas with the term MERGE and allowing hitherto separate phenomena to be connected.
The disparate elements of the city form a network conglomerate of variable components which amidst divergences offers the impression of a constant uniformity.
This peculiar kind of space is not bound by a specific place but is primarily marked by vectorial displacements, "multiplicities, lines, strata and segmentarities, lines of flight and intensities." It is ahierarchical, decentralized, and nomadic in its organization. Smooth space connects differences and distinctions: it literally smoothes over divisions.

SCAPE / -SCHAFT

In a differentiated play of dense and empty spaces, of infra-structures and housing structures, of natural and artificial natures, a continuous urban landscape is formed. **Through the superimposition of systems a field is generated promoting spaces of varying quality.** This formation process pertains to heterogeneous and nonetheless coherent relationships developing into a connected entity. In this sense, the city, evolves, not through external imposition of order, but according to internal interdependencies.

INFRASTRUCTURE-ARCHITECTURE-LANDSCAPE

Through mutations and transformations, new morphologies are explored considering the possibility of an architecturalization of landscape and infrastructure, a terminology which reciprocally suggests an infrastructuralization or landscapification of architecture. Koolhaas understand the city as a field determined by

accumulations, connections, densities, transformations, and fluctuations. This choice of terms, borrowed from the field of topology, points to a conception of the city as a dynamic system in which architecture, infrastructure, and landscape are no more than events or occurrences within an uninterrupted spatial field.
The project Dolphins avoids any type of compositional order which might prioritize architecture, it instead alludes to potential strategies promoting a hybridization of components within a space of topological extension.

FLUID MORPHOLOGIES

The city morphology, in this sense, is fluid and formally undetermined, pertaining to the oscillating interdependencies of contextual forces rather than to the logic of pre-established form. Encapsulating magnitudes of processes the city manifests itself as an open field.

Bhatia, N. & White, M. (2011). Pamplet Architecture - Coupling Strategies for Infrastructural Opportunism

FORMATTING CONTINGENCY

FORMATS, SURFACES, CONTAINERS, AND CONDUITS

Designing for contingency has no prescribed methodology in architecture, though certainly all architecture is already charged with anticipating possible eventualities, higher loading, inclement weather, potential of fire, or even change of use. However, anticipated contingencies typically focus on mitigation rather than opportunism. And an architecture that responds to opportunities of contingency is manifest in atypical spatial formats. Performing in a manner similar to infrastructures, these spatial formats support energies, flows, resources, and matter, yielding an emergent multivalent public realm. ?Formatting? identifies three spatial formats in which a contingent architecture might materialize surfaces, containers and conduits. ?? format mediates between architecture and its environment, between the biological and the infrastructural, the entrepreneurial and the logical simultaneously performing the roles of both. These formats enjoy an ignorance of the prejudices that distinguish architecture from infrastructure, landscape, and urbanism instead relishing the dynamic ambiguity of a spatial format or spatial product.

Rauss identified three subpractices of sculpture that had previously been buried within a generalization of sculpture. She qualifies them as site construction, marked sites, and axiomatic structures. These three uncovered practices became disciplinary parallels to sculptural practices. Today, architecture previously absorbed within Rauss's group is In need of qualifiers to esatblish its position among the expanding disciplinary terrain of landscape architecture and urbanism. Toward this end, we suggest removing architecture from the original group and replacing it with urbanism which is missing from Rauss's original diagram. From this new group we identify three subpractices of architecture from infrastructure's expanded field: productive surfaces, programmed containers, and civic conduits. Identifying infrastructure in the expanded field reveals new formats and operations for architecture as a conduit, container and surface

within the capacities of infrastructure.

What are these formats? Surfaces are planes of mediation, thickened and intelligent. Containers are shells of enclosure, processing and performing as nodes within a network. Conduits are carriers of matter and energy, changing and transferring within a larger network. Formats suggest an emergent productive public realm, one in which performative processes are integral to occupation. While one format typically serves as the primary organizational device, other formats absorb contingencies or account for missing information. The projects and proposals take the position that infrastructures operate as contingent ecologies, or manages dynamic systems. Identifying their role and how they interrelate becomes an act of design coupling.

COUPLING

The twentieth century was witness to both an infrastructure boom and bust. It is the twenty-first century that will need to determine not only how to address crumbling and ineffective infrastructure, but also how to position new infrastructures that confront urgent issues of climate change, sustenance inequality, and environment degradation. The opportunity for projecting a future infrastructure lies in bundling multiple processes with spatial experiences. The work in this book aims to declare infrastructures as open systems, adaptive and responsive to environments and occupation. Formatting employs interventions that also operate extrinsically, sometimes at a territoiral scale. Easily replaced or upgraded, these infrastructures double as landscape life support, creating new sites for production and recreation. The ambition is to supplement ecologies at risk rather than overhaul them. The following six design-research projects merge landscape, urbanism and architecture into a mutant assemblage of surfaces, containers, and conduits. Existing landscapes meld with emergent systems to catalyst a multivalent network for a new public realm. Seeking opportunistic associations between economy, ecology, politics, and information, coupling is not simply a combinatory exercise so much as a typological

investigation into new spatial formats for the twenty-first century.

…

THE ARCHITECTURAL RECONSTRUCTION OF GEOGRAPHY
(DAVID GISSEN)

The geographical project of architecture is symptomatic of a shake-up concerning the very realms that architectural design negotiates. Design, as it was conceptualized in both the interwar and postwar periods of the twentieth century, was a practice positioned at the intersection of labor, governance, and industry. Space-time, as it emerged within the rise of industrializing states, was the very thing shaped by design. In many ways, design contained a utopian notion as a force that could negotiate the space-time tissues of experience and an idea that could bring its agents – proletariat, state, and bourgeoisie, into unity. It's clear to virtually all who are surveying the contemporary situation that the relations between these agents are falling apart. Labor neither constitutes an autonomous, isolated force -i.e. "the masses", nor a sole class as it has become something more amorphous. Sadly, states are suspect on the right and left, and industry has so atomized itself that it cannot be located with any precision. Governance, production, and management are simultaneously everywhere and nowhere, or, to put it another way, they occupy spaces outside the perceptual space-time of individual subject. Those who adhere to design in its early-twentieth-century incarnation have the fascinating role of devotees to a form of modern antiquity, even as they search for the new. At its most extreme, we have contemporary architects who find heroism within the movements of space itself and the computerized, multi-axial routers that form it. This extends architects' emotional and intellectual investment in the forms of production driven by modernity, but with zero transformative potential on the constituent actors. **. Sore convincing are those architects who attempt to reduce the amorphous quality of contemporary experience into a more intelligible urban and political whole. But such work often operates at the scales of the industrial city as room, courtyard, region without the necessary constituent actors.**

(…) Geographically oriented architects do not necessarily design buildings at the literal scale of the map; their work can be as small as a street lamp. Nevertheless, whether they author a massive bridge proposal or the tiniest piece of street furniture, their aim is similar: to bring design objects into cartographic narratives. Such work searches for a theory of architecture relative to geography, similar to architects' search for a theory of architecture relative to the city. Similarly, drawn sections articulate the flows of social and natural matter relative to the project, versus the psychological sense of space within a building. Such section emphasize the articulation of material through a territory or on a person, rather than the specific experience of individuals. Significantly, the entire connective tissue of the geographical within architecture is the redesign of "environment". **Geographically oriented work is not simply anti-spatial: environment is spatial and temporal, but relations between space and time are beholden to the constituent features of the environment. In turn, these redesigned environments create new forms and ideas about the geographical.**

Unlike plans, sections, and spaces, geographical forms of representation tend to take on the mask of natural reality versus representational forms. And in some hands, geography can be turned into a frightening tool to make architectural interventions appear as works of nature, **rather than acting as another system for architects to use to tinker with reality.** Design and design pedagogy contain forceful and articulate relationships to history, within notions of "parti", "precedent", and "referent". These historically driven terms would sound absurd within most of the geographically oriented architecture of today. Geographical concepts are notoriously ahistorical, and geographers often use this to challenge the primacy of history within a society's established forms of self-understanding. But the ahistoricity of geography generally, and geographical imagery within architecture more

specifically, needs to be questioned and interrogated. When architects bring aesthetics and history into geographical concepts, they transform an environment into something more unfamiliar and monumental. The flows of matter will slow down, and the environment will begin to appear as an object, even as we find ourselves immersed within it. Through such work, architecture will begin to show how environments are historical constructions versus natural ones. In turn, this work might reveal the geographical chain that moves through all of architecture and the architecture of our future geography.

Project ICELINK as precedent.

Boettger, T. (2014). Threshold Spaces - Transitions in Architecture

DEFINITION OF THRESHOLDS AND SPACE

THE IDEA OF SPACE AND SPATIAL PERCEPTION

In the following sections, space is defined according to Jurgen Joedicke's idea of ''between-ness.'' The result is the simple and clear interrelationship between space-defining elements and the space itself, which exists in relation to the sentient human being.
The percipient human
What is particularly important for the perception of spatial experience is, according to Joedicke, ''the introduction of a system of basic orientation, which includes the sense of above and below, in front and behind, or left and right.'' Various studies demonstrate the importance and prominence of this sixth, or rather new fifth, sense.
How does this relate to the cyborg, where ground, boundaries are reworked?

…

''The definition given at the beginning, according to which space was seen as the sum of relationships between points, must be formulated more precisely to read: Space is the sum of consecutively experienced relationships between points. Here too time is the consequence of our perception and not at all comparable with the three dimensions of space.''

PERCEPTION OF MOVEMENT SPACES

Spaces that offer transitions often present themselves as open spatial bodies that are experienced in motion. For the most part they are only partially delimited by spatial boundaries and provide access in an open or circumscribed manner. The basis for considering threshold spaces is the phenomenological view of space, including, however, Joedicke's understanding of architectural space as one in which humans can move in exact between-ness. Humans move between space-defining elements. They open their spheres of

perception, which are created, together with the spatial bodies, by the architectural space.
The idea of designing a space as an open spatial body or as a field is actually, according to Joedicke, not an invention of the twentieth century. Nonetheless, he sketches a particular view of space that developed in the 1930s, dissolving walls and seeing the interior and the exterior as a continuum and a spatial field.
Perception of connecting movement spaces occurs in a manner analogous to the general perception of spaces, namely in interaction among various sense organs. A movement space is characterized by its function as a transitional space; in other words it is a ''passage space'' which distributed and redirects. This means it is primarily perceived as we stroll through it, as opposed to a ''place space'', which serves as place to stay or rest.
Gibson's observations are essential to the perception of movement spaces:
''All the perceptual systems […] can serve to govern directed locomotion. They are all orienting systems insofar as they can guide the individual to a goal.''

…

In summary it can be said that transitions, and thus traverses of thresholds, are particularly associated with intermediate states. First of all, percipient humans find themselves in spatial between-ness. Moreover, the intermediate state between two spatial areas, for example inside and outside, also plays a role. One could even speak of a double intermediate state.
Between-ness also offers users a certain flexibility, insofar as they can change their minds – there is a chance to ''go back''.

HISTORICAL THRESHOLD SPACES

Japanese homes

Bruno Taut gives a very detailed description of entering his new

home in Japan. He explains the function of transitional space, for example, in the ritual of taking off shoes. Secondly, the particular spatial relationship between inside and outside has a general influence on design concepts in modern architecture. The flexible wall elements provide the living space with a layered transition between interior and exterior, which in turn produces ambivalent spaces of between-ness.

The system described here makes it possible to react to seasons and times of day in the house. Each of the various positions of the sliding elements defines a different kind of transition. The blurred boundary between inside and outside is achieved through the different possibilities of the superimposed systems. This principle has been used in many contemporary variations. In his design for the Fondation Cartier, Jean Nouvel, for example, uses gradated transparent layers, some of which are in front of the building. The spaces in between that are created by this system form a threshold space.

THE THRESHOLD SPACE

Grenzen (Borders/Boundaries/Limits)

In the language of architecture, a boundary is a space delimiter. Boundaries define spaces by separating a smaller space out of a larger spatial structure. Joedicke provides the definition: ''The creation of space therefore always implies dividing off a smaller space from a larger one.'' This means that the act of separating can be seen as a space-delimiting process. Boundaries always have spatial consequences. They organize and arrange space. Boundary interfaces can define closed spaces that make the contrast between inside and outside perceptible.

A transparent boundary represent a special case among boundaries in general. The expectation held of a boundary is that it can be perceived and recognized. If a boundary can be seen through because of its particular materiality, say, glass or transparent plastic, then at times the delimiter cannot be directly recognized and understood as a spatial boundary. Display windows make use of this phenomenon. We can approach the products but we have learned that direct access to them is not possible. Transparent boundaries organize space and can be understood as thresholds even if they do not provide for spatial transitions.

Schwellen (Thresholds)

Openings in boundaries make transitions in space possible. Thresholds interrupt boundaries for the transition from one zone to another. That is, they are both a part of the boundary and a gap in it. A threshold is understood as a linear interruption in the boundary, so it naturally runs in the same direction as the boundary. It is a perforation of the boundary and respresents a small portion of that boundary. The threshold is perceived as a possible crossing point and at the same time as a part of the boundary, so that permission to cross is required.

Thresholds are openings in boundaries that constitute an invitation to cross. They are a preface to a space and create not only the transition but also the space itself. In terms of defining space, thresholds are both boundary and transition. That means they thrive on the ambiguity of both opening and closing off spaces.

Threshold spaces

…
Threshold spaces border on thresholds. Together with other space-defining elements, thresholds can create a perceptible space, a threshold space. Thresholds constrict a threshold space and often form protuberances from it. Threshold spaces are transitional spaces that form a spatial preface to functional spaces. From the point of view of the functional spaces, threshold spaces infold into them. The threshold space precedes the space to be entered. The threshold space can lie primarily outside, between inside and outside, or entirely inside. Threshold spaces can be organized in the form of a point, a line, an area, or a three-dimensional figure.

Threshold space can be described and defined from various perspectives. In the following text the term is seen from the point of view of the user, the space, and the architecture:

- A threshold space defines the opening of spatial delimiters during the act of crossing them.
- A threshold space is a transition that separates spaces from and connects them to another.
- Threshold spaces are transitional spaces that provide a spatial preface to the functional spaces that follow.

…

Threshold spaces, like thresholds, thrive on ambiguity. They live on their double function: access control and opening. In addition, the design of threshold spaces often makes use of the varying spatial atmospheres of an exterior or an interior space. The essence of a threshold space is capturing and staging an entrance. A clear, planned sequence allows the visitor to gain entrance to the design of the building. Thus the threshold space provides orientation and facilitates, both literally and figuratively, access to the space. In threshold spaces, people find themselves in a state of between-ness. *What is the essence of liminal/threshold space within the interface?*

THRESHOLD SPACE DESIGN TOOLS

COUNTERBALANCING PAIRS OF OPPOSITES

Furthermore, the interplay between the extremes appears to be particularly characteristic of a threshold space and places it in a unique position based on its very ambiguity. An attempt will be made to explain how a space can be simultaneously opened and closed.

Each of the threshold parameters is used to examine the architectural example and identify analogies in their strategies, and for each position is determined between the poles of "open" and

"closed". For this classification, the general pair of opposites, "open" and "closed", is modified and defined to suit the spatial parameter in question. The following pairs of opposites have been derived for the various threshold space parameters:

Delimitation: open – closed
Sequence: freely selectable – guided
Geometry: free – ordered
Topography: independent – embedded
Materiality   neutral – distinctive
Furnishings   unobtrusive – self-contained

DELIMITATION

Spatial containment is of particular significance in terms of energy efficiency, as the shell can be closed more easily. Open spatial bodies in the form of unheated exterior spaces can generate transitions. In parts of the world where low temperatures are not experienced, exterior spaces can more easily be infolded into the inside of a building. A comparison of Le Corbusier's Carpenter Center and his Mill Owners' Association Building clearly demonstrates this phenomenon. The delimitations of the threshold space can be seen as a reaction to the different climates in Cambridge, Massachusets, and Ahmedabad.
The Neue Nationalgalerie is an example of a flat threshold space that is open in all direction and has clear boundaries only on the inside. The museu de Arte in Sao Paulo (MASP) opens its exterior space to the city in a similarly extensive way and forms a clearly delimited threshold space body whose two long sides extend a generous invitation to enter. The open space that is offered in both cases, the Neue Nationalgalerie and the MASP, is clearly read, understood, and used as public space.

…

A similar strategy can be found at the Museum fur angewandte

Kunst in Frankfurt. There the threshold space body can be called "porous" and is linked to the city space by the portals. The park, however, is more definitely bounded by its low wall and it is clearly delimited as a protected public space.

In the case of the Fondation Cartier in Paris we have the following situation: visually, the visitor is led close to the threshold space and its aura, but physically, he or she is kept at a "layered" distance.

The threshold space suggests an expansive spatial opening. Jean Nouvel's strategy is the creation of an open space. This space exists as an open picture and is only open at one point and with securely monitored access. This combination of solely visual opening and spatial closing facilitates easily organized access control.

SEQUENCE

Comparisons of the sequences of a threshold space, that is, the order of the various spaces as you move through them, can differentiate between freely selectable and guided paths. This analysis determines the extent to which the architectural experiences follow a predetermined order and whether there is only one path of motion through them. Furthermore, in addition to these differences, certain analogies can be found between the individual threshold space sequences.

At the Fondation Cartier, the first experiences are of spatial enclosure as you arrive and gain access to the inside at a single point. Thereafter, the threshold space can be freely explored. The privatized public space offers a system of paths in the park, but this system provides great flexibility and freedom to choose a path.

GEOMETRY

The spatial geometry of a threshold space is the structure that essentially determines how the space is ordered. In extreme cases, the threshold space geometry may be hardly recognizable, presenting itself as free geometry. At the other extreme, the structure is very strict and ordered. In the latter case, spatial organization can be traced back to recognizable geometric shapes.

…

The threshold space of the Fondation Cartier also presents itself as a park, one whose ground plan is strictly structured by the layered, tiered spatial delimitation of the structural body.

The threshold space of the Neue Nationalgalerie is strictly and distinctly determined by an omnipresent cubelike module. The space-defining elements conform to the readable squares in both the plan and the view. Lina Bo Bardi does not outperform the Neue Nationalgalerie in terms of the clarity of her threshold space structure, but the simplicity of the MASP's spatial shape is unrivaled. The cuboid of the threshold space form a simple counterpart to the oblong box shape of the museum body. Both architectures work with the clear readability of cubic volumes. It is interesting to note that both the roof of the Neue Nationalgalerie and the museum body of the MASP are approximately eight meters from the ground and provide the spaces under them with their cubature.

TOPOGRAPHY

With regard to the topography of a threshold space, we can distinguish, speaking in terms of space, between independent and embedded sites. At one end of the spectrum, the threshold space forms its own self-determined space in relation to the architecture as a whole, which can be used and perceived accordingly. At the other end, it can be embedded as a place within the architecture and be less present and readable as an independent space.

…

In Frankfurt, the threshold space, a seclusive place, tells the history of the city and forms an urban park that is closely related and connected to the MAK. The park serves as a mediator on all levels and finds its identity in its artifacts and its surroundings. Although

the Fondation Cartier threshold space is immediately visible, its spatial position marks it as contained by and embedded behind the glass panels. It is not so readily accessible.

MATERIALITY

The materiality of the threshold space makes particular use of the tension between open and closed, or in other words neutral and distinctive. Usually, the aim is to provide the threshold space with a materiality that is not easily classified. Architects make use of the effect of changes in the appearance of the materials according to the time of day or the seasons. This means that the opposite poles of materiality in a threshold space run from neutral and subordinate to the overall design to distinctively dominant.
Experimentation with the material of between-ness is particularly evident in the use of glass. The Fondation Cartier, for example, plays with the capacity of glass to both close and open spaces at the same time. Pronounced transparency and reflections can make the threshold space appear as an open or closed spatial body.

COUNTERBALANCING AMBIGUITY

Although the architectures are very different, analogies can be traced in their intrinsic logic and strategies with regard to the complex of interacting spatial parameters – delimitation, sequence, geometry, topography, materiality, and furnishings. When we examine the threshold spaces of the selected architectural designs separately, we see that, with respect to the spatial parameters, an "open" situation always counterbalances a "closed" one. One spatial parameter stands in contrast to a different parameter which tends to the opposite pole. Occasionally, an opposing attribute pair can be found within a single spatial parameter. For each attribute of a threshold space there is an opposing player. The complementary parameters either compensate for one another or the extremes are brought into equilibrium within a single aspect.
The Fondation Cartier demonstrates strong bipolarity regarding

materiality itself. Here, the spatial parameter "materiality" need not be considered with any other parameter; it incorporates both extremes simultaneously.

