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System Autonomy: A New Condition of Space

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Introduction

autonomy, politics, system space

This thesis began with an interest in autonomous communities, and a question of how to consider and form the most basic meaning of 'sustainability', which is the ability to sustain. As simple as the word seems, the perspectives on how it is applied are diverse and connected to many abstract concepts, such as the ones investigated throughout this book. The expected resultant of the thesis was augmented multiple times, and the very scope of what was being researched also reoriented based on the inevitable following of the rabbit hole.

The part and parcel of this work has a sense of being aleatoric and tangential, but that is probably because the end result of the work during the past year is an odd mixture of research and written resolutions that circle around a shared identity. The process ended not in rote informational regurgitation, nor the application of previously applied methods, but in the half-way answer to an unclear question. I don't believe that to be a failure of the work, as the clarity of the answer and question is something that needs to be worked towards - and this is the beginning of that work.

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The study of autonomy is an immediately controversial topic, especially in the context of architecture, space, and urban design, and this tension, in my opinion, arises because of the perceived claim of non-connection within a design field that is increasingly cognisant of the scalar affectations it both projects and is has projected on it by tangential fields. The assumption of an undefined autonomy is that it demarcates a 'separate' thing, an 'unconnected' thing, a thing outside the boundary of other things. While a portion of the following study of autonomy within development will focus on the exaction of the scope of the term, there are no definitions that will be used to claim the 'separateness' or 'non-connection' of architecture from influence. Rather, the subsequent pursuit of autonomy will be in direct recognition of how infinitely connected the built environment is, and in final will aim at the conception of autonomous systemic spaces and organizations that are able to respond to the complexities involved in ways more equitable and stable than previously achieved.

A more correctly oriented definition of 'Autonomy' in this context might be claimed as the absence of subjugation to hierarchical models of control, and in this application used broadly as the eschewing of the belief that in systems of complexity, such as the many in which we practise in the built environment, that there are no elements that lack responsibility to the processes that support them. Self-sufficiency and sustained equilibria are at the

very heart of this conception of Autonomy, though even those terms have dissonant connotations that work against the project goals. Rather than self-sufficiency, a better term might be system-sufficiency, a condition which ecological systems are constantly evolving towards, reacting to novel or recurring stimuli that provide moments of reorganization, central to the study of emergence and its relevance to the built environment, as is investigated by contemporary authors such as Michael Weinstock.

The project of Autonomy in this light is increasingly relevant to architectural and urban contexts in the methods that it implies the relationship between the built environment, the society which it contains, the environment in which it is contained, and the spatial complexities by which it is defined. The argument behind the push towards autonomous conceptions of space is predicated on the limitation and subjugation of each of these elements by the involvement of hierarchical models of control. I assume this is going to remain as one of the points of higher contention within the project, because of the political nature to the statement and the radical perspectives that it involves, but the basic tenets that structure the argument are more and more clearly relevant within the contemporary era each time the premises are revisited.

The development of an understanding for System Autonomy and the ways that it informs the political subjectivity of the scalar contexts that it organizes, from the building instance to comprehensive urban context, follow a discourse that has been widely investigated with the acceleration of the applied sciences. The presence of systemically autonomous organizations has been highly developed in alternative fields, however progressed or not the resultants have been, and the application of the same type of thought is only of benefit to the field of architecture and built design.

Agrarian systemic autonomies have been pursued through the work of Bill Mollison on permacultural structures for agricultural yield and Dr. Dickson Despommier's work on the realization of vertical farming techniques that would reconsider the monolithic and close-sighted agricultural methods that are currently used throughout the world to great consequence.

Technological system autonomies have been of interest since the development of modern communication tools, and specifically have been pursued and applied in response to Paul Baran's On Distributed Networks in 1964. Even before the realization of multiple and redundant sources of productive use as Paul Baran outlined, technological system autonomies can be seen in the visionary Science Fiction works of the golden age writers. In I, Robot Issac Asimov details the global organization and communication of system integrated computer control centers that monitor and adjust the operations of supportive systems worldwide, impressively

aware considering the publication of I, Robot in 1950 was a full 14 years prior to the publication of Baran's work for the RAND organization.

Social system autonomies, born from the development of the technological networks, now define an incredible portion of modern social interaction. The ability to communicate, share, and evaluate information over network sites (Facebook, Reddit, Twitter, etc.) is predicated on the autonomous ability of one to communicate to many as well as be communicated to by many, and even that level of social system autonomy relies on the siteless system autonomous technology nodes that the social network is accessed by, which we all walk around with in our pockets - for the most part.

Political system autonomies, following the master goal of creating social and organizational models that limit the subjugation of populations by hierarchical control, have a deep and well-built critical culture based in the writing of Kropotkin through Chompsky, and the productive work that has been written through the political perspective has done more than any other critical interaction with Autonomy to define the context of ethics and social interaction that a systems model would include. Anarchist political and ethical theory are just as often assumed in connotations that irrationally define them based on presumptuous conditions, but to understand the interaction of populations in systems autonomy is innately defined by the work that critical anarchism has done.

Already in the workplace has there been the implementation of non-traditional models of administration, most recently in the Zappos.com announcement that it is transitioning to a system of 'Holacracy', which redefines the authority structure of the presumed corporate model. Although 'Holacracy' is still very much hierarchical in its organization, the degradation of traditional authority structures is an interesting signifier that shows corporate responsiveness to the heightened efficacy of work environments that are increasingly without explicit hierarchical control.

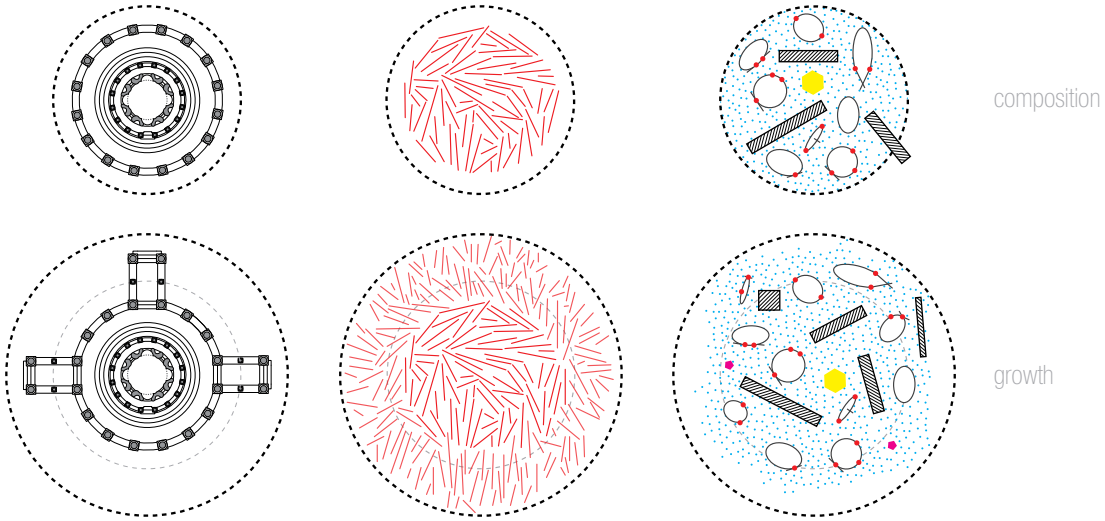
Specifically in the field of design, the corporate structure of IDEO and the basic arguments of Tom Kelly's Design Thinking involve the abolition of hierarchical adherence based on the recognition that top-down hierarchical models are destructive to the design fields. Although the signature of anarchist critical writing is routinely admonished and ignored, elements of hierarchical critique are now applied more and more commonly, which can be seen as frustrative dissonance that is limiting in fully understanding a comprehensive implementation.

Beyond tangential interest in system autonomies, there are several currents of similar interests directly within the context of architectural design, varying in level and specificity of implementation. The environmental crisis and its specific claims against the responsibility of the built envi-

ronment have resulted in various levels of interaction with the system interaction of the architectural project, from the efficient engineering and application of technological systems limiting emission and energy use to the comprehensively passive and non-pollutant architectural instance as is seen in 'Earthship Biotecture' and the specific projects that it has inspired throughout the world.

Recognizing the legacies of these architectural, tangential, and conceptual understandings of the possibility of system autonomies, this thesis aims to understand, define, and visualize the framework in which systemically autonomous organizations of space, both on the project instance and in the urban context, can be applied. Following Stan Allen's reorientation of the modernist ethic of space into the range of the field condition and how it 'moves from the one towards the many: from individuals to collectives, from objects to fields,' the intent of the following work is to complete the realization of the spatial responsibility to work within the system complexities that it exists, essentially moving from field to system, yet in a way that is more the destruction of binary thinking rather than a utopic vision.

Grayson Bailey,
May 01, 2014


composition
growth
OBJECT
FIELD
SYSTEM

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		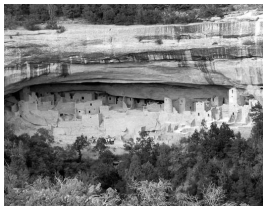	*Exterior*
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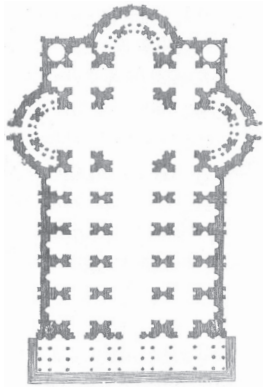
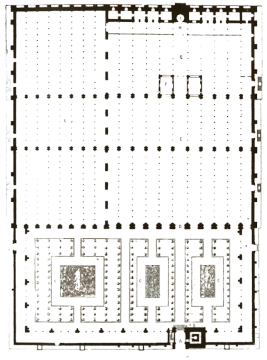
			*Plan*

Across : Object, Field, and System comparatively diagrammed and evidenced through architectural example, with St. Peter's Basilica[1,2,3], Cordoba Moswue[4,5,6], and Mesa Verde's Cliff Palace[7,8,9]

Preface
abstract introduction

System Autonomy is an attempt to move beyond the oppositional views of object and field compositions that theoretical projection has found itself trapped between. The object is compositionally complete through the application of strict geometric schema, yet unrelatable and self-focused in its rigid application. The field condition is non-directional and highly manipulable in its expansion and propagation of space, yet requires the flattening of anomaly and uniqueness in its coordination of diverse similarity. The system, an aggregate of disparate identities, is projected as a tertiary condition which is able to contain infinite variation and distinct difference within an organization that is maintained through the personal obligation of elements.

The construction of *System Autonomy* uncovers the conceptual, political, and architectural character of truly unrestrained organization and space - the types of spaces naturally developed in concert with context and environment, through the culture of interdependency and inclusivity. Rather than viewing space and architectural creation as contained and complete, *System Autonomy* claims the absence of completion, constantly reconfiguring and readjusting based on an index of internal and external expectations. Instead of the pursuance of the final perfect ordering method, *System Autonomy* is the negation of the very idea of perfection, cohesion, or stability. Past the former methods of applying strict geometric schema or loose mathematical variance, *System Autonomy* returns to an idea less controlled, less homogenous, and more human.

The intent of the text is not to strictly define the context in which *System Autonomy* should be applied, but to set a course toward a more responsive and open style of spatial practice based on the interaction of obligation and response. The natural environment is complex and diverse and reacts to change on the basic level, and *System Autonomy* aims to reorient the artificial and built environment in the same way. With the introduction of so many environmental, economic, and social imperatives that require diverse solutions, sometimes contrasting, it is critical for architectural and urban practice to begin transitioning to a method of creation that does not consider itself in isolation, but as a part of something demandingly greater.

System Autonomy
a new condition of space

The 'System' can be understood in many ways, each with a specific presence in semantics. "All systems are go" beckons to the placement of technological routine, or supportive processes. The shuttle crew verifies that each system is working, and in one spectacular moment the coordination of these 'systems' results in unified movement that defies gravity. In "all systems are go" there is a differentiation of these processes, a compartmentalization that separates each - there is no "system is go", but only "*systems* are go." The system in this sense is specialized in its use, limited in its expectations.

Human systems (circulatory, neural, skeletal, etc.) are referential to the same use. Both the navigation system on the shuttle and the integumentary system in biological terms are collections of differentiated elements that are coordinated to achieve their specific goals. The coordination of all things involved in each of these systems is utilized to achieve specific results, which is the central meaning of 'system' in this context. The process, either the orientation of the ship in space or the pumping of blood through the body for oxygenation, is what is of importance. The technology and matter involved is supportive, but kindly irrelevant in face of the expected result. In so much, the components are necessary in the creation of something alternative to the index of parts.

Another semantic use is the the idea of "having a system" for set practices. The gambler 'has a system' for winning, the artist 'has a system' for composing the image or work, the pick-up artist 'has a system' for engaging with a target, and the chef 'has a system' for correctly executing his recipe. 'Having a system', in contrast to the systems of the shuttle, is process-oriented as well, but more correctly posed as a set of if-then reactions. The gambler, through his system, will raise if the next card is high enough, will fold if it is too low. The artist will determine the composition of elements in either their proximity or importance, choosing to adjust focus or resolution, in order to correctly complete her work. The pick-up artist will either advance through his steps of seduction, adjust course, or pull back based off of the communication from his target. The chef waits until the water is at a simmer before adding the next ingredient to her creation.

To 'have a system' is to be systematic - to have instinctual or planned steps through an operation. Unlike "all systems are go", which is connected to the meaning within "system failure", the systematic application of reactions is not dependent on the success of the operation. The gambler can fold, an admittance of failure in the attempt to win, but a viable and necessary portion of his 'having a system' in gam-

bling. There is no conception of failure in this semantic use, for the reaction to operative failure is contained within the system as a reaction. Folding is not a failure of the gambler's system, but a routine of it.

Increasing in ambiguity, there is also the semantic use of "system of oppression". In this form there is a sudden simultaneity that appears. Instead of "all systems are go", the semantics solidify into "the *system* goes", which is representative of a variance of operations that work towards a conceptually similar end. In I.M. Young's "Five Faces of Oppression", the forms of oppression that fuse together as a structural concept are *Exploitation, Marginalization, Powerlessness, Cultural Imperialism,* and *Violence*[1]. Each of these faces are systemic in their forms of active oppression, yet in the context of a "system of oppression" they are seen as contributive to a larger orchestration, rather than unrelated operations in parallel. There is not a unification of their individual process, but a collection of differentiated processes that serve a larger scale operation in unison.

In the context of "system of oppression" there is further definition of the interscalar resolution of what is, in essence, the system. The interactive elements at each scale can be infinitely studied in larger and smaller focuses. This type of scalar infiniteness is the same as was portrayed in the Charles and Ray Eames short film *Powers of Ten*, in which the couple laying on their picnic blanket is the stable focus in which the film is based[2]. As the film progresses, this primary scale is tied to the perspectives of ten internal and ten external jumps, connecting the subjects to their role as a whole containing contributive processes, and as parts contributive to larger and larger versions of the whole.

In the case of oppression, Young defines the primary scale (Oppression), then its supportive scales (Exploitation, Marginalization, etc.). Each of the supportive scales themselves have a "system of..." tied to them at their own resolution, creating the "conceptual structure" of oppression - there is a "system of marginalization" in which another level of supportive processes are active[3].

"System of Oppression" also brings with it the sense of rigid structure. The use of system in this context is identical to the phrase "against the system" or "not a part of your system". There is a structural nature to this semantic use that denotes a level of control, or at least of specific organization. The "system of oppression" is a structure of power that is intact and broadly institutional, which must be rebelled against - all of this is semantically included in the use of the phrase. This aspect of control and institution comes coupled with the aforementioned interscalar perspective, an affectation of there being a limitless resolution to what the "system" encapsulates.

Growing from "system of oppression", the final semantic form through which the

system projects itself is that of the "ecological system", which again reorients the semiotic value of "system" in its context. The two instances that naturally and artificially represent this usage are those of the "mountain system" and the "information system". In the mountain system there is a field of mountains, which also contains the definitive and differentiated characteristics of the ecological systems that are located on and supportive of the mountains. The mountain system is a collection of things related locally and broadly, and attains the level of interscalar perspective related to the "system of oppression", yet the essential difference comes in the non-appearance of control.

In the "system of oppression" there is a rigid structure, which causes its connection to control and institution, yet when speaking of the "mountain system" there is no rigidity or perception of unitary control. This side-stepping of connotated control comes through the circumstance of dependence, interconnection, and diversity of the identities in the "mountain system", versus the centralized response of each scale in the "system of oppression" usage. The particular fall of the semantic "system of..." comes in its high level of processes and systems *in unison*. In the "system of..." there is an essential priority on *cohesion*, which can be derived from the need for concerted connection in achieving a specific end *in unison*. In the same context there is a "system of oppression" and a "system of resistance", each aimed towards distinct goals, each requiring efforts in cohesive direction with rigid connection among supportive elements.

The "mountain system" also requires connection, but its connections are neither rigid nor complete. The "mountain system" is partially concerted, but partially contrasting - there is a partial consensus and partial dissensus. The absence of central control in the "mountain system", while still being able to obtain interscalar perspective is because of the absence of structural cohesion - the absence of all being in unison. There is, fundamentally, a presence of *autonomy*.

In this context autonomy is not taken to mean a strict un-connectedness or separation of elements, but the absence of enforced or absolute control by a singular entity. The mountain system has a presence of autonomy because there is no central response to structural control, but instances of ephemeral exchange in which elements act either in concert or in opposition. There are not rigid connections, but a rich diversity of partial connections, allowing multiplicity of action leading to the state of dynamic equilibrium. The "mountain system" has no forced priority, but multiplicitous priorities that feed into each other.

The semantics of the "mountain system", far beyond the limitations of the alternative meanings, expresses the qualities of *System Autonomy*.

The Preceding Context

The culture of theoretical positioning in architecture has resulted in the binary condition of object and field. The object is a singularity, composed to a level of completion, in which the augmentation of composition can only cause destruction. The field is defined by similarity, composed by the collection of instances which hold relation to each other through the manipulation of shared criteria.

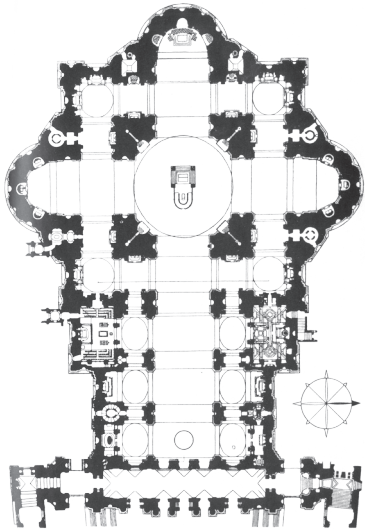
In contrast to this binary, the value of the system comes through its ability to act as an aggregate of disparate identities - an index inclusive of essential differences. There is no assumption or prescription of cohesion, because cohesion, beyond moments of similarity or homogeneity, is counterintuitive when compared to the activity of the real world.

'System Autonomy' in this context implies not only the acceptance of the real in its routine, but also in its novel and uncertain, without attempt to exert control in any structural way. The interaction of elements in the comprehensive complexity of the real is done not through control, but through *obligation*. Obligation, in opposition to the application of control from hierarchical centers, is the personal response of the element to the locality and the broad network in which it exists, whatever those may be. In a simple way, the window's obligation is to the wall, to the floor, to the ceiling, and to the space it provides an opening into, not the geometric schema from an overview, nor to the context of its neighboring windows.

The organization and development of the system gains its definition from the evolution between classically composed object-space through that of the 'field condition', and its necessary ascension from the latter. The limitations of what is considered 'systemic' in spatial terms is the very fact that the 'systemic' is not practiced in the definition of the system, but in that of the field. The 'systemic' coordination of elements or multiple field types calls back to the flattening of their identities into similarity, the same logic that flatly demands cohesion in situations of difference. For this to be clear, the basic understanding of each (Object, Field, System) must be understood.

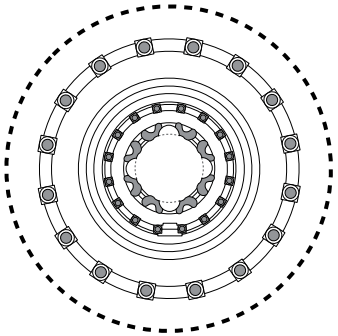
The object-instance, composed and complete, is self-involved. The logic of the object-instance is formed internally, its definition without reference, without adjacency. The object has a unique identity, regardless of its similarity to other objects. The autonomy of the object, its lack of reverence to a higher source, comes in the simple fact that it exists as it is independently from what it is not, as a singularity or static composition.

Architecturally, the object-instance is broadly taken to be the single project.. In the object-oriented project, the entirety of the composition is directly related to the primary geometry from which all aspects of the project are generated. Organization



Above : St. Peters Basilica plan[1]

Below : object composition - rigid geometric schema determining organization and growth



is strict and dogmatic, with an absolute level of resolution or completeness.

Stan Allen gives the example of St. Peter's Basilica in Rome as the extent to which compositional observance is required[4]. While St. Peters has a deep history of 'morphological transformations', its reconstruction and addition are always tied back to recomposition, returning to the 'basic geometric schema' in order to extend and propagate. It can be combined to create larger compositions, but its singular observance to geometry is never broken.

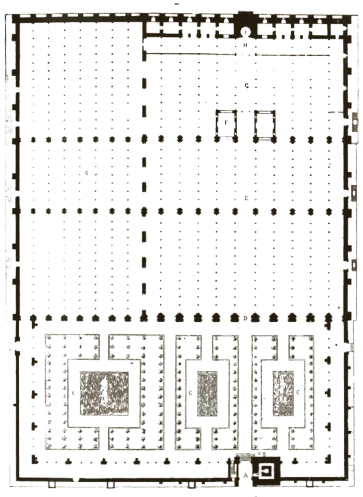
The field, in comparison, is not defined by singularity, but by similarity. The field is fundamentally a collection of similar instances with differing but comparable characteristics. The logic of field is determined by the relation among these instances in collection, the definition thus referential to its adjacencies. In its collection, the identity of one element is related directly to its neighbors and to nothing beyond that. The autonomy of the field comes not through the specificity of its identities, but through the shared and exclusive traits that all instances exhibit in concert within the collective.

When projected to the architectural environment, the field is both used in the coordination of multiple projects into a comprehensive whole (a field of houses into a neighborhood), and as a coordination of similar elements (a field of windows within the facade). In contrast to classically organized object-space, the field project is developed algebraically[5]. Completeness is not prioritized or possible in field space, recognizing the ability for addition and multiplication of the instance type within the field, as all members call back to the control of the fundamental logic that defines it.

The mosque of Cordoba, Spain, (used by Allen as the field counterexample to the object-ness of St. Peters) is able to extend and reattribute itself while maintaining its collective identity. Against the required harmony of geometric composition, the structure is able to proliferate through algebraic means. The form and space of the mosque are able to multiply while still maintaining the basic relationship between elements, allowing for 'non-directional space'[6]. Rather than striving for finality in completion, the mosque's completion is indeterminate, as it can always be added on to, multiplied, or subtracted from with ease.

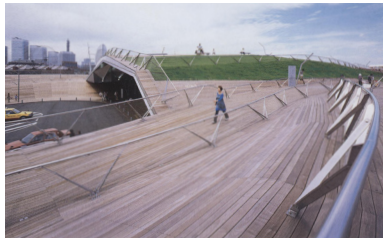
In more recent work, the Yokohama Port Terminal by Foreign Office Architects is able to resolve the field condition through intense surface manipulation and the coordination of various elements in concert. Non-composed space is elicited from the smoothing of spatial functions into one another. The orientation of floors, ceilings, walls, lights, and railings are all dictated by the local field variables, allowing each to achieve similarity in their appropriation[7].

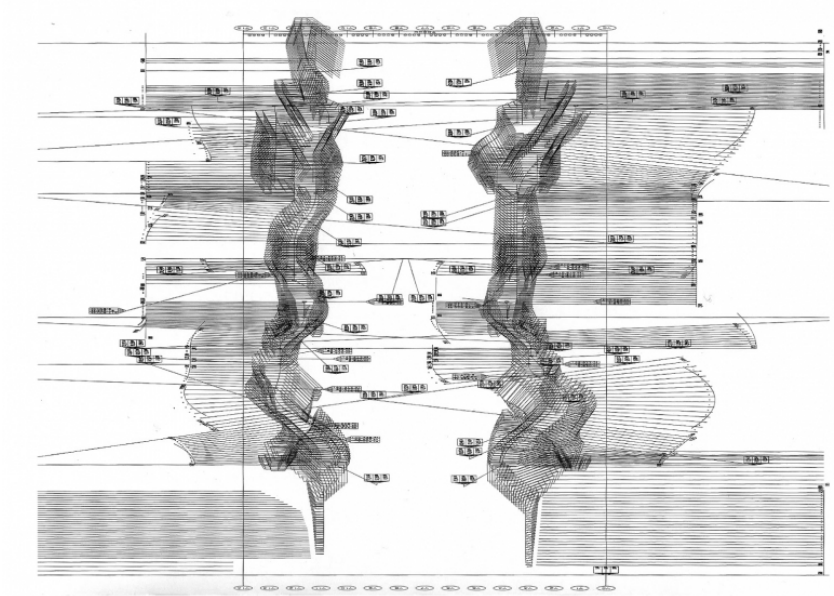
Yet, the level of perfection within the field space that is achieved by the Yokohama



Above : Great Mosque of Cordoba plan[2]

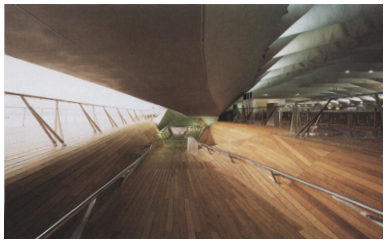
Below : (*top*) Yokohama Port Terminal field landscape[3], (*bottom*) port terminal automobile entrance[4]





Above : Yokohama Port Terminal field vector diagram[5]

Below: Yokohama Port Terminal interior ramp at a point where system intervention is required[6]



project is also able to demonstrate the failure of the field condition. In observing its own field logic, it clearly defines its own boundary. The field necessarily draws a dividing line of what is included versus excluded, and does not attempt to form relationships with anything that is external. Like in the Cordoba mosque, there is no final completeness in Yokohama - there is still the capability of extension and multiplication under the same field condition. But there is also no partiality. Either an element is a part of the field condition or it is not. In this way the shore and city are not inclusions, and so do not require an architectural response.

Interestingly, the specific points of failure within the field condition found in the Yokohama Port Terminal begin to show glimpses of system conditions. As the field that defines the orientation and position of elements meets moments in which the field logic is not viable, negotiation between the inclusion and exclusion is suddenly necessary.

Whereas the floor, wall, ceiling, and subordinate elements can all be administered by a unitary logic, the door cannot. The door, regardless of the vectors and orientations of the field condition, is obligated to be vertical, and to open a specific way, react to its users in a specific way. The door negates its own inclusion within the field, personally reacting to the need of its use. Still, it relates itself to the field condition locally, attaching to the logic that directs the inclusionary elements, though not being dominated itself.

These moments of system in the field

Below : Yokohama Port Terminal transition from interior to exterior[7]

Above: Winchester Mansion layout - no order leading to complexity and specificity[8]

Below: Winchester Mansion's famous "door to nowhere"[9]

come from points of failure to meet needs outside of the field, in which the obligation of use or position overrides the field condition. In popular terminology, 'systemic' is often used to designate the adherence of multiple types of things to an overall theme or force. The floor, ceiling, lights, and railing in Yokohama are 'systemic' in that use, whereas the door is not. Rather, the door is *autonomously* reacting within the system.

Breaking the Binary

Tearing away from the binary of object and field space, there are architectural projects that can be seen as neither composed by geometric schema or the algebraic relation, which give evidence of a tertiary condition.