…

For each of the two extremes among the individual spatial parameters, then, an opposing player can be found. This bipolarity described a state of suspension and of inner tension. The visitors do not generally perceive the individual spatial parameters one by one and match them to their counterparts, yet they can feel the balanced dynamics of the pairs of opposites and thus come to a better reading of the gestures of the design concept.

PHASES AND ORGANIZATION

The balance in ambiguity described here provides insights into the design concepts that are intrinsic to the threshold space. I will now describe the general sequence in which we walk through threshold spaces. Analyses of how the threshold space, regardless of its spatial configuration, is organized in the architectural examples show similar strategies and a common sequence. In addition to the tension-building counterbalances, a threshold space is strongly determined by the sequence in which space is experienced:

Recognition
Approach
Reaching
Arrival
Orientation and information
Monitoring
Exit

RECOGNITION

In the case of transparent faces, design considerations often lead to both the entrance and the closure being uniformly transparent. The geometry and/or the pathways are particularly called upon to make it possible to recognize the entrance.

REACHING

Depending on the climate, it can be appropriate to use horizontal planes to protect spaces from rain or sun. Vertical planes are useful in blocking out wind or insulating against noise pollution, for example from traffic. In the cases of both the Carpenter Center and the Fondation Cartier, an approach by car has been integrated into the design of the sequence without disturbing how a pedestrian reaches the threshold space. The change in the mode of locomotion can take place in the threshold space.

ARRIVAL

Arriving is generally associated with deceleration. Insofar as you ascend steps or ramps or notice a change in materiality, you are slowed down. Such thresholds can intentionally delay arrival. As you move more slowly, your sensory organs can comprehend the spatial context better. You can concentrate on the space and your senses can perceive it. This is an important moment for the threshold space sequence, as the focus is on physical experience of the space. You have bodily arrived in the threshold space.

ORIENTATION AND INFORMATION

It should be noted that transparent spatial boundaries that can truly be looked through have the ability to make a positive contribution to the orientation process because they provide glimpses of what is to come and in a very natural manner communicate necessary information.

Sensitive guidance

''The threshold provides the key to the transition and connection between areas with divergent territorial claims and, as a place in its own right, it constitutes, essentially, the spatial condition for the meeting and dialogue between areas of different orders.''

Positioning thresholds

In apartment blocks and residences, this appropriation is generally shifted indoors. For many, it seems to be especially important to take over the threshold space and use it as an opportunity for presentation, decoration, and communication. Personal objects are demonstratively placed here as a clear extension of the living space, the home. Rituals of greeting often take place here. The tenants can encounter and welcome their quests. Social contacts with the neighbors are cultivated. Communication with the building follows the phase of arrival.
Guests inform and orient themselves. Different technical thresholds can support this communication, sometimes in a very compact format as a station and sometimes distributed around the threshold space. Lighting plays an important role in this area.

Essence and potential

The design of a threshold space seems to take the demands of the human senses into account, in particular with regard to the kinesthetic sense and visual perception. It offers users the opportunity to arrive inside a building in steps and under guidance. There is a strong interdependency between preparation for the particular spatial experience of the threshold space and the process of making a building one's own. A threshold space is created from the continuity of the space and is thus an exceptional space of experience in modern architecture. Knowledge of the essence of a threshold space and its potential make it possible for users to more easily ''get into'' a building and ''get their bearings.'' They can

develop an awareness of the respective spatial design and compare this awareness to other spatial experiences.
In a threshold space we find an entrance, a transition, and access to architecture.

Spatial potential

All architectural designs must deal with the concept of transition, regardless of the type of building. The spatial potential of a threshold space is as multifaceted as the architecture itself. The examples and analyses given here are designed to demonstrate and discuss this variety and to use it as a source of inspiration. Generous use of space for the threshold space sequences is evident in all the examples. The large area of space available to these sequences is in part responsible for their being able to address and deliver the transition in such sensitive steps.
The individual analyses demonstrate different strategies for the organization of transitions and the spatial experience to be offered in transitions between spaces that are perceived as being outside or inside. Users aim for the interior space ahead of them. What is crucial in this examination is the fact that there is no need for thermal separation of the interior space; above all, it should be able to communicate the feeling of "inside-ness." The threshold spaces in the examples provide access to an architectural experience and are themselves part of this experience. In each individual threshold space, outside and inside are linked suing the defined design parameters with their contradictory tendencies. Between-ness becomes a key spatial experience.

Brenner, N. (2006, 2020). Hinterlands Urbanised & Operational Landscapes

THE HINTERLANDS URBANISED?

THE URBANISATION PROBLÉMATIQUE

In this way, the urban-age metanarrative has come to serve as a framework not only of interpretation, but of justification, for a huge assortment of spatial interventions designed to promote what geographer Terry McGee has classically labelled 'city dominance'. Around the world, the shared goal of such urbanisation strategies is building the 'hypertrophic city' – whether by densifying and extending extant megacity areas; by creating new urban settlement zones ex nihilo in pockets of the erstwhile countryside or along major transporation corridors; or by orchestrating rural-to-urban migration flows through a noxious cocktail of structural adjustment programmes, land grabbing, agro-industrial consolidation and ecological plunder.

INTERIORISING THE CONSTITUTIVE OUTSIDE

Despite its pervasive representation as a neutral, generic background parameter within which spatial relations are situated, the process of urbanisation must itself be subjected to theoretical scrutiny. -> two epistemological fissures.

- First, in the mainstream interpretive framework. Urbanisation is said to entail the universal diffusion of 'cities' as the elementary units of human settlement.

- Given the de facto heterogeneity of agglomeration patterns, can a universal notion of 'the' city be maintained?

- Instead heterogeneity, differentiation and variegation would have to be recognised, not simply as unstructured empirical complexity, but as intrinsic, systemically produced properties of the urbanisation process itself.

- Second, in the hegemonic dispositive, urbanisation is defined as the growth of 'cities', which are in turn conceived as spatially bounded settlement units. This conceptual equation (urbanisation = city growth), coupled with the equally pervasive assumption of spatial boundedness, logically requires differentiating the city-like units in question from a putatively non-urban realm located outside them.

Just as importantly, the developmental pathways of capitalist agglomerations have always been intimately intertwined with large-scale transformations of non-city spaces, often located at a considerable distance from the major centres of capital, labour and commerce. Mumford described this relation as an interplay between '**up-building**' (vertical, horizontal and subterranean industrial-infrastructural clustering), and '**un-building**' (Abbau), the degradation of surrounding landscapes through their intensifying role in supplying cities with fuel, materials, water and food, and in managing their waste products.

In this sense, the rural, the countryside and the hinterland have never been reducible to a mere backstage 'ghost acreage' that supports the putatively front-stage operations of large population centres.

The spaces of the non-city have been continuously operationalised in support of city-building processes throughout the global history of capitalist uneven development. Such spaces are, therefore, as strategically central to the processes of creative destruction that underpin the 'urbanisation of capital' as are the large, dense urban centres that have long monopolised the attention of urbanists.

Can the urban 'phenomenon' still be anchored exclusively within and confined to, the city? In fact, once the rigid analytical constraints imposed by such pointillist assumptions are relaxed, the **static dualisms** of mainstream urban theory **(city/ countryside, urban/rural, interior/exterior, society/nature)** can

be swiftly **superseded.** New analytical horizons thereby open: the geographies of urbanisation can be productively reconceptualised in ways that illuminate not only the variegated patterns and pathways of agglomeration, but the continuous production and transformation of an unevenly woven urban fabric across the many terrains of industrial activity (agriculture, extraction, forestry, logistics and tourism) that are today still being misclassified on the basis of inherited notions of the countryside, the rural, the hinterland and the wilderness.

DESIGNING OTHER URBANISATIONS

Alternatively, might an architecturally grounded exploration of the world's non-city spaces help animate the project of developing new analyses, visualisations and designs of our emergent planetary urban fabric? **Two concluding proposition:**

- First, inherited vocabularies for describing non-city spaces – rural, countryside, hinterland – are locked into an externalist framework that attempts to distinguish them, analytically and spatially, from the city. **The non-city is no longer exterior to the urban; it has become a strategically essential terrain of capitalist urbanisation.**

Second, the capitalist form of urbanisation continues to produce contextually specific patterns of agglomeration, but it also relentlessly transforms non-city spaces into zones of high-intensity, large-scale industrial infrastructure – **Operational landscapes.**

OPERATIONAL LANDSCAPES

In the age of planetary urbanisation, this position is untenable: city/hinterland relations lie at the heart of the contemporary urban problematique.
Urbanisation is understood as city growth tout court – in effect, as cityisation – rather than as a process that is actively supported by non-city spaces.

Counterpoint: Metabolic Urbanisation

From this point of view, cities are supported by diverse metabolic inputs (labour, materials, fuel, water and food) and engender a range of metabolic byproducts (waste, pollution, carbon), the vast majority of which are produced within and, eventually, absorbed back into non-city zones. Such approaches articulate a **multiscalar understanding of urbanisation** that encompasses not only cities and metropolitan region, but **extended landscapes of primary commodity production**, logistics and waste management.

City and non-city landscapes are thus **dialectically co-produced under modern capitalism.** The urban problematique can only be deciphered adequately through an approach that systematically connects them, at once in social, political, material, infrastructural and ecological terms.

The Hinterland Enigma

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Investigating such mutations will require new conceptualisations of city/hinterland matrices in relation to emergent geographies and ecologies of planetary urbanisation.

HINTERLANDS OF THE CAPITALOCENE

What is required is a framework that can connect historically and geographically specific forms of city and non-city space as coproduced, coevolving moments within the combined, uneven, variegated and crisis-riven world-ecologies of capitalist urbanisation. The development of such a framework requires systematic elaboration elsewhere. Here, it must suffice to offer some initial generalisations regarding four key mutations of city/hinterland relations that have been particularly pronounced during the last half-century.

1. Disanciation and infrastructuralisation
Primary commodity production has been globalised and specialised, causing local, contiguous hinterlands to be enmeshed within specialised, export-oriented transnational production networks.

2. Hinterlands of Hinterlands
On the one hand, most of the world's most productive, specialised and export-oriented hinterlands circulate their outputs to a multitude of metropolitan agglomerations, or across the global metropolitan network as a whole. Just as importantly, many zones of primary commodity production are now most directly articulated not to major cities and metropolitan regions, but to other productive landscapes of cultivation, extraction, processing and distribution, which are in turn embedded and intermeshed within an intercontinental logistics space.

3. From Formal to Real Subsumption
In this manner, many erstwhile hinterlands, or parts thereof, are transformed into configurations of large-scale territorial-ecological marchinery: mechanised assemblages of human and nonhuman infrastructure oriented towards capital accumulation within a planet-encompassing profit-matrix.

4. Metabolic Rifts and Cycles of Creative Destruction

The proliferation of such metabolic rifts further accelerates capital's drive to mechanise hinterland geographies, at once through the substitution of manufactures inputs into the production process and through the construction of colossal techno-infrastructural configurations.

THE HINTERLAND QUESTION, REFRAMED

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Indeed, even as they support enhanced industrial productivity and the accelerated, long-distance circulation of commodities, the hinterlands of the Capitalocene expose local territories and communities to increasing turbulence, risk and precarity, while systematically degrading the ecological preconditions of both human and nonhuman life.

Gandy, M. (2005). Cyborg Urbanization - Complexity and Monstrosity in the Contempary City

Introduction

Now, the boundaries between the organic and the inorganic, blurred by cybernetic and biotechnologies, seem less sharp; the body, itself invaded and re-shaped by technology, invades and permeates the space outside, even as this space takes on dimensions that themselves confuse the inner and the outer, visually, mentally and physically. Anthony Vidler, 1999

It is since the mid-1980s, however, that the idea of the cyborg has been associated with a more densely argued series of theoretical applications as a means to explore the interface between technology and the body. Donna Haraway:

A cyborg is a hybrid creature, composed of organism and machine. But cyborgs are compounded of special kinds of machines and special kinds of organisms appropriate to the late twentieth century. Cyborgs are post-Second World War hybrid entities made of, first, ourselves and other organic creatures in our unchosen "high-technological" guise as information systems, texts, and ergonomically controlled labouring, desiring, and reproducing systems. The second essential ingredient in cyborgs is machines in their guise, also, as communications systems, texts, and self-acting, ergonomically designed apparatuses.

This succinct and revealing definition reminds us that the idea of the cyborg, as originally elaborated by Haraway, is at root a political as well as an intellectual project, an idea which originated in and from the 'belly of the monster', that nexus of political and economic entanglements that we might term the 'first world' in distinction to the proliferating spaces of marginality that lie beyond.

The emphasis of the cyborg on the material interface between the body and the city is perhaps most strikingly manifested in the physical infrastructure that links the human body to vast technological networks. **If we understand the cyborg to be a cybernetic creation, a hybrid of machine and organism, then urban infrastructures can be conceptualized as a series of interconnecting life-support systems.** The modern home, for example, has become a complex exoskeleton for the human body

with its provision of water, warmth, light and other essential needs. The home can be conceived as 'prosthesis and prophylactic' in which modernist distinctions between nature and culture, and between the organic and the inorganic, become blurred (Vidler 1990: 37). And beyond the boundaries of the home itself we find a vast interlinked system of networks, pipes and wires that enable the modern city to function. These interstitial spaces of connectivity within individual buildings extend through urban space to produce a multi-layered structure of extraordinary complexity and utility.

NEO-ORGANICISM AND THE RHIZOMATIC CITY

In recent years, however, the organicist emphasis on the city as an integrated body with identifiable organs, which emerged in response to the nineteenth-century industrial city, **has been increasingly displaced by the idea of urban space as a prosthetic extension to the human body.** The body-city problematic has been reconceptualized in the context of post-Cartesian and post-positivist modes of thinking. **The emphasis on the city as a self-contained body or machine has been challenged by a hybridized conception of space as a system of technological devices that enhances human productive and imaginative capabilities.** The cyborg metaphor not only reworks the metabolic preoccupations of the nineteenth-century industrial city but also extends to a contemporary body of ideas that we can term 'neo-organicist' on account of deployment of biophysical metaphors for the interpretation of social and spatial complexity.

The organicist city of the modern era was founded on a clear separation between mind and body that enabled the city to be conceptualized as a coherent entity to be acted upon, disciplined, regulated and shaped according to human will. The emergence of the neo-organicist city, in contrast, is founded on the blurring of boundaries rather than their repeated delineation. We can detect two principal dimensions to contemporary neo-organicist urban thought. A first strand, rooted in the bio-physical

sciences, perceives the city to be a special kind of complex, yet intricately ordered system. This homeostatic perspective, which is inflected by ecological thinking and recent developments in evolutionary biology, has diffused through parts of the architectural literature and is only tangentially linked with the epistemological challenge of cyborg theory. A second and more intellectually significant development is represented by **the convergence of ideas surrounding the 'thinking space' of the city and the indeterminacy of spatial forms.** If the body-city nexus is **conceptualized as a thinking machine** then the analytical focus shifts towards the identification of those **critical networks** or 'neurones' t**hat sustain the relationship between the body and the city** (Kurokawa, 2001a).

PHANTOM SPACES AND THE PUBLIC REALM

The pervasive dilapidation of urban infrastructures, and especially those physical networks associated with the growth of the modern industrial city, is intimately connected with questions surrounding the state of the public realm and its future prospects. The marginal spaces of the post-industrial city are now littered with technological relics: the twisted combinations of metal and concrete which cluster along rivers and major rail intersections and extend beneath the surface if the city can be likened to what William Gibson describes as the 'semiotic ghosts' of yesterday's tomorrows. These 'anxious landscapes,' are emblematic of a new kind of urban form which finds its logical counterpart in the new shopping malls and other quasi-public spaces that characterize the post-industrial city. Yet even before their neglect and abandonment these complex assemblages of physical artefacts, technical expertise and accumulated cultural meaning had begun to fade from collective consciousness and were no longer an integral part of the 'social imaginary' of the modern city. From the middle decades of the twentieth century these vast infrastructural networks gradually disappeared from view as part of the 'taken-for-granted' world of everyday life.

These municipal networks required incessant inputs of capital and human labour in order to 'prevent the entropic disintegration of frail material circuits' and have been especially vulnerable to the protracted fiscal crisis facing the modern stat since the 1970s.

The last 20 years has seen an accelarting process of dematerialization or deterrorilization driven by the spread of informatics, increased capital mobility and the fracturing of place-bound identities, yet the implications of this urban transformation for the public sphere remain extensively occluded in the cyborg literature.

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The territorial and administrative structures associated with the industrial city have been displaced by an increased plurality and simultaneity of different spatial forms. 'At the end of the twentieth century', suggests Paul Virilio, 'urban space loses its geopolitical reality tto the exclusive benefit of systems of instantaneous deportation whose technological intensity ceaselessly upsets all of our social structures'.
The cyborg city is, in other words, close to an interpretative analytical framework that can connect analysis with the cultural and ideological realm of everyday life and include those 'unconventional' urban landscapes that have emerged outside the core metropolitan regions of the world economy and where incongruities and displacements are an even more pervasive feature of the urban experience.

The centralized modes of universal service provision associated with the development of the modern city have been replaced by a new logic of differentiation and exclusion. **Many former sites of service provision have merged or melted into a proliferating zone of urban 'non-space' that is disconnected from contemporary patterns of economic production.** And the hidden city, exemplified by nineteenth-century water and sewer networks, now faces the

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prospect of extensive collapse with far0reaching fiscal and public health implications. The role of urban infrastructures has been altered within an emerging reorganization of territoriality marked by a progressive dislocation between urban spaces and those administrative and governmental structures associated with the emergence of the modern city and the nation state.

A materialist reading of the cyborg city can be used to illuminate different facets to the history of capitalist urbanization: the interaction between trade in specific commodities, for example, and the cyclical pulse of capital combine to produce successive cycles of investment in the built form of the city.

REPRESENTING COMPLEXITY

Urban infrastructures are not only material manifestations of political power but they are also systems of representation that lend urban space its cultural meaning. We can conceive of urban infrastructures as modes of cognition as well as processes underpinning the restructuring or urban space. The development of the cyborg metaphor has coincided with the re-emergence of urban infrastructure as a discursive field permeated by crisis, uncertainty and political contestation. The association between cyborg metaphor and the rediscovery of the humbled mass of pipes and wires that constitute the hidden city reminds us that the technological fascination of the cyborg city owes as much to late modern sensibilities in architectural design than to any putative shift towards 'dematerialization' in the postmodern city.

CONCLUSIONS

I have sought in particular to develop a relational and materially grounded reading of the cyborg as an intrinsic dimension to the co-evolution of social and technological systems. I have suggested that the concept raises issues that extend beyond the development of urban technological networks to encompass expanded conceptions of the human subject, changing conceptions of the public sphere

and new ways of interpreting urban landscapes. **Most notably, however, the distinction between 'city' and 'non-city' becomes extensively blurred under cyborg urbanization to produce a tendential landscape exhibiting different forms of integration between the body, technology and social practices.** Viewed in this way, the city is **both a tangibly entity** but also **a relational construct** so that we cannot disentangle the one from the other. Part of the political challenge facing the hybrid city and its multifarious entanglements between the 'real' and the 'unreal' is to construct new kinds of autonomous spaces within which it is possible for different conceptions of the city to take shape. The emergence of the cyborg at a time of infrastructural crisis is more than coincidental since the concept simultaneously engages with both the r**enewed recognition of urban vulnerability** and the theoretical hiatus facing **the study of the city as a polymorphous web of different social practices, imaginative constructs and material elements.**

Geers, K. (2021). Without Content

ARCHITECTURE WITHOUT CONTENT

Our contemporary city is run by machines we prefer to ignore. These machines are planned in the periphery, in veritable areas of impunity where the project is not driven by what is desired, but by what has the least resistance. As long as the periphery is what its name suggests, a place outside the realm of control and desire, this does not pose a visible problem, thought it is one.

As currently almost every single piece of surface is occupied, we can no longer leave the leftovers of our society outside of it. There is simply no outside anymore. The machine rooms are integrally part of the world we inhabit. We can no longer ignore their existence; we are forced to live together with them. The disappearance of these leftover spaces forces us to fundamentally rethink the status or our own infrastructure.

What we consider autonomous boxes of nondescript machinery, are already vital elements of our public infrastructure. These data centres, recycling plants, storage facilities, etc. should thus be considered with a similar dignity. If the Enlightenment inspired a generation of architects to take the essentially banal programmes of the urban infrastructure of the eighteenth and nineteenth centuries and elevate them to urban projects that can structure the city today, we cannot be less ambitious.

WiFi and small computing eliminated in a very short time the "technical" distinction between a place to live and a place to work. Fascinatingly, it gave back power to architecture itself to define hierarchies of spaces. Technology is no longer an alibi. While the bulk of current architecture may indeed be interiorized, that does not relieve it of its responsibilities. As a tool to define space, it is stronger than it has been in the last century. It could concentrate solely on the definitions of the qualities it provides from within, in conscious disconnection from functional requirements. **An architecture made as a sequence of spaces is one that concentrates on the threshold, both internally and between the inside and the outside. It is an architecture that is increasingly disconnected from its real content, and that – perhaps in an old tradition – concentrates on the perimeter.** One could say it is an architecture without content, provocatively perhaps, but with the aim of emphasizing that its primary function lies not in the manipulation of what it contains, but rather in the simple mediation between what happens inside and outside. If the big boxes are our new monuments, then the interior is our new world. In a world lacking an outside, scale is the only thing that matters.

METHOD AS FORM

LeWitt's wall drawings are made in a way that introduced a radically different approach towards the making of art and the status of the art-object. The wall drawings represent the visual expression of an accumulation of rules and principles – in other words, guidelines – that are preconceived, or described, once could say, through a total disconnection from the context in which they were executed. On the one hand, the wall drawings seem to investigate how the method of description of the drawing, or the guideline, can accumulate a critical significance through repetition, for LeWitt's drawings can be read as a search for form. On the other hand, they seem to present an idea of (artistic) form that lies beyond its direct formal representation. One is thus led to ask if the form of the wall painting is the form of the painted drawing, or if it is the set of rules – the guidelines, the principles or the methods – that describe a possible outcome.

…

However, to compare Ungers' superficial minimalism with LeWitt's superficial Minimalist transformations would be a mistake, as it would not take into consideration the far more fascinating conceptual complexities of both bodies of work. Ungers developed his square pattern in the mid 1970s (perhaps his most prolific

period), almost as a recurring decorative element of his highly experimental pseudo-practice of that time. Hans Kollhoff has reportedly claimed co-authorship of the rectilinear façade. As a pseudo-façade, the relentless repetition of the square in the form of a grid may represent Ungers' most radical tool for annihilating design. Interestingly, however, the tool is not about the tool itself. One could argue that the very choice of his weapon – a repetitive grid – reveals the intended target: as post-structuralist, Ungers was well aware that the Structuralists' naïve belief in repetition as a design solution had to be destroyed from within, not by presenting randomness as an alternative, but by reclaiming the profusion of repetition, or seriality, as the one and only way forward. According to this approach, multiplication and repetition are a method, not a tool; the unit disappears, and the relentless sameness turns all other elements – everything that is already there – into protagonists. Repition itself doesn't solve anything. As a result, a very hybrid set of principles surfs the waves of a self-generated sameness. This allowed him to make designs with remarkable wit and open-mindedness: any place or any project required a new, highly original hybrid typology. Using this technique, he (and his colleagues) could design a project without really designing anything. In this way, the method machine is capable of developing form. This machine is the ultimate incarnation of the scary architect, because it allows him to disconnect the responsibility of his own shaping of form from the actual questions being posed. In other words, he escapes the responsibility of having to solve problems with form. Instead, he only gather and mirrors what is already present. His serial form is elsewhere. What shapes the project is the seriality of what are seemingly repeated incarnations of the same set of tools.

Haraway, D.J. (1991). A Cyborg Manifesto - Simians, Cyborgs, and Women

An ironic dream of a common language for women in the integrated circuit.

A cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. **Social reality is lived social relations, our most important political construction, a world-changing fiction.** The international women's movements have constructed 'women's experience', as well as uncovered or discovered this crucial collective object. This experience is a fiction and fact of the most crucial, political kind. Liberation rests on the construction of the consciousness, the imaginative apprehension, of oppression, and so of possibility. The cyborg is a matter of fiction and lived experience that changes what counts as women's experience in the late twentieth century this is a struggle over life and death, **but the boundary between science fiction and social reality is an optical illusion.**

…

Hilary Klein has argued that both Marxism and psychoanalysis, in their concepts of labour and of individuation and gender formation, depend on the plot of original unity out of which difference must be produced and enlisted in a drama of escalating domination of woman/nature. The cyborg skips the step of original unity, of identification with nature in the Western sense. This is its illegitimate promise that might lead to subversion of its teleology as star wars.

The cyborg is resolutely committed to partiality, irony, intimacy, and perversity. It is oppositional, utopian, and completely without innocence. **No longer structured by the polarity of public and private**, the cyborg defines a **technological polis** based partly on a **revolution of social relations in the oikos**, the household. **Nature and culture are reworked**; the one can no longer be the resource for appropriation or incorporation by the other. **The relationships for forming wholes from parts**, including those of polarity and hierarchical domination, are at issue in the cyborg world.

Now I want to signal **three crucial boundary breakdowns** that make the following political-fictional (political-scientific) analysis possible.

1st , Biology and evolutionary theory over the last two centuries have simultaneously produced modern organisms as objects of knowledge and reduced the line between humans and animals to a faint trace re-etched in ideological struggle or professional disputes between life and social science. Biological-determinist ideology is only one position opened up in scientific culture for arguing the meanings of human animality. There is much room for radical political people to contest the meanings of the breached boundary. The cyborg appears in myth precisely where the boundary between human and animal is transgressed.

2nd , The second leaky distinction is between animal-human (organism) and machine. Basically machines were not self-moving, self-designing, autonomous. They were not man, an author to himself, but only a caricature of the masculinist reproductive dream. Late twentieth-century machines have made **thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed**, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert.

In short, the certainty of what counts as nature – a source of insight and promise of innocence – is undermined, probably fatally.

3rd, The boundary between physical and non-physical is very imprecise for us. Modern machines are quintessentially microelectronic devices: they are everywhere and they are invisible. Our best machines are made of sunshine; they are all light and

clean because they are nothing but signals and **these machines are eminently portable, mobile.** The ubiquity and invisibility of cyborgs is precisely why these sunshine-belt machines are so deadly. **They are as hard to see politically as materially.**

So my cyborg myth is about transgressed boundaries, potent fusions, and dangerous possibilities which progressive people might explore as one part of needed political work.

FRACTURED IDENTITIES

It has become difficult to name one's feminism by a single adjective – or even to insist in every circumstance upon the noun. Consciousness of exclusion through naming is acute. Identities seem contradictory, partial and strategic. With the hard-won recognition of their social and historical constitution, gender, race, and class cannot provide the basis for belief in 'essential' unity.

…

Reproduction had different tones of meanings for the two tendencies, one rooted in labour, one in sex, both calling the consequences of domination and ignorance of social and personal reality 'false consciousness.'

THE INFORMATICS OF DOMINATION

...

The entire universe of objects that can be known scientifically must be formulated as problems in communications engineering (for the managers) or theories of the text (for those who would resist). Both are cyborg semiologies.

One should expect control strategies to concentrate on boundary conditions and interfaces, on rates of flow across boundaries – and not on the integrity of natural objects. 'Integrity' or 'sincerity' of the Western self gives way to decision procedures and expert systems.

Human beings, like any other component or subsystem, must be localized in a system architecture whose basic modes of operation are probabilistic, statistical. No objects, spaces, or bodies are sacred in themselves; any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language.

The cyborg is a kind of disassembled and reassembled, postmodern collective and personal self. Communications technologies and biotechnologies are the crucial tools refracting our bodies. Communications sciences and modern biologies are constructed by a common move, a search for a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, investment, and exchange.

In communications sciences, the translation of the world into a problem in coding can be illustrated by looking at cybernetic (feedback-controlled) systems theories applied to telephone technology, computer design. In each case, solution to the key questions rests on a theory of language and control; **the key operation is determining the rates, directions, and probabilities of flow of a quantity called information. The world is subdivided by boundaries differentially permeable to information**. Information is just that kind of quantifiable element (unit, base of unity) **which allows universal translation, and so unhindered instrumental powe**r (called effective communication).

Communication technologies depend on electronics. Modern states, political processes, fabrication of our imaginations, labour-control systems, the international division of labour intimately depend upon electronics. Micro-electronics is the technical basis of simulacra; that is, of copies without originals.

Communication sciences and biology are constructions of natural-technical objects of knowledge in which the difference between machine and organism is thoroughly blurred; mind, body, and tool are on very intimate terms.

WOMEN IN THE INTEGRATED CIRCUIT

Let me summarize the picture of women's historical locations in advanced industrial societies, as these positions have been restructured partly through the social relations of science and technology. If it was ever possible ideologically to characterize women's lives by the distinction of public and private domains – suggested by images of the division of working-class life into factory and home, of bourgeois life into market and home, and of gender existence into personal and political realms – it is now a totally misleading ideology, even to show how both terms of these dichotomies construct each other in practice and in theory. I prefer a network ideological image, suggesting **the profusion of spaces and identities** and the **permeability of boundaries** in the personal body and in the body politic. 'Networking' is both a feminist practice and a multinational corporate strategy – **weaving is for oppositional cyborgs.**

…

There is no way to read the following list from a standpoint of 'identification', of a unitary self. The issue is dispersion. The task is to survive in the diaspora.

Market: Women's continuing consumption work, newly targeted to buy the profusion of new production from the new technologies (especially as the competitive race among industrialized and industrializing nations to avoid dangerous mass unemployment necessitates finding ever bigger new markets for ever less clearly needed commodities); bimodal buying power, coupled with advertising targeting of the numerous affluent groups and neglect

of the previous mass markets; growing importance of informal markets in labour and commodities parallel to high-tech, affluent market structures; surveillance systems through electronic funds transfer; intensified market abstraction (commodification) of experience, resulting in ineffective utopian or equivalent cynical theories of community; extreme mobility (abstraction) of marketing/ financing systems; interpenetration of sexual and labour markets; intensified sexualization abstracted and alienated consumption.

CYBORGS: A MYTH OF POLITICAL IDENTITY

American radical feminists have profoundly affected our political imaginations – and perhaps restricted too much what we allow as a friendly body and political language. They insist on the organ opposing it to the technological. (…) They would simply bewilder anyone not preoccupied with the machines and consciousness of late capitalism. In that sense they are part of the cyborg world. But there are also great riches for feminists in explicitly embracing the possibilities inherent in the breakdown of clean distinctions between organism and machine and similar distinctions structuring the Western self. It is the **simultaneity of breakdowns** that **cracks the matrices of domination** and opens geometric possibilities. **What might be learned from personal and political 'technological' pollution?**

Writing is pre-eminently the technology of cyborgs, etched surfaces of the late twentieth century. Cyborg politics is the struggle for language and the struggle against perfect communication, against the one code that translates all meaning perfectly, the central dogma of phallogocentrism. That is why cyborg politics insist on noise and advocate pollution, rejoicing in the illegitimate fusions of animal and machine. These are the couplings which make Man and Woman so problematic, subverting the structure of desire, the force imagined to generate language and gender, and so subverting the structure and modes of reproduction of 'Western' identity, of nature and culture, of mirror and eye, slave and master, body and mind.

'We' did not originally choose to be cyborgs, but choice grounds a liberal politics and epistemology that imagines the reproduction of individuals before the wider replications of 'texts'.

To recapitulate, certain dualisms have been persistent in Western traditions; they have all been systemic to the logics and practices of domination of women, people of colour, nature, workers, animals – in short, domination of all constituted as others, whose task is to mirror the self. Chief among these troubling dualisms are self/other, mind/body, culture/nature, total/partial.

High-tech culture challenges these dualisms in intriguing ways. It is not clear who makes and who is made in the relation between human and machine. It is not clear what is mind and what body in machines that resolve into coding practices. In so far as we know ourselves in both formal discourse (i.e., biology) and in daily practice (for example, the homework economy in the integrated circuit), we find ourselves to be cyborgs, hybrids, chimeras. Biological organisms have become biotic systems, communications devices like others.

Why should our bodies end at the skin, or include at best other beings encapsulated by skin? From the seventeenth century till now, machines could be animated (…) or organisms could be mechanized – reduced to body understood as resource of mind. These machine/organism relationships are obsolete, unnecessary. For us, in imagination and in other practice, machines can be prosthetic devices, intimate components, friendly selves. We don't need organic holism to give impermeable wholeness, the total woman and her feminist variant.

…

The machine is not an it to be animated, worshipped, and dominated. The machine is us, our processes, an aspect of our embodiment. We can be responsible for machines; they do not dominate or threaten us. We are responsible for boundaries; we are they.

Cyborg imagery can help express two crucial arguments in this essay: first, the production of universal, totalizing theory is a major mistake that misses most of reality, probably always, but certainly now; and second, taking responsibility for the social relations of science and technology means refusing an anti-science metaphysics, a demonology of technology, and so means embracing the skilful task of reconstructing the boundaries of daily life, in partial connection with other, in communication with all of our parts.

Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves.

THE BIOPOLITICS OF POSTMODERN BODIES: CONSTITUTIONS OF SELF IN IMMUNE SYSTEM DISCOURSE - CHAPTER X

Lumpy discourses and the denatured bodies of biology and medicine.

This chapter explores some of the contending popular and technical languages constructing biomedical, biotechnical bodies and selves in postmodern scientific culture in the US in the 1980s. The chief object of my attention will be the potent and polymorphous object of belief, knowledge, and practice called the immune system.

Pre-eminently a twentieth-century object, the immune system is a map drawn to guide recognition and misrecognition of self and other in the dialectics of Western biopolitics. That is, the immune system is a plan for meaningful action to construct and maintain the boundaries for what may count as self and other in the crucial realms of the normal and the pathological.

The apparatus of bodily production: the techno-biopolitics of engagement.

Organisms are made; they are constructs of a world-changing kind. The constructions of an organism's boundaries, the job of the discourses of immunology, are particularly potent mediators of the experiences of sickness and death for industrial and post-industrial people.

In this over-determined context, I will ironically – and inescapably – invoke a constructionist concept as an analytic device to pursue an understanding of what kinds of units, selves, and individuals inhabit the universe structured by immune system discourse: the conceptual tool, 'the apparatus of bodily production'. Scientific bodies are not ideological construction. Always radically historically specific, bodies have a different kind of specificity and effectivity, and so they invite a different kind of engagement and intervention. The notion of a 'material-semiotic actor' is intended to highlight the object of knowledge as an active part of the apparatus of bodily production, without ever implying immediate presence of such objects, or what is the same thing, their final or unique determination of what can count as objective knowledge of a biomedical body at a particular historical juncture. **Bodies as objects of knowledge are material-semiotic generative nodes. Their boundaries materialize in social interaction; 'objects' like bodies do no pre-exist as such**. Scientific objectivity (the siting/sighting of objects) is not about dis-engaged discovery, but about mutual and usually unequal structuring, about taking risks.

…

The biomedical-biotechnical body is a semiotic system, a complex meaning-producing field, for which the discourse of immunology, that is, the central biomedical discourse on recognition/misrecognition, has become a high-stakes practice in many senses.

THE ONE AND THE MANY: SELVES, INDIVIDUALS, UNITS AND SUBJECTS

Function is about action. Here is where Dawkins has a radical solution, as he proposes a view of individuality that is strategic at every level of meaning. There are many kinds of individuals for Dawkins, but one kind has primacy. 'The whole purpose of our search for a 'unit of selection' is to discover a suitable actor to play the leading role in our metaphors of purpose'. The 'metaphors of purpose' come down to a single bottom line: replication. 'A successful replicator is one that succeeds in lasting, in the form of copies, for a very long time measured in generations, and succeeds in propagating many copies of itself'.
The replicator fragment whose individuality finally matters most, in the constructed time of evolutionary theory, is not particularly 'unitary'. For all that it serves, for Dawkins, as the 'unit' of natural selection, the replicator's boundaries are not fixed and its inner reaches remain mutable. But still, these units must be a bit smaller than a 'single' gene coding for a protein. Units are only good enough to sustain the technology of copying. Like the replicon's borders, the boundaries of other strategic assemblages are not fixed either – it all has to do with the broad net cast by strategies of replication in a world where self and other are very much at stake.

…

'The network theory differs from other immunological thinking because it endows the immune system with the ability to regulate itself using only itself'. Jerne's basic idea was that any antibody molecule must be able to act functionally as both antibody to some antigen and as antigen for the production of an antibody to itself, albeit at another region of 'itself'. All these sites have acquired a nomenclature sufficiently daunting to keep popular understanding of the theory at bay indefinitely, but the basic conception is simple. **The concatenation of internal recognitions and responses would go on indefinitely, in a series of interior mirroring of sites**

on immunoglobulin molecules, such that the immune system would always be in a state of dynamic intern responding. It would **never be passive**, 'at rest', awaiting an activating stimulus from a hostile outside. In a sense, there could be no exterior antigenic structure, no 'invader', that the immune system had not already 'seen' and mirrored internally. **'Self' and 'other' lose their rationalistic oppositional quality** and become subtle plays of partially mirrored readings and responses. The notion of the internal image is the key to the theory, and it entails the premise that every member of the immune system is capable of interacting with every other member.

IMMUNE POWER: IMAGES, FICTIONS, AND FIXATIONS

…

Immunity can also be conceived in terms of shared specificities; of the semi-permeable self able to engage with others (human and non-human, inner and outer), but always with finite consequences; of situated possibilities and impossibilities of individuation and identification; and of partial fusions and dangers. The problematic multiplicities of postmodern selves, so potently figured and repressed in the lumpy discourses of immonology, must be brought into other emerging Western and multi-cultural discourses on health, sickness, individuality, humanity, and death.

Hookway, B. (2014). Interface

THE SUBJECT OF THE INTERFACE

The interface as form of relation

For while the interface might seem to be a form of technology, it is more properly a form of relating to technology, and so constitutes a relation that is already given, to be composed of the combined activities of human and machine. The interface precedes the purely technological, just as one encounters a mirror image before the mirror itself. Likewise, the interface describes the ways in which humanness is implicated in its relation with technology. For even at the moment human and machine come into contact, their encounter has already been subject to a mediation. Both the actions performed upon the interface and the agency of their performance are to a critical extent already anticipated.

If the interface is now ubiquitous and pervasive, it is so with respect to a proliferation of ever more complex devices and networks. If it is indeterminate and elusive, it is so in that it channels the activities under its influence toward a resolution within a common protocol, while at the same time opening up new vista and capabilities to a now-augmented human sensorium.
      The interface is defined here as a kind of theoretical construct whose essential characteristics and operations are common to each of it various realized instantiations. Specfically, the interface is treated here as a form of relation. This is to say what is most essential to a description of the interface lies not in the qualities of an entity or in lineages of devices or technologies, **but rather in the qualities of relation between entities.**

A preliminary definition of interface might then be as follows: the interface is a form of relation that obtains between two or more distinct entities, conditions, or states such that it only comes into being as these distinct entities enter into an active relation with one another; such that it actively maintains, polices , and draws on the separation that renders these entities as distinct at the same time as it selectively allows a transmission or communication of force or information from one entity to the other; and such that its overall activity brings about the production of a unified condition or system that is mutually defined through the regulated and specified interrelations of these distinct entities. Or again: **the interface is that form of relation which is defined by the simultaneity and inseparability of its processes of separation and augmentation**, of maintaining distinction while at the same eliding it in the production of a mutualism that may be viewed as an entity in its own right, with its own characteristics and behaviors that cannot be reduced to those of its constituent elements.

The separation maintained by the interface between distinct entities or states is also the basis of the unity it produces from those entities or states. While the constituent entities and processes of the interface may be examined individually, such analysis yields only a partial view of the interface and addresses only aspects or derivations of its full functioning. Such derivations of the interface include the surface, the test, and the simulation. [The theory of the interface presented here investigates the interface both in part and in full, including the processes by which the interface comes into being, the behaviors and activities that it both draws upon and produces, and the status it ascribes to the discrete elements it brings into relation and the mutually directed entity or system that is the result of its operations. In this analysis, the interface entails implications for notions of control and intelligence as well as regarding those entities that are both its constituents and its products. These include the system and, perhaps most relevant to this study's focus on the human relation to technology. The subject and its production through processes of subjectification.

The interface is a liminal or threshold condition that both delimits the space for a kind of inhabitation and opens up otherwise unavailable phenomena, conditions, situations, and territories for exploration, use, participation, and exploitation. Often the territories it opens up constitute in themselves further threshold conditions.