The Winchester Mansion in San Jose, California, presents itself as an example elusive of either object or field designation. Developed under the guidance of Sarah Winchester, the widow and proprietor of William Wirt Winchester's estate, the Winchester Mansion was under construction without interruption from 1884 until Sarah Winchester's death in 1922[8]. The mansion has been turned into a tourist trap, as much for its former inhabitants (ghostly and otherwise) as for its architectural absurdities. Driven to madness by the spectres of the dead through means of the Winchester Repeating Arms Company, Sarah Winchester felt the need continue adding to the mansion to escape the roaming spirits, regardless of need or sense.

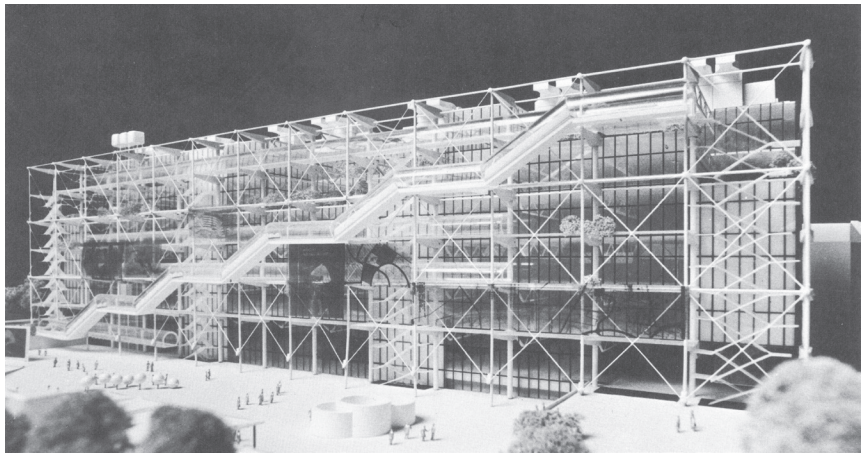
Doors open to nothing from higher floors, stairs run up to rigid ceilings, and layers of windows find themselves in every orchestration throughout the complex. The mansion, in its growth without logic, is not composed as an object or field - it has no sense of completion, as it was never meant to be complete. Where an object would specifically complete, and a field composition would be indeterminately complete, the Winchester Mansion is something different. The "door to nowhere" hints that the design is not incomplete, but partially complete. The door is waiting for a connection from the outside, for the intervention of something external. There is a ridiculousness to being 'partially complete', which is why the Winchester Mansion as an architectural anomaly is

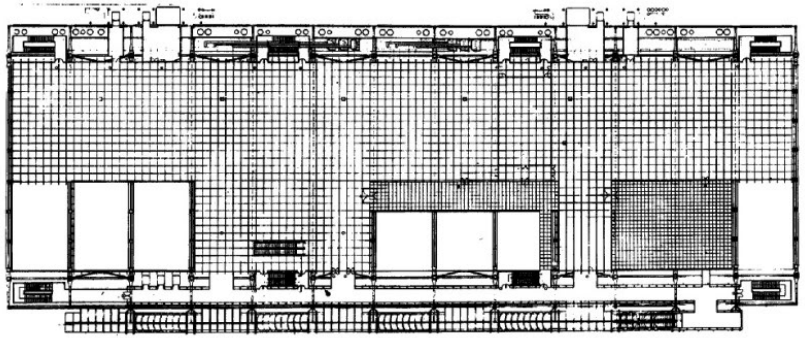
written off as the result of Sarah Winchester's madness. Yet, to be partially complete is to allow external and changing connection, to allow differences to collide and form relationships inter-object and inter-field.

A more canonized project that lends itself to the breakdown of the object and field binary is Centre Pompidou in Paris. The gallery and performance spaces are allowed expansive freedom by the extrication of circulation, structural, and technological sub-systems from internal inclusion[9]. This pulling out of supportive processes to the exterior striates the field condition that develops internally, similar to the Cordoba mosque.

The externalized circulation, structure, and technology are outside of the field of space within the galleries, and thus allowed to react within their own right without observance to the field. The brightly colored tubes and shafts that iconically allow the free horizontal space within are capable of differentiated sizing and vertical placement that would otherwise be constricted by their internal composition. Yet, they are obligated to interact with the internal field space in specific ways, as they need to connect to the mechanics of dispersal inside.

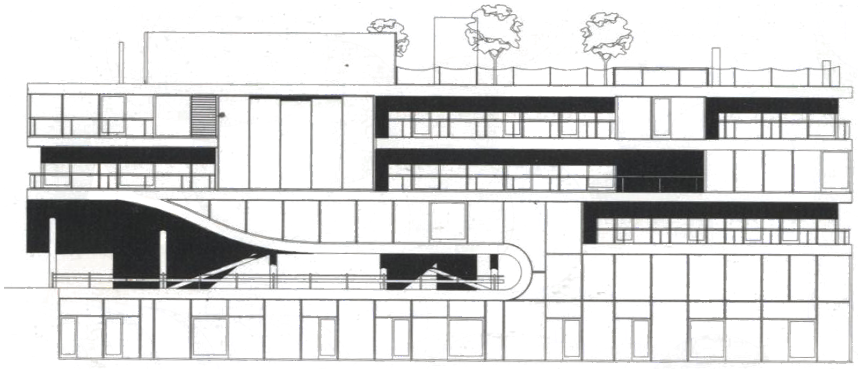
The circulatory tube that climbs up the Western facade of the building is able to wind diagonally upwards without consideration to the clutter of tectonic components behind the bracings on which it is placed. One might say there is a 'sym-tectonic' relationship among the structure, the circulation, and the opened connections between the tube and the galleries.





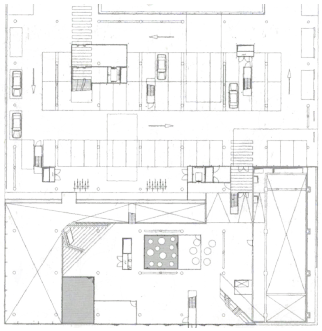
Above: (top) Centre Pompidou western facade with externalized structure and circulation expressed in a model[10], (bottom) Centre Pompidou upper levels plan[11]

No single process (circulation, structure, technology, space) directly demands subordinance, but each is interdependent on the actions of the others. The structure is obligated to partition itself in a way that supports the space and circulation, the space is obligated to recognize the connection to circulation and not extend beyond its supportive structure, and the

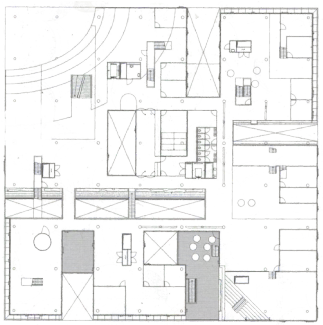


Above : Villa VPRO North Elevation[12]
Below: Villa VPRO Level 1 & 2 floorplans[13]

Level 1



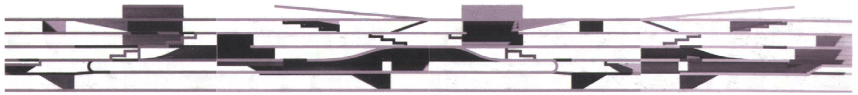
Level 2



circulation is obligated to guide users to the space fluidly while observing the logic of the structure.

Another breaking of Centre Pompidou's internal field space is the obligations that come along with addition, multiplication, or propagation of the space itself. Like in Cordoba, the structural elements are able to extend algebraically, but in dealing with vertical circulation and technological sub-systems any extension is met with the obligation of reconfiguration or further propagation of these external elements, which do not coincide with the same recurring schema of either the space or the structure.

The Centre Pompidou is limited in its break from either field or object by its self-focus. The technological sub-systems alone do not respond to their full range of obligation, showing non-consideration of the environmental factors that have mitigated the relevance of their externalization. Heat from the sun and asphalt have limited the efficiencies of the cooling they are supposed to enact, pointing to the hesitancy of the building to act through system methods. The building does not respond to the numerous systems that surround it, and as such succumbs to the pitfall of both field and object: the strict delineation of boundaries between what is included versus excluded.

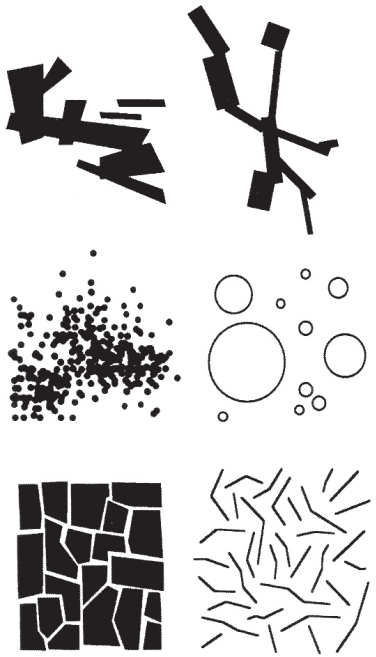


A more recent, and final, example of the binary break can be seen in MVRDV's Villa VPRO in the Netherlands. The office building consolidates the prior use of 13 villas to contain the necessary atmosphere and functions of the public broadcasting company VPRO[10]. Design imperatives were both spatial differentiation (variety of room sizes and types) and compactness (absence of long corridors), which in their appropriations are non-contiguous with the object or field in the project. The office arrives at a diverse variation of office types, while each space is connected to and defined by both adjacent spaces, as well as the presence of the external environment.

On a spatial level, the presence of disjunct variety is apparent - the sections montage diagram produced by MVRDV by itself begins to speak to its ascension from the required flat similarity found in Stan Allen's field diagrams[11]. The spirit of collage allows stark difference to take place, while maintaining organizational quality - there

Above : Villa VPRO Section Montage of floor, circulation, and transforming elements[14]

Below: Stan Allen's field diagrams showing collection without composition[15]



Above: (*top*) north - western level 3 interior[16], (*bottom*) western facade[17]

is not geometric dictation, there is not field cohesion, but there is also not chaos. There is a system of things that work together, based on their own personal obligations, to create differentiated and variegated space.

Beyond the formative device of collage, the system relevant aspects of the building can be seen in both plan and elevation. Specifically, in the North Elevation of the building there are a number of instances that call to question Villa VPRO's relationship with either object or field. There is not a finalized compositional quality to the arrangement of single-floor to double floor-heights, nor is there the retreat of window planes in the formation of terraces and courts.

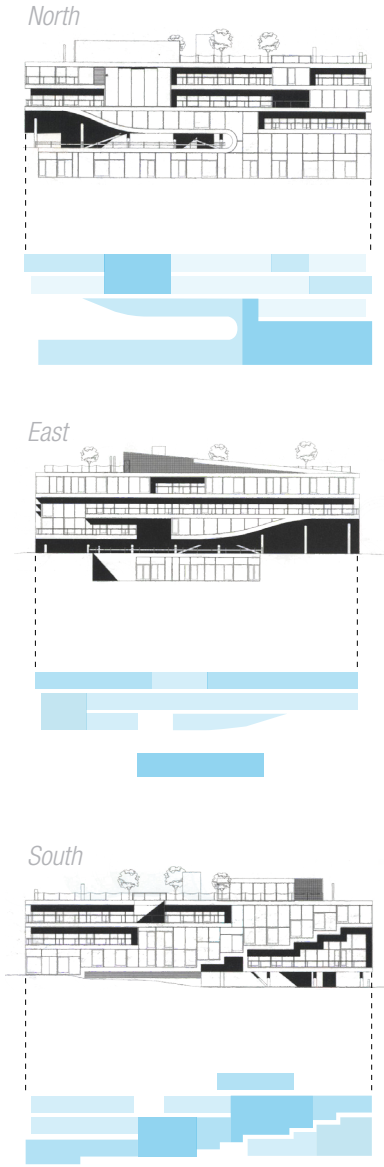
Unlike in the application of the field condition to component types, there is an allowance of disjunct transition - the single floor height does not need to cohesively transfer into an augmented space, but rather can turn based off of immediate need. However minute, this shows that the windows themselves are not treated as a field in their manipulation, but rather as a collection of instances that react based on their relation to adjacent elements and to the internal spaces.

Double floor heights are obligated for creating both large open-feeling office types, but also for drawing in sunlight a greater distance. The double height window is thus related to the floorplan, the windows adjacent in its connection, the climatic condition of external environment, and in the proximity (or lack thereof) of atrial courts that might offset the need for the extended sunlighting conditions that the double-height provides.

Object composition would define the window placement as a property of routine, with differentiation exclusively based on geometric consonance. Field composition, especially in component organization, would post the transition in openness via gradient change from window to window. Rather than having window types, there would be a transformation of the characteristics of a loose, but singular type. Instead, Villa VPRO is able to resist the finality of the object and the cohesion of the field in developing a character of response in window types based off personal locality and obligation.

The schema of Villa VPRO is also of interest when applied to the process of addition or propagation. Unlike the object, it has no rigid quality of completion, but it is also opposed to the limitless projection of the field. The propagation of its system logic would not act like the additions of the Winchester Mansion, in their wacky appropriation of elements without logic, but neither would it act like the Centre Pompidou, extending limitlessly with the need of circulative and technological sub-system extension in response.

Instead, the propagation of Villa VPRO would act within the realm of the system. If the volume remain unchanged, yet 14



MVRDV's Villa VPRO North, East, and South Elevations with window type differentiation highlighted[18]

instead of 13 villa spaces were to be inserted into the scheme of design, there would be an inherent reorganization, as the system is wont to do. If the space were to be extended in any direction, some elements would react much like the Cordoba mosque or Centre Pompidou, but many would need to be completely reconsidered, reorganized, renegotiated. As the volume would enlarge, the obligation for atrium and court spaces would demand a proliferation on par with the extension, and the window types would reorganize based even off of that singular consideration.

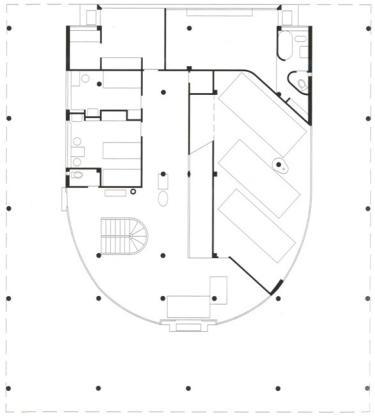
Contrasting to object recomposition, such as the evolution of of St. Peter's Basilica, the reorganization involved in the system is not geometrically determined, but tied to the interaction of spaces. Such as a molecule which has oxygen drawn away from its equation, or an addition of alcohol, the connections made are not blankly additive. The system in its expansion must be specifically tied to openings and opportunities, just as the molecule binds and grows based off preference of connection. Otherwise, growth is a destruction of relationships, rather than an accentuation and extension of them.

Even within its static composition, Villa VPRO also contains differentiation based on the environmental context in orientation. The southern elevation differentiates the terrace offsets versus the stepping double height spaces distinctly, while the organization of non-southern elevations react with higher mixture and are less starkly combined.

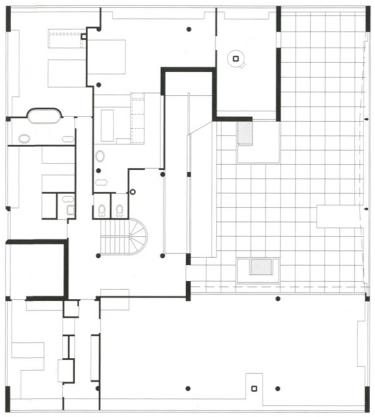
Again, the condition of being 'partially complete' is introduced. The building relies on its context, environment, and individual sets of obligation to find a resting level of resolution, so when these aspects are changed or manipulated, the building cannot help but reconfigure or grow in a specifically induced way. Even in its formative collage, there is a point beyond juxtaposition that Villa VPRO achieves. Spaces are dependent, but also autonomous. Component types are ordered, but not directed or driven by cohesion. While it cannot be claimed as the prototypical project of the 'system', Villa VPRO is successful in its resistance against denomination in either object or field status. It is, at the very least, evidence of the tertiary condition.

This third condition achieved is thus based in the negotiation among very different expectations of space, just as the atmosphere of the 13 individual spaces in Villa VPRO were expected to retain a sense of individuality[12]. There are points where these individual sub-villas are so discordant that they need to be separated in plan and section, or else connected through interventions of open field-like space that can act as negotiating devices between. There are also points where the relationships between different spaces are complementary and parallel, connected with greater ease and spatial consonance.

Level 1

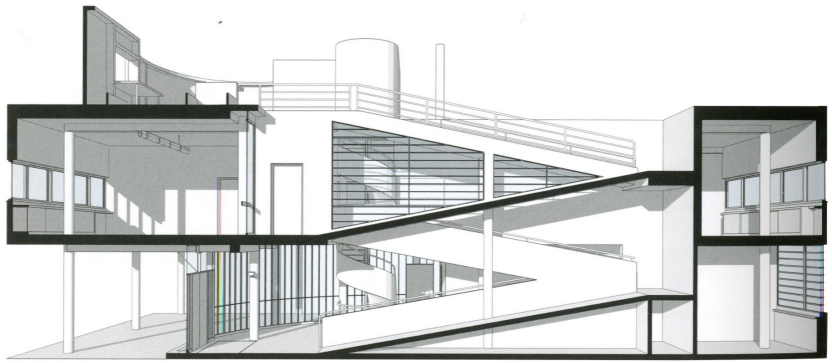


Level 2



In the *System Autonomous* composition there are these moments of cohesion, of field coordination, but the moments are not dictatory. The system is inclusive of object and field qualities, but is not controlled by them - it is the reaction to atmospheres in collision. In Villa Savoye, the canonical Le Corbusier house in the northern-central Parisian suburb of Poissy, there are elements of *System Autonomy* as well, which stand out against its classically composed organization.

In plan, the range of structural devices (piloti and wall) seem geometrically organized at a glance, but investigation reveals several moments of specific reaction that break the perceived classical organization. Piloti cluster at the landing of the stair, and stretch in response to the garage. In the transition between the first and second level there is a stark switch between piloti and bearing wall in almost half of the structural occurrences, creating drastically different spatial configurations between the two[13].

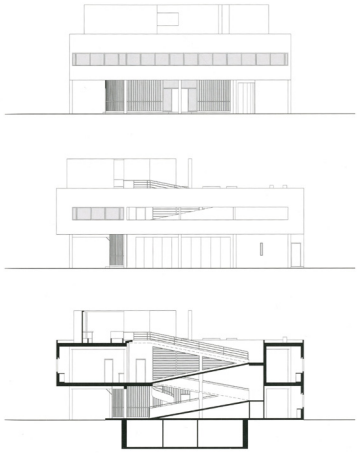


The prominent diagonal of the ramp, spanning among three levels, is not cohesive within a specified geometric schema or field condition, yet connects the extremely different qualities of each level. On the ground floor full height windows wrap along the semi-circle that encloses the garage and entryway, dotted with piloti that create open internal and external space. Up one level, in the visually object-like box of the second level, the ramp is divided into its interior run and its continuance in the open court. Again space on the second level is torn between the openness of the internal court and the tight organization of utilities inside. The third level is a garden and a sculptural wall which wraps around the stair, and the quintessential space of openness. Seemingly, the lone hard lines of the diagonal ramp are at once dissimilar to the spaces it reaches into, yet also the most connective element through the types of spatial organizations that appear on the three levels.

There is a dissonance in the application of window types, of geometries present, and the spaces created within the project, but the negotiation of all its disparate qualities arrives at a resolution that is wholesome. There is no overarching prescription of space or element that forces cohesion, yet the system of spaces and elements is productively interdependent.

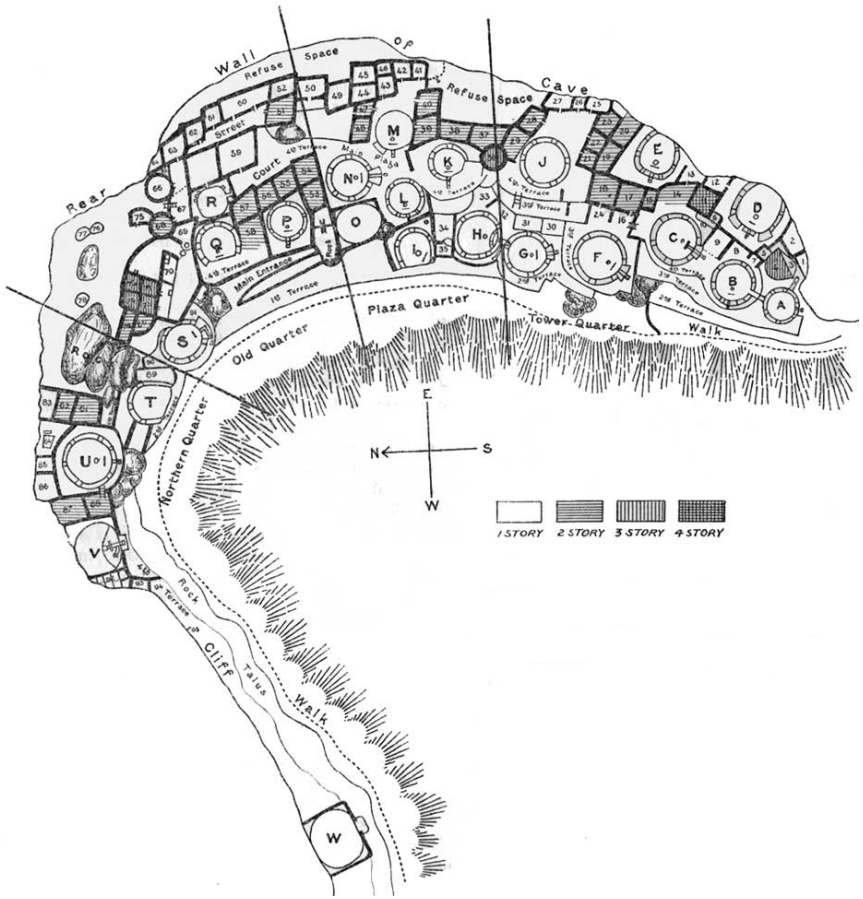
The Tertiary Condition

The step from St. Peter's to the Cordoba Mosque by Stan Allen encapsulates a fun-



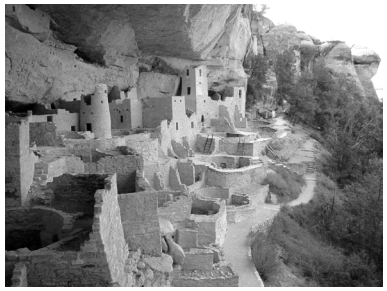
Above : Southern and Eastern elevations, and North-South Section[19]

Across : (*top*) Villa Savoye (1928) level 1 plan & level 2 plan[20], (*bottom*) North-South section along ramp[21]



Above : Mesa Verde Cliff Palace plan, showing organization of rooms and kivas[22]

Below : Mesa Verde's Cliff Palace[23]



damental difference of space, which can be at least in part tied to the techniques of building and specific values of the culture responsible[14]. It makes sense that where Italian Renaissance would put extreme priority on axiality and proportion, that the development of moorish space would harken back to an advanced knowledge of mathematics rather than an object fixation. Similarly, the resolution of *System Autonomy* can be seen via a shift in cultural value and building style.

The Cliff Dwellings at Mesa Verde, a clutter of Anasazi complexes in the South-West of Colorado, offers the final transformative counterexample to both object and field. The Cliff Palace is largest of these complexes, and also the largest and best preserved cliff dwelling in the world[15]. Compared to the uses of both St. Peters and the Cordoba Mosque, the Cliff Palace (along with each of the complexes in Mesa Verde) was not exclusively functional for religious ceremony, but as the communal home for, speculatively, around a hundred residents. The Mesa Verde area had been settled by 400 A.D., and the population of Anasazi remained there until approximately 1300 A.D. The variety of use, and the Cliff Palace's localized production of agriculture and resource management is evident in the differentiated rooms and proliferation of its 23 ceremonial kivas[16].

In line with system understanding, the ratio between kivas and the rooms included in a complex is almost definitive, hanging around 12 rooms to every kiva. In the Cliff Palace there is a ratio of 9 rooms to every kiva, which supports the explanation of its role as a polity center, supporting surrounding communities along with its residents. The kivas are strategically placed, responding to their obligation to sunlight and public access, with more privatized kiva spaces reducing in size and access. The agricultural storage rooms recede to the back rooms of the complex, and the housing for residents finds itself in the middle ground of the construction.
Beyond communal appropriation of uses,

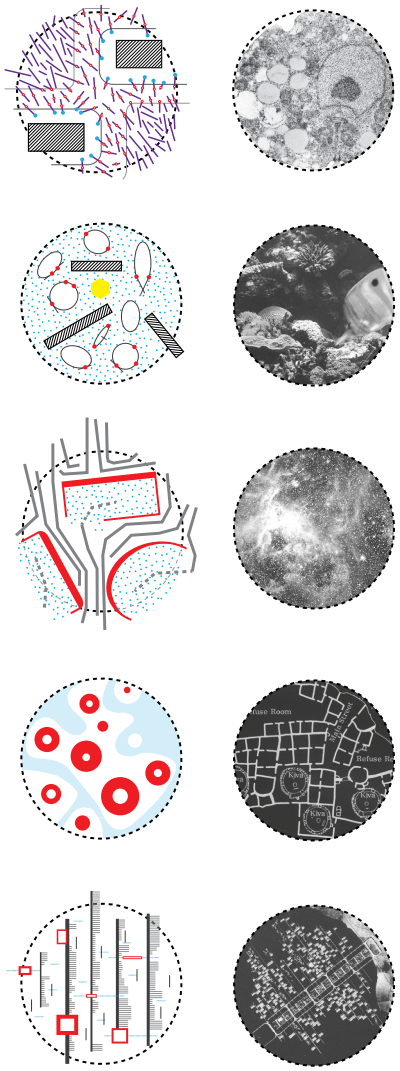
there are also scaled personal spaces for hearth, granarie, and resource management. The spaces within the Cliff Palace are at once communal and personal, and redundantly efficient. The secular rooms (1-94), located on the ground level for communal access, are dotted with a variety of inclusions (fireplaces, communal living rooms, non-residential stored items), with spatial and component decisions being made on an obviously individual basis. The residential structures and the kivas can be broken down into a series of types, all of which are augmented based on the proximity to adjacent structures and environmental conditions.

The levels of spaces are based on a variety of factors, including family size, the height of the cliff ceiling, and the proximity to communal kivas. The placement of doors and windows are determined by lookout views, ventilation patterns, and sunlight. The balconies and terraces throughout each complex react to a variance of inputs, from the amount of multi-story structures present to the circulative transition of priority communal (non-ceremonial) spaces to the general public space of the ground level[17]. There is no geometric shema in plan, and no observance to field condition. There is, however, an ordered system of development, which is declaratively functional, yet without hierarchical control. There is the appearance of architectural *System Autonomy*.

The growth of system is determined by the equilibrium between space and the aspects that support it. Instead of projection by geometric composition or the algebra of the field, the system is free to grow without specific restriction, as long as the supportive elements are in ratio to space. There is both clearly defined and ambiguous space. There is the ability to achieve both private and public spaces without strict administration or cohesive field operation. There are moments of parallel growth, but also of negotiation among spaces that are in opposition. Unlike the field condition found in the diagrams of Stan Allen, and in the projects developed through field logics, there is not an overarching importance put on coherence from a top-down perspective. The understanding comes from the relationships among elements themselves.

Above : Mesa Verde's Spruce Tree House[24]

Below : system autonomy conceptual diagrams



System Autonomy, in its construction, is reminiscent of the natural organization of ecologies. There is a diversity that exceeds that of the field condition, referring back to Bill Mollison's explanation of the term in *Permaculture* as not the total variety of different things in the ecosystem, but the number and variety of connections that can be made between all that is present[18]. There are personal and communal redundancies, and oppositions are always present, but the scale of the composition is constantly tied to the ability to sustain the identities of which it is composed.

The example of the Mesa Verde cliff dwellings is not only appropriate because of its composition of space and use, but also because of its direct proportion to the environment and climate where it is located. The architecture is bound to its location in every sense, is supported by and supportive of the system it is involved in. Instead of infinite development in one location, the Mesa Verde system of complexes experienced growth where sustainable growth was available[19]. It did not recompose in a single location in its expansion, as St. Peters did, or experience the infinite possibility of expansion, as at the Cordoba Mosque. Its growth was without prescribed order, because it necessarily reacted to the obligations of survival. It's composition at each site was in negotiation of the population, the architectural and spatial needs of the functions present, and of the immediate environmental context.

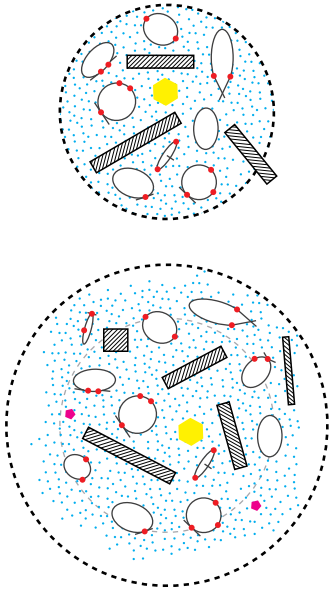
Outside the boundaries of geometric determinism or field cohesion, there is quality to *System Autonomy* that is far more accepting of individual and the interactions that it has with the collection. In this way, its operations are not only more connected to the ephemeral instances of cohesion and opposition, but to something more organic and human than before.

Spatial Politics

In further developing an understanding of the differences and unique aspects of *System Autonomy*, the politics of space can be dissected to reveal its novel characteristic of liberation in response to the quality of control in both the object and field.

Space is innately political in its appropriation, and the architectural instance projects and reacts to a series of broad institutions of the context in which it is built. The building must negotiate with the street, the boundary of the lot, the spatial rights of the area, but also the involvement of the public, the policy of the neighborhood, and the socio-economic values of the culture surrounding it, let alone the style of governance and political control exerted by those in charge. The necessary interaction between development and economic interest alone has changed standardized building practice and the formation of urban centers far more in the past two centuries than the fields of design independently.

Below : system autonomy conceptual growth through proliferated obligation



Neoclassical economic drivers were instrumental in the resultant segregation of the city via functional zoning, responding to the sudden programmatic and social repositioning of the industrial revolution[20]. While many elements of political enaction are tangential in their relation to the built environment, there is an emergent relationship between the evolution of political structures, the types of interactions they prioritize, and the definition of architectural space there within.

Making the obvious connection first, there is an undeniable parallel between object compositions, rigidly developed geometric schema controlled by completed hierarchy, and the politics of monarchical governance. There is proportion, importance, and unyielding authority to each. Referring back to Stan Allen's notes on the object recomposition of St. Peters, there is also the connection of extremely involved and arduous recomposition or reconstruction when the hierarchy is challenged and replaced[21].

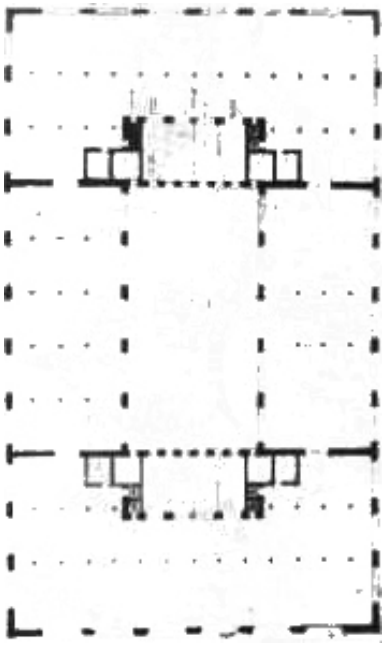
Through the reintroduction of democratic and parliamentary governances, the object space remained as projectors of political message, unavoidably exampled in the urban plan and architectural development of Washington D.C[22]. Humorously enough, it seems that architectural democracy came not through the governmental overhaul, but through the burgeoning freedom in democracy to implement higher levels of capitalist policy.

Henry Hobson Richardson's Marshall Field's Wholesale Store in Chicago shows the architectural reaction to the industrialized economics of the late 19th century in terms of dealing with mass - both in needing space for masses of things built through mechanized routine, and in dealing with the masses that would come to consume them[23]. Strikingly, there is unavoidable similarity between the plan of Marshall Field's Wholesale Store and that of the Cordoba Mosque.

In the ways that the structure at Cordoba begins to appropriate field space in response to the masses (those who use the space in religious prayer), Marshall Field's is required to react to the presence of the mass in semi-identical ways, however different its religion might be.

The field in many ways coincides with the intent, the practices, and the failures of democratic governance. Instead of control by unitary positions (geometry, royalty), a broadened scope of reference prioritizes the collection of instances within defined boundaries (vectors/characteristics, population)[24]. The mass is of absolute concern, and the coordination of all within the mass is necessary.

Instead of a complete or identifiable composition, the field is representative of an ephemeral completion, just as the transition between authoritarian and democratic governance switches from identifiable leadership to the representation of power via the composition of the 'state'[25]. There



Above : Henry Hobson Richardson's Marshall Field's Wholesale Store upper floor-plan (1890)[25]

Below : Marshall Field's WHolesale Store photograph from Chicago Historical Society[26]

is no singular location of power or lone importance in either democratic structure or the field condition, ideally, yet the manipulation of broad collections is both possible and constant.

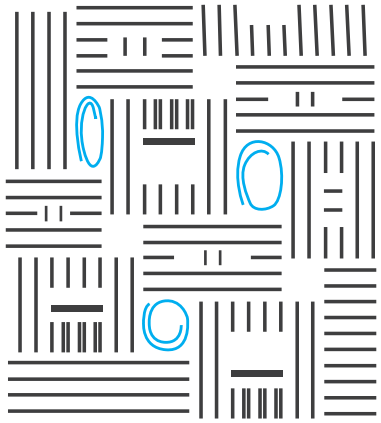
The hesitancy and failure of prioritizing the mass, both politically and spatially, comes with the development of 'majority rule' and other devices that flatten the scope through which governance and reaction take place. The position of those external to the largest voice is lost, giving to the dominance of the mob. Specificity, exception and the understanding of forces in action upon unique elements is devalued in preference of simplified generality, reminiscent of the phrase so often used in the propagation of state-driven values, "if you don't like it here, then leave."

There is not room for direct conflict in compositions in which the majority is prioritized, and although there is available a heightened level of manipulability and change, it must always be referent to the composed whole. The abuse of minority voice is to be expected, as until there is a majority in support of an issue or condition, the difference is lost in the zero-sum total.

The limitations of the democratized field are thus the inability to simultaneously realize multiplicitous aspects of element identity, essentially a non-comprehension of the contemporary use of 'intersectionality' in dealing with minority oppression. In democratized policy and within the field, the involved elements are seen for their group involvement, and their individual identity is lost via the non-recognition of the presence of both individual and group-member statuses at the same time. The field boundary can be redefined from comprehensive index (total population) to specific characteristic types (minority, gender, etc.), but there is no coordination between those differing scopes. The conversation is either exclusively about the entirety or the specific characteristic, with no interaction able to recognize overlapping field group statuses.

Complexity in the field is often developed through superimposition, overlaying multiple field groups, though under scrutiny the fields can only be deconstructed individually. The complexity is simple, the overlap of unconnected compositions, and the interaction that they hold is only implied.

In the Swiss Sound Box by Atelier Peter Zumthor & Partner for the Hanover Expo 2000, the space is developed through a field condition in plan and the composition of a field via timber components[26]. The field of walls is opposed by three stage objects which are inserted into void spaces, posing the two fields (walls, stages) over one another. The method of superimposition is able to coordinate the two non-oppositionally, yet there is no simultaneous consideration. Either the field of stage-objects or the field of the timber structures is of interest, with no intelligent dependence of either on the presence of the other. There is a perfection to the Swiss Sound



Above : plan structure diagram of the Swiss Sound Box (2000) by Atelier Peter Zumthor & Partner for the Hanover Expo 2000

Below : Swiss Sound Box interior corridor[27]

Box in its field application, but its perfection comes through its scale and use as a pavilion, which demands no complex use of space beyond simply standing. It works as a field, but in its adequate execution the non-connection between walls and stages can be felt - they share a footprint, but not much of anything else.

The recognition of failure in focussing on the mass comes through its being pushed beyond the limits of its complexity, in projects such as the Yokohama Port Terminal, in which the designers must carefully interact with the given moment where field logic becomes broken (the door, the code of the railing)[27]. These are instances of recognition that the field condition is aloof to its applicable obligations, and represent brief periods in which limited system methods are used in solving the intelligence that the field lacks.

The politics of *System Autonomy* draw, expectedly, from more radical policies of coordination. The system acts politically off of simultaneous recognition of part and whole, accepting specificity and broadness. The fundamental difference that puts simultaneous recognition available is the property of individual obligation, which ties to anarchical theory, specifically in the context of Simon Critchley's *Infinitely Demanding* [28].

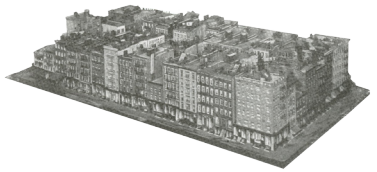
Critchley asserts that the obligations of the individual, both to the self and to the other, are infinite and unobtainable, but that the ethical drive to respond to obligation is what results in interdependency. His definition of anarchy, in developing a sense of personal response rather than applied control, is "the creation of interstitial distance within the state through the continual questioning from below of any attempt to establish order from above.[29]" Following the reasoning of anarchy in this sense, the organizational strategy of *System Autonomy* is not the application of rules over the whole, but the development of personal and individual reactions to contextual obligations - a priority of the element responding to the group in its immediacy.

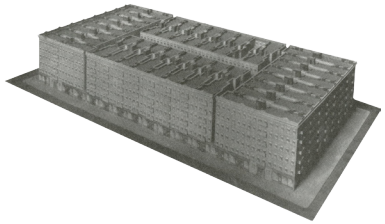
In spatial and political governance it pulls back from the scope of attempting to control composition from an observance of the total - reaction and order comes from understanding the immediate relationships of elements, peripherally and broadly. The interest of *System Autonomy* is from the contextual looking outward, rather than the object looking inward, or the field condition looking inward.

In architectural practice, the sense of these obligations is conceptually hard to grasp, because they are non-specific, but there are moments in which obligation to individual spatial conditions overtly takes place. Often, these moments are due to the introduction of different codes and regulations that are instituted because of some causal event that recognizes the need for regulated change. The two most basic moments of this type that come to mind are the evolution of the organized

Above : evolution of the basic tenement apartment structure (1850 - 1901)[28]

Below : (*top*) model of aggregated tenement block without 1901 regulations in place[29], (*bottom*) model of tenement block with exclusive dumbbell design organization[30]





tenement apartment, and the vertical zoning visualization of Hugh Ferriss in *The Metropolis of Tomorrow*.

First, the evolution of the tenement apartment complex is of interest in relating to the system autonomous because its transitions are based in the obligation of space to the specific condition, yet also organized within a collection of spaces[30]. As regulations on light and ventilation per unit were put in place and augmented over time, the formal organization of the basic tenement apartment complex adjusted to meet the obligation that was both external (put in place by federal and local legislations) and internal (the individual unit requirements)[31].

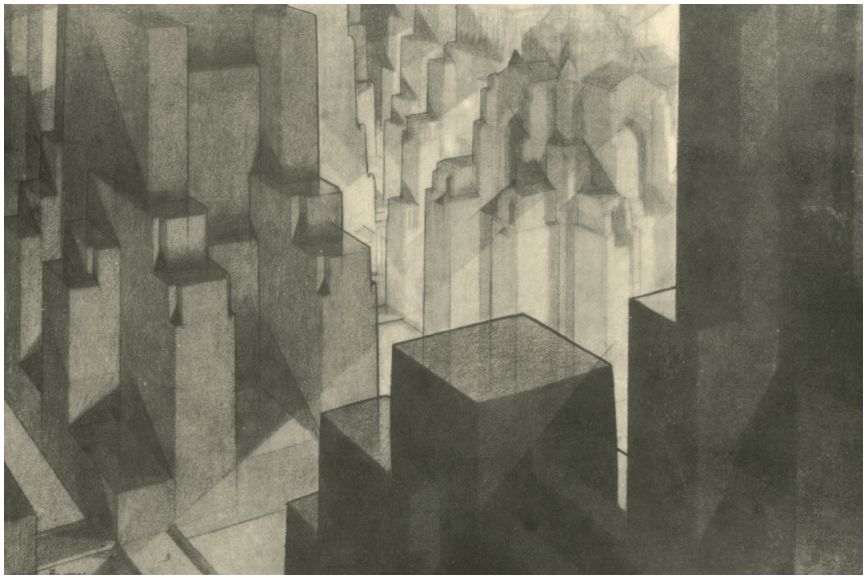
The simpleness of its system qualities is due to the oppositional constraints on developing tenement complexes at the time - they must be livable, but they also must be economically viable. The balance there between commercial necessity and human necessity leads to an interesting compromise of space and organization, showing the ability of change in *System Autonomy* not through cohesion, as in the field condition, but because of the presence of *dissensus*.

Of course, the driving concern of the tenement house as an example is the dichotomy of its obligations. The true quality of *System Autonomy* is in reacting to the multiplicitous obligations that are in force, beyond that of 'livable' and 'economic' or any simplification that might lead to the prototypical application of a type without specific consideration of its context. In general, the tenement house evolution shows the reaction of form to the obligations of healthy standards of light and ventilation for every residence within, but applies it in a sense that is placeless, unresponsive to specific context, orientation, or climate.

In response to these limitations of the prototypical evolution of the tenement apartment complex, the visualizations of New York vertical zoning code by Hugh Ferriss in *The Metropolis of Tomorrow* show an amazing capability of variety, creativity, and specificity in face of the obligations put on the early 20th century skyscraper[32].

The visions entailed within *The Metropolis of Tomorrow* range in specificity, generally showing a variety of reactions within their contexts. There is a quality of redundant action that connects with bottom-up process prioritized in *System Autonomy*, showing reactions of specific architectural volumes to both the immediate and the peripheral. Driven by the assumed logic of vertical construction, in being able to move upward while still providing the obligations of light and ventilation on an urban level, the circumstances are broadly similar, yet Ferriss is able to render their environments diversely[33].

Both similarity and true difference are able to be present, due to Ferriss's avoidance of perfect cohesion in rendering the urban



Below : Hugh Ferriss rendering of possible future city conditions in his book *The Metropolis of Tomorrow* (1929)[31]

environment. The quality of negotiation, even in cityscapes including monolithic buildings, allows there to be natural (even if simulated) interaction among buildings, spaces, and streets.

Although the drawings of Ferriss exhibit a former style of constructive, technological, and spatial restraint, the more abstract renderings are able to show an incredible level of quotidian conditions, as well as evidence of the anomalous. There is not total focus on the singular or the formal prescription that comes along with it, but an exhibition of many spaces reacting with many spaces. There is not forced similarity or cohesion of the masses, but seemingly an emergent reaction of form to a series of obligations based on individual identity, as well as each identities contextual environment.

The *System Autonomy* political nature is based in individual reaction against the formation and expectations of the group. It defies and negates overall control, because the recognition and understanding, let alone dictation, of the processes and vast identities that take place within space, architectural or urban, is impossible. Instead of attempting to maintain an imposed order over infinite qualities that are coordinated as well as conflicting, the politics of *System Autonomy* take place on the level of what can be understood and reacted to in the given situation - the true nature of bottom-up and non-hierarchical organization.

The Integration of Contexts

Although the description of *System Autonomy* so far is limited in its conceptual language, its possible execution is excitingly limitless. The unfortunate aspect of the exposition of field conditions by theorists like Stan Allen was how quickly it transformed from a conversation concerning space to an applique of a visual. The popular use of field devices has become the development of either formal or component organizations that are more or less stylistic, rather than referent to the critical condition first uncovered. *System Autonomy*, in its depth beyond the pure analysis of cohesion, avoids the process of applique, as it is the constant questioning of proper responses, rather than isolated experiments with form.

Since the failure of the modernist prom-

ise, the vision of a one-size fits all solution for social, urban, and architectural problems, the interests of projective theory have ranged broadly from antipathy for non-discipline issues to the sweeping intent to artificially construct a framework for the multiplicity and complexity that is already present. Each side of the spectrum is an attempt at de-contextualizing the placement of architecture in its environment. At its worst, the culture of theoretical projection argues for the erasure of discontent and opposition through the assertion of cohesion, which is incontestably impossible. At its best, it is a search for coherence, which can be similarly described.

There is no point in creating coherence, but there is the imperative of dealing with and reacting to the essential incoherence that will endlessly manifest in any collection of populations, in any collection of elements, and in any collection of space. Architecture, both of the city and the project, needs to release the amount of control it holds, as Stan Allen concludes in *From Object to Field*, but also the idea that it can manage complexity in general[34].

Richard Sennett, in *The Uses of Disorder*, puts forward the idea that the very want for order is the inclination of adolescence, whereas the acceptance of disorder is the ascension into adulthood[35]. Reacting to that statement, the responsibility of architectural practice is no longer the control of space through geometric schema or the 'management' of space via the field condition, but the spark of recognition that complexity, multiplicity, and opposition are issues which the built environment must react to rather than attempting to arrange.

System Autonomy shifts away from the project and city understood through overview, and into viewing spatial practice from the split perspective between personal and collective scales. A necessary portion of this comes with recognizing the interconnection between the architectural project and its neighbors, both immediate and throughout the broadest of contexts. No architecture is an island, nor is any architecture landlocked and subservant. Instead, every architecture is a confederacy, with obligations to the self, and to the loose assemblage of the whole. The failings of both object and field are the ways in which they negate each other, and it is time to begin working on how simultaneity of identity is achievable in the built environment.

The point of this investigation is not to distinctly define *System Autonomy* or concretely demonstrate its necessary specific or detailed execution. However, there is a level of conceptual resolution and situational understanding that can be achieved - qualities and characteristics that are loosely definitive. The qualities of *System Autonomy* can be described (at least in part) as: infinite, inclusive, interdependent, diverse, and complex.

These are qualities that can begin to be applied through multiple perspectives.

Urban form, infrastructure, social agency, and many other fields both peripheral and outside the scope of architectural discourse can apply the same system methods in reacting to the acceptance that control and management are no longer viable tactics. Some already have.

The culture of the built environment specifically, and especially that of the theoretically projective in architecture, must break their conceptual dependence on devices of control and management. Instead, it is imperative to begin to recognize the moments in which the appropriation of space within the project, block, and city can react to the present needs and expectations of so many disparate sources.

This is not achievable through the top-down understanding of all elements in motion, but rather through the basic and personal responses that come through the bottom-up organization that is innate within natural ecologies, social interaction, and the concept of *System Autonomy*.

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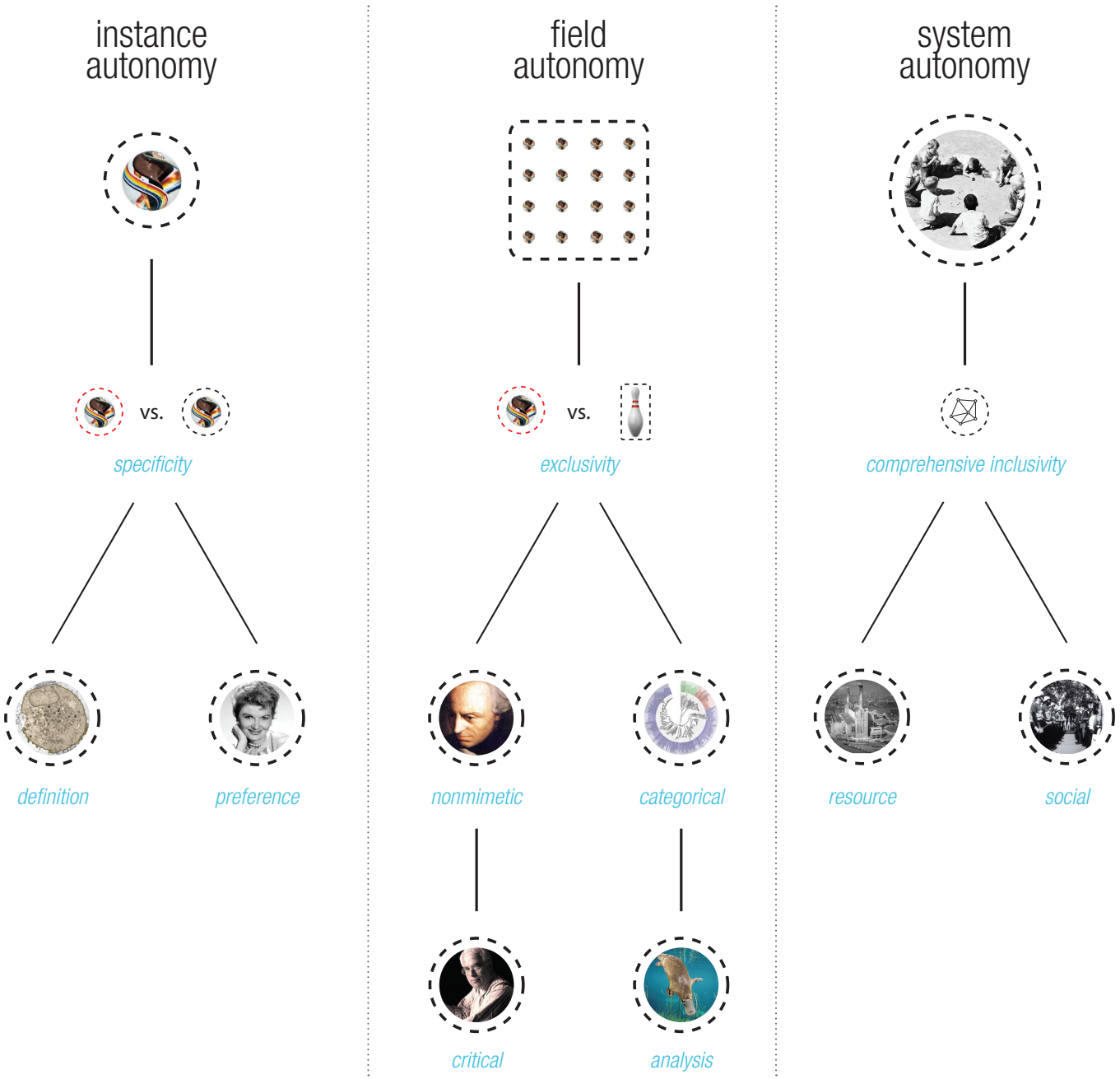

instance autonomy
vs.
specificity
definition
preference
field autonomy
vs.
exclusivity
nonmimetic
categorical
critical
analysis
system autonomy
comprehensive inclusivity
resource
social

Definitive Autonomy
the three perspectives

In the unexamined extents of conceptual 'Autonomy' there is a limitlessness that feeds an underlying anonymity of intent or context, and as such the strict defining of the applied Autonomy in use through this thesis is undoubtedly required. So often the explanation of Autonomy can be divergent even in singular explanation, as such basic concepts are preconditioned to do, and without the exposition of assumptive measures by the interpretor, the full meaning of the active definition can be lost due to a lack of a correct cognitive framework or context.

The endeavour to completely expose the lens through which Autonomy will be viewed is, of course, futile - the interconnectivity among the various forms of Autonomy, as well as the conditions they each evoke on individual and collective levels, is a complexity that has no logical resolution. This portion of intent-finding is just as searching for the interpretor as it is the reader, as each step forward in defining strict measures of context in the use of the term requires the re-evaluation of prior assumptions made in the pursuit of the definition - the intellectual equivalent of the Ouroboros.

In short, before using Autonomy in speaking about organizational models for the city, or anything for that matter, the active definition must be first extricated.

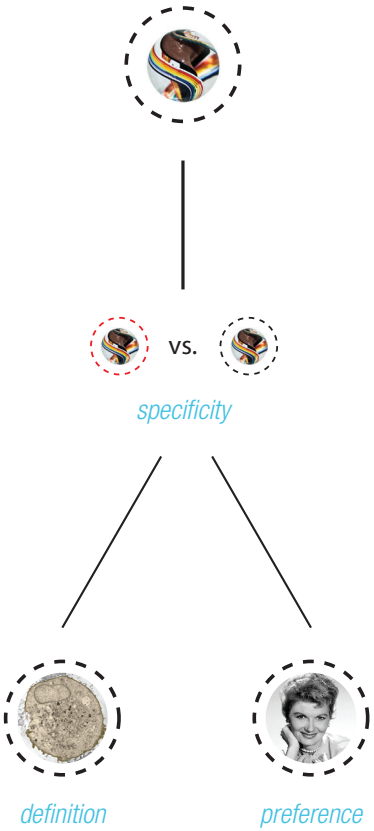
The complexity of Autonomy will be examined through the perspective lenses of the autonomous instance, the autonomous field, and the autonomous system. These three lenses, in comparison to eachother's scope, are not quite scalar, not quite disparate, and certainly not quite concrete in their exaction, but have relational elements that fall within each.

The conclusion of this examination of the active definition of Autonomy in this thesis does not strictly claim one lens to be superior to another, but there are inaccuracies, inadequacies, and validations of each that might predispose its relevance to the practice of architecture and urban planning.

Each has a certain placement in the theory and history of the built environment, though the "could, would, and should" of each is equally undecided in the broad scheme of their enaction as the definition they are attempting to clarify. In this exposition, certain moral parameters are assumed, as the application of Autonomy in development is only being pursued in the interest of finding a quintessentially 'better' way of organizing urban communities, with a focus on both human and non-human responsibilities that are so often shirked.

Across : Three Autonomies breakdown, in which the basic assumptions are translated into the uses and derivations of the logic that supports each type.

Figure A.02 : Instance Autonomy breakdown.



Instance Autonomy

Instance Autonomy begins in the simple framing of singular identity, and as much can begin to be broken down from the focus of *specificity*. Definitively, it the separateness of a thing from all other things. An object is autonomous in its unique identity from all other objects, regardless of how identical two objects might be in comparison.

Immediately, this fundamental understanding can be put to use in the self-recognition of a sentient being - one can observe their own instance autonomy in recognizing the presence of one's self and its innate difference to the presence of another.

Accepting that one is defined by a singular self, and while composed of influences from limitless external sources cannot sever nor permeate the dichotomy of 'self' and 'other', the pursuit of achieving specificity pushes past this simple definition.

As is used in the diagrammatic breakdown shown in Fig. A.02, the scalar level in which the recognition of an object (marble) is achieved allows one to differentiate between one object and its identical partner, but upon further inspection it must be understood that this is achieved through the recognition that the aggregate matter that composing both objects is innately distinct and as such autonomous in identity.

The definition so far of an object taken as an autonomous instance is obfuscated by the necessary step of declaring not only the object total an instance autonomy, but also the object components, further dividing up a conceptually autonomous identity into the full index of autonomous parts and *their* inherent identities. The specificity of an object, at this point, has fractured into layers of specificity, and this recognition of layers leads to interesting forms of extreme complexity.

The first form of complexity that layering leads to is the recognition that when beginning to break any object into its index of parts that the index itself is constantly manipulated to varying degrees. In taking the example of any person, the biochemical processes taking place within the person are in constant motion, and as such the component index of the person is in active flux.