This reflects what may be taken as axiomatic: that the interface is at every stage of its operation concerned with the liminal. Not only does the interface constitute itself a threshold condition, but it also operates through the seeking out, identification, and development of thresholds of various kinds. **These thresholds are guarded, regulated, and maintained in place by the interface both in its internal organization and in the relation or effect it produces with respect to the externality with which it interfaces.**

To the extent that the identification of difference is essential to the operation of the interface, the interface is aligned with the test; and to the extent that the interface occupies the threshold that governs the change from one state to another, the interface may be said to possess a tendency to come into being, operate within, and express its character with reference to the transformative or transitional.

!![In each of these settings, and whether as a general theoretical construct or within a specific instantiation, the interface carries with it a third major tendency, along with the identification of differences and the facilitation of transformations; this is a tendency toward a seeming transparency and disappearance, even as it is undoubtedly a condition that demands to be worked through. While promising an illusory effortlessness and seamlessness in its provision of an augmentation, the interface nonetheless requires an extraction of work and for this work a cost must be paid]!! The cost is extracted both in terms of energy and in confinement and channeling these energies into a form compatible with the interface, even as the cost of working through the interface is hidden from the perspective of its having been worked through. In its occupation of the threshold, the interface is both the conduit through the threshold and the judge sitting upon the threshold to determine what may pass through and the manner of its passing. Both of these aspects of the interface constitute a kind of friction upon the threshold that requires work or the exertion of energy to overcome. What occurs within the interface, the kind of relating across a threshold that is often described as interaction or interactivity, may also be described as a transaction, in the sense of a cost being extracted and compensation being given in exchange.

BETWEEN FACES AND FACING BETWEEN

It pertains to an inward orientation, an interiority. As an interiority of relations, inter- encompasses relations that may occur between, among, or amid elements insofar as they are given as bounded within the space of their relating, or of events insofar as they are bounded in time. Inter- holds its bounded condition as already given, as a priori to the relations it describes. It does not exclude that which is exterior to it, since it has already been separated out as an interior. **This reading of inter- would suggest an interface that does not define its bounding entities but is rather defined by them. The interface thus would be an interior condition, whose activity and influence is constrained within the boundaries given by its defining entities. If used as a form of communication between these entities, the role of the interface would be limited to the translation, or transmission of that which its bounding entities project into it. !![While the specific means of communication belong to the interface, the interface would otherwise always refer back to its bounding entities. Its influence would not extend into the bounding entities that confine it, but would rather be constrained to the relations that occur between them. The interface would be defined according to its betweenness, its amongness, its duration-within.]!!**

Against this reading of the interface as an interior condition, the etymology of face points toward an outward orientation and an exteriority.
First, to face is to give a thing the properties of possessing a face, such that it both becomes capable of projecting qualities and energies outside itself and is opened up as accessible to a kind of reading, just as a text is available to read. Second, to face is to be oriented toward, or to confront with persistence and determination,

as in an adversarial situation. Here, to face is not yet to enter into a relation, but rather to marshal energies from an interior toward an exterior. **The face is the threshold for this marshaling; it is the site from which the qualities of an interior are translated into a communicative or combative form, so that they may be projected outward onto an exterior.**

The combining of inter- and face makes of the interface the embodiment of a contradiction, which may be seen in two possible readings of the term. First, as "between faces," interface would suggest activities within a circumscribed field or an enclosure. Second, as "a facing between", interface would suggest a boundary or zone of encounter that actively extends into and conditions that which it separates. **In combination, the interface is both an interiority confined by its bounding entities and a means of accessing, confronting, or projecting into an exteriority. It is defined by its bounding entities at the same time that it defines them. In encompassing interiority and exteriority, passivity and activity, the interface governs transformations from interior state to exterior relation from inward to outward expression.**

One between-faces approach to the interface would be to treat it as if it were a closed system. The interface could then be characterized according to the bounding entities (or faces) that delimit it, and by the relations that take place within this delimited field. A human-machine interface, for example, would be fully bounded by the "faces" of human and machine. Its study would concern only the relations that take place between human and machine, and its operation would be delimited as acts of transaction and translation between these two entities. **The view of the interface as an instrumental technology is such a between-faces approach. Here, the interface becomes a discrete object or apparatus available for use, or a technical problem constrained within the criteria of its design and production.**

At the same time, the reading of the interface as between faces

reveals those aspects of its operation where it delimits, encloses, or produces an interiority. This is not only the interiority of the closed system, but also a form of interiority that defines the subjective experience of control interfaces, or of media of control. Here, the interface opens up a space of inhabitation, within which the use of a control interface and its exertion of control are reconciled within user experience. (about human-computer interface, why is a space of inhabitation also not featured in the human-machine interface?)

As a zone of encounter between entities, the interface is at once between faces and a facing between, just as it is at once passive and active. It comes into being between faces, constituting the site of encounter between two or more entities as they enter into relation; as much as this relation produces mutually determined activity, the interface operates as a facing between to bind together the actions and reactions of each entity in the production of an overall act. Likewise the interface is at once passive in that it only comes into being when energy is directed into and through it, and active in that it captures that energy as its own, drawing energies from one entity to channel it into another in the production of a mutual activity that only it can fully describe. To return to the human-computer interface, the interface is not only defined by but also actively defines what is human and what is machine. In this mutual defining, which is also both a communication and a contestation, the interface operates as an essentially unbounded condition – one that continually tests and redefines its own boundaries as it comes to face with the entities that face it.

…

THE INTERFACE AND THE SURFACE

The interface may be distinguished from the surface in that it does not primarily refer back to a thing or condition but rather to a relation between things or conditions, or to a condition as it is produced by a relation. The interface as a problem does not

primarily bear on the characteristics or properties of the entities it interfaces though it may do so secondarily. **Rather the problem of the interface bears on what must take place on the drawing together of entities into a relation, and to the combined or synthesized behavior of those entities within that relation.**

A surface presents a form, while an interface performs a shaping. Though it may produce a trajectory or even a surface, the interface nonetheless remains resistant or hidden to formal analysis. For example, to be illusory with respect to a surface is to refer to its role in masking some aspect or property of a thing, so that the surface brings about the illusory disappearance of that aspect or property. **With respect to the interface this illusory disappearance is performed as part of an active relation, and takes place as the concealing of constituent activities within the production of an overall trajectory.**

At the same time, the interface remains strongly related to the surface, not only in that both entail processes of facing, but also in that each may break down, combine, or be reconfigured into the other. The coming into relation of two or more surfaces may also constitute the production of an interface, while the holding constant of one constituent element in the relation that produces the interface may make of the interface the surface of another constituent element. In this latter case, where the interface becomes the surface of an entity, the entity is still held to the interface as something it must work through in order to possess a face to be able to act. It is in this way that the interface may in turn be read as a surface of each of the entities it has brought into relation, and so may become a means for the analysis (or close reading, or testing) of these entities. Available to such analyses are the lines of inquiry that follow or recapitulate the penetrations into or colonizations of those entities that have already been accomplished with the coming into being of the interface, and so with the binding together of those entities into relation. In this way, while the interface is not in itself a surface, it may be a producer of surfaces.

Kaika, M. (2005). City of Flows - Modernity, Nature and the City

PREFACE: VISIONS OF MODERNIZATION – CHAPTER I

The specter of the drought made me reconsider what I had been taking for granted: namely, the naturalness of the delivery of goods into the domestic bliss of my home, and the clear-cut conceptual separation between my home, my city, and nature. The drought revealed (by disrupting it) the continuous flow of natural elements (water, electricity, gas, etc.) from the countryside into the city and finally into the modern home. What I used to perceive as a compartmentalized world, consisting of neatly and tightly sealed, autonomous "space envelopes" (the home, the city and nature) was, in fact, a messy socio-spatial continuum.

Modernity here is understood as a programmatic vision for social change and progress, linked to industrialization and capitalist expansion, and in effect as an ideology for human emancipation.

The analysis in the book unravels the "Promethean Project" of modernity, i.e., the historical geographical process that started with industrialization and urbanization and aimed at taming and controlling nature through technology, human labor, and capital investment. The same process aspired to rendering modern cities autonomous and independent from nature's whims. The project transformed socio-natural landscapes across the world and disrupted the preexisting ontological categories of "nature" and "the city".

I argue that, although the programming vision was to render cities independent from nature's processes, the materialization of this vision was predicated upon establishing intricate networks and flows of natural elements, social power relations and capital investment cycles, which, in fact, not only did not separate nature from the city, but instead wove them together more closely into a socio-spatial continuum. **The modern city and the modern home appear only to function autonomously and independently from natural and social processes, because the flow of natural elements,**

social relations, and money that support their function remain fetishized (in the case of social relations) or visually severed (in the case of technology networks).

Finally, the book brings to the foreground the fetishized social relations of production and the hidden material networks and flows that urbanize nature.

Baring the flow of water between the natural, the urban, and the domestic sphere reveals that nature and the city are not separate entities or autonomous "space envelopes", but hybrids, neither purely human-made nor purely natural; outcomes of the same socio-spatial process of the urbanization of nature.

THE URBANIZATION OF NATURE – CHAPTER II

The nature /society dualism has not been produced and reproduced only at theoretical and conceptual-ideological elvel, Since this separation inevitably permeated social and spatial practices, these ideas often became politicized and were translated into spatial practices from the production of nature in cities in the form of parks that would help produce better societies, to Nazi eugenics that would manipulate nature in order to produce the perfect human being. Lefebvre touches upon this issue when he points out that the separation between spaces of extraction, production, and reproduction (what he calls "the social building blocks of space" or "space envelopes") is related to the nature/society dualism, and notes that this is also accompanied by the fragmentation of everyday experience, and by an increasing commodification of everyday life.

"To combat nature or to "enter into" it to the point of penetration; to grasp its dialectical aspects with respect to concentration; to order it geometrically, or to make of it, in cultivating one's garden, ideal nature, a chosen cosmological precinct (earthly paradise, nature propitious) to human living as against wild nature; or pedagogically to invoke it as mirror of truth and goodness of man

– these are attitudes to which have corresponded, each in turn, precise and differentiated architectural responses." -Gregotti

Much of modern urban planning has been infused and inspired by particular scriptings of the "nature" of nature and of the "nature" of the city. In the above quote, Gregotti's enquiry into the relationship between nature and the built environment captures the multiplicity of meanings, and imaginings of nature: nature as something that must be "penetrated", conquered, tamed; or, nature as something sacred, as ideal order and pedagogical inspiration.

McHarg's seminal book Design with Nature (1969) drafted the first guidelines for "ecologizing" the city, no longer bringing nature in the form of green spaces inside the city, but **by bringing nature squarely into the multiple relations that structure the urbanization process and by treating nature and the city as interacting processes rather than inert things.** In these first seeds for political ecological thinking, nature and the city appear as a single interacting system. Changes to any of the parts will affect the operation of the whole.

…

The neonlights are fed by energy coming from nuclear power plants and from coal or gas burning electricity generators. The cars burning fuels from oil-deposits and pumping CO2 in the air, affecting forests and climates around the globe, further complete the global geographic mappings and traces that flow through the city, and produce London as a palimpsest of densely layered bodily, local, national, and global – but geographically uneven – socio-ecological processes. This intermingling of things material and symbolic combines to produce a particular socio-environmental milieu that welds nature, society and the city together in a deeply heterogeneous, conflicting and often disturbing whole.

Perpetual change and an ever-shifting mosaic of environmentally and socio-culturally distinct urban ecologies – varying from the manufactured landscaped gardens of gated communities and high-technology campuses to the ecological war-zones of depressed neighborhoods with lead-painted walls and asbestos covered ceilings, waste dumps, and pollutant-infested areas – shape the process of capitalist urbanization. The environment of the city is deeply caught up in this dialectical process as are environmental ideologies, practices, and projects. The idea of some sort of pristine nature that needs to be saved (First Nature) or of a city as an entity separate to socio-environmental processes, becomes increasingly problematic as historical geographical processes continuously produce new "socio-natural" environments over space and time. In sum, the world is a historical geographical process of perpetual metabolism in which "social" and "natural" processes combine in a historical geographical "production process of socio-nature" whose outcome (historical nature) embodies chemical, physical, social, economic, political and cultural processes in highly contradictory but inseparable manners.

This constructionist perspective considers the process of urbanization to be integral to the production of new environments and new natures. It also sees nature and society as fundamentally combined historical-geographical production processes. Consider, for example, the socio-ecological transformations of entire ecological systems, sand and clay metabolized into concrete buildings. Similarly, the contested production of new "genotypes" such as Oncomouse on which Haraway elaborates, or Dolly the cloned sheep support the impossibility of an ontological basis fo a separatiopn between human beings and nature, between nature and culture. Anthony Giddens suggests that in this context we have reached "The End of Nature". Of course, he does not imply that nature has disappeared, but rather that nothing is out there anymore that has not been transformed, tainted, metabolized by society/culture. Latour contends that:

"nature" is merely the uncoded category that modernists oppose to "culture", in the same way that, prior to feminism, "man" was the uncoded category opposed to "woman". By coding the category of "natural object", anthropological science loses the former nature/culture dichotomy.

As Lewontin suggests, modernity's nature is no longer fearful or strange. It is instead more open to fulfilling promises and desires, yet remains full of conflict and tension:

A rational environmental movement cannot be built on the demand to save the environment, which, in any case, does not exist. Rather, we must decide what kind of world we want to live in and then try to manage the process of change as best we can approximate it.

Lefebvre, H. (1970). The Urban Revolution

The political city is inconceivable without writing. It is completely given over to orders and decrees, to power. Yet it also implies the existence of exchange to procure the materials essential to warfare and power and of artisanship to fashion and maintain them. Thus, such a city also comprises artisans and workers. The political city administers, protects, and exploits a territory that is often vast. It manages large-scale agricultural projects such as drainage, irrigation. It rules over a number of villages. Ownership of the land becomes the eminent right of a monarch, the symbol of order and action. Nonetheless, peasants and communities retain effective possession through the payment of tribute.

In such an environment, exchange and trade can only expand. Initially confined to suspicious individuals they become functionally integrated into the life of the city. Those places given over to exchange and trade are initially strongly marked by the signs of heterotopy. Like the people who are responsible for and inhabit them, these places are at the outset excluded from the political city caravansaries, suburbs. This process of integrating markets and merchandise (people and things) in the city can last for centuries. Exchange and trade, which are essential to the survival of life, bring wealth and movement. The political city resists this with all the power at its disposal, all its cohesiveness. It is threatened by the markets and traders' form of ownership (money, a form of personal property, being movable by definition). The market place became centralized. It replaced and supplanted the place of assembly (the forum). Around the market, which had now become an essential part of the city were grouped several institutional buildings. Architecture follows and translates the new conception of the city. Urban space becomes the meeting place for goods and people, for exchange. It bears the signs of this conquered liberty. The fetishism associated with merchandise appeared along with the rise of merchandize, its logic and ideals, its language and world. The Merchant City succeeded the political city. At this time, commercial exchange became an urban function, which was embodied in a form (both architectural and urban). This in turn gave urban space a new structure. Market towns and suburbs began to struggle with centers

of political power (institutions) for influence, prestige, and space, forcing to compromise, entering with them in the construction of a powerful urban unity.

The importance of the city for the social whole became such that the whole seemed to shift. In the relationship between town and country, the emphasis was still on the countryside: real property wealth, the products of the soil, attachment to the land (titles). Compared with the countryside, the town retained its heterotopic character, marked by its ramparts as well as the transition to suburban areas. At a given moment, these various relationships were reversed; the situation changed. The moment when this shift occurred, this reversal of heterotopy, should be marked along our axis. From this moment on, the city would no longer appear as an urban island in a rural ocean, it would no longer seem a paradox that contrasted sharply with village or country life in a natural environment. The country is now nothing more than the town's environment. Villagers produced for the city, for the urban market. And even though they realized that the wheat and wood merchants exploited them, they understood that the path to freedom crossed the marketplace.

So what is happening around this crucial moment in history? Thoughtful people no longer see themselves reflected in nature. Between them and nature, between their home and the world, lies the urban reality, an essential mediating factor. From this moment on society no longer coincides with the countryside. It no longer coincides with the city, either. The state encompasses them both, joins them in its hegemony by making use of their rivalry. The rationalism that culminated in Descartes accompanied the reversal that replaced the primacy of the peasantry with the priority of urban life. Although the peasantry didn't see it as such. However, during this period, the image of the city came into being.

After a certain point in time, the city developed its own form of writing: the map or plan, the science of planimetry. During

the sixteenth and seventeenth centuries, when this reversal of meaning took place, maps of European cities began to appear. These are not yet abstract maps, but a cross between vision and concept, they displayed the city from top to bottom, in perspective, painted, depicted, and geometrically described. This perspective, simultaneously idealist and realist was situated in the vertical dimension and dominated and constituted a totality: the city. This shift of social reality toward the urban, this (relative) discontinuity, can be easily indicated on a space-time axis, whose continuity can be used to situate and date any (relative) breaks. All that is needed is to draw a line between the zero point and the terminal point.

This reversal of meaning can't be dissociated from the growth of commercial capital and the existence of the market. It was the rise of the mercantile city, which was grafted onto the political city but promoted its own ascendancy, that was primarily responsible. This was soon followed by the appearance of industrial capital and, consequently, the industrial city. Was industry associated with the city? One would assume it to be associated with the non-city, the absence or rupture of urban reality. Industry gradually made its way into the city in search of capital and capitalists, markets, and an abundant supply of low-cost labor. It moved if there was an economic advantage elsewhere. Just as the political city resisted the conquest of the merchants , exchange, and money, similarly the political and mercantile city defended itself from being taken over by a nascent industry, industrial capital, and capital itself. But how did it do this? Through corporatism, by establishing relationships. Something strange and wonderful was also taking place, which helped renew dialectical thought: the non-city and the anti-city would conquer the city, penetrate it, break it apart, and in so doing extend in immeasurably, bringing about the urbanization of society and the growth of the urban fabric that covered what was left of the city prior to the arrival of industry. Urban reality simultaneously amplified and exploded, this loses the features it inherited from the previous period organic totality, belonging, an uplifting image, a sense of space that was measured and dominated by monumental splendor. It was populated with signs of the urban within the dissolution of urbanity; it became stipulative, repressive, marked by signals, summary codes for circulation, and signage, It was imperious. But no terms completely describe the historical process of implosion-explosion that occurred: the tremendous concentration (of people, activities, wealth, goods, objects, instruments, means and thought) of urban reality and the immense explosion, the projection of numerous, disjunct fragments (peripheries, suburbs, vacation homes, satellite towns) into space.

The Industrial city serves as a prelude to a critical zone. At this moment, the effects of implosion-explosion are most fully felt. The increase in industrial production is superimposed on the growth of commercial exchange and multiplies the number of such exchanges. This growth extends from simple barter to the global market, from the simple exchange between two individuals all the way to the exchange of products, works of art, ideas and human beings. Buying and selling, merchandise and market, money and capital appear to sweep away all obstacles. During this period of generalization, the effect of the process – namely the urban reality - becomes both cause and reason. Urban reality modifies the relations of production without being sufficient to transform them. It becomes a productive force, like science. Space and politics of space ''express'' social relationships but react against them. Obviously, if an urban reality manifests itself and becomes dominant, it does so only through the urban problematic.

CHAPTER II – BLIND FIELD

The Marxist theory of surplus value distinguishes the formation of surplus value from its realization and distribution. Surplus value is initially formed in the countryside. This formation is shifted to the city to the extent that it becomes the center of production, craft activities, and industry. In contrast, the commercial and banking system found in cities has always been an organ for the realization of surplus value. In distributing wealth, those who controlled the

city have also attempted to retain the majority of this surplus value (greater than the average profit from their investments). For these three aspects of surplus value, the urban center plays an increasingly important role, an aspect of urban centrality that is essential yet misunderstood within the mode of capitalist production. This contradicts the belief that the city of old and the contemporary urban center were no more than superstructures and had no relation to productive forces and the mode of production.

Heterotopy: a difference that marks it by situating it (situating itself) with respect to the initial place. This difference can extend from highly marked contrast all the way to conflict, to the extent that the occupants of a place are taken into consideration.

The shape of urban space evokes and provokes this process of concentration and dispersion: crowds, colossal accumulation, evacuation, sudden ejection. The urban is defined as the place where people walk around, find themselves standing before and inside piles of objects, experience the intertwining of the threads of their activities until they become unrecognizable, entangle situations in such a way that they engender unexpected situations. The definition of this space contains a null vector (virtually); the cancellation of distance haunts occupants of urban space. It is their dream, represented in a multiplicity of ways – on maps, in the frenzy of encounters and meetings, in the enjoyment of speed "even in the city". This is utopia (real, concrete). The result is the transcendence of the close and the open, the immediate and the mediate, near and far orders, within a differential reality in which these terms are no longer separated but become immanent differences.