This index fluctuation augments the frame in which the total object (person) is autonomous. In defining any object as autonomous from another as an instance, the argument is fully formed only in being able to find distinction between the presence of both the total and its parts from other autonomous objects, so as it is recognized that the index of parts is consistently changing, an argument for instance

autonomy might be broken into the differentiation between one object's instance autonomy in each state of change that is being achieved during chemical processes that are enacted within it. Simply, if any object is defined by its makeup, it must also be distinct in each change of that makeup, and the object in any given span of time is comprised of multiple instance autonomies.

In example, one is a collection of autonomous instances and the only sustained autonomous identity that one can define one's self by that contains the collection of these instances is the concept of one's self. Constantly in physical fluctuation, the idea of the cohesive self is the only constant.

The second form of complexity is reactive to the obfuscation achieved through the first in the way it begins to search for the most basic level of object autonomies, which further exemplifies the pursuit of *specificity*.

If an object is the total scalar level of an instance autonomy, the discovery of the exact matter of its most exclusive layer would correctly address the tensions that the chemical change of the an object's component index creates. This can be seen in the pursuit of atomic theory and specifically in the definition of elementary particles through particle physics.

The definition of the total object in this case is being formed through the inspection of the object's most indivisible layer - the atomic structure of matter that stretches beyond the differences of singular atoms into the very smallest particles that define any and every separate instance of matter.

This second form of complexity reaches to define the object as the specific set of sub-atomic particles that connect exponentially in order to form the totality of the said object. Through this method of object defintion the assumption is that the way in which to understand anything is to fully define its most indivisible part, and that the definition of the most basic reveals the logic set that organizes the entirety.

In understanding Instance Autonomy and its application, the concept is used both in the discovery of scientific properties by investigating the most basic, a method of *defining* things previously undefined, but also in the more casual way in which one comes to employ *preference*. While the former has been fervently explained, the latter involves a more instinctual understanding of Instance Autonomy on the object-level.

The most simple way in understanding the use of the concept in achieving preference might be to discuss a type of object each person has a specific opinion on: the mother. In a statement of the autonomous instance: I love my mother, not all mothers. In this way each person applies the concept of Instance Autonomy in separating the specific object that they prefer not only in the process of defining the distinct

identity of an object, but also in the evaluation of that object in comparison to all others. Following this logic, evaluation itself is an enaction, or at least recognition, of an object's instance autonomy, which has very interesting implications on the conceptual application of moral or political choice - but we'll leave that there.

Through the understanding of Instance Autonomy and the complex layers that it involves, speculation upon how this lens of autonomy has been interacted with in an architectural spectrum can begin to be examined.

The architectural connection similarly has a variety of ways and layers in which it can be seen, though the most simple understanding is the defintion of architectural work to itself and its division between it and another, just as the object (marble) was defined.

The project as an autonomous instance also can be similarly, and more clearly, broken into its component index - the instance can be completely divided into the number of bricks, screws, boards, windows, doors, and slabs that comprise it. In fact, the architect as master-builder is predicated on this divisional knowledge of the component makeup of the built environment and the processes employed in the completion of an architectural work.

This thread of defining a project through the identity of what it incapsulates ties to the descripition of a project through its square footage, program, or primary structural materials, but also has a more critical relevance to the evaluation of a project through its component index.

In the recent film "How Much Does Your Building Weigh, Mr. Foster?" the titular question is posed regarding the Sainsbury Centre, and leads to a relevatory rexaming of the efficient use of material in the pursuit of a successful architectural work by the subject firm.[1] Suddenly, the architectural instance needs to be critically justified through the correct and balanced appropriation of its component index, though this index in the case of the film covering the career and work of Norman Foster casts the moral imperative as one innately material.

On the object-level, the architectural instance has an underlying connection to autonomy in the way singular works are envisioned separate from the architectural context surrounding them. The perceived autonomy of a work consistently signifies its importance, whether it is seen in the form of the emblematic cathedrals in European city centers or in the capitalist driven 'iconic architecture' of the recent past.[2]

While the connective context of urban fabrics has always been viewed through the scope of the field, or more accurately through sectors, the iconic project has held a historical power over the critical discussion of architecture in the way that both style and era are discussed through

the exclusivity of comparing monumental works without strict consideration of their direct consequential surroundings. Whether in discussing the Sante Maria del Fiore or the CCTV Tower, the cynosural project has been distinct in the discussion of stylistic eras for similar reasons concerning the interest in elementary particles: in order to describe the conceptual entirety, the index is observed.

In these cases, the description of the critical periods of architectural practice are done through the examination of what that comprise the specific nature of the period, the instance being reframed as the period itself. The death of modernism, if taken as a conceptual instance, is often described in citing the destruction of the infamous Pruitt Igoe housing project, and in being described as such is understandable through its component index of evidence.

This method of inspecting the critical progress of architecture as a field has not been complete, especially in recognizing the matrix and field interests that have permeated more pressing research over the past quarter of a century, but while these investigations have led to an incredible shift in organizational methods, the tradition and history of architecture is one of the defined instance.

This is not inherently negative nor positive, but a core process of architectural production, counting that any project needs to be self-focused in organizing the complex combination of material, structural, and aesthetic inclusions that it involves. Rather, the architectural instance, if taken out of the object context and critically observed, seems to take on the definition of more than its physical components, but also its contextual, cultural, social, and political responsibilities.

This would be true of any instance autonomy, though the architectural work is historically in a short list of types of objects that have been so comprehensively investigated and evaluated in their full spectrum of identity roles, both physical and otherwise, reaching into deeper history. The critical reservations over the applied evaluation to the architectural instance are not in the method itself, but rather in the range of projects to which the method is applied.

Whereas the iconic project was the object of exclusive focus, the new imperative of applying the autonomous instance description and evaluation is to include the entirety of architectural production comprehensively, and in so doing involve every architectural work in the spirit of the spectrum of responsibility that has been traditionally expected only of the iconic.

Figure A.03: Field Autonomy breakdown.

Field Autonomy

Field Autonomy as the secondary lens through which autonomy can be classified begins with many of the assumptions that are contained in Instance Autonomy, though applied in a very different frame. This new lens begins with the intent of comparison between objects, and in beginning to speculate on the identical nature of object-types and their characteristics.

Whereas the instance object (marble) is autonomous in its identity, the critical evaluation of many of its characteristics have the implication of a collective evaluation on all instances that are so similar to it to be considered collectively identical. Beyond the individual evaluation of every autonomous identity in a collection of similar objects, the shared qualities of a collection of objects may be evaluated as the collection overall.

At the scale of Field Autonomy the collection is evaluated as an overarching singularity in which the defintion of identities is in the overlapping physical and conceptual qualties of the field. In example, the evaluation of an object-field (marbles) excludes the evaluation of an alternative object-field (bowling pins). The scope within which the object-field is being evaluated inherently separates objects contained within the field and all those which are not. The scope of an object-field is infinitely flexible, depending on what level of characteristics are being examined.

In one way jacks and marbles might be evaluated in the same autonomous field due to their overlapping conceptual use in 'playground games', but also would mutually exclusive in an object-field in which physical characteristics are being evaluated. The colloquialism of "comparing apples to oranges" also exemplifies the intent of separation in evaluating items only in the object-field context that they are involved in - that said, if the object-field were to involve the scope of 'fruit', both apples and oranges would be included and could be critically evaluated in their shared characteristics.

Inherently, the scale of Field Autonomy is divided into two major scopes of application: categorization, and nonmimetism.

First, in the organization of Field Autonomies similar instances are grouped together with the intent on creating categorical fields. The utility of categorizing instances into fields lies in the ability to further investigate the similarities between all scales of categorical groups, as can be seen in many systems of taxonomy. Just as Instance Autonomies are utilized in the pursuit of objective understanding of a singular identity, Field Autonomies are used in the investigation of sets. The system of biological taxonomony is one such

example in which all forms of biological instances are included within a hierarchical organization in which divisions of an overall field (biology) are utilized in inspecting the specific qualities of more and more exclusive groupings (marsupials, invertebrates, canines, etc.).

Categorization also allows a level of analysis that relies on Field Autonomy. Instances of the overall field that do not fall within usual categories, such as the Platypus, are placed within the field in order to progressively understand the overlapping and exclusive qualities that the specific group (platypuses) contains in relation to the overall field.

The second major scope in which Field Autonomy is applied is the evaluation of the nonmimetic. The nonmimetic object is one without the dependence of representation, and thus autonomous in its qualities and characteristics.

Notably, the field of art has been most complexly involved in the nature of mimesis, and its modern liberation from representation has defined it as a model of conceptual Field Autonomy. Art as a field involves an amazingly complicated set of instances, yet the philosophical implications of autonomy in aesthetics maintains the claim that creative product has no dependence on being representational of either history or other hierarchical power models, such as government or religion. This break from mimesis allowed specific breaks in traditional aesthetic processes in the late 19th century, in which the technical and conceptual processes of the artist began to underlie aesthetic movements rather than the methods of representation.

The claim of Field Autonomy in such conceptual fields like aesthetics implicates a the consequential claim of critical autonomy, in which criticism of the field can only viably be formed from the perspective of the field itself.

The claim of critical Field Autonomy lies within the absence of its obligation to be representational, and in so much having the liberated power to be criticized only through the processes that it chooses to involve. In this way art can only be critically evaluated through the lens of art and not by that of devices of control, such has been the historic precedent in the control of aesthetics by divine or political devices. These claims link back to the colloquial call to not “compare apples and oranges”, which implies the critical evaluation of either apples or oranges belongs to the field of each respectively.

Outside of the technical processes of the two major scopes of Field Autonomy, many social implications can be derived from the concept in both positive and negative affectations.

Immediately, the grouping of similar instance into autonomous fields allows, in direct opposition to the claim of critical autonomy, the evaluation of any field by those external to it. This can be seen in

the form of social prejudice, in the way that external entities are able to evaluate fields of people and often assume characteristics that are not definitive of the field.

In a more benign way, self-categorization allows distinct collective identities in which overlapping preferences or characteristics become simultaneous forms of bonding and separation. To call oneself a "dog person" is a form of self-categorization that involves all other persons that would similarly identify themselves. In this way Field Autonomies are used both in the inclusion and exclusion of oneself from specific fields of instances.

The architectural affectations of these types of Field Autonomy can paralleled in the application of the same types of logic. The most civically relevant example of Field Autonomy in architecture would be the establishment of cultural districts, as is investigated through Richard Sennett's *The Foreigner* in the form of the Venetian Jewish Ghetto during the Renaissance and the expatriate culture of Paris in the 19th century.[3]

The forms of cultural division of the city are both implicit and explicit, sometimes being as brazen as specialized ruling and walled districts, as in the case of the Venetian Jewish district, and alternatively being formed without formal ruling, as in the case of Manhattan and its socio-cultural lines drawn by property rental prices. Urban districts have always had cultural identies that form the collective description of the built environment that is included within their borders, even in the relatively short-lived urban environments in the United States. White flight periods, and modernist solutions for welfare housing have defined sections of many American cities, and in the same way that the Etruscan district of Rome was defined by the cultural values of its inhabitants, each district of prototypical American city has a sense of cultural autonomy that creates a divison between itself and outsider.

Taken in a similar fashion, the divisionary zoning regualtions that have defined urban growth and renewal around the world since the first siting of the industrial revolution have created autonomous fields of programmatic use. With many cities still being split into districts specifically classified as commercial, residential, idustrial, and many others, the separation of these programs has led in part to the dependence of the automobile, which has adeptly facilitated the separation of working and residential districts.

This city zoning separation can be seen as partially resulting, though not entirely responsible for, the divisionary programmatic knowledge of building types. The exclusivity of office, residential, medical facility, etc. design knowledge sets is inherently connected to the separation of programs from shared space, and in such the designer of a singular type needs not retain the exclusive knowledge set that might be applied to an alternative type. Both this programmatic separation, as

well as the zoning district separation of building uses can crititqued in its inability to cohesively achieve highly functioning districts, except in specific cases on the overlapping borders between separate districts. In this case, strangely, the area of overlap achieves a higher culturally autonomous identity than either of the districts in separation.

In direct relevance to the field of architecture, an abstract much the same as the field of art, the Field Autonomy achieved is an issue of the critical. In establishing an independence from mimetic devices in which the architectural work would be necessarily reproductive or representational of governance or religious hierarchical models, the field of architecture defined its critical evaluation in terms of itself.

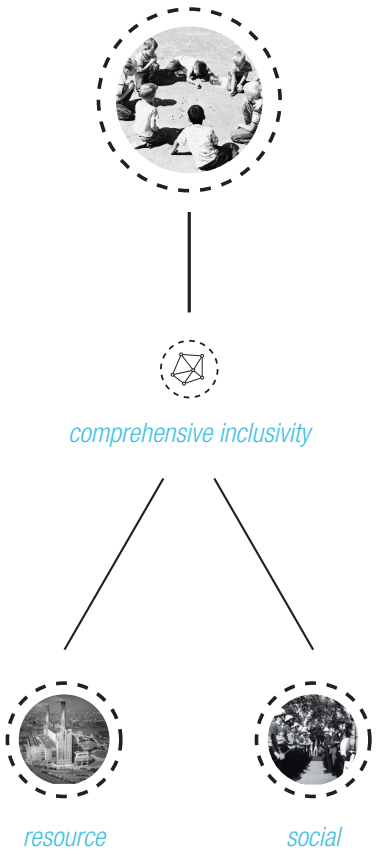
The dawn of modernist theory begins to exclusify the discourse of architecture into only the educated fields that were connected through shared senses of design, but the introduction of the International Style can be seen as a form of architecture autonomous from context, history, climate, and culture.

To an even further extent, Eisenman's critical autonomy divulged in his processional examination of the project, severs the architectural responsibility towards formal reaction to program, as well as the intentions of the consumer. Whereas Modernism might have declared the death of historical reference, it remained resolved to frame the project as conceptually representational of the machine. This era ends with the critical period of the late 20th century, and the severance is reveled in through Post-Modernism, in which architectural languages of non-contextual reference and sarcasm become so exclusive in their reception as to alienate all except for those unarguably architecturally literate enough to understand.

There is now a dichotomy between the same culture of exclusive literacy in architectural publication and a newer view on the pervasiveness of the full design field, which would promote inter-disciplinary coordination and collaboration. The autonomous nature of the field of architecture is fluctuation between these two, or perhaps in the pursuit of systems like 'bio-mimicry', which might be seen as a partial return to a mimetic identity. Still, these forms of coordination are not the dismantlement of Field Autonomy, but the widening of the field itself to include a wider identity.

The most important resolution that must be found is the consolidation of the architectural fields fielty to either a fully autonomous or fully assimilated responsibility to organizational fields outside of itself. The poltiical, cultural, social, and economic role of architecture has felft forever unsure, though often architects and designers attempt to breach the separation in specific overlaps. The moral decision of the external obligation of architecture is an issue that must be decided.

Figure A.04: System Autonomy breakdown.



System Autonomy

System Autonomy, as the third lens through which autonomy will be examined, might be described as the comprehensive understanding of the actions of the instance and the relationships it holds with the drivers that are both influential upon it and influenced by it.

Whereas Instance Autonomy might be seen as the object-identity, and Field Autonomy as the object-collective, System Autonomy is the full operational process within which the object exists. If the instance is a marble, and the field is the characteristics of marbles, the system would be the game of marbles - the marble plays a part, but is not unitary in its importance.

The communication network research of Paul Baran's 1962 *On Distributed Communications Networks* touches on the abstract concept of autonomy within systemic operations.[4] Inspecting the system as a network of nodal points with operations to themselves, Baran presents three operational network models: centralized, decentralized, and distributed.

The centralized network is an aggregate of nodes that are dependent on the operations of a single node that supplies a set of requirements for the entire field of nodes. Decentralized networks are a modified organization in which multiple nodes supply the requirement, each with dependent nodes surrounding them. Distributed networks, the idyllic form of System Autonomy, is the final organization in which each node has operational capabilites of producing requirements while still being connected to the network in order to provide interchange.

Causality and influence are both uniquely included in System Autonomy in its ability to describe comprehensively the operational process of a system, whether it be machincal, political, or cultural. Conceptually, System Autonomy is inherently scalable, and as such can represent the process through which photosynthesis takes place inside a plant cell, the energy inputs and outputs from a city, or orchestration of planetary revolutions around the sun. In accepting this, System Autonomy is the least understandable because it represents the entirety of active instances in any given process.

The application of System Autonomy can be viewed through two perspectives: multiplicitous nodal production, and exclusive nodal production.

The first of these two perspectives, multiplicitous nodal production, involves the comprehensive network within which systems of production exist. In the case of a distributed (autonomous) network, production of requirements, whatever they

might be, takes place in every node in the index of the network, and the System Autonomy is contained within the ability of interchange. Interchange and collaborative system production is what differentiates the network as systemic, rather than as a field of autonomous systems.

The ability for collaborative production among multiple nodes is liberatory in its denial of a primary production site which supplies the rest of the network. The finest example of this kind of distribution of power is the types of interchange that take place routinely on the internet. The capability of accessing and producing from a single node (computer), while other nodes are able to access and produce similarly in a vast network of both units and servers, provides the dissemination of voice unavailable in a centralized network.

The primary characteristic that identifies the distributed network as systemically autonomous is the situation in which the destruction of a single node within the network does not adversely affect the stability of any other node in the network. In this way, even the global organization of computer networks that comprise the internet are not completely distributed, due to their reliance on aggregate servers for grouped services and operations. It might even be claimed that System Autonomy as a goal can be exponentially approached, but never reached, because primary or secondary reliances might always fall into more decentralized types of organizations over distributed models.

The model of System Autonomy, in its attempt to provide a fully distributed network of production, attempts to orchestrate an organizational model in which each node, while connected and communicable with any other node, has complete independence from influence if it so chooses.

This intent can be seen in many examples involving access to computer networks, notably in John McAfee's most recent endeavour with the D-Central box, which aims to provide a network connection through non-traditional processes in order to maintain the total anonymity and independence of the unit connecting to the network.[5] In reaction to recent events, such as the leaks provided by Julian Asange, Edward Snowden, and Chelsea Manning, which have brought questions over the true independence of the connected network unit, such technology ventures aim to achieve a higher level of complete system autonomy.

An example sans technological networks can be found in the media reaction to these events, specifically in the case of The Guardian's interaction with the Snowden information through reporters and editors in multiple locations.[6] The physical separation of personnel with the data in question allowed the english news source to remain unassuaged by the pressures from government sources inside the UK to refrain from printing the leaks.

Networks in which multiple nodes have redundant abilities, either in cooperation

towards a similar goal or in the self-production of resources in demand by local sources, provides the disolution of hierachical control devices. The liberatory function that this allows can be evaluated in muliple ways, but the process of liberation it provides is unquestionable.

The second of the two perspectives, exclusive nodal production, pulls away from the role of interchange and focuses on the self-production of a node in the pursuit of providing entirely the resources required for the processes of the node to be sustained. Any process of production has an index of required resources and processes, and the ability to fully provide the entirety of each is the ideal situation of System Autonomy. The process in which a pot of coffee is made would be an example, including the kettle, coffee beans, grinding machine, water, cup, and french press. The system in question would also include the fields in which the coffee beans are grown, the process of heating the water, and the energy resources expended in the production of the coffee eventually achieved.

The total system would also include the solar energy and climatic requirements necessary for the coffee plant to grow, which again questions the ability to totally achieve autonomy in production. Conceptually, the system itself is autonomous in the index of processes and materials, but the intent of System Autonomy is to localize the system of production to the highest degree possible. Following this logic, System Autonomy is ever present, but its practical application is never fully autonomous. Still, the push for localized agricultural production shows the social preference for hightened levels of System Autonomy. Exclusive nodal production is thus much easier to explain, yet much less capable of achieving in total.

These two perspectives of System Autonomy attempt to explain the capabilites and inherent qualities of the abstract idea, yet their application is as infinitely scalable as their description. The search for perpetual motion machines and infinite energy suppliers are within the realm of System Autonomy, and the correct arrival of hightened levels of autonomy in this regard will be of critical importance in the organization of the built environment.

The relation of System Autonomy to the architectural field is yet again as varied as that of Instance Autonomy or Field Autonomy. In the case of the individual architectural instance, the development building systems (HVAC) is an attempt to cast the building as a system autonomous of the environment around it. Still, the energy required for sustaining these systems has come into question, as traditional systems have proven themselves to be inefficient when attempting to negate the environmental conditions of the climatic region within which the building is located.

Technological system application can even be seen to approach system autonomy in speculation during the phase in

which complete operational surveillance was being attempted in such projects as Morphosis's San Francisco Federal Building, or even in fictional creations seen in The X-Files episode *Ghost in the Machine* (S1E7)[7] and the Ray Bradbury short story "*The Veldt*." [8] Interestingly, the built attempt by Morphosis is in search of actualizing the autonomous nature of the building project, while both fictional accounts are expressive of the negative aspects that such a project might eventualize.

The same search for hightened levels of energy autonomy can be cited in the architectural application of renewable energy generation techniques, such as applying solar arrays to projects, or in using geo-thermal heating techniques. These attempts involve energy exclusively, but their relevance is unquestionable. From a social perspective, community gardens in which an amount of agricultural yield is produced are examples of the same intent from a different user base.

In a programmatic scope, involving multiple programs within a single architectural work is also an attempt at System Autonomy in the way that office space, retail, residential, and parking lot space are all available in the same instance. The prototypical use of communal space in educational facilities as 'cafe-gym-atorium' models also applies to the conversation of representing a range of processes within a single shell. These examples apply primarily to the instance over the system en large, but the scaled application the principles of System Autonomy begin to apply to the larger instance aggregates of the city district and the city in its entirety.

For the district or urban center to begin to self-produce the resources it consumes, or a high percentage of them, is an imperative of new urban models - the energy expenditure of transportation, and much of the inefficiencies innate within non-localized networks, can be mitigated by the division of production centers and the balancing of prudent importation and exportation percentages.

Blankly, the contemporary urban center is a site of almost exclusive consumption, with sites of production outside the urban boundary. Some instances, such as New York City, draw energy and water from a shed of almost 500 miles in radius.

The application of System Autonomy in architecture begins to apply itself in the self-production of resources that it is capable of producing, while sustaining the mulitplicitous nodal production that new communications technology allows. The social, resource, and political liberation that this will allow is unknown, as its execution has been absent, but the theory behind speculation has been well developed over the last few centuries.

Definitive Autonomy Notes

1 *How Much Does Your Building Weigh, Mr. Foster?*, DVD, directed by Carlos Carcas and Norberto Amado (2010; London, UK: First Run Features, 2012).
2 Peggy Deamer, ed, "Context: 1800-1860," *Architecture and Capitalism: 1845 to the Present* (New York: Routledge, 2013), _____.
3 Richard Sennett, *The Foreigner* (Notting Hill Editions, 2011),13.
4 Paul Baran, *On Distributed Communications: I. Introduction to Distributed Communications Networks* (Washinggton D.C.: DTIC Document, 1964), 8.
5 Matt Buchanan, "Joh McAfee Lives to Fight Another Day," *New Yorker*, October 3, 2013, online access.
6 Ken Auletta, "Freedom of Information," *New Yorker*, October 7, 2013, online access.
7 Chris Carter, "Ghost in the Machine," *The X-Files*, October 19, 1993, written by Alex Gansa and Howard Gordon.
8 Ray Bradbury, and Gary Kelley, *The Veldt* (Mankato, Minn.: Creative Education, 1987).

From Field to System
a network perspective

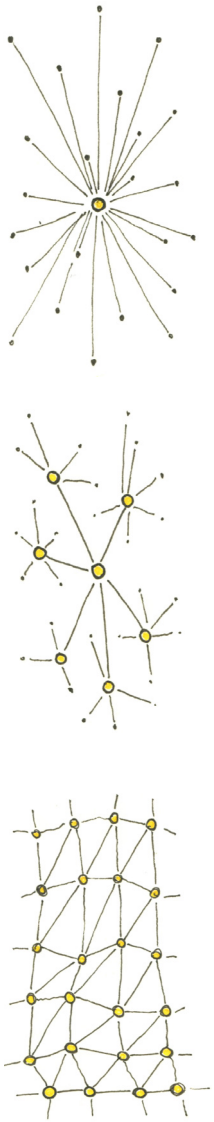
Before moving on from the conceptual definitions of the three lenses of autonomy, the full context within which they interact with each other in hierarchical organizations must be explored. While each exists conditionally, there is responsibility of application for each which presupposes the organizational structures that they compose. To understand these conditions and their subsequent ethical and social structures, the examination of the complex ways that they relate to network organizations (explained previously) is necessary, coupled with a responsive critique to an essay in which much of the critical architectural language of object and field has been already deconstructed, Stan Allen's *From Object to Field*[1].

First, it must be clarified that the three autonomies (*instance, field, system*) and the three network organization types (*centralized, decentralized, distributed*) cannot be superimposed and assumed to be directly correlated. Each of the three autonomies has a presence in each of the three network types - each node in a distributed network has a conceptual instance autonomy as prior defined, multiple nodes in any organizational type form field autonomies as prior defined, and assuming the network involves complex processes, regardless of the presence of productive redundancy, there is a system autonomy as prior defined.

Second, it must stated that the interaction among the three autonomies and the three network organizational types creates a very complex and interesting reaction: hierarchical ethical conditions, which will be of extreme importance in the evaluation of these autonomy-network interactions. The assumption that is made within this thesis, whether it be regarded as naive or overly presumptive, is that the ethical condition which is organizationally preferable for all involved is one in which models of hierarchical control are absent.

Autonomy in this condition is taken to mean situational organizations in which no constant hierarchical control are present, which is broad in its coverage, but essentially applies to any situation in which there is a recognition of control absence. The prescription that no one hierarchical device is in complete control is an easy assumption to make, proven by the deeply complex nature of systems interactions, whether it be the interaction between economic and environmental forces resulting in implicit social reactions, though this recognition of the impossibility of control does not keep elements of the system from attempting to exert hierarchical control.

In the built environment there is a great deal of attempting to apply organizational control within systems that will inevitably



Above : Centralized, Decentralized, and Distributed network organizations, first explained on a technological level by Paul Baran for RAND's telecommunication reconstruction during the early 1960s.[1]

dissolve any constraint, and, if one is to listen to Jeremy Till, the built environment is the designing of contingency objects in the face of pervasive and constant unpredictability[2]. This argument is hard to argue with, pervasively being accepted in various fields that deal with broad systems of interaction, specifically in social and technological networks through the various contributors to *Networked Publics*[3].

The applied definition of Autonomy, especially in the case of the system, is fundamentally the acceptance that no comprehensive hierarchical control is possible, and that the attempt at constructing hierarchical controls is ethically negative. The first part is fundamental and unchanging, but the second part is an argument to be widely contested, though its correctness is to be assumed through the following examination of System Autonomy in spatial and architectural organization.

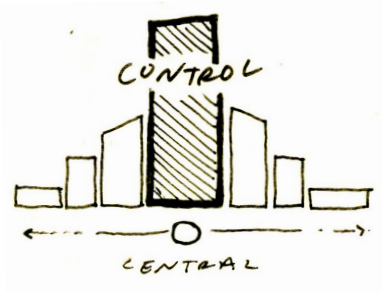
• • •

Instance Autonomy within network contexts is fundamentally the unitization of components and the treatment of the unit thereafter. Although the autonomy as prior defined is unchanged within each network context, the autonomous nature being tied to identity independence, the condition of the unit in each network organization changes drastically and is politically dependent on the presence or absence of field or system processes simultaneously within the network. Being the most basic of attributes, the Instance is an essential part of each subsequent autonomy, as well as each network organization type, but the inverse is not necessarily true, and the ethical conditions that are resultant are drastic in range.

Centralized networks interact with the instance as points respondent to the core, which represents the productive center of control. Each instance is controlled by the logic or priority of this control, and the hierarchical structure that is definitive in such a system can be described as one in which the operative value of an instance is statically subordinate to the structure that supports it.

Stan Allen explains the underlying rigidness of this "object" oriented condition in describing the essentially geometric relation in traditional architectural and spatial design. The reference to Alberti's axiomatic claim that "beauty is the consonance of the parts such that nothing can be added or taken away" certainly implies the static coherence of the unit compared to the whole which is central to the structure of space in a controlled hierarchy, evidenced in Allen's explanation of the spatial determinism as dictating "not only the proportions of individual elements but also the relationship between individual elements.[4]"

This strict "hierarchical order by extensive geometric relationships[5]" is conceptually identical to the examination of the formality of estates and castes by G. M. Tamas, and the comprehensive, beautiful 'object' whose geometric logic must be adhered



Above : Rigid hierarchies of geometrical relationships contributing to the solidarity of focus found within the object-oriented product.

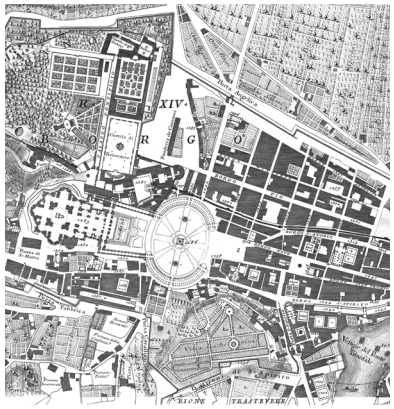
to by individual elements is thus strikingly similar to that of the 'State'[6]. The repetition, proportion, axiality, and formal sequence of the controlling geometry in object-oriented space is the centralized hierarchical control that establishes the ability and limitation of the individual elements that act within in it, just as the formal organizations of aristocratic or centralized political control establish primacy of the state in concentrated roles with political process adhering to the structure that is defined by those roles.

Transitioning the instance into a decentralized or distributed networks does not absolve the dependence on static structures, because any autonomy that exclusively prioritizes the Instance will draw back to the object-orientation of political and social space, but there is an essential diversification that also takes place. The decentralization of control creates political structures that are dissected into levels of status, such as in the case of feudalism, which retain their dependence on fundamental and unitary hierarchies, but allow for heightened levels of social, political, and spatial independence while responding to the highest orders of rule. In this way, simple fractal exercises show how geometrical order can split from singular sited concentrations into multiple while still controlling the organization with a unitary set of principles.

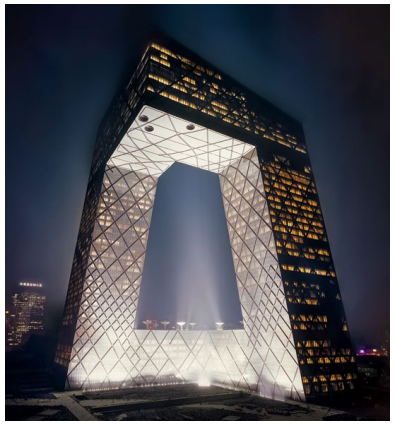
Feudal communities are subsets of an overarching system of municipalities, but their urban structures are fundamentally similar, regardless of location, because of the application of the same status principles that organize the aristocratic hierarchy en large. These separate centers must have local economies, local production, and local political process, but each of these operations are scalar exercises of the same logic that determines the centralized order of each of the sites.

Architecturally this decentralized network of object-orientation is explained by Allen's description of the additions to St. Peter's cathedral as "morphological transformations elaborating and extending a basic geometric schema, and tending toward compositional closure," as well as in the classical organization of "durable institutions" such as the city hall, the library, the capitol, the bank, and other programmatic instances which inherently respond back to the social and political identity of the civilization in which they are built[7].

The object-orientation of many modern urban planning schemes is overt in the priority, geometrically and fiscally, that it places on these durable institutions, but also through the importance put on works of the iconic, "declaring their owner's participation in the New World Order and their designer's participation in the global economy," as Ellen Dunham-Jones put it[8]. Citing the Bilbao Guggenheim, the Beijing CCTV Tower, and the Hong Kong HSBC Headquarters as examples, Dunham-Jones describes the unhealthy infatuation of global architectural and urban culture with works of formal and scalar impor-



Above : The New Plan of Rome by Giambattista Nolli from 1748, illustrating the completed and attempted geometries of the St. Peter's Basilica and its surrounding context.[2]



Above : OMA's CCTV Tower in Beijing is unavoidably a focus of an object-oriented built environment, where context and common reference are incapabale of being made.[3]

tance, the resultant of which is an urban structure that defines the evaluation of its context and the orientation of peripheral contexts around objects defined by their unavoidable size.

Returning to the possible network organizations, the decentralized instance autonomy still controls the productive-consumptive dependency of the unit, but there is a heightened locality of dependency in essence. Going beyond heightened locality into absolute locality in which each unit is productive-consumptive independently while still adhering to the centralized hierarchical control is the condition of instance autonomy in a distributed network.

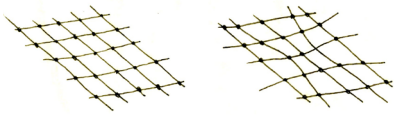
Even without political structure analogs, this condition would be the organizational aggregate of every unit producing every aspect that they consume with a centralized order that maintains the aggregate. The centralized hierarchy might even be the assumption that every unit necessarily produces all that it consumes, with that assumption rigidly being enforced.

Of course, the higher amount of independency within a network leads to tension with the object-oriented instance. Spatially, once there is dependence locally then geometric principles that do not respond to local conditions seem irrelevant and give through to the idea of Allen's *field conditions*, explained as the movement from "one toward the many, from individuals to collectives, from objects to field," an organizational understanding that has has a well developed base of theory and execution.[9]

Field organization, in contrast to object organization, responds to flexible structures of hierarchical control. Returning to the analysis of G. M. Tamas, political field organization transitions from the formal organization of estates and castes to that of the class, which "precludes formality: as a 'nation' or 'civic society', it prides itself on its depth, informality, spontaneity and naturalness, contrasted with, and sometimes opposed to, reason.[10]" The pride of informality and depth described therein might be evidenced in Allen's description of the field condition as "inherently expandable; the possibility of incremental growth is anticipated in the mathematical relations of the parts," which is the proclivity of algebraically derived spatial relationships over those of geometric origin.[11]

The political and spatial outcomes of urban field conditions are cited by Allen to be representative in the projection of the jeffersonian grid throughout unplanned western territories in the United States, producing both practical means for organizing the "vast quantities of territory" and for simultaneously projecting the semiotic values of explosive democratic expansion.[12]

The grid in this fashion is admirable in the eyes of Allen for the conditions through which it "nullifies its status as an ideal object[13]" in its incomprehensibility of size and expansion, as well as for the claim



Flexible and expandable from basic hierarchical parameters, the field responds with elusive charm.

that "infinite variety" is achievable within the projection of the grid because of its use as a "convenient starting point, not as an overarching ideal.[14]"

Of course, these arguments follow the logic laid out in the explanation of field conditions as material or operational responses to applied rules; in the case of art as the "conditions within which the material will be deployed,[15]" the assumption being that field-orientation of the process of creation allows the free association of relationships that are determined by the applied material rather than by the object-oriented geometry prescribed by the creator.

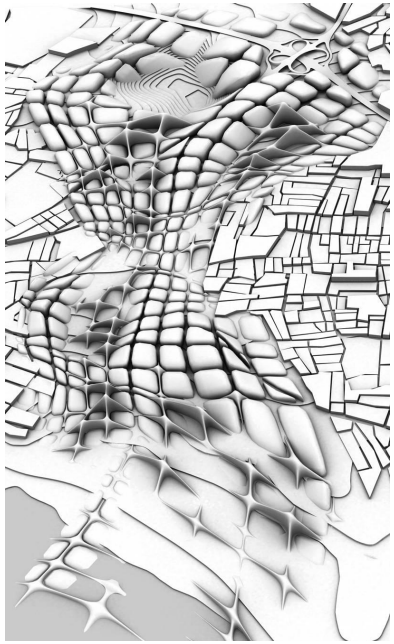
Noting that "[a]uthentic and productive social differences it is suggested, thrive at the local level, and not in the form of large scale semiotic messages or sculptural forms," Allen seemingly concludes the non-hierarchical nature of field conditions, linking positive social outcomes from the implementation of process that is not object-driven, either semiotically or formally[16].

Of course, the argument begins to fall apart when recognizing that the jeffersonian grid, applied as a "convenient starting point, not an overarching ideal", has remained statically semiotic, however inherently expandable and non-object driven the geometry and spatial organizations of it might be[17]. The democratic equality and capitalist potential of the grid have proven hard to manipulate or change beyond the use of expansion once they've been implemented, and they have shown little ability to fully integrate with the topological or cultural conditions that Allen states is inherently field conditional.

These are major recognized drawback of the jeffersonian grid, but it must be remembered that "all grids are fields, but not all fields are grids," so as to not indefinitely link the resultant failures of one instance with the entire family of possible field conditions[18]. Spatially, this resolves the failure of the grid to respond to contextual situations, because field conditions can very easily navigate spatial complexity once the organization is able to move beyond the convenience of the rudimentary starting point. Unfortunately, the negative semiotic aspects of the jeffersonian grid show a much more ingrained and rooted problem that is not resolved by the allowance of higher complexity in more responsive field conditions.

This is an essential aspect of the critical description of field conditions, negatively attributed because it shows the field as still highly connected to hierarchical models of control, even as liberative as its break from object-orientation has proven. The spirit of the field condition will always return to the rules it is generated through, as the "conditions within which the material will be applied[19]" will always be established by the creator, and the resultant of the applied conditions will never be autonomously resolved.

Hierarchically the field absolves the rigid-



Parametrically resolved urban planning, based on the priority of specific types of data, is able to arrive at the expectation of the field, as Allen puts it: "figure not as demarcated object, but as an affect emerging fom the field itself - as moments of intensity, as peaks or valleys within a continuous field.[21]" Still, the moments of intensity and the figure overall, whether described by a field or unitarily, is still a solidified message. The fluidity of the field is often used to fill in the gaps when the rigid hierarchies of geometry go amiss.[4]

ness of object-orientation by replacing its control devices with the conditions it provides, replacing a direct structure with an implicit one, mirroring the representative governance in which no specific figure or role would "become the state as aristocracy and royalty once did[20]." Just as no one person is definitely the State in collectively governed political structures, there is no innate object within field conditions, but the conditions in which the intended variety of the field are created are determined by similar political machines of control.

Centralized network organizations of the field can be envisioned in the instance of the artist in complete control of conditions in which field organizations are made, and this analogy can just as easily be connected to urban planning and the political offices that determine the conditions in which planning devices can be applied.

The unity of planning initiatives that stretch for multiple decades have been devised through the careful consideration of conditions in which the resultant is not object-oriented, but is still intimately linked to a specific and limited vision of what should be done. These limitations are often dismissed through the devices of community input and other processes that are supposed to equalize the intent and vision of any plan and its rollout, but the validity of such claims is questionable.

Colin Ward explains the mistrust of planning offices by the populations that they are servicing by explaining the inherent control of initiatives by the remote powers of bureaucratic and entrepreneurial alliances, essentially stating the implicit hierarchical controls that are set in place when organizational conditions are provided by representations rather than populaces themselves[22]. The political structure in which planning offices are set up are innately hierarchical, so the spatial and social ramifications of their decisions are going to be limiting regardless of the openness of the conditions provided by them.

An argument against Ward's claims might be made through the critique of the time in which he wrote, and the radical political stances that he represented, but his opinions on the matter are not alone and are not limited to the time in which he wrote the previous claims.

Examining Michael Sorkin's recent letter to the incoming New York City mayor Bill de Blasio published in Architectural Record, it is clear that the claims against civic planning initiatives made by Ward in the early 1970s are still very much valid and ever-present in the situation of planning determined by limited organizations of those representing the decided good of entire populations.[23]

The intent of the claims by Ward and Sorkin are not to be taken as a claim of malicious intentions by those that comprise planning offices, but more to note the proclivity of such organizations to not be

Above : The Hudson Yards development vision of 13-million square feet of residential and commercial space, not including the scheduled cultural venue, park, restaurants, or shops that will inhabit the construction.[5]

capable of being fully aware or fully responsive to complex needs of those that they are planning for, and that reliance on hierarchical planning structures will always lead to the benefit of those that provide the conditions that field will be self-organized within.

Again, "the conditions within which the material will be applied[24]" will always be resultant in field conditions that are indirectly controlled by the creators of their conditions, thus only being an extension of hierarchical control rather than an absolvement of it.

Decentralized and distributed network organizations of field conditions show the ability of the field to progress beyond exclusive control, but the fallibility of the field comes in its complete focus on aggregation of items. Politically, the Operaismo give a good example of decentralized field conditions as they express duplicity of political identity through the struggle of the worker in the face of capitalist structures, but the failings of it are directly because of the need within field organizations to build collectivity.

In the arguments of the Operaists the focuses are broken into three parts: the Workers, the State, and the processes of Capitalism, which essentially strip the complex interactions of the full identities of those involved. Segmenting, but still flattening the complexity of involvement is a fracture in the utility of decentralized and distributed field organization inherent in the process of creating the field condition itself.

As prior described, field autonomy is the focus of similarity within multiple instances, and the field condition as described by Allen reacts identically in needing to distill complexity of field organization into admittedly two dimensional analysis of moments of intensity within the comparison of overlapping characteristics.

This distillation can be seen in the process of functional urban zoning, the division of uses and the segmentation of space through the applied structure of the field condition, described by Leon Krier as abstracting the communities that it organizes and the in the process "reduces the proudest communities to mere statistical entities, expressed in numbers and densities.[25]" In Krier's words the same argument against the field condition appears - that the application of conditions deprives the full understanding of complexities and identities in service of condensed layers of analysis.

The futility of non-hierarchical field conditions comes in the very explanation of its attempt at rethinking the "institutional form through the concept of the field.[26]" Any of non-hierarchical organization cannot rely on the creation of institutional form, because institution is just what it fights against, thus concluding that projection itself, whether object-oriented or through field condition, is the core failure of attempting non-hierarchical organiza-

tion. Allen's reference to Michel Foucault's claim that there are no liberating architectures shows an awareness of these failings, and the exposition of field conditions is curtailed with the vision of possibility in field values implying "an architecture that admits change, accident, and improvisation.[27]" The assumption is still that the application of field conditions is neutral to the involvement of hierarchical models, even non-hierarchical in its essence, but that assumption is incorrect.

The confusion comes with idea that replacing the object-oriented hierarchy of traditional geometry leads in any way to non-hierarchical organization, which cannot be projected because to project is to establish hierarchy. The involvement of the field condition still strives for the consensus of evaluation criteria and fluidity of instances within the field, while non-hierarchy, following anarchical theory, is instead the pursuit of *dissensus*.[28]

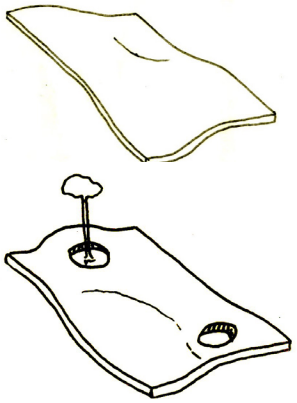
Non-hierarchical organization can in this way can be explained as antithetical to the idea of order and traditional organization similar to anarchic definition as Levinas described it, "Anarchy, unlike arche, cannot be sovereign. It can only disturb, albeit in a radical way, the State, prompting isolated moments of negation without any affirmation. The State, then, cannot set itself up as a Whole.[29]"

Following this description of anarchy, and essentially the pursuit of autonomy, the creation of non-hierarhical urban structures and spatial organizations is to pursue the pulling apart of order to provide a fragility that allows the area for liberation as a practice, as Foucault would describe. In the a-political understanding of anarchy, Simon Critchley explains this condition of fragility as the "creation of interstitial distance within the state, the continual questioning from below of any attempt to establish order from above.[30]" Whereas the complexity of interaction needs to be resolved, simplified, and contained in any projection of order, which leaves "no simple equations of organization and behavior, of politics and form,[31]" non-hierarchical and systemically autonomous space makes no attempt at equation or order.

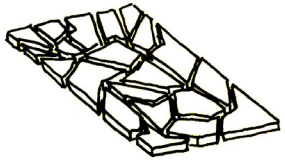
Here, via the application of devices to construct conditions which are interstitial within urban and spatial order, marks the transition *from the field to the system* in the application of autonomous organization.

In the creation of spatial conditions that allow the questioning from the bottom that Critchley describes there is fundamental need for productive redundancy so as to alleviate reliance on centralized models of production-consumption, which deter the ability to create interstitial conditions. Hierarchical control works through its ordering of the processes necessary for the system to survive, and the negative affectations of it are often seen in the tension that is placed on those that are not given priority within the order.[32] At the same time, system autonomy also is intimately tied to the

Rigid Object



Fluid Object



Fragile Object

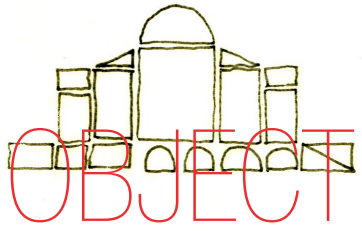
"heteronomous ethical experience of the relation to the neighbour," being the need for simultaneous communal reliance and responsibility beyond that to the self.[33] These two conditional necessities allow for the evaluation of the superimposition of the network organizational types against System Autonomy in the way that processes can be locally independent while communally dependent, which precludes the implement of centralized networks in favor of a combination of decentralized and distributed organizations.

Centralized organization could be visualized as the complete productive-consumptive reliance on dislocated sources, such as an entire neighborhood relying on a completely communal field for agricultural yield, or a single localized venue for the presentation of cultural production, in the same way that functional zoning on the urban scale might be applied. This returns the order of processes to a condition antithetical to system autonomy, to the defined authoritarian contexts that solidified through the organization of the industrial city, so the resolution of localized interstitial must slide between localized sources of production that provide independence, but also the diffusion and distribution of production and consumption to increase the community dependence that provides the space for complexities and the unexpected.

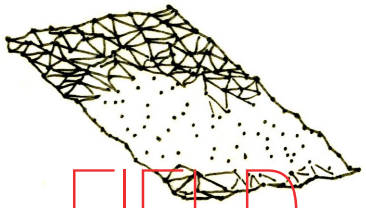
The formation of System Autonomy asks for the orientation of instances within the system as retaining independent character as well as creating communal dependencies, and the way that this can be done can be explained as the ascendency from the expectation of permanent organizing systems. If instance-object orientation is inherently geometric and subsequently rigid, and field orientation is algebraically driven and subsequently fluid, system orientation is inherently chemical and subsequently fragile.

Urban structure will instinctually be ordered, so the claim is not just to leave everything to form as it will, because hierarchies arise out of any condition, as the examination of the field has shown, and imposing non-hierarchy as the hierarchical model is useless. What must be done is the creation of fragile, breakable urban structures and spatial configurations that can be reacted against when hierarchical controls become present. The system is said to be chemical because rather than the simpleness of geometry or the conceptual flatness of algebra, chemical and atomic interactions retain the identity of each component while also marking specific and intimate moments of interaction , as well as new identities created.

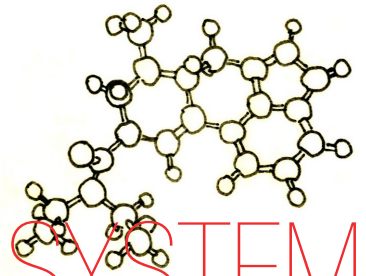
Beyond formal or organizational configurations, System Autonomy is an architecture, both of the project and of the urban, that admits not only change, accident, and improvisation, but the necessary potential of negation. Combination, interconnectivity, destruction, reorientation, and dissensus are inherent in the nature of the system autonomous condition, and the



OBJECT



FIELD



SYSTEM

> execution of this architecture can only be based on space that can be broken down to atomic elements in order to be built or unbuilt. The presence of the interstitial ability to resist and restructure is neither rigid nor fluid and not only accepts complexity and change, but recognizes it as inevitable, crucial, and constant.

Notes

1 Stan Allen, "From Object to Field," *Points + Lines: Diagrams and Projects for the City* (New York: Princeton Architectural Press, 1999), 92-103.
2 Jeremy Till, *Architecture Depends* (Cambridge: The MIT Press, 2009).
3 Kazys Varnelis, Ed, *Networked Publics* (Cambridge: The MIT Press, 2008).
4 Allen, *Points + Lines*, 94.
5 Ibid, 93.
6 G. M. Tamas, "Innocent Power," *dOCUMENTA* 13 (2012): 7.
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8 Ellen Dunham-Jones, "Rem Koolhaas and the 1990s," *Architecture and Capitalism: 1845 to the Present* (New York: Princeton Architectural Press, 1999), 163.
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10 Tamas, "Innocent Power," 7.
11 Allen, *Points + Lines*, 94.
12 Ibid, 93.
13 Ibid, 93.
14 Ibid, 96.
15 Ibid, 96.
16 Ibid, 95.
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19 Ibid, 96.
20 Tamas, "Innocent Power," 6.
21 Allen, *Points + Lines*, 95.
22 Colin Ward, *Anarchy in Action* (London: Freedom Press, 1982), 60.
23 Michael Sorkin, "Bridge Over Troubled Waters," *Architectural Record* 202 (2013): 35.
24 Allen, *Points + Lines*, 96.
25 Leon Krier, *Houses, Palaces, Cities*, (London: St. Martin's Press, 1985), 235.
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27 Ibid, 93.
28 Simon Critchley, I*nfinitely Demanding: Ethics of Commitment, Politics of Resistance* (London: Verso, 2012), 129.
29 Emmanuel Levinas, *Otherwise than Being or Beyond Essence*, trans. by A. Lingis (The Hague: Nijhoff, 1981), 194.
30 Critchley, *Infinitely Demanding*, 129.
31 Allen, *Points + Lines*, 96.
32 Critchley, *Infinitely Demanding*, 129.
33 Ibid, 129.

Images

1 Paul Baran, "On distributed communications networks," *Communications Systems*, IEEE Transactions on 12, no. 1 (1964): 4.
2 "Nolli Map of Rome (1748)," last modified March 16, 2014, http://commons.wikimedia.org/wiki/File:Giovanni_Battista_Nolli-Nuova_Pianta_di_Roma_(1748)_01-12.JPG
3 "Architectural Photography," last modified 2014, http://www.nathanielmcmahon.com/
4 "Kartal-Pendik Masterplan," last modified 2013, http://www.zaha-hadid.com/masterplans/kartal-pendik-masterplan/
5 Michael Sorkin, "Bridge Over Troubled Waters," *Architectural Record* 202 (2013): 35.

Obligation Resolved
individualized response

The natural organization of things, in the example of ecosystems and developed social systems, is never one of broad institution. The defining characteristic that allows complexity and multiplicity is not the presence of a rule-set that everything responds to, but the appearance of individualized responses to obligation.

Politically, the work of Levinas, Kropotkin, and (in a more contemporary position) Simon Critchley has been discussed for the reason that it is a field that is well involved in the organization of populations through individual responses rather than top-down control. In this political context the device that is investigated is that of *ethics*, and specifically in the way that ethical responses are never-ending. The titular argument of Critchley's *Infinitely Demanding* lies in the very fact that there is no limitation to what human ethical practice expects of the individual, and that the resolution of one social or personal obligation inevitably presents another expectation.

In the context of *System Autonomy*, the quality of obligation is central to its organization. The complexity that is tied to thinking of systems, even in the most simplistic way, requires the wiping away of the expectation to comprehend and specifically react to every detail from a top-down understanding. Complexity gives to the infinitely demanding quality of dealing with very disparate situations, and this is impossible to do when the attempt is to institutionalize or create hierarchical structures. Attempting to understand and control everything all at once leads to failure, so personal obligation provides a different perspective through which to organize in complex situations. It is the non-attempt to understand things in full, and react to partiality and locality instead of the entirety.

This lack of understanding and control is a very frightening thing, especially to a field like architecture, whose impulse to directly organize and perfect is ingrained. The instinct is to demand order where there is none, and to create it if need be, but the application of order is futile and without real purpose. Natural systems are not divinely ordered, but developed through a process of multiple things constantly negotiating coexistence in order to meet their own personal obligations to survive.

The spirit of this bottom-up development has not been successfully found in architecture, though there has been the drive to find it previously. The application of personal obligation in architecture is unclear, but presents the opportunity to work towards a truly bottom-up style of organization. The artificial application of individualized response has been investigated in so many differing fields, and it is time to find its use in architectural contexts.

Architectural Obligation

instances of personal response

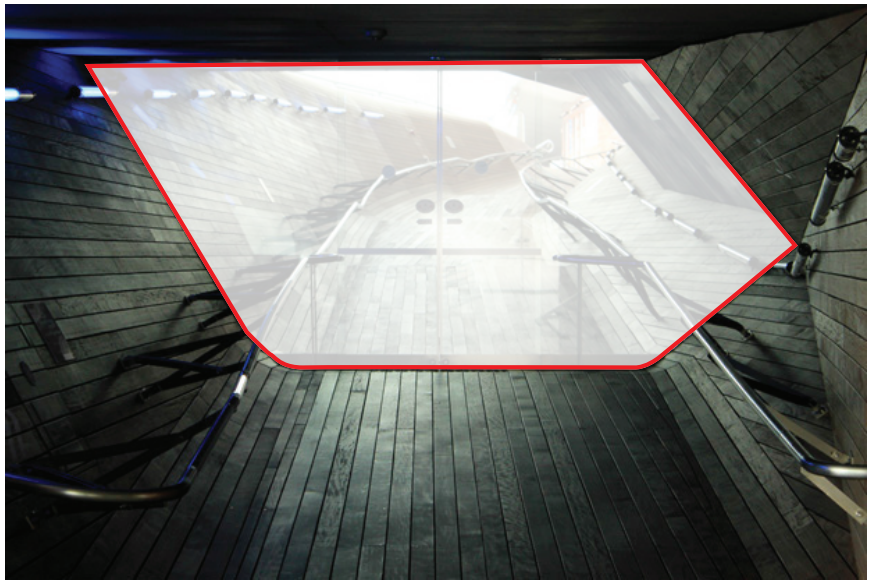
Obligations within architecture immediately want to be placed in a way that has been used before. Louis Kahn famously described the wants of material, specifically a brick wanting to be an arch, and the want of space to be logically (and geometrically) composed. This is not the obligation that is being talked about. The sense of material 'want' in Kahn's context personifies the brick, whereas obligation in architecture does not mean the personification of inanimate objects.

The difference is in the very idea of what is 'want' versus what is 'obligation'. The two terms are not parallel - want is the self-involvement of an object, whereas obligation has to do with relationships between things. The obligation of the window is provide view and opening on a certain level, but is also to act a permeable barrier between external and internal environments. The window is obligated to be connected to its immediate surroundings in such a way that the difference between internal and external is achieved. A window hanging unconnected to wall, ceiling, or floor is still a window, but one which has failed to meet its obligations. It is, in this simple description, unuseful. Often the meeting of these obligations is done through basic repetition, as in the object composed work, where the geometric relationship of structural bays unitizes the windows placed and strictly repeats the same functioning example throughout.

Yet, this is not full meeting of the window obligation, because the window must act as the barrier between external and internal in a permeable way, but also must do so in a way that relates to the external and internal conditions. The interests of the window is varied - provision of light, provision of view, provision of ventilation, provision of barrier - but the variance of its interests are smashed down in its application in object and field senses.

The object applies based on geometry, so does not specifically design the window to meet its own obligations, but only the obligation of the object composition to be complete and self-referent. The field, in its own form of self-involvement, does not prioritize the window's ability to fulfill its own obligations, but only the obligation of acting in coordination to the field operation at hand.