The confusion between the industrial (practice and theory, whether capitalist or socialist) and the urban ends up by subordinating one to the other in a hierarchy of actions, considering the urban as an effect, a result, or a means. This confusion has serious consequences, for it leads to the production of a pseudoconcept of the urban, namely, urbanism, the application of industrial rationality, and the evacuation of urban rationality.

The period of industrialization gave rise to the well-known paternalism of the company owner or boss. At times, patriarchalism (peasant) and paternalism (industrial) became superimposed and strengthened one another, giving rise to an ideal head of state. Because industrialization makes considerable demands (capital accumulation, the use of all of a country's resources, a form of planned organization that extends corporate rationality to every aspect of a country's life)m it has contradictory political consequences: revolution and authoritarianism, with both processes interacting in so-called socialist countries.

Similarly, today the urban reveals the industrial, which appears as a hierarchy that is paired with a highly refined form of exploitation.

During the vast process of transformation, space reveals its true nature as (1) a political space, the site and object of various strategies, and (2) a projection of time, reacting against and enabling us to dominate time, and consequently to exploit it to death, as it does today – which presages the liberation of time-space.

CHAPTER III – THE URBAN PHENOMENON

Description is unable to explain certain social relations – apparently abstract with respect to the given and the lived - which appear concrete but are only immediate. These include relations of productions and exchange and markets relations. These relations are both legible and illegible, visible and invisible. They are projected onto the landscape in various places: the marketplace, stock and commodities exchanges, labor exchanges, etc. Their projection enables us to identify those relations but not to grasp them. Once they are grasped at this levela the urban reality assumes a different appearance. It becomes the sum, the home of various markets: the market for agricultural products (local, regional,

national), industrial products (received, manufactured, distributed on site or in the surrounding territory), capital, labor, lodging, land for development, as well as the market for works of art and the intellect, signs and symbols.

But is it not enough to define the urban by the single fact that it is a place of passage and exchange. The urban reality is not associated only with consumption, with "tertiary" activities, distribution networks. It intervenes in production and the relations of production. The constriants associated with description impede thought at this level.

A good example of these totalizing ideologies (which reflect harmful practices) can be found in the representations of economic space and development that culminate in the elimination of a specific urban space through the absorption of social development into industrial growth, the subordination or urban reality to general planning. The politics of space sees space only as a homogeneous and empty medium, in which we house objects, people, machines, industrial facilities, flows, and networks. Such a representation is based on a logistics of restricted rationality and motivates a strategy that destroys the differential spaces of the urban and "habiting" by reducing them.

The city and the urban phenomenon can't be reduced either to a single system of signs or to a smeiology. Rather there are several on several levels. They include modalities of daily life (objects and products, signs of exchange and use, the deployment of merchandise and the market, the signs and significations of habiting and "habitat"), of urban society as a whole (the semiology of power, strength, and culture considered as a whole or separately), of particularized urban space-time (the semiology of features characteristic of the city, its landscape and appearance, its inhabitants). From this point of view, our research has just begun. It poses problems that we are unable to separate from the "urban problematic" but nevertheless need to distinguish.

Negroponte, N. (1975). Soft Architecture Machines

INTELLIGENT ENVIRONMENTS

RESPONSIVE ARCHITECTURE

In the late sixties, the adjectives flexible, manipulative, and responsive have received a wide variety of conflicting definitions and interpretations with examples of flexibility ranging from the cafetorium to the tepee.

The term flexible has generally followed the spirit of Mies van der Rohe's "Less is more" in the sense that, when two activities have a large intersection (in set, mathematical, theoretical terms), we design for the few "ands." The "exclusive ors" are compromised, if not ignored, for the purpose of cohabitation of the two activities. Just as with any conduct, one maintains flexibility by making as few commitments as possible.

The term manipulative, on the other hand, implies effort committed to making a close fit for each activity by providing for change and alteration that can range from closing a curtain to moving walls. Each state of a manipulative environment is in a very real sense nonflexible. To achieve a multiplicity of uses, the environment must undergo a physical transformation, large or small, at the behest of the users. What is important to my following arguments is that this change, that is, manipulation, is an overt action directed by the user(s). **The manipulative environment is a passive one, one that is moved as opposed to one that moves.**

In contrast, responsive, sometimes called adaptable, or reactive, means the environment is taking **an active role**, initiating to a greater or lesser degree changes as a result and function of complex or simple computations. There are very few examples of this kind of architecture.

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The typical introduction to responsive architecture is made with the thermostat. Eastman's (1971) **"Adaptive Conditional Architecture"** carries the analogy to great length. I believe that it is the wrong analogue. In Eastman's essay it leads to the objectionable process-control model for architecture, a decode-interpret-translate decision structure with old-fashioned feedback loops evidenced in the most common oil burner.

MÉNAGE À TROIS

The founding notions for an intelligent environment are in Brodey's (1967) "Soft Architecture: The Design of Intelligent Environments." More recent reflections can be found in Avery Johnson's (1973) "Three Little Pigs Revisited". Neither paper, however, presents convincing examples or gives the slightest inkling of a picture or description of how such a system might work. This is because there are no examples, there are no pictures, in short, there are no historical precedents of intelligent environments. Space capsules, cockpits, and any environment that consists solely of complex instrumentation are not the correct metaphors.

The proper metaphor is the family with a new member in it – the house. What does Johnson (1971) mean and what are the implications of his position: "We must build environments that invite their playful participation so that their self-referent knowledge of their community will grow…"?

Big Brother is not only watching, he is measuring your pulse, metering your galvanic skin resistance, smelling your breath. No. Those belong to the paradigm: "An adaptive process for architecture is made up of: A sensing device, a control algorithm, a change mechanism, and a control setting" (Eastman, 1971). This attitude is tupified in the sofa that alters itself to "fit" the body aloft and that initiates soporific music and smells at 10.30 PM. This view is wrong because it is ignorant of context, because it is generative of a complacency hitherto unseen, and because it does not account for

what Gordon Pask has titled the you-sensor.

Transposing a similar responsiveness to the physical environment suggests that it, too, must have purpose and intentions, and it must have all the paraphernalia required to build the necessary models of me and to use them in context. In brief, it is not a regulatory control system, it is an intelligent system.

RECOGNITION

The simple sesing-effecting model of computation that views a processor receiving signals from its sensors and emitting responses with its actuators is not appropriate to making responsive architecture; it is the downfall of the thermostat analogy. The problem with this model is that the consequences of inputs are determined strictly by a feedback loop, no more responsive than (and equally as regulatory as) the governor of a steam engine. **The model is inappropriate for two reasons:** (1) the "control algorithm" in the feedback loop can issue effector changes as a result of what has been sensed, but it cannot initiate changes in its own criteria; (2) the behavior of the system resides at the interface; not self0referent, it is oblivious to the important inputs of observing its own responses. This second reason is stated more elegantly by Avery Johnson (1972): "In order to elicit meaning from any data entering our sensorium, it either must have arisen as the consequence of our course of the information, or at least imply an interaction in which we might engage with some other."

A final step back might be to view the goal of responsive architecture to be the support of the "good life" as defined by our individual tastes for a mixture of action modes. In "The Organizing Principles of Complex Living Systems" the responsive system must know me. To this point it might have been possible to tune a passive device, singularly concerned with the manipulation of a handful of criteria within complicated but well-stated contingencies: if this and

if that or that, then this and this. In the last case (and, I believe, in the one before) we definitely need the **you-sensor.**

The mechanism necessary to recognize enough features to distinguish you from me is formidable. As a particular example, I am drawing upon the master's thesis of Mark Lavin (1973) on GREET, a doorway that recognizes who is passing through it. The experiment has many implication that exceed the scope of the example; however, in today's technology, it is the epitome of the you-sensor. At the onset of the experiment we must deny the recognition mechanism of inputs from any overt action required on the behalf of the person passing through the door. The recognition should take place without counting on any single or small set of "faithful inputs".

RESPONSES

What sort of behaviour can the physical environment exhibit? I propose two classes of behaviour: **Reflexive** and **Simulated**. The first is a motor, visual, olfactory, or auditory response that takes place as a part of space, reflecting a purpose. We have very few examples of even the simplest sort. Electric doors, rotating stages, and motorized partitions are **not good examples because they are activated by yes-no, overt commands**; thus they are no more interactive than the turning on of a vacuum cleaner. We find more valid (but still not illuminating) examples in the Rolls-Royce engine whose grill is composed of louvers that automatically open and close as a function of the heat of the engine and the ambient temperature or the greenhouse that opens and closes a glass roof for the comfort (as determined by us) of the flowers. **But these are process-control, decode-interpret-encode procedures of the thermostat variety**. Do we have any better examples?

"Self-organizing controllers can maintain (for example) average light levels or favorable brightness differeces in the context of the weather, time of day, and the difference between your mood and that mood which was anticipated. The radiation or absorption

of heat in direct exchange with the surroundings can be made relevant to your activities and to the thermodynamic conditions available. The acoustic properties of the inner spaces can be caused to enhance the privacy of a tête-à-tête or the mutual involvement of a larger gathering. Walls that move to the touch – relevant to the function of support or moving back in retreat – that change color and form: streamlining themselves to the wind or shrinking down when unoccupied, are all possible within the state-of-the-art technology'' (A. Johnson, 1971).

Johnson's vision is vulnerable in detail. What is a self-organizing controller in this context? How do we recognize mood? What encompasses the enhancement of mutual involvement? But the theme is instructive in its description of a participating, courteous (as he calls it) environment with goals of a higher order than 72 degrees Fahrenheit and 50 percent humidity. Nevertheless, are not most of the responses going to come from voice output? The gesturing nature of reflexive responses is still difficult to imagine (and even find relevant).

The second kind of response, what I have called ''**simulated**'' is easier to envisage. One of the reasons that simulated responses may appear easier, more wholesome, and less troublesome than reflexive ones is that they are naturally relegated to play and entertainment and most probably will not intrude into the pragmatic, serious activities that are the cornerstones of our daily lives and the Protestant ethic.

At this point, two other forms of response warrant elaboration: **operational** and **informational**. They are not exhibited through architectural gestures and transformations. However, at present they afford the most convincing examples of computers at home. For example, operationally, we can imagine the home of the future having surrogate butlers and maids embedded in all walls and floors or clunking about in bodies of plastic or steel. Informationally, the notion of responsiveness becomes even clearer. Unlike the

household robot, my machine would know me on a more abstract and individual level. Putting all of these responses together begins to reveal a picture, however unclear it may be. We can start to imagine a dramatically different relationship between ourselves and our houses, one characterized by intimate interaction. Fanciful wondering can lead us to rooms that giggle, doors that fib, or windows that fidget. Or maybe concepts like ''room,'' ''door,'' and ''window'' are anachronisms. Just as the previous chapter removed the architect-middleman, maybe the notion of intelligent environment removes the contractor-middleman, and the design process and building process become one and the same, continually in operation. **Out of what will a self-reproducing autogenic environment be made?**

ON MATERIALS AND MEMORY

Sant'Elia's 1913 plans for Milano 2000 were a direct extrapolation from the industrial revolution, from a glass to a concrete Crystal Palace. In some sense, today's research and development in the field of ''building technology'' is still no more than a similar, direct outgrowth of the ways of the industrial revolution, a way of thinking that has long been superseded in most other disciplines by a cybernetic, informational, computational, or whatever you want to call it, revolution. **The industrial revolution brought sameness through repetition, amortization through duplication. In contrast, information technologies – soft machines – afford the opportunity for custom-made, personalized artifacts**. This opportunity, however, has been ignored for the most part by industrialized building systems (for which Dietz and Cutler, 1971, provide a comprehensive overview).

Nevertheless, there are some researchers (Allen, 1974; Schnarsky, 1971; Wellesley-Miller, 1972) who see the chance for **custom-made environments more reflective of personal needs, implemented with techniques of personal needs, augmented by computing systems.** In studying intelligent environments one must look at

these pioneering efforts because, aside from the ethical validity of intelligent environments, there are serious questions about the materials of which all this shall be made. There seem to be two types of construction in the infancy of invention that lend themselves to physical responsiveness. I will refer to them as the "**softs**" and the "**cyclics**".

Soft materials, like inflatable plastics, are presently the most natural material for responsive architecture, because they exhibit motor reflexes through simple controls. Sean Wellesley-Miller at the forefront of this technology once built a child's crèche whose entrance contained the photocells necessary to count the kids entering and exiting. With the population of children always known, he wired his compressor to inflate and deflate the structure in proportion to the population: the more children went in, the bigger it became; as they left it would shrink until finally collapsing for the night.

The computations necessary to control the size of the crèche are hardly symptomatic of intelligent behaviour, but the response is architectural, and the material has indeed not afforded the opportunity for dramatic change. However, I do not agree that: "The construction of this kind of sophisticated pneumatics takes us into the realm of living things and ecology" (Hamilton, 1972). I do agree with Rusch (1972): **"Such 'soft architecture' is only one alternative. 'Hard architecture' can be responsive as well... However, 'hard architecture' is almost by definition harder to make responsive, so it is no mystery why soft materials, air, light, and sound have formed Brodey's pallet. The unfortunate result is that we do not tend to see his work as particularly relevant to 'architecture'.**

There is a particular aspect of pneumatics that (to my knowledge) has not been explored, that is so far untapped, and that is an **innate property of the large class of inflatable structures: cellular structures. This property is memory**. However, what is more important than this malleability and mobility is that the pressure states of the cells are its memory. One can sample the cells and know the shape. In other words, form is memory. Of course it would be equally possible to have an electronic computing mechanism "remember" which cells were inflated when and to what degree (and to query the computer). But it is more suitable to have pressure-sensing devices in each pneumatic cell, letting them be memory, because this makes it possible t**o have the structure respond locally to body movements and interactions. In this manner we could directly push and pull upon memory.** This can be extrapolated to exercises of cellular automata, in three dimensions, having the structure dance about.

The notion of memory is not limited to inflatables; it can be extended to "hard" architecture. A potentiometer in every door hinge or a sliding resistor in every window can also be viewed (mildly) as devices for giving the environment memory. If planes could disappear, move aside, or expand themselves, such a memory would be more revealing. However, it is much hard to make stone, brick and stud walls move or change themselves than it is to control inflatable structure. Not only is it difficult to conceive of the motor reflexes themselves, but the impediments of mechanical systems tend to make the most simple dwelling into a monolithic, immutable unit. It is no surprise that we have no historical precedents.

The other approach to responsive materials, what I have called "**Cyclics**'", considers "architectural" responses in a coarser time grain, relegating the moment-to-moment responsiveness to informational and operational features. **The underlying assumption is that we can develop a continuous construction and destruction process.** I am not referring to "kleenex architecture" that can be disposed of and readily replaced. I am referring to an ever-continuing building process as suggested by Allen (1970;1974).

Edward Allen is working on just that and more. **The "more" is**

the important feature because it is the necessary dissembling process that makes this notion viable for the premises of responsiveness. The magical materials needs the supplementary feature of being reversible or, at least, digestible by a house-building bug. In the event that a "bug" could crawl about extruding and eating up chunks of my house, **I can envision architectural transformations taking place on an hour-to-hour or day-today basis.** This would be a viable route to physical responsiveness, reminiscent of royal traditions of building pavilions and structures of a gala event, vulgarized to building a jalousie porch to peruse Reader's Digest.

Reiser, J. & Umemoto, N. (2006). Atlas of Novel Tectonics

The most important distinction on our changed notions of architectural design is the shift from geometry as an abstract regulator of the materials of construction to a notion that matter and material behavior must be implicated in geometry itself. In the older models, the sovereign role of geometry was to regulate or impress itself upon the irrational and accidental condition of matter, thus measurement, proportion, and all of the elements of pure extension maintain a priority over that which they regulate. The new model must be understood not as a supercession of measuring but as the interplay between intensive and extensive differences.

Intensive differences, also known as gradients, are properties of matter with indivisible difference, such as weight, elasticity, pressure, heat, density, color, and duration. Any intensive property that is halved maintains an equal property in each half. In other words, a pot of boiling water, when split in half, is just as hot as it was when it was whole. In contrast, extensive properties are properties of matter with divisible differences, such as measurement, constraint, limits, codes, rules, modulation, mass, total volume, and time. If a pot of boiling water is split in half, each half has half the mass of the whole.

We must not fall into the trap of saying that the extensive is quantitative and the intensive, qualitative. In fact, the one is simply quantitative, and the other, since it is inherently embedded in a material field, exists always as quantitative and qualitative.

The legacy of essentialist approach to architecture, which elevates rationality (mainly in the lineaments of geometry) above matter, precludes the productive and rich capacity of matter to define or influence geometry. Allowing this dynamic to operate is especially important not so much in the realm of new materials for architecture but as a way of reconceiving tectonics and organization.

Looking at the process in reverse, when intensive limits are loosened, extensive controls increase. For example, as information technologies become dematerialized (paradoxically, by becoming more intense), the typical office program ceases to have a one-to-one relationship with the technologies that function within it. Paraphernalia and function, in taking up space, simultaneously force the workplace to represent what it does. With the dematerialization of function, hardware shrinks, and the fit between program and space becomes looser. This opens up the possibility for two very different conceptions of the function and atmosphere of the workplace. The first, an extrapolation of the modernist model, would ordain a featureless whitebox container for dematerialized technology. The second recognizes the opportunity for an entirely different ambient space – one that may very well have functions that, by having nothing to do with the business at hand, actually augment it.

THE DIAGRAM

Material organizations at the macro scale must of necessity be modelled in order to predict or track changes in their behavior. Thus an analog connection must be made to micro scale. Macro-organizations of material behavior can be approximated at smaller scales, but adjustments are necessary as the system becomes rendered in a more intensive or more extensive model. (Example -> model airplane has to be remodeled to compensate for scale changes of wind etc.

The implications of this scalability of material behaviors has far-reaching implications for architecture.

The medium of these implications is the diagram, which provides an abstract model of materiality. Such a diagram can be derived from any dynamic system at any scale. A close tracking of a

certain dynamic (temperature, pressure, wind speed, etc.) can be mapped as a gradient field that can be abstracted from its origins or its material source. **A diagram of relationships, not of scale, emerges. Or, more precisely, the diagram is a field of relationships awaiting a scale and a materiality.** This elastic yet precise diagram thus can acquire other material systems such as architecture and have the capacity to affect those systems in ways specific only to architecture.

Representation always ties its meaning to an origin, while in a trans-scalar diagram origins are irrelevant; it is how they are finally instantiated that matters.

EXACT/ANEXACT-YET-RIGOROUS

Gilles Deleuze defines three types of geometry: the exact, which correlates with the regular, or royal, science; the inexact, an accidental or worldly approximation of exact geometry; and the anexact, which correlates with the vague or nomad science.

What makes the anexact different is that its geometry is assumed to play out in real space rather than in the ideal space of abstract geometry.

The anexact is thus the result of forces on matter, whereas the exact and the inexact are only assessments relative to a purely geometrical model. In the anexact, the matter/force index is precisely that which establishes its rigor and distinguyishes it from the inexact, which is merely a less precise form of the exact. The anexact is therefore intimately tied to a material field, the expressions of which the direct index of forces and the energetic of which is manifest through intensity. Rather than seeing, for example, a catenary either as a correct (exact) or incorrect (inexact) parabola, the anexact sees it as a calculus of forces on matter. In contract to the dichotomy of inexact and exact, the essences of which are read and interpreted for meaning the anexact field is asignifying and delivers up

expressions based upon intensity and consequent effects rather than signification.

While the new models of production cannot make any undue claim for their socially liberating effects, they nevertheless have increased the degrees of freedom available to the designer and, by extension, to their productions. Virtually every facet of the design process, including the spectrium of material properties and effects, are actors in this parametric field. Moreover, this new pattern of organization operates not only at the scale of the matter field from which it was derived but can migrate into radically different scales and material regimes. In effect, this means that for architecture a vast spectrum of organizational models becomes available, from the microscopic to the macroscopic, and will operate not as representations in architecture but as organizing principles for architecture.

Sarkis, H. (2001). Le Corbusier's Venice Hospital

CHAPTER: MAT BUILDINGS AND THE ENVIRONMENT –
EXAMINATION OF A TYPOLOGY

As a challenge to the iconic tall housing block of the modern movement, but with the same objective of countering the existing urban environment, **the concept of buildings with interstitial outside spaces was developed to create cities that controlled both the exterior and interior environments.** Mat building emerged from this concept, and the resulting typology has recently been revisited in the design approach of a younger generation of architects searching for an environmentally responsive architecture.