The example of the door in the Yokohama Port Terminal is of interest, because it shows that there is a point, when either composition or field techniques negate the personal obligation of an element or space to a point where the element necessarily removes itself from inclusion in order to meet its personal obligations. In Yokohama the self-removal from the cohesion of the field comes because of the intense manner of elements in their



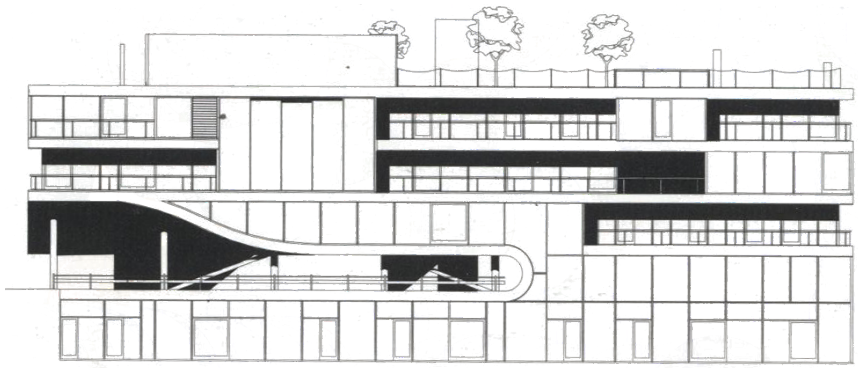
Above : Yokohama Port Terminal door outside of field operations

appropriative response to the field condition. In the Sanford Kwinter context of elements acting as graphic records of the field condition values, the obligation of everything in the port terminal is to act as a visual index to ephemeral data, and the personal obligation of elements is lost. In the case of the door the obligation to be vertical and non-referent to the field condition usurps the control by cohesive collectivity, and asks that the door specifically address personal obligations in a way that is definitively non-referent.

The door has a relationship, or at least an interaction with the field condition, but the relation between it, as an externalized element, is not direct. It reacts to the field condition, but is not a part of the field condition. This is not the success of the field in being able to accomodate difference in specific moments, but evidence of system appearance. The door, in its obligations of specific use and vertical orientation responds individually, whereas the coordinated elements referent to the field condition respond as a collection.

The example of MVRDV's Villa VPRO (previously used) also examples the spirit of individual response in architectural contexts. The windows react individually to the differentiated spaces internally, as well as to the climatic conditions externally. The simple presence of single and double-height windows in response to the differentiated spaces internally breaks the connotation of the project with the field because the elements are not being used in reference to geometric schemes or as a graphic record of field conditions. The elements are individually reacting to their personal obligations.

Of course the personal responses are interconnected and interdependent, recognizing that the placement of spaces internally which the windows react to are



in turn affected by the location of atrial courts in plan. There is the sense of negotiation between disparate things, which is far beyond the ability of the directly top-down organization of the object, and of the informed top-down organization of the field.

The ability to draw a complete listing of obligations and responses for spaces and architectural works is limited to simplistic examples, such as the ones given here. The potential of obligation in an architectural sense is in the interpretation and experimentation with attempting to solve how the puzzle goes together.

In being able to individually respond to personal obligation there needs to be a highly iterative process in finding the correct organization of things so that the resultant is as resolved as possible. The process is not certain, but is parallel to the steps that ecological reconstruction undertakes, in which there is the experimental introduction of different items to understand what their relationship to other items implicates in various combinations.

There is no perfect example to look to in the systemic use of personal obligation as an organizational technique, understanding that it is a conversation that anarchists and ecologists have been having for almost a century without total understanding. Still, it is an imperative to figure out, as we are getting close to applying ecologies through informed means. If architecture waits too long to begin transitioning into these more highly complex and natural forms of organization, its development will continue to act as a restriction in other fields. The built environment, in the ways it controls and subjugates social structures and negatively affects environmental conditions, needs to be on forefront of these novel techniques, rather than reactionary to the progess of alternative fields.

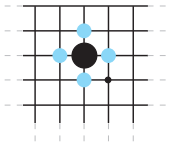
Virtual System Space
complexity through simplicity

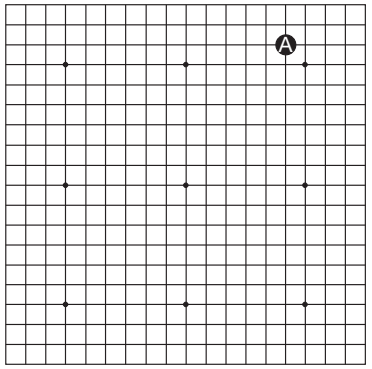
The resolution of the system autonomous is not only found in an architectural context. In actuality, it much easier to see system development in areas in which less control is exerted stably. Gaming offers a special situation in which to see the system operate, because it is definitively involves high amounts of opposition.

In the chinese game of Weiqi the opposition comes through direct challenge of another player in a situation which involves piece-by-piece strategy. The game is martial in application, but also extremely spatial in its resolution. The push and pull between the black and the white can tie very simply to a system in which negotiation takes place, and derives the immense amount of complexity that it involves because the placement of stones is in human hands. Choices are made at every move, rather than being orchestrated by a predetermined or controlling logic. Weirdly enough, lessening the amount of control is able to lead to much more involved and interesting situations. The level at which Weiqi involves system space is very basic, and as such limited in its application, though conceptually it projects a method in which autonomy, difference, and minority can take place architecturally.

In video gaming, the culture of systemically generated space was born of both necessity and of intellectual interest. In mitigating the limited amount of storage space in early computers, the maps of dungeons would need to be recreated every time the program was booted, based off of algorithms which took up far less space than the programming of set maps. The genres that these first gaming solutions gave birth to are various, and the ways that they explore the potential of systemically derived spaces are equally undefined. That said, the more involved and recent applications of the same basic idea that was used in the late 1970s to save memory space are able to shed light on the simple relationships that architectural space is based on.

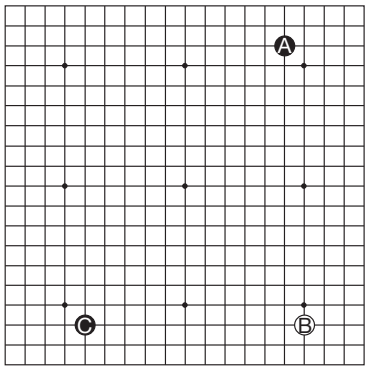
These gaming devices are not directly related to architectural theory, but their foundations share a similar gene code with the sense of autonomy and bottom-up logic that it intended through this theoretical investigation.





Above : (*top*) liberties surrounding a piece, (*bottom*) First stone placed in weiqi game

Below : First series of placements in weiqi game



Game of the System

Weiqi and Rogue-like comparision

There are two fundamental active rules to the 2500 year old game weiqi: 1. *when a stone no longer has open spaces touching, it is removed from the board*, and 2. *the game cannot be returned to an earlier state of play*[1]. Such simple rules lead to such infinite complexity.

Played on a 19 x 19 board, the possible outcomes of play are logically $2.08168199382\times10^{170}$ (not counting specific moves that would add to that total). Weiqi is a game of territory, points accruing from taken stones and territory surrounded. The game is considered a martial art due to the amount of relevance it has in the planning of military strategy, and said to have been a compulsory activity for japanese generals through the Edo period.

The game can be understood many ways, but through the lens of the architectural mind it is innately spatial. Three identies in play: the black (self), the white (other), and the territory (open). Each piece is valued unitarily, though scoring values only territory claimed and taken pieces, which gives weight to influence, which comes through the coordination of pieces[2]. Each piece has obligations (to not be taken, to productively increase influence, to strengthen it defensive line), and the evaluation of their use can be seen through the fulfillment of those obligations.

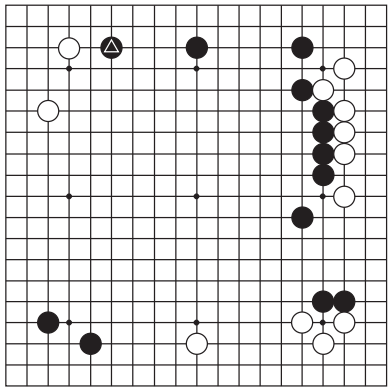
In comparison to the architectural concepts of object composition and the field condition, neither satiates a description of the make-up of weiqi. Played on a grid, there is a connection to the rigidness of the grid, yet the placement of stones is only limited by what is open on the board and the condition of not playing into spaces without open liberties. The patterns and strategy of placement are not responsive to geometric schema or specific movement geometries like that of chess. The field, unconnected from geometric doctrine, seems to be evoked through the viewing of process and finalized games (seeing objects as collections), yet that connection is broken.

Rather than a superimposition of fields (black pieces as a field, white as a field, the grid as a field), there are the range of simple and complex relationships that determine the placement of stones - the introduction of the instance into the system of the game. The pieces need to respond to the grid (being played on the intersections), and also to the influence of the board (not playing into capture), and with the intent of retaining the highest amount of territory possible (not needlessly filling in ones' own space).

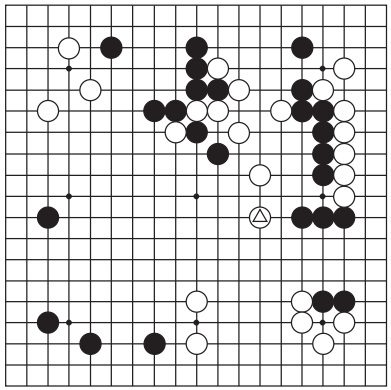
Obviously, the context of the system application is oppositional - the end of the game is point loss or resignation - but

Below : Honinbo Shusaku v. Ebisawa Kenzo weiqi game playthrough (1859)[1]

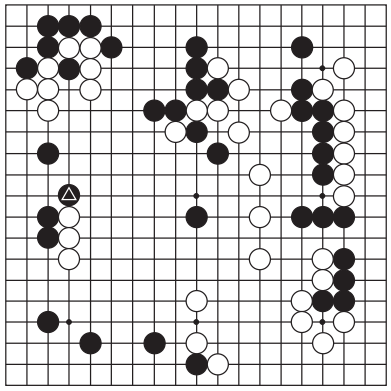
Play 25



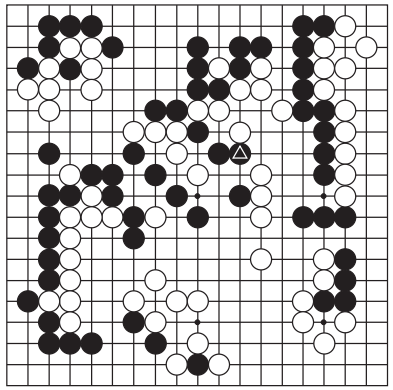
Play 50



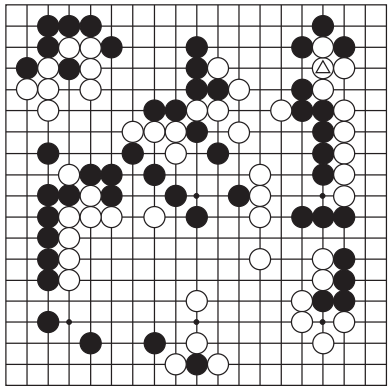
Play 75



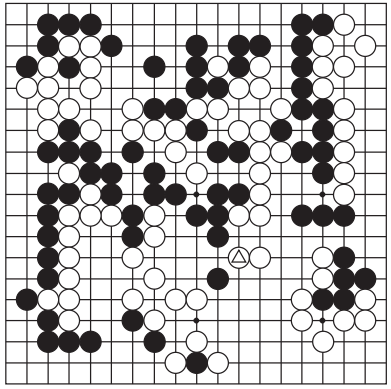
Play 100



Play 125



Play 150



much of the architectural and urban space is also oppositional. Unfortunately, the advantage of urban space is not given through first play, but through the control of design, development, and implementation exclusively through one side. There is the grid, the is the application within the grid, but there is no negotiation.

In the highest level of play, a game of weiqi is intelligently progressed, with oppositions resolved through the negotiation of space. The result of the game is still win or loss, but the process of negotiation is the most elusive system quality that seems to evade even the most free of associations in field composition.

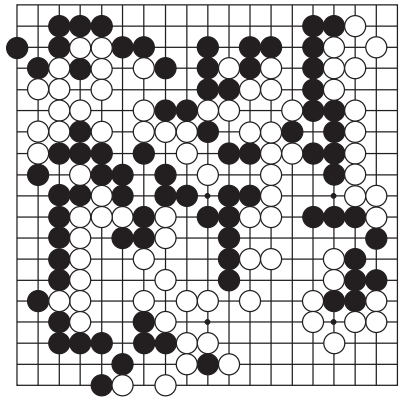
Comparatively, checkers is a game that would be object in its application. The pieces (however homogenous) are dictated in action by specific movement, and game play is exceedingly structured overall. The field condition game could be seen as that of chess. Although there is not a homogenous identity to the piece, and movement is structurally varied, the logic of play is extremely structured. Chess is more intelligently and freely played than checkers, but there is not negotiation - there is either death or life in aggressive interactions. The rules and regulations of chess are much more specific and complex than weiqi, yet there is not a sense of interaction of either team. The pieces are positioned, then either lost or taken - like two veils attempting to draw themselves over the other.

Weiqi, as profoundly simple as its fundamental rules are, is beyond the complexity of either checkers or chess, because of the simplified rule-set, which has led to a variety of canonized practices for each ceremonial stage of the game (beginning, middle, end). These stages are based on the specificity of play required, ranging from broad influencing moves, the regional coordination of space, and the specific detail play. There is an underlying connection here with the scales at which the built environment is developed (urban, neighborhood, building).

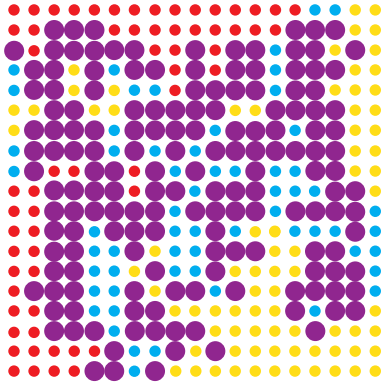
Checkers, in its formality, is considered a 'solved game', meaning that computational logic can be used so that the result in a game between human and computer is either a draw or a win for the computer. Chess is considered partially solved, the specifically programmed machine Deep Blue by IBM having beaten chess world champion Garry Kasparov in 1997, though the result of game-play on the highest level is not strictly determinate at this point[3]. Weiqi, on the other hand, remains unsolved.

Specific programs to process game-play when on a 5 x 5 board have been able to reach 'weak solved' status, but the play by computer on a traditional 19 x 19 board becomes incredibly erratic. The ability to solve weiqi has become a metaphorical Mount Everest of programming. *Such simple rules lead to such infinite complexity.* The strength and unpredictability of weiqi comes from its foundational system of

Final Positions



Below : Diagram of piece positions (purple), black territory (red), white territory (yellow), and contested space (blue)



play, creating (ethical?) choices at every turn of play. Without prior given structure, the pieces being placed additively, there is achieved an incredibly level of required response that can be referenced back to Simon Critchley's description of ethical obligation as *infinitely demanding* [4].

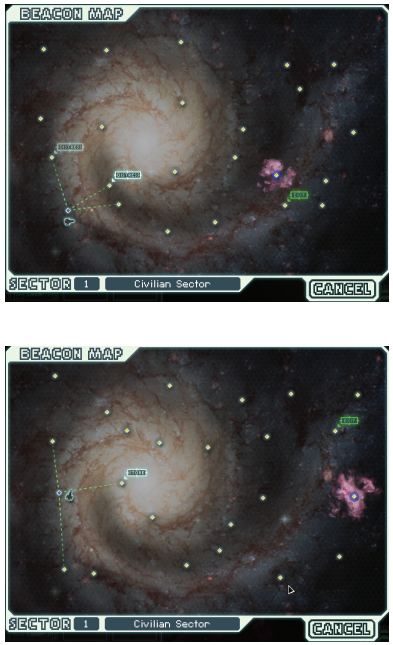
Weiqi gives a conceptual vision, simplified to the management of pieces on a 2-dimensional plane, of what *System Autonomy* begins to spatially form. The reading of a game is much more encoded with specificity and anomaly than the diagrams of Stan Allen introducing the field condition, and yet retain the specific identity and role of the piece as a unit.

The example of weiqi is not the only instance of the system applied in gaming, however the other introduced example was not developed on the simplicity of rules of interaction, but the literal appropriation of space within which action takes place.

Rogue, a "dungeon-crawling" video game, in which characters are prompted to navigate maze-like dungeons in search of enemies to fight and the rewards that they drop, was produced in 1980[5]. Due to the amount of memory at hand, there was not the ability to program or directly plan the maps that characters would encounter, so the developing team figured out a way for the maps to be derived from algorithmic process. From this beginning, a culture of games to be played on computer, console, and handheld devices have been produced within the designation of "rogue-like", meaning that maps and other aspects of the game are procedurally generated.

The limitations of manual generation are the time and expense that specific modelling involves, needing each detail's resolution to remain constant throughout the game, and although rogue-like gaming is not widely used, its modern applications allow a view for its surprisingly systemic qualities. It's application in modern gaming ranges from the very simplistic process of randomizing level arrangement (FTL: Faster Than Light), to sandbox operations within a limited area (darwinia, Sword of the Stars: The Pit), to the involved generation of endless worlds as is the case in popular games like Minecraft, along with other open-world and sandbox titles.

In the case of lower tier procedural generation, like in FTL: Faster Than Light[6], the stage construction is procedurally generated, though in a very loose sense. There is not a specific layout of space or environment, because the representative mapping of the level (jump points) takes place of experienced space. The interactions wrapped in these path points range from arbitrary dialogue sets to specified interaction roles ("distress", "store"). No two stages are identical, yet all are very similar, and it comes down to the nuance of working within the learned mechanics of the game that result in successful play-throughs. There is a simplified level of generation in FTL, though games such



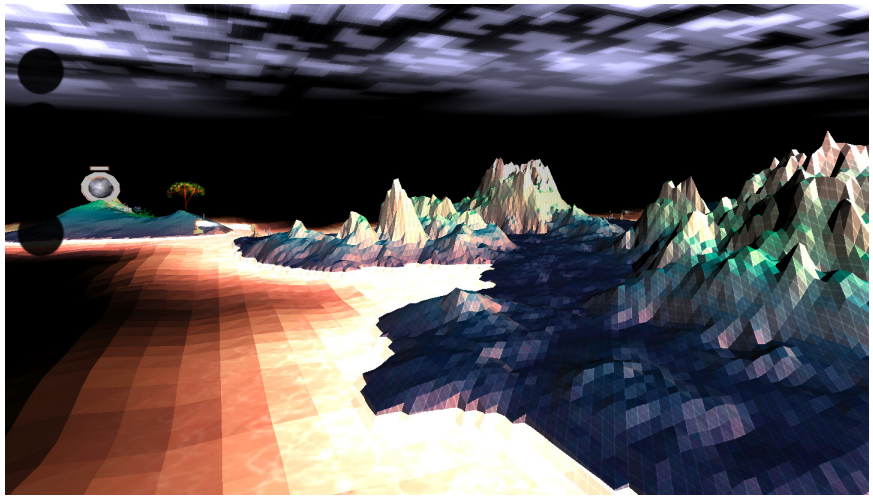
Above : FTL: Faster Than Light section 1 procedurally generated map variances [2]

Above : Sword of the Stars: The Pit second level map[3]

Below : Sword of the Stars: The Pit first level randomized layout scenarios[4]

as Sword of the Stars: The Pit (2013)[7], and Darwinia (2005)[8], achieve elevated levels of sophistication in their spatially generated environments.

First, in Sword of the Stars: The Pit, there is the generation of dimensional space, rather than the organization of points in FTL. Moving through multiple levels to reach the bottom of the game environment, the turn-based game takes hallway widths, door placement, room function, and entrance to exit pathway into consideration through its generation. Without prior construction the game is able to maintain the separation of oppositional elements (entrance, exit) connect differentiated spaces (hallways, rooms) and specifically locate their intersection (doors). The environment, although completely contained in its set boundaries (extent of area possible), is able to organize itself based off of these basic and expected interactions between spatial elements.



In Darwinia there is an even further push beyond simplicity in its creation of large-scale natural environments through the same procedural programming. Instead of hallways, rooms, and doors, the relationships that determine the enviroments made are instead the reaction between mountains, water, sky, and flatland. Obviously, the water and shore are connected, as the mountains are to the flatland, but there suddenly emergent relationships among multiple types of elements that determine how maps are constructed.

In the production of these games, the procedural generation is simultaneously aware and aloof in its application. The randomized level generation is highly desirable because replay is infinitely variable and there is not a set path for achieving success, but also the procedurally generated content is still not the emphasis or plot of the gameplay. Instead, the procedural quality is supplementary.

Above : Darwinia procedurally generated map[5]

Above : Minecraft procedurally generated world viewed from top of mountain terrain[6]

Beyond acting as a supplementary portion of gameplay, procedural generation is able to take full focus in sandbox type games, notably in the popular survival game Minecraft[9]. In its construction, various types of environments and climates are created, ranging from desert to artic conditions, and the types of blocks (basic unit of the world) are increasingly limitless. There are geological and ecological differentiations through the proliferation of flowers, trees, and grasses, along with a wide variety of rock types.

Minecraft is “open world” in the way that the meaning of the game is player derived, but also in the way that the map extends infinitely in all directions - not so dissimilar to our own universe from an existentialist view. Each map created under a new save is differently composed, although works off of the same values and assumptions. There are always deserts, mountains, oceans, and forests, etc. The formation of these vast environments is conditional on the procedure that generates them, and (unlike in Darwinia) these operations are valued as the interest of the game. Exploration of vastly different spaces is possible, even though the spaces were created from the same basic list of relationships.

There are anomalies, whether it be vast crags that split two parts of land or sinkholes that lead down into caves, but these are the same anamolous conditions that are found on earth. These instances, both in our natural world and within the game, are the emergent situations that arise with the collision of multiple relationships against one another. The environment they create, even based off of simple regulations, is extremely complex.

Spatially, Minecraft also represents the possibility of recreating real world technology. Through the use of red-stone, which is analogous to electrified matter, there have been a number of 8 and 16-bit processing structures recreated in life-size dimensions[10]. These structures can compute mathematics and other simple processes, yet are interacted with on the scale of the block unit, allowing users to spatially manipulate computation.

In the face of emergent spatial techniques, these board and video games are incredibly interesting in their ability to appropriate spaces and material in a way that is based off of logical connections, rather than geometry or simple flocking routines. In the development of naturalized and systemic space, their application to architecture is uncertain, but the possibility is engaging.

Above : Minecraft world stepping through limited playthrough of immediate radius[7]

Notes

1 Peter Shotwell, *Go! More Than a Game* (Boston: Tuttle Press, 2003), 2-5.
2 Shotwell, *Go! More Than a Game*, 9-10.
3 "Deep Blue," *IBM*, last updated 2011, http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/deepblue/
4 Simon Critchley, *Infinitely Demanding: Ethics of Commitment, Politics of Resistance* (London: Verso, 2012), 16.
5 "Rogue (video game)," last updated April 9, 2014, http://en.wikipedia.org/wiki/Rogue_(video_game)
6 *FTL: Faster Than Light*, Designed by Justin Ma, and Programmed by Matthew Davis (2012: Shanghai, China: Subset Games), Video Game.
7 *Sword of the Stars: The Pit*, (2013: Vancouver, Canada: Kerberos Productions), Video Game.
8 Introversion Software, *Darwinia*, Designed by Chris Delay (2005: Whalton-on-Thames, England: Valve, 2005), Video Game.
9 Mojang, *Minecraft*, Designed by Markus Persson and Jens Bergensten (2009: Stockholm, Sweden: Microsoft Studios, 2011), Video Game.
10 xDotxMr, "Minecraft - 8-bit Computer," *Youtube* video, 5:50, Jan. 6, 2012, https://www.youtube.com/watch?v=nMeXK0j-4MQ.

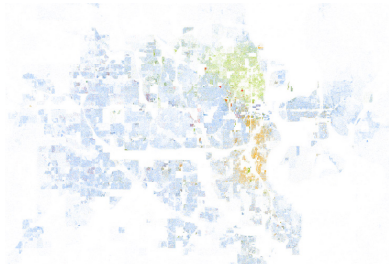
Images

1 "Honinbo Shusaku v. Ebisawa Kenzo," redrawn by author from information via *Sensei's Library*, http://senseis.xmp.net/?HoninboShusakuCompleteGameCollection
2 *FTL: Faster Than Light* (2012: Video Game), playthrough by author, 2014.
3 *Sword of the Stars: The Pit* (2013:Video Game), playthrough by author, 2014.
4 *Sword of the Stars: The Pit*, 2014.
5 *Darwinia* (2005: Video Game), playthrough by author, 2014.
6 *Minecraft* (2009: Video Game), playthrough by author, 2014.
7 *Minecraft*, 2014.

Politicized Urban Structures

Political policy has an extremely deep history with enacting, or, at the very least, representing, its fundamental characteristics within the built environment. The castle-manors and cathedrals of ancient european cities show a timeline of local influence and power, whether through tracking where public money was taxed or where it was willingly given, and the modern commercial tower defines its context in the same way. The political and economic frameworks that a society works within are invariably indexed on all scales of design, though urban structures identify with the most direct and pragmatic applications of political priority, from the subjagation of unaccepted groups to districted ghettos in various fascist states to the measures of urban reconstruction in post-revolutionary Paris to ensure that civilian insurrection would lose its efficacy.

Urban design in this way is not only affected by political process, but is in most political cultures used as an essential tool of enacting it, which can be seen in the way contemporary cities use development to rebrand their potential population types, or in the way that the most iconic and impressive architectural works are used to remind those around it of the priotitized values of the culture they live in. On a more implicit level the examination of urban structure in the contemporary city is able to show not only the portions given priority, but also the portions left to slowly dissolve against the high performance of the prioritized until they are in a state for cheap redevelopment, an implicit process most poignantly visible in the United States where segregation in city plan is highly quotidian and often quite sharply defined, as has been expertly visualized by Dustin Cable at the University of Virginia's Weldon Cooper Center for Public Service.[1]



Above : Racial Dot Map by Weldon Cooper Center for Public Center[1]

The politicization of urban structures is ingrained well beyond the ability to deconstruct each aspect in passing, though the broad tendency of such processes can be broken into examining the built environment as physicalized ideas, resultant hierarchical and spatial social striation, and specifically organized programmatic and functional interactions. Connecting to the previous section on network organization types it is also clear the power that different political types exert over their populations in demanding response to the political structures in place, especially in the centuries since the beginning of the era of enlightenment.

Physical Ideas

Architectural works have historically been the medium of cultural message, and, even after Victor Hugo's claim that the printing press had cut this essential connection between architecture and mes-

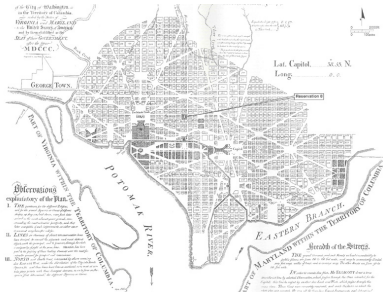
sage, it is clear that the development of monumental or iconic projects has been intrinsically tied to the spirit of the political cultures they exist in. This exercise of built ideas can be linked to models of control which act as great reminders of the force and mass of the political conditions that cities exist within. The twentieth century especially has proven that architectural and urban projects have been used to "serve as a visible sign of the power of the authorities," and the extent to which these projects broadcast their messages and are thus given ideological priority can be seen as an evaluation of the extent to which totalitarian sentiment exists within each culture.

The centralized political structure defines local and national urban policy by the development of monuments that are set to remind the population of the size and force of the state and its ideological platform, seen specifically in the nineteenth century reconstruction of Paris by Baron Haussmann into a "rhetoic of axes" that networked monuments throughout the city as both waypoints and enforcers of the righteousness of Napoleon III's rule over a recently turbulent population.[2]

Democratic nations also demonstrated the inclination to define and exalt monuments to the spirit of their political culture, and this want can be seen in both the L'enfant planning of the federal capital of the United States in 1791, as well as the later 1901 Macmillan plan for the continued development of Washington D.C. The priority of evidencing political openness was even taken so far as to exercise control over the presence of fences that might both physically and ideologically limit the freedom of the capital's residents and tourist from experiences the planned gardens and mall that were of central importance to each of the plans.[3]

Beyond the borders of the capital city, each American state has its own capital city in which architectures of democracy stand and hold reference both to the state and national political assumptions, acting as a reminders of the federal power in Washington D.C. and the implied solidarity and equality that they claim. Often the urban policy of the state capital cities are respondent to the placement and size of the capitol building, solidifying the viewership of the democratic work from specific routes or locations, or in some cases demanding the height restriction of the surrounding urban fabric so as to eliminate any chance of obstruction of the democratic icon.

Soviet planning and architectural policy more strictly defined the role of ideological sentiment in urban design, with the development of monuments as a fundamental importance, in supporting the iconography of the totalitarian rule of the communist super power in various cities of size within the Soviet Bloc and in the organized placement of special venues for holding mass events.[4] The mass event was important for the same reason that the massive architectural monument was: reminding



Above : 1901 MacMillan plan for Washington D.C., axiality of monuments and urban corridors inherited from the french urban planning revolution.[2]

Above : Stalin Square in Warsaw, Poland, a Soviet monument set within the city to remind the populations of the government which they served.[3]

the citizen of the difference between the size of the state and the size of the self. Grand urban and architectural works, whether the emobodiments of Stalinist or American ideologies, were then and still are used in this way, creating a personal response in the population that fears, glorifies, or in the very least recognizes the vast powers of the state and those values which it espouses.

The production of monumental foci can also, and expectedly, be seen in the urban design of Berlin in the early 1940s by Albert Speer, enforcing the massiveness of the Nazi state through not only the massiveness of three monuments (Train Station, Arch, Great Hall) and their axial relation, but also in the massiveness of the road that connected them, returning to the processes by which Haussmann, whom Adolf Hitler considered the greatest of urban designers, reconstructed Paris.[5]

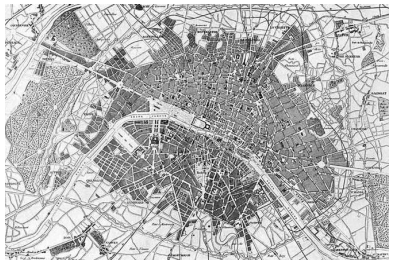
The urban project of monumentality, undertaken by each political structure in its own specific way, is the physical statement of size, power, and message, and regardless of the balance of these qualities or their moral evaluation, it is important to remember that these processes are ones of control. Through the built environment they pose a challenge any individual who might react against the state, and act as nodal objects of hierarchical models they are built within. These monuments are preserved, reconditioned, and given priority of future planning actions well beyond those of the non-monumental works that surround them in an attempt to create incredible amounts of stability of power.

Social Striation

Beyond objects of ideological affirmation, the politicization of urban structures also comes through the conditions in which urban populations are striated. Using the same urban examples, the overlay among monumentality and this subsequent striation can begin to be examined.

Beginning with Haussmann's reconstruction of Paris, on an economic scale the plan was not only intentionally striating, but aimed at redefining the population that inhabited Paris entirely from an economic perspective. The management of the city recognized that the wealth of the city was inherently tied to the tax base of the city, and in so much to the wealth of the taxpayers. The reconstruction of Paris was as much to cater to bourgeoisie and the redefining the property values of the reconstructed areas on the institutional level as it was about the unhealthy living conditions of the degrading neighborhoods on the public level, and the use of aforementioned monumental priority was used as a tool in the way of recreating views and prominent locations that would attract both French and foreign invested interest in the city by those who could afford it.

Simiarly, the effects of land valuation surrounding monuments and publicly scheduled land in Washington D.C. increases



Above : Rising from the "rhetoric of axes", Haussmann's renewal of the paris urban fabric brought class and race segregation, as well as the political condition of state dominance in the avenue.[4]

significantly, leading to the inability of many without significant wealth to live within the immediate city. The same process is speculatively making cities like New York and San Francisco unlivable for all except the wealthy, though it is not only these capitalist minded urban centers that are creating great levels of urban striation amongst their populations. Matt Hern, in *Common Ground in a Liquid City*, argues that environmentally and socially minded cities like Portland, Seattle, and Vancouver are segregating their populations based not off of the urban priority of monumentality, but because of the New Urbanist techniques applied mixed with large amounts of already bourgeois populations moving to those cities because of their progressive profiles.[6] Essentially, even the cities that are performing well in mixing different culture and progressive agendas are doing so in stark economic striation, making these urban centers unlivable for working class populations.

The Reclaim the Streets (RTS) initiative, fighting to retain public rights within urban centers, fights the currently popular model of public-private partnerships for the same reasoning. The involvment of private interests in public space and public amenities, while remaining open to those who might be able to afford to pay into the interests of both, becomes a barrier of access to public space to those without the same advantages. While the public-private partnership remains popular because of the aleviation of cost on the city, and because of its relative success in new models of urban renewal, the tactic is claimed by RTS to be flawed because it continues to serve the consumerist intention of the private benefactor within the relationship, creating further striation in the process.

Through the majority of the twentieth century, the Soviet planning agenda was critical of these exact scenarios in the 'western planned city', calling the american development style a "product of a mixed economy, wherein land is allocated by a modified market and in which the state exercises control of the use of land through its ownership of all developmental rights."[7]

This may seem rather outwardly critical from Soviet planners, considering the unanimous fixation with functional zoning throughout the past few centuries, but the soviet planning outcome verifiably ended with much more heterogenous and non-segregated populations on a city-wide scale.

The Soviet planning theorists V. N. Baranov and V. N. Belousov might explain this in the orientation of the soviet planning initiative to uniform social conditions through the process of avoiding "sharp disctinctions between areas"[8], which was not only present in United States cities, but the process of defining area boundaries by hard infrastructure was so popularized that the "other side of the tracks" came to mean a distinct cultural environment. Unfortunately for the success of Soviet

planning initiatives, while city-wide segregation was avoided to a great degree, segregation and degradation of living environments varied greatly on the block scale, again opposed to the solidarity of the block found in United States cities.

These differences might be partially be attributed to the different perspectives on automobile culture that the two countries took toward planning, the United State investing heavily in the ability of each citizen to travel in individual automobiles, while the Soviet Union found transportation the collective right and responsibility of the public realm, having determined that the "unrestrained proliferation of private cars was an irrational use of resources."[9]

Regardless of American tensions over the policies within the Soviet Union, the successes of more equally distributed cities cannot be overlooked. The social striation, based on the socio-economic class and race, is not only present, but still flourishing within the United States. Entire periods of American planning have been inspired by social segregation, the period of 'white flight' to extended suburbs being a poignant example. The success of culture within the city, as well as the success of city processes depend on the equal access to districts by the entire population. Working class populations that cannot afford private cars, the foundation on which the American planned city is based, need better systems of transportation and better representation within the parts of the city in which they work. The American model of social segration within urban centers is not only oppositional to the political identity of deomcratic process, but generally shameful.

Organized Interaction

One of the immediate problems that leads to the events of social striation and spatial class distinction is the negative organization of interacts among programs and functions on the city scale, commonly found in the process of functional zoning. Leon Krier critiques the process as exclusionary in the way it specifically allows single tasks in defined places in defined manners, and this rings true in the examination of the affects of specific zoning on the populations surrounding them.[10]

In the instance of Paris, the implicit zoning tendencies that Haussmann created with the reconstruction caused the differentiation of block use for residential versus industrial purposes, which lead to the aforementioned striation of the workforce from the job centers within the city.[11] The functional interiors of blocks, used for the communal purposes of collective production of small amounts of agricultural yield, for small community businesses, and for public activities, began to disappear.

The same argument is used by the Soviet planners agains the processes of the West in the way that the state institution "exercises the control of the use of land through the ownership of all developmental rights." Functional zoning was an inter-

national expedition, taken by each to various degrees, but the American model of planning cities showed the vast distinction of space in its use to a degree that was beyond the extent of others. Whereas the communist city was small and dense, and its uses were often slightly more distributed, the center of the western city was practically uninhabited, given to business center high-rises due to the high price of land proximal to central locations.[12] The immediate ring surrounding these centers was densely inhabited, but the population was distributed in waves that extended out to the furthest suburban developments, demanding the use of automobiles, and in many cities denying the appropriate development of public transit due to the high costs of providing transportation infrastructure for such a large area.

Politically, the capitalist fight lead to larger amounts of industrial consumption, and allowed extreme expansions of the urban boundary, buying into the immigrating populations to successful urban centers without any plan for growth limit. The Soviet plan also was unsuccessful in limiting growth, but the presence of prioritized pulblic transit disallowed the same degree of expansion in the same time.

The democratic dream of surface autonomy, in which each citizen could inhabit their own single family house, drive their own car, live around their own kind, and send their children to suburban schools, allowed the disintegration of quality within urban centers over forfeiting any level of individuality or recognizing the collective responsibility of the population to the upkeep of the urban realm.

The organized interaction of commerce, residence, business, and industry allowed a comfortable separation of urban processes that subsequently led to the overextension of resources, which for a great time razed the success of the American urban project in general.

The disintegration of these separations is required for a successful and resource efficient future of urban centers, moving away from systems in which elements are isolated and single-focused.

A-Politicization

Fundamentally, the politicization of urban space has led to explicit and implicit forces of coercion that have functionally segregated, socially striated, and imposed monumental practices of ideological control within the city.

The undoing of these processes comes with the process of building urban structures apolitically via avoiding monumentality, engendering heterogenous social cohesion, and allowing mixed function and systemically operational laminates of programmatic types. These processes are not as straight forward as their antitheses, which were chosen for their simpleness and exclusive ranges of advantage, but the equity of the city depends of them.
The fight against monumentality is no

longer just the extreme priority of the works of the state or of Stan Allen's self-described "durable institutions", because the presence of capitalist motivations has extended the monument beyond just the city hall, the capitol, the concert hall, the museum, and the library. Now the sports stadium, the shopping mall, the hotel, and the high-rise are emblematic of the same spriti of monumentality. Still, the required course of action is not to build these programs short-lived or without the quality they've been given. Instead it is to build the quotidian with the same quality and lasting value, as well as the core essence of monumentality to fade: selfish and exclusive use.

The fall of the Soviet Union left vast numbers of monumental works that were not void of ideological meaning, but inactive as the totems they once were, and have been inhabited by alternative uses. Unfortunately the uses of the grand gestures of the state have been limited to either commerical or tourist related programs, most often simply replacing the ideological content of stalinist or communist force with that of the capitalist or commerical. The question becomes how to strip the ideological meaning from a monument and not refill the husk with meaning, but negate the meaning and be able to use the space to multiplicitous ends.

At its very core monumentality is seeking a form of controlled solidarity, so at its very core what must be done is attack solidarity so as to allow the openness and liberated space that can not be returned to the role of proselytizer. Multiplicity fights this, as was explained in the section covering 'Autonomy', because multiplicity includes dissensus instead of exclusive consensus, and in so much negates solidarity.

In line with these aims is the pursuit of heterogenous social cohesion. More and more it is becoming apparent that modern society is able to not only tolerate, but accept dissensus of action, acknowledging that dissimilarity is not the same as perversion. The acceptance of non-uniformity on a social level is separate from the institutionalization of the idea, though, so it must be set as a priority to allow the dissemination of complexities throughout urban fabrics, and in concert be set that the resistence to complexity is counter to the goal of equity and urban value.

Richard Sennett's exposition of the transition from adolescence to adulthood finds that the exertion (or presumption of the possiblity) of total control is a symptom of the former, and that the latter is the acceptance that "although an adult feels no longer wholly the manipulator of the world around him he also feels that the world cannot in turn wholly manipulate him."[13] The factors in modern society which are used to socially striate and separate race, gender, and creed are based on the assumption that control can be comprehensive and unending, and the urge away from this type of ignorant, childish thinking is necessary, especially when it comes to the implementation of urban planning, a

practice which is usually mistaken as the attempt to outhink the complexities of a world misunderstood.

In respect to the allowance of multi-functional progammatic laminates, this sentiment also applies. The segregation that arises from functional zoning is an attempt to simplify and clarify issues that are neither simple nor clear. There can be no comprehensive logic that determines the form of urban structures, there can be no algorthmic answers that self-apply given the every instance that have been anticipated, and there are not truths of operation in total - at least, none that we know or understand yet.

This is not to say that urban planning cannot take place, or that no attempt should be made at the control of unjust or negative situations that can be predicted. Operationally, planning must still take place, but not from a perspective of solidarity. The city must be willing to expand and contract, must be willing to break the parts of it that do not function and resolve the pieces into something that does. Again, the city can not continue to be the big functionally zoned duplo blocks that determine the actions of every process within its range, but more the miniatured lego blocks which can forced together, taken apart, and reoriented given the correctness or incorrectness of the situation.

The apoliticization of cities is liberating because is absolves the urban structure and those that determine it from needs full and comprehensive answers. Because they never had full and comprehensive answers - they just acted like they did.

For productive and apoliticized urban structures planners, urban designers, and architects must, in the terms of Sennett, act like adults and accept diversity and disorder. Only at the point that thse profession are able to achieve that will the fields they are productive within be able progress the knowledge that currently escapes them.

Notes

1 "The Racial Dot Map," Demographics Research Group, created by Dustin Cable, last modified 2013, http://www.coopercenter.org/demographics/Racial-Dot-Map
2 Philippe Panerai, et al, *Urban Forms: The Death and Life of the Urban Block* (Oxford: Architectural Press, 2004), 3.
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Images

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3 Alfrun Kliems, and Marina Dmitrieva, eds, *The Post-Socialist City: Continuity and Change in Urban Space and Imagery* (Berlin: Jovis Diskurs, 2010).

4 Philippe Panerai, et al, *Urban Forms: The Death and Life of the Urban Block* (Oxford: Architectural Press, 2004).

The Conditions
the current and possible

In this section the current and possible conditions of the city will deconstructed piece by piece, showing the current underlying major problems of the generic city, as well as the respective potential solutions. Many of the problems that define the inequity and unresponsive nature of the urban to those living within it are administrative, based in policy and legislation. These processes are not within the boundaries of the architecture and urban design fields, but the most negative attitude that could be assumed would be one of apathy or convincing oneself that designers have no effect on the daily socio-cultural and political lives of those that inhabit the environments created.

Implicitly, the apathetic and unwilling have chosen to support organizations, development models, and building techniques that continue to support these processes of administration and governance. The contemporary designer will defined by the ethical imperatives he or she responds to in the next century. Some of these imperatives are clear and present, such as the push to environmental awareness in building materials and mechanical systems, but some of them are not as clear.

Reconceiving the obligations and potential organizations of urban space begins with understanding what is working and not working, but can not end with a single list of reactions, because there should be infinite discussion of what the correct reactions should be.

Speculative possibilities can never be comprehensive, and this section does not aim for the comprehensive, but it will attempt to tease out some of the largest detractors that must be resolved. The parts covered will not explicitly tie to the political districting, educational funding, and cultural subordination that act as drivers for the negative qualities of the generic urban area, but the illusion that these issues are not related to the built environment and the architectural project indirectly needs to be swept away.

The following will be both the critique and potential of the urban area heading forward. There is not an answer for every critique, and there is not any route being proselytized, but many being explored. Each can be taken in multiple ways, and that very multiplicity is the most exciting aspect of the future urban potential.

Above : Projections of a sustained grid in the envisioned development of Omaha, Ne, 1868[1]

Current Conditions

Paths of the SuperGrid

Organization through the superimposition of the jeffersonian grid is a process that the western American city has become very used to, but the presence of such a defining order, whether at the block level or at the aggregate level, has shown to have very serious negative affectations that bring in to question the use of the grid as an organizing tool at all.

First of all, path within the supergrid becomes not only predisposed to certain routes, but almost unable to offer any alternatives to responding to the set dominance of the arterial roads that define the city. Wider roads arise because of this predetermination of route, forcing more vehicles in transit to drive them due to their arterial quality.

Once the necessity of driving along these gridded arterial roads is set, placement of service and commercial industry is dictated by them, pushing housing into the interior of the block or along edges deemed unnecessary for alternate use.

Because the arterial nature of the roads provides a steady enough stream of potential clientele the road infrastructure is set to respond directly to the vehicularized citizen and indirectly to the pedestrian.

Walking becomes a harder and harder endeavour, sometimes impossible, and the enjoyment of the walk suffers because of the stripping of potential diverse internal qualities in response to the external emphasis inherent within the grid.

The compartmentalized index of the spaces held within each module of the grid are held firmly in their place by the 3-lane arterial roads that offer crossings at no one's leisure. The supergrid is not only unfriendly to the pedestrian, but is dangerous, yet feels no obligation to the non-vehicular user, because in return the pedestrian has no recourse to the vehicle.

Box Store Madness!

The Walmarts, Targets, Home Depots, and Costcos of the contemporary city are the big box stores that promise infinite varieties of consumption at the edges of urban centers, placed against vast parking lots to fit the mass of clientele they draw in.

The objects for consumption within these box stores are emblematic of their material journeys, from the raw mines to the factory to the shelf, and their embodied energies are the majority of their marked values.

Each store structures a skewed form of decentralized autonomy in which there is a "one stop shop" for an entire realm of

Above : Big Box development patterns like Sam's Club and Home Depot with half of the development area devoted to parking, the other with a large concentration of storage and commercial floor space

products for daily use, though on the local scale centralizing the model of consumption of many. Each store is placed to draw in the largest shed of consumers possible, taking the least expensive square footage in lower density districts surrounding the city core.

For residents in the city each location is a distance expected to be made by car, and for even the local populations living adjacently driving is assumed. The expanse of the parking lot is daunting enough to clearly demarcate the preference of the vehicle.

The box store itself acts as a pocket of pseudo-local convenience, allowing the seeping of the development well past whatever pylon it might represent in urban expansion. Products are packed densely into the frame of the box and imported on schedule, but the concentration of space surrounding it is horizontally projected to an extent that disallows any immediate localized culture to arise, instead demanding the spectacle of the shop.

Pavement, Pavement Everywhere

With the invested inclusion of the automobile within the city came the paving of the automobile surface, the maintenance and very climatic nature of the city has been augmented. Vehicles utilize the road, which catches the rain fall, contaminates, and demarcates its flow its flow beneath the city.

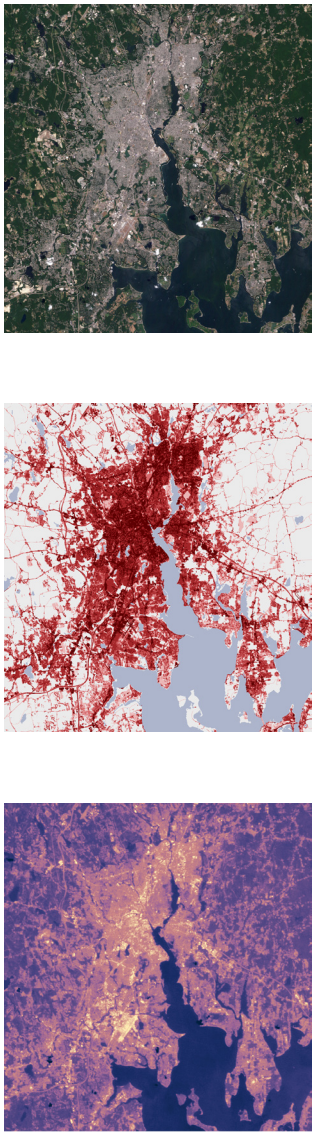
On an immediate level, the urban love of pavement aptly generates the heat island effect, which raises the temperature, raises the energy demand, elevates air pollutants, and impairs the water quality of the urban area.

In the densest of urban centers open public space can be even be large swaths of undeveloped pavement within the view of flora (if it is luxurious). The grassy park is of such note due to its contrariness and beauty, in the fact that it is not a stream of concrete, the audacity of public mindedness on a small against what could be very profitable urban commercial space.

Ground permeability is forsaken so instead the city can capture all that would be soaked into the earth and either dump it directly into the adjacent river basin or spend immense amounts of money to return it into the system of human use.

The arguement of the pedestrian is the ease and comfort of walking on such a perfectly hard and flat surface, but it is not uncanny to see pedestrian sidewalks and asphalted roads in disrepair without hope of renewal in any immediate future - especially if the sidewalk is within a district of the city which not viewed worth investing in.

The vast openness of parking lots and buildings tops are also issues of the urban pavement infatuation, rendering all that touches it useless and in need of decontamination, whether its water or humans.



Above : NASA Heat Island Effect mapping, Providence, Rhode Island (*top*), Pavement / Non-porous development (*middle*), Temperature reading (*bottom*)[2]

Above : Generic development in Lincoln, NE two miles outside of urban core[3]

Above : Architectural works lasting limited lifetimes due to both poor design and re-considered urban development plans[4]

Generica Modernica

The generic city invests in generic architecture that has no lasting value and which will survive for no longer than the outdated stye it is built in. Outside the spectacle of architectural works in the city center, the general built environment of the city is constructed for brief and immediate profit, the empty burger king and blockbuster set for general destruction, scheduled to be replaced by a Denny's.

No lasting value is expected of the general built work, and as it devolves into the statically broken space that was once hidden by thick paint and sign, the value of the building is transferred to the value of the block, which in return evaluates its inhabitants.

Each sector and field involved with the building of these artifices of apathy are complicit in the development of uninteresting and uninterested space, thrown out in the simplest, shortest sighted fashion that is most economically possible.

Legally Separated

The functional zoning of programs and spaces within the city have separated the necessarily cohesive components in the name of correcting wrongs that were self-administered. Large industrial zones, set aside because of the now recognized noxious amounts of pollutants they generated, have turned into islands of disuse and disregard.

The neighborhood is torn from the proximity in which the worker can reasonably access the work site, the lost industrial districts attempting to reinvent and redefine spaces vacant of their momentary intentions.

Food deserts have arisen on the interior of the functionally separated, and the inherent value of access has prioritized the spaces of functional overlay and adjacency for those that can already afford them.

The segratation of use and process yet again posits the automobile as the exclusive source of liberation within the zoned city, and all those without such privelege are expected to find their own way.

The ease of explanation of functional zoning within the supergrid has led to misunderstanding that ease of concept is equal to the ease of application. Unfortunately, for those with the right resources, this ease is true, and because they are within the priority of power, the process is maintained.

Cult of Monumentality

The grand project, the grand projection of values, escapes the claim of generica modernica, but for the message of the monument. The government building, the capitalist structure, the sports stadium, the high culture theatre, each inversely an investment in opposition to the mundane that is built to support its grandness. The value of space within the city is placed not

Above : Functional Zoning example in Red Hook, Brooklyn, New York City. Separation of function resulting in barren areas of city without complexity or wholesome qualities[5]

Above : Los Angeles River, a monumental infrastructural work against the natural resource it was intended to contain and direct[6]

on the spaces which are of the people, but on the spaces to which the people are to respond.

On an infrastructural scale, the city is defined by the monumental projects that can be declared outdated at the instant of their competion. The process of the city is needed to be conceived as a giant that can not be controlled by one instance or one aggregate, and in most cases not even by the administrative body. Infrastructures built so large that their repair or replacement does not only take longer than decades, it is not even guaranteed success.

The monumental infrastructure does not only skirt failure, but has experienced it, and in response to these failures the answer is to conceive of something even larger, even more pervasive.

In a capitalist setting, rather than projecting the messages of the political monument, the message is written as the grandeur of the business, the private entity able to achieve a beauty for the people to look at, but not inhabit. The superiority of the business is validated by the height, the dominance, the acquisition of a spot on the skyline, a perspective that is subsequently used in the validation of the city.

The Edge is Dead

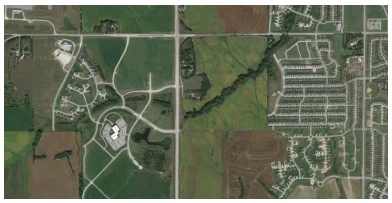
The low price of land beyond the urban edge has destroyed the urban edge. Development stretches out to capitalize on growth that it self-prophesizes, and instances of unsubstantiated expansion thus implicate the city in growth to support them. The expansion of area is due to the economic incentive of increases taxed lands.

No value is placed on the edge because the edge is a limitation of space that might be evaluated and developed and sold. The edge is acknowledgment of requisite density, and density is a loss of individual rights, a loss of the driveway on a secluded suburban street, the loss of the under utilized backyard. The edge limits the expression of wealth and distance from those without it. The edge limits the selfishness of space in the single-family home, and requires that overlay and multiplicity is present, which cannot be tolerated by a system institutionally opposed to the inconvenience (of those that can afford convenience).

The edge is the demarcation of untainted land that might be used in building a mansion, or in the development of a suburban division, or in a box store to service the current fringe. The edge is a statement of acceptance in respect to the limitations of the city, in area and otherwise, and the city childishly ignores it.

The edge is a rule to be broken in the generic city, an oft talked about but never acted upon model of practical conservation that flies in the face of commercial and developmental liberalism. The edge is dead, long live the edgeless.

Above : There is no edge when subdivision development open in phases, building infrastructures that are posed to develop past accepted extents[7]



Above : Subdivisions in different stages of development in Omaha, Nebraska[8]

Blame it on the Model T

The automobile is a sign of the liberation of the user, the claim of independence, but it has become definitive of the urban built environment. Useful buildable space is set aside for the useless of storing unused vehicles, the proud declaration of wasted space undeniably essential to the identity of the generic city. The very cost of parking is indicative of the largeness and success of the city, though the inclusion of parking space on the scale of tremendous investment is never questioned. Assumed is the ease of access that automobiles provide the user, while the pedestrian is expected to accept the elongation of distances that are explicit in vehicular priority.

The city with heavy car infrastructure is unexpected to provide comprehensive public transit, and the distances required of any attempt would prove too much. Meanwhile, the infrastructure of the vehicle is developed on massive scale which invokes the right of demolition on all that stands in its way.

The consolidation of commercial spaces is easy and natural in the vehicular city, even at the devaluated cost of losing locality, complexity, and diversity. The priority of the automobile also punishes the pedestrian in this way, ignoring the possibility of walking distances for those who do not have access.

The car is the benefactor of the supergrid, the paved environment, the box store, the functionally zoned, and the limitless expansion of the city. Even as the amount of pollution in the air is drastically effected, even if only considering the amount of vehicles idling at streetlights, the convenience outweighs the inherently negative environmental, social, and urban qualities that it brings about.

Cool, But Where is the Starbucks?

In the reinvention of failed sectors of the city the reinvigoration rewards, via low renovation and development costs, the reversal of social and economic conditions to the point that populations can not afford to live within their neighborhoods. With the need of revitalization comes influx of culture and investment, which brings those interested in culture and investment, which brings in the gentrified model of repair that costs the revitalized area of the culture that was once born of the condition that it was in.

There is a large amount of reluctance to comply with or tolerate multiplicity or diversity in an area, and rather than attempting tolerance, the city develops out of existence the parts it sees as undesirable without considering the reasoning behind the state of dereliction and disrepair.

The expected is valued, and the homogeneity of community is prioritized, leaving the city map racially, socially, and economically segregated. The value of uniqueness is given up for the mass-produced.