The intent of this chapter is to establish the context for the environmental claims made for mat buildings over the years. We will also address how these claims have been formulated and applied to rationalize design decisions based on a typological building solution.

ENVIRONMENTAL CONTEXT

This iconographic reading of the physical environment as an appropriable "outside" becomes firmly rooted in the succeeding writings of Team 10 and formed part of the basis for the description of mat building as a simultaneous concavity/convexity: "all outside, all inside". Once appropriated, however, the "outside" became increasingly disconnected from the surrounding environment. Indeed, the exterior was often described as something foul – full of noise and pollution from automobiles. Mat building provided a means through which the outside could be controlled, much in the same way as the interior environment was climatically controlled.

 The generic representation of the physical environment as a controlled concavity was further extended to the public/private reading of the psychological environment. In describing the project for Berlin Free University, Candilis, Josic, and Woods began by stating that it was "an attempt to discover structuring principles that might be applicable to the organisation of the physical

environment," but continued by asserting that the environment was a "synthesis where all the faculties would be associated rather than dissociated and where the psychological barriers which separate one from the other would not be reinforced by physical barriers such as entrance doors and building walls." The environment was a construction of the plan or the project, but had little to do with the specific climatic context. For Team 10, environment was simply and broadly conceived as l'habitat: "the spatial expression of the whole population."

 The determination that a generic and repetitive system could yield a specific environmental responsiveness was retrospectively attributed to mat buildings. The iconographic legibility of the appropriated "outside" was readily interpreted and extrapolated as critical theory in architecture was developing. Each writer added specifictity and locality, thus indicating that these buildings were designed to respond to the surrounding environment.

CLAIMS FOR ENVIRONMENTAL PERFORMANCE

Claim 1: Mat buildings allow for greater adaptability in the use of space.

The interstitial spaces of mat buildings dematerialize the borders of adjacent spaces, rendering the boundaries less distinct and the configuration of spaces more fluid and repetitive. Mat buildings can thus be seen as providing flexible "shells" to support different activities, in contrast to buildings with function-specific enclosures designed to accommodate predetermined activities. This characteristic, overlaid on compartmentalized spaces connected by clear networks of circulation, presumably allows for a "plug-in" capability – allowing new functions as well as new spaces to be readily inserted into the plan. This feature purportedly increases the possibility of reallocation of spaces for uses that may change over time, extending the useful life of the building and minimizing the need to demolish and replace facilities. This claim resonates well today with those interested in life-cycle analysis and embodied

energy, although the greater surface area and increased materials inherent in this building type may offset any reductions in energy delivered from the assumed extension of building life.

Claim 2: Mat buildings use land efficiently.

Even though mat buildings typically extend over a large land area, they are interspersed regularly with courtyards, which allow a mat building to respond to changes that extend beyond the boundaries of the envelope. The possibility for growth can be accommodated systemically, as mat buildings take advantage of their modular system to expand along circulation networks and courtyards with direct access to fresh air. Buildings could then be consistently expanded (rather than through awkward additions) or subdivided to accommodate a large number of occupants, resulting in higher0-density development. In the design of the Venice Hospital, Le Corbusier employed his Modulor system to facilitate further expansion should the number of patients increase: "I planned a hospital complex that can stretch like an open hand." The claim that mat buildings use land efficiently is thus predicated on their potential for densification and growth, rather than on their current use of land. From the space-planning standpoint, however, the plan of mat buildings may not be efficient even with increased density, because so much of the building floor area is dedicated to circulation space at the expense of functional space.

Claim 4: Mat buildings reduce the overall need for transportation.

Mat buildings tend to be associated with the image of pedestrian movement, thus providing the basis for the claim that this building type reduces the need for mechanical modes of transportation. Initial considerations of this building type focused on pedestrian zones as social spaces central to the experience of the city; the elimination of cars and the subsequent reduction of energy consumption were no the key concerns. The two fundamental means of transportation, walking and driving, were separated so as to not interfere with each other.

Claim 5: Mat buildings create their own microclimates.

The concept that mat buildings create their own microclimates finds its origin in the desire to separate buildings from urban noise and filth. In 1974, at the Team 10 meeting in Rotterdam, Aldo van Eyck was still lamenting the environmental conditions of the typical city and their effects on inhabitants: "You see, how impervious people are, physically poisoned, the useless and unreadable spaces, all motorcars, and all that noise. They're becoming afraid of noise too."

Twelve years earlier, van Eyck had described his ideal for the precursor to the mat building as "A place for rest in a restless city, not a rest house in a restful region, an oasis within a metropolis." The building type, then, was never intended to mediate the exterior environment, but rather to replace it with a more perfect "outside." This perfect microclimate could be as small as an isolated courtyard or as large as the entire complex. Given its large size, the mat building acts like an island, effectively disconnected from the surrounding city.

This concept of the mat building's relationship with the exterior environment was initially connected to the control of noise; it soon expanded to include the control of pollution, thermal environments, and today, even biological microclimates. **Each successive generation of mat buildings disconnected further from the exterior environment, such that contemporary examples typically seal even the courtyard and surrounding spaces to maintain full control.** Dit wil ik dus absoluut niet.

From its origins in the work of Team 10, the mat building typology was developed as an environmental determinant – building form created the environment. The resulting environment was to be an oasis, isolated and protected from the surrounding context. Through its successive generations, however, the mat building typology assumed the role of being environmentally determined – the building form was pbulicized as the most energy-conscious response to surrounding environmental conditions. This rhetorical shift between determined and determinant has gone unnoticed in contemporary discussions about the environmental performance oof mat buildings.

The only feature of mat building that can be termed as inherently energy efficient is the shallow floor plate, which can be exploited to enhance access to daylight and natural ventilation, As the preceding cases have shown, however, few mat buildings took advantage of this feature and, in contemporary manifestations, the trend toward wrapping the building with a weather skin negates much of the potential. Furthermore, the shallow floor plate of the mat building offers no advantages over the standard bar (high aspect ratio) building.

The type itself thus cannot be deemed energy efficient and environmentally sustainable. Each project must demonstrate these features through its relationship to and mediation of the local environmental context. The parameters that determine energy performance emerge from the specific conditions produced by the interaction of a building with its immediate, and very particular, environmental surroundings. The assumption that these parameters are determined by the type ultimately limits rather than expands the possible solutions: choices regarding the environmental performance of buildings can not be made typologically.

Smith, N. (1984). Uneven Development - Nature, Capital and the Production of Space

…

This idealist unity of nature is clearly different from the materialist unity of Newtonian science even if God is indispensable to both. And yet it is not entirely different, as the following particularly cogent passage from Leo Marx suggests:

Although scientific knowledge seemed to drain certain traditional religious myths of their cogency and power, so that it no longer was quite possible to read Genesis as it once had been read, the same knowledge enables artists to invest the natural world with fresh mythopoeic value. The movement of the heavenly bodies, space (an awesome, unimaginable infinity of space), and the landscape itself all were to become repositories of emotions formerly reserved for a majestic God. It was not enough to call this newly discovered world beautiful; it was sublime.

Even for some of the transcendentalists, therefore, there was no necessary contradiction between industrial development and the sublimity of nature. If people like Thoreau tended to be antagonistic toward the march of industry into the countryside, Emerson actually welcomed such innovations as the railroad as a means to elicit a more complete and more perfect vision of nature. Increasingly, the God-centred Edenic vision of nature was edged aside by a more anthropocentric vision. If the original wilderness was a garden gifted by God, the new humanized garden was, for some, mankind's attempt to smooth the corners of nature into a more harmonious unity. The universality of nature was preserved in the pastoral ideal; the human figures and their artifacts loomed larger in the landscape while the divine light softened.

But the potential contradiction did not disappear. The problem was that if scientific and industrial advance was progressively subduing nature, then of necessity it was subduing God that resided in nature - an unacceptable blasphemy. It was 'expediency', according to Novak, which 'strongly suggested that nature could be 'humanized' without violating 'nature-as-God'. And humanized it was.

…

Now that the machine was squarely in the garden, there emerged the 'rhetoric of the technological sublime'. Machine technology was seen as a proper part of the landscape.

The reality of industrial production eventually overpowered the romanticism of nature as an artistic and intellectual tradition, if not quite the individual romantic tradition.

…

In summary, then, the concept of nature harbours an essential dualism between external and universal. These two conceptions of nature are both interrelated and mutually contradictory. Indeed, we might even suggest that each is dependent on the other in the sense that without an external nature there is no need to stress the universality of nature. The external conception is a direct result of the objectification of nature in the production process. And yet, no matter how efficient this production process and how completely it effects the externalization of nature – in a word, no matter how effectively in emancipates human society from nature – human beings, their society and their artifacts continue to be subject to 'natural' laws and processes. The external conception therefore gives us only part of the picture of naturel a concept of nature is also necessary by which it is possible to explain human societies in nature.

MARX AND NATURE – CHAPTER III

In his earlier work, where he discussed the relation with nature extensively, the emphasis is squarely on the unity of nature, but in his later work, which is less philosophical, more analytical and concrete as well as concise**, nature seems to enter more often as an object**

of labour in the production process.

NATURE AND SOCIETY

Smith proceeds to unravel some of the specific relations that constitute the internal dialectic of Marx's concept of nature. He makes a useful distinction between 'first nature' and a 'second nature'. These were concepts used by Hegel, and here Schmidt is at pains to distinguish Marx from Hegel while at the same time demonstrating Marx's debt to Hegel: 'Hegel described the first nature, a world of things existing outside men, as a blind conceptless occurrence. **The world of men as it takes shape in the state, law, society, and the economy, is for him ''second nature'', manifested reason, objective Spirit. For Marx, Schmidt explains, 'society itself (second nature) was a natural environment' precisely because 'men are still not in control of their own productive forces vis-à-vis nature'.**

Marx denoted this mediation more precisely as a metabolism or metabolic interaction, a concept which Schmidt sees as crucial to Marx's notion of nature. ''With the concept of 'metabolism' Marx introduced a completely new understanding of man's relation to nature and went far beyond all bourgeois theories of nature presented by the Enlightenment.'

Specifically, Marx saw the labour process as the motive force of this metabolic interaction. In labour, Schmidt explains, **'men incorporate their own essential forces into natural objects and natural things gain a new social quality as use-values.''**

The 'dialectic of nature' arises from none other than the metabolic interaction of human societies with nature:

Nature becomes dialectical by producing men as transforming, consciously acting Subjects confronting nature itself as forces of nature. Man forms the connecting link between the instrument of labour and the object of labour. Nature is the Subject – Object of labour. Its dialectic consists in this that men change their

own nature as they progressively deprive external nature of its strangeness and externality, as they mediate nature through themselves, and as they make nature itself work for their own purposes.

THE PRODUCTION OF NATURE

Nature is generally seen as precisely that which cannot be produced; it is the antithesis of human productive activity. In its most immediate appearance, the natural landscape presents itself to us as the material substratum of daily life, the realm of use-values rather than exchange-values. As such it is highly differentiated along any number of axes. But with the progress of capital accumulation and the expansion of economic development, this material substratum is more and more the product of social production, and the dominant axes of differentiation are increasingly societal in origin. In short, when this immediate appearance of nature is placed in historical context, the development of the material landscape presents itself as a process of the production of nature. The differentiated results of this production of nature are the material symptoms of uneven development.

Production in general

By his or her industry, the producer 'changes the forms of the materials furnished by nature, in such a way as to make them useful to him. Insofar as labour produces useful things that fulfil human needs, 'it is an eternal nature-imposed necessity, without which there can be no material exchanges between man and nature, and therefore no life'. But labour effects more than just a simple change in the form of matter; it produces a simultaneous effect on the labourer. 'Labour is, in the first place, a process in which both man and nature participate, and in which man of his own accord starts, regulates, and controls the material re-actions between himself and nature. He opposes himself to nature as one of her own forces, setting in motion arms and legs, the natural forces of his body, in order to appropriate nature's productions in a form adapted to his own wants. By thus acting on the external world and changing it,

he at the same time changes his own nature.' **The metabolism of human beings with nature is the process whereby human beings appropriate the means to fulfil their needs and return other use-values to nature. At this abstract level, clearly, the relation with nature (the material exchange) is a use-value relation; as pure use-value does nature enter the relation with human beings.**

In addition to human physiology, human consciousness and the material means of subsistence, the production and reproduction of material life entails the production of workers, that is, the reproduction of labour power. Some form of social relations are implied in this reproduction process, and the most basic is the division of labour between the sexes. This is the first truly social division of labour, but its origins lie in pre-human social organization. As it is inherited by human society it is therefore simultaneously natural and social, illustrating again the unity of nature.

...

From the first great social division of labour arose the first great cleavage of society into two classes: masters and slaves, exploiters and exploited. But this development too depends upon a 'social revolution to break up egalitarian primitive society and give birth to a society divided into classes.' Social development splits the harmonious balance of nature. In one form or another, this surplus is appropriated from nature and in order to expedite its regular production and distribution specific social institutions and forms of organization are required. This in turn alters the social relation with nature. No longer does the abstract natural individual ('man') fit simply into an equally natural environment, since the relation with nature is mediated through the social institutions.

Production for exchange

…

This conception of a second nature carries down virtually intact to the eighteenth century. Thus, Count Buffon, the famous French scientist whose chief concerns included the transformations of nature wrought by human beings, wrote that a 'new nature can come forth from our hands.' This process he called 'the seconding of nature'. By the eighteenth century, however, it had become clear that it was not just the material creations of human labour but also the institutions, the legal, economic and political rules according to which society operated, that comprised the second nature.

Without admitting exchange-value into nature, the relation between first and second nature cannot be concretely understood. It would be difficult to move beyond the limited, ambigious and potentially ideological claim that on the one hand nature is social while on the other society is natural. Equally limited and problematic is the claim that they are 'interrelated' and 'interact' with each other, for interaction is no substitute for the dialectic, the key to which is in the production process. Elements of the first nature, previously unaltered by human activity, are subjected to the labour process and re-emerge to be social matter of the second nature. There, though their form has been altered by human activity, they do not cease to be natural in the sense that they are somehow now immune from non-human forces and processes – gravity, physical pressure, chemical transformation, biological interaction. But they also become subject to a new set of forces and processes that are social in origin. Thus the relation with nature develops along with the development of the social relations, and insofar as the latter are contradictory, so too is the relation with nature.

CAPITALIST PRODUCTION

Under capitalism the appropriation of nature and its transformation into means of production occur for the first time at a world scale. The search for raw materials, the reproduction of labour power, the sexual division of labour, and the wage-labour relation, the production of commodities and of bourgeois consciousness, are

all generalized under the capitalist mode of production. Under the banner of benevolent colonialism, capitalism sweeps before it all other modes of production, forcibly subordinating them to its own logic. Geographically, under the banner of progress, capitalism attempts the urbanization of the countryside. 'The history of classical antiquity is the history of cities, but of cities founded on landed property and on agriculture ... the Middle Ages begins with the land as the seat of history, whose further development then moves forward in the contradiction between town and countryside; the modern age is the urbanization of the countryside, not ruralisation of the city as in antiquity.

…

What is an abstract potential in the origins and fundamental character of human labour becomes a reality for the first time under capitalism. It is not just the immediate or the local nature of human existence that is produced under capitalism but nature as a totality. The mode of production based on capital strives toward the 'universal appropriation of nature as well as of the social bond itself by the members of society. Hence the great civilizing influence of capital; its production of a stage of society in comparison to which all earlier ones appear as mere local developments of humanity and as nature idolatry.' Material nature is produced as a unity in the labour process, which is in turn guided by the needs, the logic, the quirks of the second nature. No part of the earth's surface, the atmosphere, the oceans, the geological substratum or the biological superstratum are immune from transformation by capital. In the form of a price tag, every use-value is delivered an invitation to the labour process and capital – by its nature the quintessential socialite – is driven to make good on every invitation.

CONCLUSION

Marx and Engels traditionally viewed the substance of the relation with nature in terms of growing mastery or domination over nature,

although not in a one-dimensional sense: 'Mastery over nature began with the development of the hand, with labour, and widened man's horizon at every new advance.

Capitalism inherits a global world market – a system of commodity exchange and circulation – which it digests then regurgitates as the world capitalist system, a system of production. To achieve this, human labour power itself is converted into a commodity, produced like any other commodity according to specifically capitalist social relations.

The production of nature should not be confused with control over nature. Although some control generally accompanies the production process, this is by no means assured. The production of nature is not somehow the completion of mastery over it, but something qualitatively quite different. Engels:

We are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature – but that we belong to nature and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other creatures of being able to learn its laws and apply them correctly.

The production process is quite deliberate, but its immediate goal, profit, is reckoned in terms of exchange-value not use-value. The issue of control is vitally important, therefore, but only once it is viewed in context. The first question is not whether or to what extent nature is controlled; this is a question framed in the dichotomous language of first and second nature, of pre-capitalist mastery and non-mastery over nature. **The question really is how we produce nature and who controls this production of nature.**

What is certain is the struggle over this conflict, the revolt against deprivation. In many ways it is a struggle to control what is 'socially necessary'. Like pollution, much of the production of nature is the indeliberate, uncontrolled result of the production process. They may be integral products of the labour process, but pollution and

many other produced parts of nature are not bearers of 'socially necessary labour time'.

The ultimate demand is for worker's control, control over the production process and hence control over the production of nature; that is, the overthrow of capitalism and its control of society through control of the exchange-value system. This is in order to control the sphere of use-values. The concept of 'production of nature' in this way does what Schmidt's 'concept of nature' wanted to do but never could: it 'changes into the concept of political action'.

THE PRODUCTION OF SPACE

SPACE AND NATURE

…

The third thread to be examined is the material basis of the development of the concept of space. For Reichenbach's Hegelian dialectic also has a material foundation; the concept of space is after all a social product. Newton was explicit about the fact that 'geometry is founded in mechanical practice, and is nothing but the part of universal mechanics which accurately proposes and demonstrates the art of measuring.' Euclid's geometry, to which Newton adhered, was in early Greek times the product of practical human activity, as was the non-Eucledian geometry which underpinned post-Newtonian physics. Examining the influence of Gauss upon Riemann and upon the modern notion of mathematical space, Jammer made clear the importance of this material foundation. 'Once again,' he said, 'we see that, historically viewed, abstract theories of space owe their existence to the practice of geodetic work, just as ancient geometry originated in the practical need of land surveying.'

Not just this qualitative development of the concept, but the progressive abstraction has a material basis. Alfred Sohn-Rethel has argued that the abstraction of space into a concept removed from direct practice is closely connected to the development of commodity exchange. The abstraction from use and from the material aspect of a commodity, which is inherent in the exchange act, provokes the possibility of the abstraction of space from immediate material existence:

Time and space rendered abstract under the impact of commodity exchange are marked by homogeneity, continuity and emptiness of all natural and material content, visible or invisible (e.g. air). The exchange abstraction excludes everything that makes up history, human and even natural history… Time and space assume thereby that character of absolute historical timelessness and universality which must mark the exchange abstraction as a whole and each of its features.

If Sohn-Rethel is correct concerning the material basis for the development of concepts of space, then his argument offers insights into the historical priority of space as a concept over time. More important, his argument suggests not simply that our concepts of space change historically but that they develop in relation to the changing treatment and experience of space. **As the relation with nature develops historically, so the spatial dimension of human activity is altered and with it our conceptions of space.** We shall focus explicitly on the treatment of space as a commodity under capitalism, but before turning to this central concern, it is necessary to finish the argument at hand and to move from physical space in the sciences to explicitly geographical space.

As the example of absolute space illustrated, scientific concepts of space have greatly influenced our broader social conceptions of space, at least since Newton. Yet contemporary social conceptions of space bear no resemblance to the abstract n-dimensional spaces of mathematical physics. **Whatever the historical relationship has been, social space today is quite different from scientific space. Whereas scientific space attempts to abstract completely from social activity and events, social space is generally treated as the field of just such activity.** As we suggested, the conceptual basis for the emergence of a separate social space lies most clearly in Newton's separation of relative from absolute space. **With Newton's absolute space, the**

world of physical, biological and geographical phenomena could be treated as the natural basis of physical space. Social space on the other hand, could be treated as a purely relative space existing within absolute space; the relativity of social space is determined by the particular social relations that obtain in a given society.

!The material basis for the bifurcation of physical and social space lies in the development of second nature out of first nature.! Society had to be separated from nature in practice before social space could be distinguished completely from physical space. This absolute physical space came to be associated with the given, natural space of first nature; physical and natural space are here indistinguishable. The concept of social space, on the other hand, was abstracted further and further from any reference to natural space. Natural philosophy developed as a specialty out of philosophy while natural economics moved in the opposite direction toward the classical political economics of Adam Smith and others. … Emile Durkheim is generally credited with coining the term social space; writing in the 1890s, he was careful to insist that social space was quite different and separate from 'real' space, by which he meant physical space. **With this, social space seems to be spatial only in a metaphorical sense. Just as mathematical space has come to represent the abstract field of natural events, social space is the humanly constituted abstract field of societal events, and can be defined in any number of ways.**

Now geographical space is something different again. However social it might be geographical space is manifestly physical; it is the physical space of cities, fields, roads, hurricanes and factories. Natural space, in the sense of inherited absolute space, is no longer synonymous with physical space in that physical space can be social in definition. **This distinction emerges in the discussion of geographical space because geographers have to deal with physical space in general and not just the natural space of first nature**. … The more that geographers attempt to identify within

absolute natural space the socially relative and socially determined patterns and processes of economic location, the more problematic became the relationship between natural and social space, and the more ambiguous became the meaning of physical space.

(Conclusion)

Our conception of geographical space is considerably more sophisticated today as a result of these post-positivist traditions. Yet in reality we have only taken the first step toward dissolving the dualism with which we began. **We have come to understand and assert the unity of space and society, yet it is difficult to take the next step, form assertion to demonstration, without in practice altering our conception of space.** The notion that space and society 'interact' or that spatial patterns 'reflect' social structure is not just crude and mechanical in its construction, but also prohibits further insights concerning geographical space; at root this is because this view of the relation between space and society remains tied to the absolute conception of space. **Two things can only interact or reflect each other if they are defined in the first place as separate**. Even having taken the first step of realization, then, we are not automatically freed from the burden of our conceptual inheritances; regardless of our intentions, it is difficult to start from an implicitly dualistic conception of space and society and to conclude by demonstrating their unity. In different forms, therefore, this dualism survives in the post-positivist traditions which sought to exorcize it. **The conception of the 'production of space' is meant to provide a means of taking the next step and enabling us to demonstrate rather than simply assert the unity of space and society.**

'All mysteries which lead theory to mysticism,' Marx wrote, 'find their rational solution in human practice and in the comprehension of that practice.' With the 'production of space' human practice and space are integrated at the level of the concept of space 'itself'. Geographical space is viewed as a social product; in this conception a geographical space which is abstracted from

society is a philosophical amputee. Further, the relativity of space becomes not a philosophical issue but a product of social and historical practice; likewise, the unity of geographical space is a social rather than philosophical result. While the emphasis here is on the direct physical production of space, the production of space also implies the production of meaning, concepts and consciousness of space which are inseparably linked to its physical production. … Space is no longer an 'accident of matter' but a direct result of material production.

Teyssot, G. (2005). Hybrid Architecture - An Environment for the Prosthetic Body

INTRODUCTION

Today it seems we are confronted by two hypotheses, which are most likely mutually exclusive: (a) **a 'body without organs', i.e. a notion of the body that does not hinge on the singularity and the autonomy of each organ, but where organs would be indeterminate;** (b) a notion based on the organic organization of organs, called the '**organism**', which corresponds to **the standard notion of the body and would be conceived as a fixed hierarchy organised by an internal functional logic.**

On one side, there is the body-without-organs, a fertile schizophrenic's dream, considering the body in its exteriority, in its relation to other bodies, perceived through relations of surfaces, differences, affects, desires, functioning like 'a virtual and smooth space, connected with fluxes that traverses it and get intercepted in it.' On the other, there is the 'reality' of the organism, conceiving the body only in its interiority, in its regime of internal distribution, where autonomous organs (de)compose the whole in multiple parts, breaking up its integrity. This logic is reflected in the distribution of a hospital in various medical specialties. It is also this type of functionalism that lies at the base of all 'modernistic' architecture, which was nothing else than an application of organicism.

ORGANS WITHOUT BODY

…

Deleuze/Guattari's description of the libidinal machinery also introduces fragmentation:

Everything functions at once, but in hiatuses and interruptions, breakdowns and failures, fits and starts and short-circuits, through distances and dis-aggregations – in a totality which never unites its parts in a whole … We live in the age of partial objects … we no longer believe in an original totality, nor in the totality of a final destination.

…

The body becomes not only the site of criticism of the disciplinary apparatuses of society, but , most of all, the place of a process of incorporation, or of incarnation, which, at least in theory, can be tested to the extreme limits of disembodiment. Eventually and eventfully, the process of incarnation must be probed to the limit of its disincarnation. That limit is the vulnerability of the body itself.

CYBORGS

The development of the bioapparatus during the twentieth century has been marked by two principal stages worthy of the status of 'theoretical fiction' or paradigm. Robot derives from the Czech word robota meaning 'boredom' or 'drudgery', and refers to slavery, or repetitive factory-work, particularly in the production-line plant. While man had to become an engine, or a motor, the machine had to resemble man.
Second came the creation of the term cyborg, which is short for 'cybernetic organism' and characterizes a hybrid being, an embodiment of a monstrous idea – a part-human, part-alien type of automaton.

Today, it seems that dichotomies other than the obvious one of organism/machine can be called into question by cyborg culture – for example, mind/body, animal/human, public/private, nature/culture, male/female, primitive/civilized, virtual/real. The biologist and cyborg theorist Donna Haraway offers insight onto such challenges in a section of her CYBORG MANIFESTO:
High-tech culture challenges these dualisms in intriguing ways. It is not clear who makes and who is made in the relation between human and machine. It is not clear what is mind and what is body in machines that resolve into coding practices. In so far as we know ourselves in both formal discourse (biology) and in daily practice (the homework economy in the integrated circuit), we find ourselves to be cyborgs, hybrids, mosaics, chimeras. Biological organisms have become biotic systems, communication devices like others. **There is no fundamental ontological separation in our formal knowledge of machine and organism, of technical and organic**. The replicant Rachel in the Ridley Scott film Blade Runner (1982) stands as the image of a cyborg culture's fear, love and confusion.

The cybernetic version of the chimera describes new kinds of mutations. It even leads to a reconsideration of the notion of evolution. With the cyborg, bodies are, as Haraway makes clear, no longer born, they are made. Today organisms are constructions, the creations of the discourse of immunology. The cyborg has displaced the limit between organism and machine by coupling cybernetic devices with biological organism; it has blurred the distinction between animated and unanimated through the theory of the behaviour of homeostatic systems.

SPHERES

…

What is tested here was announced by Marshal McLuhan's writings during the same years: like media, architecture is the extension of man. Therefore, **environment is designed by the superimposition of different spheres:** skin and epithelial envelopes, things and tools, earth and fire, air and water, lights and clouds, climate and weather, apparatuses and machines, media interface. It is actually an 'atmo-spheric' architecture.

In order to fully grasp the new condition of a hybrid space, one must deal with the situation of our 'body' in society. It seems no longer possible to base oneself on metaphysical, traditional and fallacious oppositions such as interior/exterior, public/private, organ/function, because with the introduction of digital technologies those distinctions have been blurred. **At issue then, are projects that retrace the various 'folds' our bodies weave with the world. The urgent task architecture ought to assume, therefore, is that of defining and imagining an environment not just for 'natural' bodies, but for bodies projected outside themselves, absent and ecstatic, by means of their technologically extended senses.** We must conceive tools and instruments like a second sort of body, incorporated into and extending our corporal powers.

It then becomes possible and even necessary to logically **invert the terms of traditional propositions on the task of contemporary architecture. The incorporation of technology is not effected by 'imagining' a new environment**, but by reconfiguring the body itself, **pushing outward to where its artificial extremities encounter the 'world'.** It is not so much a case of imagining new houses for cyborgs. This hybrid being, part-organic, part-automatic, is always already ''ambience', environment, interface, **surface where the relation of self and the world are put into play, atmosphere.** Rather, our instrument-enhanced and equipped body should be redesigned and literally re-crafted, so that it can 'inhabit' the world and enter into transactions with the multiple sphere of comfort, media and information.

This interior could be defined as the projection of the body in a state of ex-stasis towards an exterior, crossing inside-out through the surfaces which delimit our surroundings.

Unwin, S. (2020). Shadow, The Architectural Power of Withholding Light

PREFACE

There are different kinds of shadow. Mostly we think in terms of shadows cast… shadows cast by ourselves or by objects, caused by obstructing a source of light and projected onto a surface – the ground, a wall or screen… in this sense things have shadows. But architecture contains shadows. Yes, buildings can cast shadows as objects but the surfaces of walls contain the shadows of their incisions and mouldings and, even more powerfully, the rooms within buildings have shadows as ingredients of their atmospheres. And atmospheres vary during the day, in different weather conditions and different parts of the world.

Architectural interiors are places of shadow: shadows modulated and shadows of immersion. Far from being negative, such shadows can be ingredients of the practical and aesthetic – as well as the metaphorical – power of architecture. In hot sunny places shadows help provide comfort (and reduce energy demand). Shadows provide psychological refuge. Shadow-play – of sun projecting the moving shadows of a tree on a wall; of a "searchlight" sunbeam tracking through a dark room; the gradations of shade in a Japanese tea room… - contributes to our aesthetic appreciation of architecture.

ARCHITECTURAL TYPES OF SHADOW

Shadow Container

This is a 'derived' shadow that contains. In this image the person depicted is contained by the shadow cast by the canopy. That becomes the room of shade within which the person stands even though it has no tangible walls. A "wall" of this "room" only becomes apparent when, for example, you put your hand through it to become illuminated by the sun. With a parasol you carry around with you your own shadow container.

Dark Side

This is an attached or 'primary' shadow. But it is more: its association with a cast or 'derived' shadow makes it a place. In the northern hemisphere it is the north side of a building; in the southern, the south. In the morning it is the west side, in the evening the east. The dark side has a particular character, sometimes thought to be negative. But it can be used in positive ways too.

Contained Shadow

This is the shadow that is contained within an enclosed room, a room with walls as well as a roof. The inner wall surfaces are its impenetrable edge. If a door was fitted and closed, the contained shadow would be complete darkness. Nothing would be visible in such intense shadow. The darkness we see through the doorway of the cottage on page 27 is contained shadow.

Shadow Threshold

This is a shadow line that is crossed when passing from one place into another. In the instance illustrated, the shadow threshold is created by the doorway and its lintel. The contained shadow in the doorway also has its threshold. When entering or exiting a doorway we are usually also crossing a shadow threshold.

Projected Shadow

A surface – the ground or a wall – can be a screen on which ' derived' shadows are projected. The surface of a plain wall can be enlivened by the moving shadows of the leaves and branches of an adjacent tree. Sunlight streaming through a window can cast a shadow of window's frame onto the floor. Shadows projected by the sun move during the day as the sun moves across the sky.

Shadow Gradient

Leonardo pointed out the variations in shade on curved surfaces.

But shadow gradients in architecture can be created in different ways. In the drawing light from a source hidden by the upper section of wall is washing down a wall creating a shadow gradient from light to darker.

Shadow Threshold

All shadows have their thresholds. Sometimes these are sharp and we pass from light into shade in an instant. Sometimes the edges of shadow are vague and passage from light into darkness is gradual. The third kind of shadow threshold is perhaps the most dramatically effective. It provides a moment of shadow as a prelude to emerging into brightness. Thereby the brightness is intensified by its contrast with the preceding shade.

Shadow Gradient

In drawings shadows gradients give a sense of depth. Shadow gradients are often associated with deepness. They occur at the mouths of caves and of tunnels where one is aware of a crescendo of shadow reaching into a dense darkness that eventually melds with the solidity of the rock.

Shadow gradients are associated with verticality: light towards the top and dark towards the bottom. They are the shadows of a well. They are the shadows of the faint light from the sky you might see drifting down a wide open chimney onto a cold grate below.

CONTAINED SHADOW

Shadow contains but it can also be contained. Shadow containers can provide us with cool places out of the hot sun. A simple box or completely enclosed room contains shadow. The moment before a performance, when the light have been extinguished, an auditorium is one large contained shadow waiting to be broken by the lights revealed when the curtain rises. The audience, shrouded in darkness, continues to sit in the refuge of its contained shadow throughout the performance, witnessing the action through a shadow frame.

The ultimate contained shadow is complete claustrophobic darkness, as in the cupboard under the stairs, a dungeon, an unlit attic, the grave…

But contained shadow can also be the precondition of more subtle effects of light and shade, effects that are not possible in a bright, evenly lit space. Shadow is sometimes described as a pool; things can swim together in its water.

SHADOW THRESHOLD

In the quotation below, Joseph Conrad uses 'shadow-line' as a metaphor for a rite of passage, the transition from youth to maturity. In architecture transition means movement from one place into another, usually across some sort of threshold. Such movement, such transition, often involves shadow. It may even sometimes be the case that the transition only involves moving into, out of, or across a shadow-line. Experiencing such shadow thresholds may be noticed only subliminally, but they are nevertheless significant and always affect us in some way, however lsight and imperceptible that effect might be. The basic, and timeless, shadow transition is the movement from the bright outside into the mysterious shade inside of a cave… or vice versa (an echo of birth). As well as in rites of passage, shadow thresholds play a part in religious or aristocratic architecture, often at an entrance where one passes from the ordinary world into a sacred place or one that its owner wants to present as specially privileged.
'It seems to me that all my life before that momentous day is infinitely remote, a fading memory of light-hearted youth, something on the other side of a shadow.'

…

In his landscape intervention 'Design of a door to enter into darkness', Ettore Sottsass uses simple architecture – a rudimentary

doorway constructed of poles and large leaves – to identify a place – the threshold between sunlight and the deep shadow cast across a valley by a mountain – and give it poetic significance. By doing so Sottsass invites experience of that threshold, which we might otherwise not notice. He also imbues it with allegorical power. By celebrating this threshold with his simple doorway he recognizes the poetry of every passage we make between light and shadow, and the way those transitions from light to dark resonate with and presage the final passage we must all expect, from life into death. As such the simple doorway becomes a shrine and a poem.

…

Peter Zumthor has used shadow thresholds in some of his works. He uses them as separators between places and to suggest dislocation in historical time.

…

SHADOW PLAY

Galvez House, Luis Barragan
The courtyard referred to in the quotation alongside is a small part of a villa in Mexico City, the Antonio Galvez House, designed by Luis Barragan in 1955. The courtyard is indicated at 'a' in the plan opposite. The courthyard is open towards the south, so it catches sunlight (sometimes dappled by the leaves of adjacent trees) during most of the day.
        If I were allowed, I would change one word in the quotation's last sentence: from 'light' to 'shadow'. As can be seen from the sequential drawings on the next page, this small pink courtyard, with its reflective glass and pool, is a scene of constantly changing shadow play. Capturing this is what makes this small episode of architecture into 'an object of abstract contemplation' .

JAPANESE SHADOW

Shadow Container

In the gardens of katsura stand various pavilions. One is the Shokin-tei, a tea house built in the seventeenth century. It stands by a lake and face west and north-west. Its principal paces enjoy the afternoon and summer evening sun filtered through trees. The roof is thatched with deep eaves so that the interior rooms are almost always in shadow. Looking at the pavilion across the lake (above) the interior is in deep shade which envelops and conceals those inside, making the pavilion a carefully composed landscape around. Getting closer you see that the building is a sophisticated instrument for the subtle manipulation of that interior shade.
''Even at midday cavernous darkness spreads over all beneath the roof's edge, making entryway, doors, walls, and pillars all but invisible.''

Velikov, K. (2015). Tuning Up the City

STRUCTURAL CRISIS

Complex self-organizing systems studied in the biotic world have been shown to operate through positive feedback loops and are described as "open" systems, characterized by interaction with their environment and the tendency to operate further and further from equilibrium, eventually coming to a critical point of instability, at which time the system will spontaneously reorganize into a new and unpredictable organizational state.

...

Of the numerous architects and designers who embraced systems-based approached in their work and thinking, Cedric Price seemed to intuitively understand the interaction dynamics inherent in open systems, cybernetics, and games. He sought to embrace and experiment with ways to productively "intervene" within them in order to generate what he believed to be more socially relevant and useful architectures that could provide individuals with freedom and empowerment and that could correspond more readily to changing societal needs.

…

In their article for the May 1968 issue of AD, entitled "The End of the Classroom," which included a summary of Design Fete project brief, Tirrel and Canfield argued that it was imperative for teaching and education to adopt new technologies in order to reach more members of the community, and to allow students to learn more effectively. They identified that this would also signal the demise of the classroom as the privileged location of information exchange; with this information technology-enabled distance education, the article argued that learning could now take place almost anywhere and anytime, in "the home, the factory, the office and the shopping centre." What could this mean for the architecture of the new learning institutions?

The design mobilized a network of portable technologies (television, radios, calculators), portable spatial educational elements (furniture, adjustable decks, bleacher seating, and portable viewing screens), and semipermanent educational buildings: the "Town Brain" (a data bank and central hub for the production of educational material as well as the servicing of other educational facilities), the "Life Conditioner Box" (a flexible structure that could provide educational facilities for all age groups) and the "Infant Teach Toy" (a portable elementary school).

Design, for Price, was not limited to the design of novel physical structures alone but necessarily included conceiving of the gathering, organization, and interaction of an entire company of necessarily associated everyday artifacts and technologies.

Price understood the fundamental laws of open systems, that is, their eventual structural crisis and bifurcation. His design proposal sought an architecture that could come to terms with those dynamics by embracing the emancipatory potential of such transformations. The Atom project, for example was conceived with a "self-destruct mechanism to be triggered by changes in education philosophies.

…

Potteries Thinkbelt. This was a thesis about architecture as an urban proposition. Price wrote that in the same way that "defence, energy and commerce" had in the past been generators of cities, that the "need to exchange information" could be an urban generator in the future.

…

The focus was shifted away from the objects of architecture to the interactions and possibilities they produced within the space of the urban, and to the adaptability of the system over time.

…

The Think Grid would differ from the Thinkbelt in "that its capacity to service the are is multi-directional," with concentration of effort located at a variety of points, with only a few having permanent locations. Its boundaries would be elastic, with the total area of facilities being provided conceived of as variable over time. The grid also appears to have provided a conceptual framework for how specific and projects would operate, alternatively as "closed", "open" or "fragmented" grids.

The framework included physical (portable) facilities and infrastructures, and ones that were more ephemeral and operational, or, as Price described them, occupying the space beyond the "threshold of major public visibility". These would include all of the communications and programming, cooperation with regional institutions and industries, and the equipment and mobility infrastructure necessary to support OCC operations.

…

Even more emphatically then the Atom project, the Think Grid envisioned architecture as an additive infrastructure, grafted within the existing spatial fabric of the city, and working to rescript or, to use a term Price often used, "tune up" existing spaces so that new social opportunities and uses could be availed.

This ability of the Think Grid to respond and adjust itself over time was an integral aspect of the conception of the project as an adaptive or, in the words of Christopher Alexander at the time, a "generating" system. Alexander had described a generating system as a "kit of parts, with rules about how these parts may be combined," adding "almost every ' system as a whole' is generated by a generating system.

This feedback mechanism would evaluate the effectiveness of each project throughout its life span, and they could be altered, amplified, recast, or perhaps abandoned in response.

Price advised that this information program should not only be communicated via media such as newspapers, radio, and television but should also have a physical presence within the city via the information pods and the reutilized abandoned storefronts, "situated at key urban and transportation nodes." With this, Price's Think Grid could not only be considered in terms of its goals to develop a "new form of learning," but also potentially as a new urban process that Price referred to as "consensus action planning" requiring "major cooperation of other bodies" and controlled, at least in part, by the urban citizenry.

William, R. (1970). The Country and The City

COUNTRY AND CITY – CHAPTER III

It is not only the Golden Age, as in Jonson to Sir Robert Wroth, through Penshurst, in its first positive description, is seen through classical literature: the woods of Kent contain Dryads and Pan and Bacchus, and providing deities of the charity are Penates. More deeply, however, in a conventional association of Christian and classical myth, the provident land is seen as Eden. This country in which all things come naturally to man, for his use and enjoyment and without his effort, is that Paradise:

> The early cherry, with the later plum,
> Fig, grape and quince, each in his time doth come:
> The blushing apricot, and woolly peach
> Hang on thy walls, that every child may reach.

Except that it is not seen as Paradise; it is seen as Penshurst, a natural order arranged by a proprietary lord and lady. The manipulation is evident when we remember Marvell's somewhat similar lines in The Garden:

> The Nectaren, and curious Peach
> Into my hands themselves do reach;
> Stumbling on Melons, as I pass,
> Insnar'd with flowers, I fall on grass.

Here the enjoyment of what seems a natural bounty, a feeling of paradise in the garden, is exposed to another kind of wit: the easy consumption goes before the fall. And we can then remember that the whole result of the fall from paradise was that instead of picking easily from an all-providing nature, man had to earn his bread in the sweat of his brow; that the incurred, as a common fate, the curse of labour. What is really happening, in Jonson's and Carew's celebrations of a rural order, is an extraction of just this curse, by power of art: a magical recreation of what can be seen as a natural bounty and then a willing charity: both serving to ratify and bless the country landowner, or, by characteristic reification, his house. **Yet this magical extraction of the curse of labour is in fact achieved by a simple extraction of the existence of labourers, their work is all done for them by a natural order.** It is this condition, this set of relationships, that is finally ratified by the consummation of the feast.

> A Table plentifully spread we find,
> And jugs of huming Ale to cheer the Mind,
> Which he, too gen'rous, pushes round so fast,
> We think no Toils to come, nor mind the past.
> But the next Morning soon reveals the Cheat,
> When the same Toils we must again repeat;
> To the same Barns must back again return,
> To labour there for Room for next Year's Corn.

GOLDEN AGES – CHAPTER IV

In the poems we have been looking at there is no historical reference back. What we find, nevertheless, **is an idealization of feudal and immediately post-feudal values: of an order based on settled and reciprocal social and economic relations of an avowedly total kind**. It is then important that the poems coincide, in time, with a period in which another order – that of **capitalist agriculture** – was being successfully pioneered.

> And you must know, your Lord's word's true,
> Feed him ye must, whose food fills you

These celebrations of a feudal or an aristocratic order have been widely used, in an idealist retrospect, as a critique of capitalism. **The emphases on obligation, on charity, on the open door to the needy neighbour, are contrasted, in a familiar vein of retrospective radicalism, with the capitalist thrust, the utilitarian reduction of all social relationships to a crude moneyed order.**

This leads to an evident crisis of values in our own world. For a retrospective radicalism, against the crudeness and narrowness of a new moneyed order, is often made to do service as a critique of the capitalism of our own day: **to carry humane feelings and**

yet ordinarily to attach them to a pre-capitalist and therefore irrecoverable world.

But also, and more important, this kind of critique of capitalism enfolds social values which, if they do become active, at once spring to the defence of certain kinds of order, certain social hierarchies and moral stabilities, which have a feudal ring but a more relevant and more dangerous contemporary application.

There is only one real question. **Where do we stand, with whom do we identify, as we read the complaints of disturbance, as this order in its turn broke up?**

It is not, taken as a whole, a story of decline from the medieval order, but of vigorous, often brutally vigorous, growth. Down to the Civil War there was some official resistance to wholesale enclosure and the new kinds of ownership, but in the Restoration a government of the new kind of landlord was at last in control. **This marked the decisive establishment of the new order which had been developing for at least two centuries. A more settled and centralized order – a system of social and economic rather than directly military and physical control – was now fully in being, in a more prosperous and more populated country.** For the majority of men it was the substitution of one form of domination for another: the mystified feudal order replaced by a mystified agrarian capitalist order, with just enough continuity, in titles and in symbols of authority, in successive compositions of a 'natural order', to confuse and control.

That temporary contrast, then, between country and city is only indirectly important. But there is another dimension in the whole contrast which requires emphasis. Of course a city eats what its country neighbours have grown. It is able to do so by the services it provides, in political authority, law and trade, to those who are in charge of the rural exploitation, with whom, characteristically, it is organically linked in a mutual necessity of profit and power.

But then, at marginal points, as the processes of the city become in some respects self-generating, and especially in the course of foreign conquest and trade, there is a new basis for the contrast between one 'order' and another. The agents of power and profit become, as it were, alienated, and in certain political situations can become dominant. Over and above the interlocking exploitation, there is what can be seen as a factual exploitation of the country as a whole by the city as a whole.

THE GREEN LANGUAGE – CHAPTER XIII

The is the separation of possession: the control of a land and its prospects. But there is also a separation of spirit: a recognition of forces which we are part but which we may always forget, and which we must learn from, not seek to control. In these two kinds of separation the idea of Nature was held and transformed.

Two principles of Nature can then be seen simultaneously. There is nature as a principle of order, of which the ordering mind is part, and which human activity, by regulating principles. May then rearrange and control. But there is also nature as a principle of creation, of which the creative mind is part, and from which we may learn the truths of our own sympathetic nature.

Now, with Wordsworth (1770-1850), an alternative principle was to be powerfully asserted: a confidence in nature, in its own workings, which at least at the beginning was also a broader, a more humane confidence in men. **It is significant and understandable that** in the course of a century of reclamation, drainage and clearing **there should have developed, as a by-product, a feeling for unaltered nature**, for wild land: the feeling that was known at the time as 'picturesque'.

It is not, at this level, an alteration of sensibility; it is strictly an addition of taste. Like the landscaped parks, where every device was employed to produce a natural effect, the wild regions of mountain

and forest were for the most part objects of conspicuous aesthetic consumption: to have been to the named places, to exchange and compare the travelling and gazing experiences, was a form of fashionable society.

…

The figure thus seen is at first the shepherd, moving and working in the mountains, but is then the idea of human nature –

> The impersonated thought,
> the idea or abstraction of the kind

The labourer is now merged with this landscape, a figure within the general figure of nature, is seen from a distance, in which the affirmation of Nature is intended as the essential affirmation of Man. It is in this spirit, at once separated and affirming a submerged general connection.

It is not now the will that is to transform nature; it is the lonely creative imagination; the man driven back from the cold world and his own natural perception, and language seeking to find and recreate man. This is the 'green language' of the new poetry.

Closer description of nature – of birds, trees, effects of weather and of light – is a very marked element in this new writing.

In the actual scale of the regulated conquest of land which enclosure, among other procedures, represented, this persistent image of invading barbarians is understandable. But the harder fact, that these barbarians were well-born Englishmen, is characteristically displaced. And then it is very much to the point, that the first general word chosen to describe the instigators of the 'curse' of enclosure is 'tasteless'. This connects with that structure of feeling which was beginning to form, from Goldsmith to the poets of the Romantic movement, and which is particularly visible in

Clare: the loss of the 'old country' is a loss of poetry; **the cultivation of natural feeling is dispossessed by the consequences of improved cultivation of the land; wealth is not only hard and cruel but tasteless.**

Over a century and a half I can recognize what Clare is describing: particular trees, and a particular brook, by which I played as a child, have gone in just this way, in the last few years, in an improved use of marginal land. And then what one has to consider is the extension of this observation – one kind of loss against one kind of gain **– into a loss of 'Nature'. It is not only the loss of what can be called – sometimes justly, sometimes affectedly – a piece of 'unspoiled' country. It is also, for any particular man, the loss of a specifically human and historical landscape, in which the source of feeling is not really that it is 'natural' but that it is 'native'.**

…

> I am, but what I am
> Who cares or knows?

It was as far as the mind could go, within that structure. Any new direction required an alteration of structure and of essential convention. Clare marks the end of pastoral poetry, in the very shock of its collision with actual country experience. He could not accept Lamb's characteristic advice, which had tamed so many: 'transplant Arcadia to Helpstone. The true rustic style, the Arcadian English, I think is to be found in Shenstone.' He is, rather, the culmination, in broken genius, of the movement which we can trace from a century before him: the separation of Nature from the facts of the labour that is creating it, and then the breaking of Nature, in altered and now intolerable relations between men. What we find in Clare is not Jonson's idealization of a landscape yielding of itself, nor Thomson's idealization of a productive order that is scattering and guarding plenty. There was a conscious reaction to this, in Goldsmith, in Langhorne, and in Crabbe. But there was also an unconscious reaction, to a country from which any acceptable social order had been decisively removed. Clare goes beyond the external

observation of the poems of protest and of melancholy retrospect. What happens in him is that the loss is internal. It is to survive it all, as a thinking and feeling man, that he needs the green language of the new Nature.

KNOWABLE COMMUNITIES – CHAPTER XVI

There can be no doubt, for example, that identity and community became more problematic, as a matter of perception and as a matter of valuation, as the scale and complexity of characteristic social organization increased. Up to that point, the transition from country to city – from predominantly rural to a predominantly urban society – is transforming and significant. The growth of towns and especially of cities and a metropolis; the increasing division and complexity of labour; the altered and critical relations between and within social classes: in changes like these any assumption of a knowable community – a whole community, wholly knowable – became harder and harder to sustain. But this is not the whole story, and once again, in realizing the new fact of the city, we must be careful not to idealize the old and new facts of the country. For what is knowable is not only a function of objects – of what is there to be known. It is also a function of subjects, of observers – of what is desired and what needs to be known.

THE BORDER AGAIN – CHAPTER XXII

Yet what Lawrence has to say can never be reduced to an argument. An historical scheme is important to him, and in various forms is continually reintroduced, but what he has mainly to say is about life and death in relationships, with social and historical forces present but reworked into forms of life and death. Consistently, however, industrialism and its forms of property and possession are seen as signs of death. Yet what is opposed to them is not, in the run of his work, a farming community; it is rather a primitivism, at times given some social or historical base, as in the Indians of New Mexico, but more often and more significantly accessible as a form of direct living in contact with natural processes – animals and birds and flowers and trees but also the human body, the naked exploration and relationship.

The apparently familiar reflex to the 'old agricultural England' must then be seens as, thought present, a minor theme. It is the way the history conventionally came, but it is only a form, at times misleading, of his essentially different emphasis. This can best be seen if we look at what he has to say about the city:

> The great city means beauty, dignity and a certain splendour.
> This is the side of the Englishman that has been thwarted and shockingly betrayed.

Or again:

> We live in towns from choice, when we subscribe to our great civilized form. The nostalgia for the country is not
> so important. What is important is that our towns are false towns – every street a blow, every corner a stab.

And this must be set alongside his more conventional insistence:

> The real tragedy of England, as I see it, is the tragedy of ugliness. The country is so lovely: the man-made England is so vile.

For it is not the town but the false town that is the symptom of ugliness, and the root of its falseness is the system and spirit of possessive individualism, which has frustrated that instinct of community which would make us unite in pride and dignity in the bigger gesture of the citizen, not the cottager.

And his indictment of English cities follows a familiar nine-teenth-century mode:

> Nottingham is a vast place sprawling towards a million, and it is nothing more than an amorphous agglomeration. There is not Nottingham, in the sense that there is Siena.

The conclusion is reconstruction:

> Pull down my native village to the last brick. Plan a nucleus. Fix the focus. Make a handsome gesture of radiation from the focus. An then put up big buildings, handsome, that sweep to a civic centre.

When we look back at Lawrence, the relevant question: important just because of his genius. With the simple rural retrospect he has, as we have seen, only conventional dealings. He pushed beyond it to ideas of natural independence and renewal, and he saw quite clearly as an enemy a materialist and capitalist industrial system. But it is characteristic and significant that he then aligned the ideas of human independence and renewal – the ideas of nature itself – with an opposition to democracy, to education, to the labour movement: a restless, often contradictory opposition: at its sourest between the war years and the middle twenties: re-thought and in some ways amended, with more real sense of connection in the reflective essays f his last years. His is a knot too tight to untie now: the knot of a life under overwhelming contradictions and pressures. But as I have watched it settle into what is now a convention – in literary education especially – I have felt is as an outrage, in a continuing crisis and on a persistent border. The song of the land, the song of rural labour, the song of delight in the many forms of life with which we all share our physical world, is too important and too moving to be tamely given up, in an embittered betrayal, to the confident enemies of all significant and actual independence and renewal.

THE NEW METROPOLIS – CHAPTER XXIV

The 'metropolitan' states, through a system of trade, but also through a complex of economic and political controls, draw food and, more critically, raw materials from these areas of supply, this effective hinterland, that is also the greater part of the earth's surface and that contains the great majority of its peoples. Thus a model of city and country, in economic and political relationships, has gone beyond the boundaries of the nation-state, and is seen but also challenged as a model of the world.

The traditional relationship between city and country was then thoroughly rebuilt on an international scale. Distant lands became the rural areas of industrial Britain, with heavy consequent effects on its own surviving rural areas. At the same time, the drive for industrial markets and the drive for raw materials extended the effective society across half the world.

…

Indeed there has been some important movement away from the city in the older sense, as city centres are cleared for commercial and administrative development; or as suburbs, new towns and industrial estates are developed in rural and semi-rural areas as parts of a policy of relative dispersal. The concentrated city is in the process of being replaced, in the industrial societies, by what is in effect a transport network: the conurbation, the city region, the London – Birmingham axis. The city thus passes into its tertiary development, when it becomes in effect a province or even a state.

CITIES AND COUNTRIES CHAPTER XXV

The country and the city are changing historical realities, both in themselves and in their interrelations. Moreover, in our own world, they represent only two kinds of settlement. Our real social experience is not only of the country and the city, in their most singular forms, but of many kinds of intermediate and new kinds of social and physical organization.

Yet the ideas and the images of country and city retain their great force. This persistence has a significance matched only by the fact of the great actual variation, social and historical, of the ideas themselves. Clearly the contrast of country and city is one of the major forms in which we become conscious of a central part of our experience and of the crises of our society.

We then find ourselves facing the further questions: what kinds of

experience do the ideas appear to interpret, and why do certain forms occur or recur at this period or at that? To answer these questions we need to trace, historically and critically, the various forms of the ideas. But it is useful, also, to stop at certain points and take particular cross-sections: to ask not only what is happening, in a period, but also with what other ideas, in a more general structure, such ideas are associated.

There are similar radical differences in associations with ideas of the country: the ideas of settlement, for example, as compared with the idea of rural retreat, which implies mobility. Each idea can be found in very different periods, and seems to depend on class variations, whereas the other obvious contrast, between an idea or cultivated country, cultivation being honest growth, and the idea of wild or unspoiled country, not cultivation but isolated nature, has a clearer historical perspective, since the latter so evidently involves response to a whole way of life largely determined elsewhere?

…

What the oil companies do, what the mining companies do, is what landlords did, what plantation owners did and do. And many have gone along with them, seeing the land and its properties as available for profitable exploitation: so clear a profit that the quite different needs of local settlement and community are overridden, often ruthlessly. Difficult and complex as this process is, since the increases in production and the increases in new forms of work and wealth are undoubtedly real, it is usually more necessary to see this kind of contrast – between form of settlement and forms of exploitation – than to see the more conventional contrast between agricultural and industrial development: the country as cooperation with nature, the city and industry as overriding and transforming it.

The motorway system, the housing clearence, the office-block and supermarket replacing streets of homes and shops, may materialize in the form of a social plan, but there is no case in which the

priorities of a capitalist system have not, from the beginning, been built in.

The industrial-agricultural balance, in all its physical forms of town-and-country relations, is the product, however mediated, of a set of decisions about capital investment made by the minority which controls capital and which determines its use by calculations of profit.

…

For we really have to look, in country and city alike, at the real social processes of alienation, separation, externality, abstraction. And we have to do this not only critically, in the necessary history of rural and urban capitalism, but substantially, by affirming the experiences which in many millions of lives are discovered and rediscovered, very often under pressure: experiences of directness, connection, mutuality, sharing, which alone can define, in the end, what real deformation may be.

The common idea of a lost rural world is then not only an abstraction of this or that stage in a continuing history (and many of the stage swe can be glad have gone or are going). It is in direct contradiction to any effective shape of our future, in which work on the land will have to become more rather than less important and central. It is one of the most striking deformations of industrial capitalism that one of our most central and urgent and necessary activities should have been so displaced, in space or in time or in both, that is can be plausibly associated only with the past or with distant lands.

It is important to remember how much damage to the environment was and is being done by the capitalist mode of progressive agriculatre; this is nt a crisis of manufacturing industry alone.

Neither will the city save the country nr the country the city. Rather the long struggle within both will become a general struggle, as in a

sense it has always been.

And if we look up from the idea of the city, we find in and through the extraordinary pressures a good deal of caring and intelligent work to make the cities cleaner and finer, to bring out and to build their best qualities. To know any of this directly is to know also, very closely, the constant threat of deliberate and indifferent destruction. But each process is a fact; in the best and in the worst there is neither a lost nor a won cause; it is an active, immediate and persistent struggle. It is also, as we shall see, a very complicated struggle, reaching into every part of our lives.

Yatmo, Y.A. & Atmodiwirjo, P. (2021). Interiority and Urban Interiority

INTERIORITY AS RELATIONS

Understand the relation between human being and its environment is critical in our attempt to create an appropriate built environment. Interior as a discipline has a privilege to be in the intersection between subjective experience of human users and the physical manifestation of environment occupied by the human. Look at interiority as a relational construct that occurs between the users and the environment should be an essential basis for design practice.

The reciprocal relationship between body and space occurs in such a way "that the one not only occupies the other but commands and orders it through intention" (Tuan, 1977; p.35). The intentional nature of human being allows the human capacity to select, evoke, and manipulate their environment (Gosling, Glfford, & McCunn, 2013), which suggests a form of reciprocal relations between human and the surrounding interior and architecture. Understanding the transaction that occurs between human and environment allows us to define the quality of space based on the active response of the human towards their environment (Yatmo & Atmodiwirjo, 2013), rather than seeing human merely as a passive receiver of the environmental qualities.

The knowledge on interiority as relations inevitably poses some challenges for design practice. Interior and architecture needs to go further "in responding to human body: it extends and enhances human capacities" (Franck & Lepori, 2000, p.36). To be "life-enhancing," it has to "address all the senses simultaneously and help to fuse our image of self with the experience of the world" Interface (Pallasmaa, 2012, p.12). **It becomes critical to explore the relevant medium, techniques and materiality in the design attempts that could appropriately respond to the nature of human-space relations.** The choice of medium, techniques and materiality remains open for further creative development for practice. In addition, the presence of different interior and urban situation where the relations occur, with diverse characteristics of subjects,

the diverse purpose of the built environment, and the diverse social and cultural condition, also calls for innovative design practice through possible appropriation and intervention.

…

The sensorial experiences may take place in various forms, not only through immediate physical response to the stimuli but also through responses to particular stimuli identified in memory with particular time and place (Malnar & Vodvarka, 2004). Thus the relations between human and environment expands beyond the physical sensory encounter and actions. **Zarya Vrabcheva discusses another way of how human relates to the environment which is not through physical encounter but through memory, imagination and illusion. The transitional phases of empathy involving those three aspects demonstrate the invisible relationship that we have with the surrounding interior and architectural space.**

Time and temporality is another key aspect in the relations between human being and environment, as the relations tend to be dynamic and continuously change through time. The final article in this issue presents a project by James Cary that employed a variety of techniques and medium to respond to the existing interior and urban situation. This project argues on the importance of process, time and duration in the practice of interior, and suggests the relation with time and duration as the interiority of the context.

URBAN INTERIORITY: EMERGING CULTURAL AND SPATIAL PRACTICES

The urban interior discussion has focused on the shift from viewing the urban interior in terms of location and spatial enclosure, to a setting for urban acts and inhabitation. The urban interior highlights urban settings' role as containers of urban life through encounters and occupations (Hinkel, 2011). The urban interior addresses

urban places' ability to promote individuals' character within urban environments (Pimlott, 2018); provide spatial conditions that incorporate the experience of transition, movement and time (Poot et al., 2018); and become a setting ready to be transformed through a series of methods and techniques (Attiwill, 2011; Hinkel, 2011).

The urban interior is characterized by its fluid character that "manifests itself as a social, economic, cultural or political construct that changes and evolves in response to fluctuating borders, multiplicity of identities and varying layers of sense of belonging" (Hadjiyanni, 2018).

Viewing urban settings from the interiority perspective allows us to comprehend unique local character in particular contexts. The urban interior is manifested as a setting of urban life "through activities and practices in particular localities" (Hinkel, 2011).

The particularities of urban actions, performed by urban factors, could lead to narratives on particular uses and the distinctive meanings of particular urban settings.

Design strategies for the urban interior aim at placemaking, an attempt to create an interior condition that amplifies people's engagement with the urban environment, through "specific character, materiality, atmosphere, and evidence of relations, through which people may be more conscious of themselves and others, the world and their place in it." The making of the urban interior is essentially the making of the condition of an interior that could promote the character of its actors in their engagement with these places. One of the critical emergent questions is how to create and urban interior that can become a container for society's dynamic cultural practice.