At the Flick of a Switch

The reliance of the generic city on resources and amenities well outside of itself harkens to the same spirit of unconditional independence and excess, hardly recognizing the future consequences of heavy dependencies on importation of the useful and exportation of the unuseful.

Locality of production is of lowest priority, valued only on a community scale, while the city dismisses any occasion of failure. Conservation or self provision are seen as superfluous and distracting from the projection of growth, and the very expectation is referential to the city's sentiment of the edge.

Constant and unmonitored consumption is expected and promoted, seeing as automobile is a site of an inordinate investment of resources. Very often the energy and water of a city is controlled directly or indirectly by the city, so there is no reason for a disruption of increased consumption or the reconsidering of the methods in which it generates what is needed.

The grid takes another meaning in terms of resources, and while the supergrid expects the user to respond to it, the resource grid demands a response if one is to survive in any contemporary setting. The orchestration of these grids is again monumental in its exaction, and inefficient in its execution, but this is because there is not expectation of efficiency. The only expectation is consumption.

The priority of localized generation or production is of no matter to the generic city, because, as with all other aspects of locality, there is a profit to be made elsewhere.

Adjusted Conditions

How Pedestrian

One of the fundamental shifts needed in the construction of the city is a renewed investment in the pedestrian experience, adjusting the expected travel distances to local amenities and public transit. The average walked distance in a day is a statistic that does not favor the average American (5k steps/day compared to the ideal 10k), nor does the statistic of walk radii that average Americans will endure instead of driving, which is placed firmly at a quarter mile.

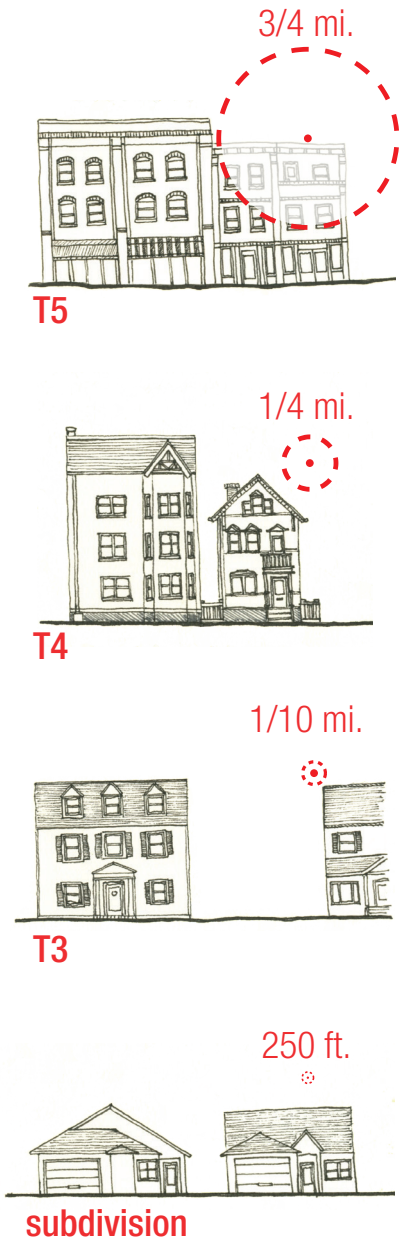
Of course, even this quarter mile distance is up dissection on the level of urban development that it involves, as can be seen in Figure C.__. To Increase the level of pedestrian priority in cities is simple in concept, though not as simple in application, considering the resistance of the current condition of automobile priority.

Fundamentally there must be a shift from prioritizing arterial roads towards the development of multiplicitous road networks that do not allow there to be such distinct divides between sides of the street. Priority roads has been an assumed condition of urban development that arose with the assumption that larger arterial avenues would alleviate congestion and quicken the amount of time for vehicles to arrive at their destinations, but this assumption has been proven baseless in the recognition that street priority funnels all traffic to these arterial streets and creates the same levels of congestion, and in many cases even higher levels.

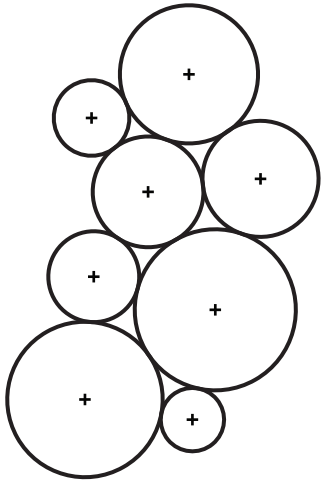
The restricting of arterial venues for cars has a limiting effect on the speeds on those roads, which inherently makes the roadway more accessible to the pedestrian, in turn creating a more inviting environment for more people to feel comfortable walking. Most of the current problem with American pedestrianism is the fact the urban environment for a large portion is extremely uninviting and dangerous, and changing those conditions will have a drastic effect on the number of people who walk and the distances they achieve.

The priority of the pedestrian must be clear and unquestioned in the design of cities through every extent, and that begins with the unwinding of heavy vehicular use within the city. This seems to be a grand and heavy task to put forward, but there is considerable hope for change if we are able to adjust the composition of the average urban structure.

In order to effectively pedestrianize the city amenities must be organized within acceptable walking radii, but the distances of these radii must also increase, which is an issue of the built urban fabric and the density that traditionally dissolves past the



Above : Average acceptable walking range before use of automobiles for development sectors



Above : Non-uniform development of multiple community centers, eliminating large amounts of space without access to amenities

areas immediately surrounding the urban core.

The pathway towards a pedestrianized city in this way is one that is developed through networks of communal centers.

Communal Centers

The tactic of building communal centers keeps every district or subset of community within the city within walking distances to the necessary local amenities, such as grocery stores, street shops, etc. The development of these centers is based on the intent of achieving less segregated zones that separate functions and programs, so that work, home, and leisure can all be within an achievable distance of each other.

Each communal center is not restricted to certain sizes, but must respond to the populations that it is expected to hold, with the density and radii being determined by those expectations. The complete redundancy of every aspect of the urban environment cannot be expected, so it is assumed that heightened specialization of certain processes would take place within each center, but the assumption of basic self-sufficiency is standard.

Publically Transported

A condition of these networks of communal centers with heightened densities is a renewed investment in public transportation in various forms. The level to which the average American city emphasizes public transit is offset by the assumption of individual vehicles, which is directly responsible for the amount of wasted urban space used for parking structures and parking lots.

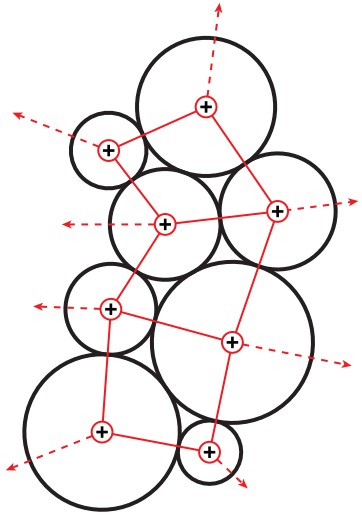
The condition of public transportation in the average city currently assumes that only those without the privelege of individual automobiles are in need of its use, and this perspective on public transit is limiting of total investment in systems that are efficient and well-represented throughout the total urban area.

Whereas communal centers should be developed with walking sheds limited enough for the assumption of pedestrian use, the travel between communal centers can't default back to the individual vehicle or else the same standards of the current situation will still be propegated.

Agricultural Localities

In order to offest the condition of importation of the resources consumed agriculturally, localized agricultural production is of necessary investment. The potential of urban agricultural production can be seen on the level of community gardens, but the yield is not high enough to represent any great percentage of the consumption in a given community.

What is required is multiple scales of approach on commercial, personal, public, and community levels. Personal gardens



Above : Public Transit connectivity among community centers

provide an amount of yield, though if organized correctly would not require complete personal care, considering the job opportunity of care for these gardens while the individual owners are otherwise engaged.

Public gardens would allow the cultivation and agricultural yield of public spaces, substituting non-useful green space with productive focus. Community gardens might be seen as production on the block level, whether in a courtyard or on shared roofspace. These community gardens have shown to be successful in a variety of areas and their locales vary to great extent.

Commercial agricultural production would be pursued through the investment in the types of vertical gardens laid out by Dr. Dickson Despommier, reorienting the current agricultural models that have proven negative to the environment in an extreme number of ways. The reconception of commercial models would bring localized agriculture into the city, available in multiple scales given the size of communal centers, and would involve a great number of employment opportunities for those in the community in all ranges of education and skill.

The development of localized agricultural production would fight against the appearance of food deserts and would have the potential to deflate the emobodied energies of the current model based on importation via various types of long-distance transport. Of course, there would not be a limitation of the community to survivie exclusively on what it is able to produce locally, and trade would still be completely possible, allowing climatic variation and specialty to continue to exist, though in the condition of a more sustainable model of production.

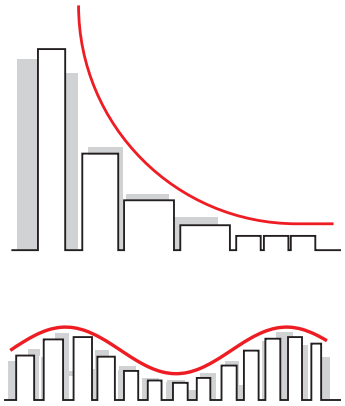
Energy Localities

Energy generation would also need to transition into the locality, which would be able to be done while still involved in overall networks for redundancy. Centralized grid generation is an outdated and inefficient system that needs to be reconsidered in a way that allows communities to have levels of self-sufficiency in their generative capabilities.

The technologies that would make local generation possible are available currently, with the design obligation being the cohesion of different renewable and climatically efficient set ups in use. The continued efficiencies of modern photovoltaic arrays, wind energy turbines, and alternative energy systems is hopeful, but regardless of the technologies applied, there must be a localized network of generation.

Intermediacy of Height

Instead of building up the vertical heights of current urban centers, which vast commercial applications, and highly valued residential uses, there should be an adjustment towards an intermediacy of height, being able to provide sufficiently



Above : Rather than the extremes of highly dense and invested development, the shift towards intermediacy of height in terms of the urban fabric aims at providing a less violent shift in locality

dense, but not overly dense envrionment so that localities are not populated beyond their capacities.

Intermediacy of architectural height also responds the conditional needs of heigh limitations in repsect to the development of public and personal gardens, as well as in the building of communal centers in ways in which every residence has equal access to natural light through periods of the day. While density is needed, vertical density has a tendency to extend populations passed reasonable amounts of consumptive debts.

Intermediacy is a scope in which individual and block structure has extremely varied range, but must be constructed within the ranges of consumption of the community that it holds.

Distributed Infrastructures

In addition to the productive qualities of localized energy and agriculture, the development of general infrastructures must become distributed in the ways that locality of response is inherent. While the interconnectivity of these infrastructures cannot be abolished, the ability of each communal center to represent itself infrastructurally should be assumed.

Environmental Response

The importance of environmental and climatic response has not been something traditionally included within the organization of the city, but in responding to a system autonomous organization it is an imperative that is unavoidable. Far from the projection of non-responsive logics, such as the supergrid, cities cannot search for ways to mitigate the environmental conditions they inhabit, but accept and respond to them in respectful and comprehensive ways.

Responding to the seasonal and climatic specificities in any given situation provides the city an ability to act along with the ecological system in which it exists. Permeable surfaces allow a larger amount of rain water to be absorbed by the ground, alleviating the heat island effect, as well as reducing the severity of flooding in some circumstances.

Infrastructure must become more ecological in its implementation, allowing the landscape to dictate the ways in which rainfall is taken from the surface to the stream, and providing an urban organization that can naturally deal with the temperature, humidity, and wind qualities of the area. The specificity of site in this case is something that goes well beyond dealing with nature in a general sense, let alone attempting to tame or control the ways it will react to circumstances.

The systemically autonomous city not only reacts to the environment it is in, but recognizes the influence that human and urban process have on it, as well as the the influences and control that the environment has over the city.

Architecture as Investment

Dealing with the technical and material qualities of the architectural works in the city, a passively performative focus must be taken by the architectural field. In addition to the organizational qualities of the city that must be addressed, each project being built must feel the obligation of creating quality work that can operate with the least amount of addition or external input as possible.

Generally, to fight the proliferation of short-term poor quality projects, each architectural work needs to have a higher design investment than is currently usual. The architectural project must be able to remain, assuming correct maintenance and care, for an extended period of time, acclimating itself to multiple or cooperative uses if possible.

Shared Space, Layered Use

In order to find the perfect balance of density and self-sufficiency, the amount of space that is used inconsistently or without routine must be questioned. The collaborative space must be invested in, and the ability to use spaces for multiple uses within the same time period needs to be seriously considered.

The amount of singular space that is infrequently occupied can be put to much better use in transforming to spaces which coordinate schedules of use, allowing there to be full activation of the structure.

At the same time, architectural design must begin to put away the assumptions of the single enclosed program, and accept layers of multiple uses. Already this is a programmatic situation that is being used, though usually in the condition that a large portion of one of the uses is vehicular parking.

The sharing and layering of space is a necessity of the city in being able to better utilize the spaces it creates, as well as in creating a high performing density.

Phases of Social Space

Space for social and communal processes must be included on every level within the city. The block must be able to congregate and express its identity just as well the community center in its full radius, and the same must be available on the city scale. Social space must be seen in these scales so that there is no cordoning off of the interactions and cultural processes that take place.

Apart from these social aspects, there must also be a level of self adminstration on these levels. Although the conditions of governance are outside the realm of architectural and urban design, self-administration of the community begins with the appropriation of space.

Essentially, the social identity of the city must be considered within every frame of the city and its parts to avoid any segregation of groups or processes.

Above : Tiers of social space: City Space (top), Community Centered Space (middle), Block Space (bottom)

Heterogeneity

Following the same civic-mindedness of socially phased spaces, heterogeneity must be a fundamental focus of the system autonomous city. On a housing level this might be seen as the non-segregation of low square footage and high square footage, or the non-segregation of high-rent and low-rent residences.

Following the denial of functional zoning, the complexity and heterogenous identities of the city must be accepted, and posed against each other rather than filtered out and separated.

Public Obligations

The architectural project is obligated to not only contain the programs and functions that are expected within the design parameters, but also respond to the public domain.

Public obligation within architectural projects manifest themselves in a number of ways, but the imperative of the situation is that architectural works in general contain a public gesture or offering, contributing to the development of the civic quality of the city.

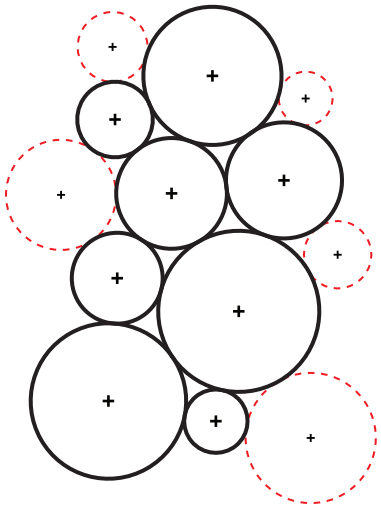
Whereas the city is conditioned to self-involved architectures that demand aesthetic and technical responses to their presence, the architectural work of the systemically autonomous city always has the public realm in mind.

Responsive Growth

Finally, responsive growth is one of the most important qualities in need of application. Instead of fearing, resisting, and denying the edge of of the urban center, expanding in endless cycles of growth that stretch well beyond the limits of infrastructure and urban support, the city must grow via the development of new self-sufficent communal centers.

Predetermined levels of completion of centers that are scheduled for growth must be achieved prior to adding more and more partially developed spaces to the city. Additionally, density and diversity must never fade from the quality of the communal center, which will allow the city to grow at contained levels with appropriate plans to where and when the edges of the city will terminate.

Growth must be able to be projected to sustain itself in the same way as all other community centers, and by these obligations the dereliction of the city spread can be avoided.



Above : Responsive development with a specific approach to the amenity provision for the populations to inhabit the centers of growth

Notes

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System Explanations
ambiguous qualities

In beginning to visualize the system in in its illusive qualities, there is an importance in capturing the essence of its characteristics. Within the framework of *System Autonomy* there is the presence of 'obligation' in a conceptual sense, meaning the necessities of use - the window's obligation to act in the way that a window does - but beyond that conceptual sense there is also a realm of architectural ethics.

Project Inclusions describes the progression of what is expected from an architectural work in a more philosophical way. If broken down, the acceleration of technology and society has changed the way that architecture is built and what is expected of even the most routine of programs, and looking at the ways that architecture has been able to successfully and unsuccessfully bend to these changing expectations leads to being able to define the necessary steps for design to take in the future.

Infinite Scale describes the individual quality of the system to work simultaneously between focuses, with each change affecting both the smallest detail and the broadest organization in a constant feedback loop. Even the simplest system becomes extremely complex in the way that this feedback loop works, and the effectiveness of systems can be judged based on the efficacy of a system reacting to change. A controlled situation is unable to bend as flexibly and locally as a liberated situation, though change will always come.

Control and Influence describes the way that relationships in a system are brought about through the definition of chemical bonding, as well as the comparison to the relationship between pollinating bees and flowers in the reproductive systems of each.

System qualities are not easily visualized, and the extent to which they take place here is not complete, but the attempt to describe the ephemeral must be made to begin to recognize the constant factors.

Project Inclusion
architectural obligation

In beginning to speak on the programmatic issues that innately tied within System Autonomy, there comes a reconception of the responsibilities of the generic architectural work. In developing the levels of complexity that the architectural work has come to represent, each choice of inclusion provides additional sets of ethically imperative obligations to which the architect must respond. The complexity that is now inherent in the built environment

The most basic level of the project, besides that of physical existence, is one that provides the innately architectural obligation of shelter against environmental conditions, with all other obligations being met outside of the project. Fundamentally, the transition between basic and more involved phases of inclusion can be seen through the placement of the toilet, a mechanism that is now not only expected, but obligated through legal regulation.

In the most spartan of organization, a defining element of much of the built environment historically, human waste was dealt with in processes well outside of the project, which can still be evidenced in structures who are accompanied by an outhouse or portable toilet. The project, in these cases, denies the obligation to respond to the responsibility of human waste.

Stepping beyond the situation in which there is no response to waste management, the medieval circumstanes of garderobes - protruding rooms in which holes in benches led to the exterior of the project - shows a higher level of response to human waste management, though only to a level in which there is space appropriated for the occupier to dispose of their waste to the exterior while remaining interior. In this instance, there are architectural responses to the condition of human waste, but only to a degree that is fundamentally similar to the process of utilizing containers to collect waste and emptying them out of a window. The processes tied to human waste are recognized, but the management of the process are seen strictly as outside of the project.

Plumbing, and higher forms of waste management, can be seen as the next forward, in which the architectural obligations of human waste are to both appropriate space for the acts involved, but also the presence of direct connections to management systems within the project. Public lavatories and systems of transport and management are by no means novel to recent history, the Palace of Knossos on Crete having involved rudimentary plumbing systems in its construction around 1700 BCE[1]. The presence of plumbing systems does not define a complex management of waste, thoguh, considering that historically ‘management’ obligations ended after transporting waste to reason-

able distances or to specfic locations for dumping, often anywhere that would not taint the local water supplies.

These plumbing systems represent a stage in which architectural obligations included both the appropriation of space for a process outside the most basic tenents of shelter, as well as the connection between that space and the final location of waste, but did not include any obligation towards the actual process of managing waste.

While the techniques and processes in dealing with waste products has become more and more sophisticated on a municpal level, the architectural obligations towards them has not changed. The most evolved circumstance is the development of septic systems, in which the organization of the project - including the general development of the property within its definition - is inclusive of the human space required, the transport of waste, and actual processes of management within a localized area.

Beyond the current circumstances of the usual project, the next step of architectural response to obligation - or the next level of obligation within management of waste in respect to the project - is the development of architectural tactics in which to manage and utilize the process of management inclusively within the project in an architectural sense. Even the septic is a technilogical application of an external system that is within the project, rather than any architectural response to waste management, and the next phase of responses to obligations needs to be internal and architectural.

Pulling away from the example of human waste management within architecture, there are phases of basic obligation within architecture that can be derived. These phases of obligation begin with the fundamentals of architectural appropriation of space, but extend to complex levels of response to multiplied obligations, and at a basic level question the definition and intent of the architectural project.

Fundamentally, architecture at its very basic is the appropriation of space, and this is also the first phase of obligation. To be architecture there is a requirement of physical dimension, which is to say spatial presence.

This is not to question the definition of architectural work, but more to seek out the basic attributes of architecture whenever it is active and present, much like the attributes needed for the designation of life. The architectural work in this context is recognized neither as representation nor the theoretical basis on which architecture should be appropriated, avoding the overly complex discussion of more than is needed to describe these phases of obligation. That said, the extent to which these basic obligations can be interpreted is quite devious, and the discussion of their application will be one expected in response.

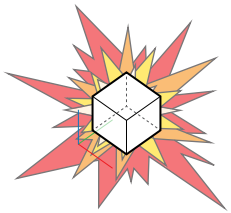


Figure V.01: Obligation of existence.

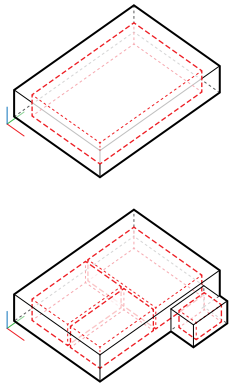


Figure V.02: Obligation of space.

On this fundamental level there are no further obligations, and the first phase of obligation is complete within the confines of the existence of spatial appropriation, and so might be categorized as the 'obligation of existence'.

The next phase of obligation can be seen as one that requires that the appropriation of space is done in a way that provides the physical dimensions needed of action or process. The appropriation of space in response to the needs of use from the space given, which can be interpreted variously, brings us to defining the use of space and the architectural response to that use. The architectural responsiblity of shelter is found in this phase, as well as the formation of programmatic requirements, which need to respond to various influences, such as occupant scales, and the defining dimensional standards of the enclosed function. If the first phase of obligation was one of existence, the second phase is one of space in response to use.

The third phase of obligation in architecture responds to extra-architectural processes, such as the inclusion of lavatories and electricity (on a technical level) or formal and cultural inclusions within the creation of architectural work (on a non-technical level). These are not spatial elements, nor are they programmatically essential, though they have proven to be so well adjusted to architectural inclusion that they are now ubiquitous. Whereas the first two phases deal with innately architectural elements, the third phase reacts to the inclusion of invasionary devices - technological and otherwise.

In this tertiary phase, architecture responds to pulling external processes into the project, though does not requisitely respond to the generative or managerial forces that control the processes which are being included. The architectural project is now obligated pervasively to include electrical systems, which visibly manifest themselves in the technical consideration of outlets. The complexity of these systems, however they have progressed from simple origins, do not receive any true architectural response, recognizing that the appropriation surrounds these systems, but do not attempt to propagate specifically architectural moments. The organizations of these invasionary elements are inherently superimposed, rather than absorbed, and their presence in the project is that of water and oil. The architectural stays architectural, the technical stays technical, the cultural stays cultural, and the proximity of the elements, however combined, have a smashing together of multiple processes without mixture. The identity of the project is not chimeric, but ajacent.

The quaternary phase of obligation goes beyond the superimposition of invasionary elements within the project, further developing the coordination of technological systems to architectural moments. The relationship of elements in this phase can be evidenced most easily in high-tech projects that involve technical sys-

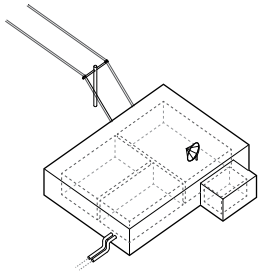


Figure V.03: Obligation of invasion.

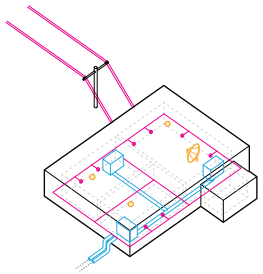


Figure V.04: Obligation of coordination.

tems, such as the Federal Building in San Fransisco by Morphosis, which involves an advanced system technologically that controls and responds to architectural moments.

At the same time, the circumstance of high-technology within the project is not the exclusive identity of the fourth phase, which is most basically the architectural response to invasionary elements. Architectural projects that passively mitigate conditions that involve invasionary elements are also specimens of this quarternary phase, which can be perceived as technological, environmental, or other types of non-architectural inclusions. Public action, cultural generation, multiple contexts, etc. are also invasionary elements that influence architectural work, yet are not so easily referenced at the level of development that supportive technologies allow in showing the heightened attention to what is expected ubiquitously. At its most simple, the fourth phase represents the obligation of coordination between the architectural and the non-architectural, a condition beyond that of the presence of the non-architectural laid out in the third phase.

The quinary phase of architectural obligation, which has not been yet successfully applied in any field of breadth, is one concerning that of locality and generation. Whereas the third phase introduced invasionary elements, and the fourth phase concerned their architectural coordination, each of these obligations is still founded in the condition of externality to which the invasionary elements responds. Electricity is the element of most often coordination and of locality, following the architectural appropriation of devices that aid in controlling energy usage, and the elements widely used to localize the generation of electricity. This locality of generation is one of the few examples in which the modern architectural project has begun to respond to the fifth phase of obligation, whereas externally driven systems that architecture often involves have seen little attempt at included generation.

In progression from the circumstance in which the project draws from external sources to support included systems, the fifth phase pulls sourcing as an obligation within the project. Already architecture is interested in the idea of localized generation, which can be seen in the concentration of academic and competition projects that involve the concept of urban or vertical farming, but these projects often do not specifically respond to the fifth phase of obligation for a couple of reasons.

First, the systems involved are often applied in the same as general projects, in which the production at that given site would be treated as its function, rather than the project's obligation beyond function. Second, the project descriptions of localized production too often return to similar decentralized systems of production, however scaled they are to a particular locality, which supports the extention of production outside of the project, denying

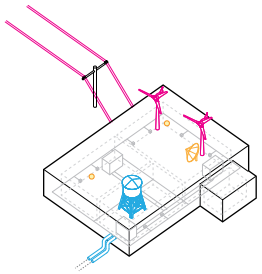


Figure V.05: Obligation of locality and production.

its relevance to the fifth phase.

Culturally and contextually, the closest architectural works to the obligations laid out are those of historic religious wonders, in which the cultural production of faith and literature is present, the housing of core members is present, the production of consumed resources is present, the space for public action (however controlled) is present, the space for private absolvement is present. Of course, very often these structures of religion fell for the same attempts at control as the governmental correlations laid out it in the previous chapter, *From Field to System*.

The resolution of the quinary phase comes in the redundancy of production and management amongst the basic responsibilites of the architectural project, just as the inclusion of toilets and electricity outlets, and faucets, and light switches are now assumed within architectural work. There is naked reluctancy to transition into this phase of architectural obligation within the field, because of the prioritization of cohesion, but the transition is innevitable and needs to be immediate.

System Autonomy assumes the presence of the fifth phase, and the successful implementation of efficient and redundantly inter-dependent system organizations require this level of obligated locality.

These observable phases of architectural obligation are still largely given to the discretion of the architect at hand, and only the obligation of existence is technically definitive of architectural work. Many project types still involve only the first two phases, such as follies and non-conditioned works, but the majority of projects built today voluntarily or responsively involve invasionary elements as a quotidian assumption. In the ability to correctly react to the invasionary elements, the evolution through the quaternary and quinary phases is essential in validiating the ethical identity of architectural practice.

Practically, the quinary phase of obligation most directly relates to the involvement of production within architectural settings, and it is also this phase that can most easily be understood. It is in this phase that visions of architectural works that each include portions of productive program as a standardized measure, and that the consumption of the building is at least partially produced within the context of the architectural work itself. This exaction of the quinary obligation is programmatic, but the extent to which the obligation can apply is beyond that of resource production and maintenance.

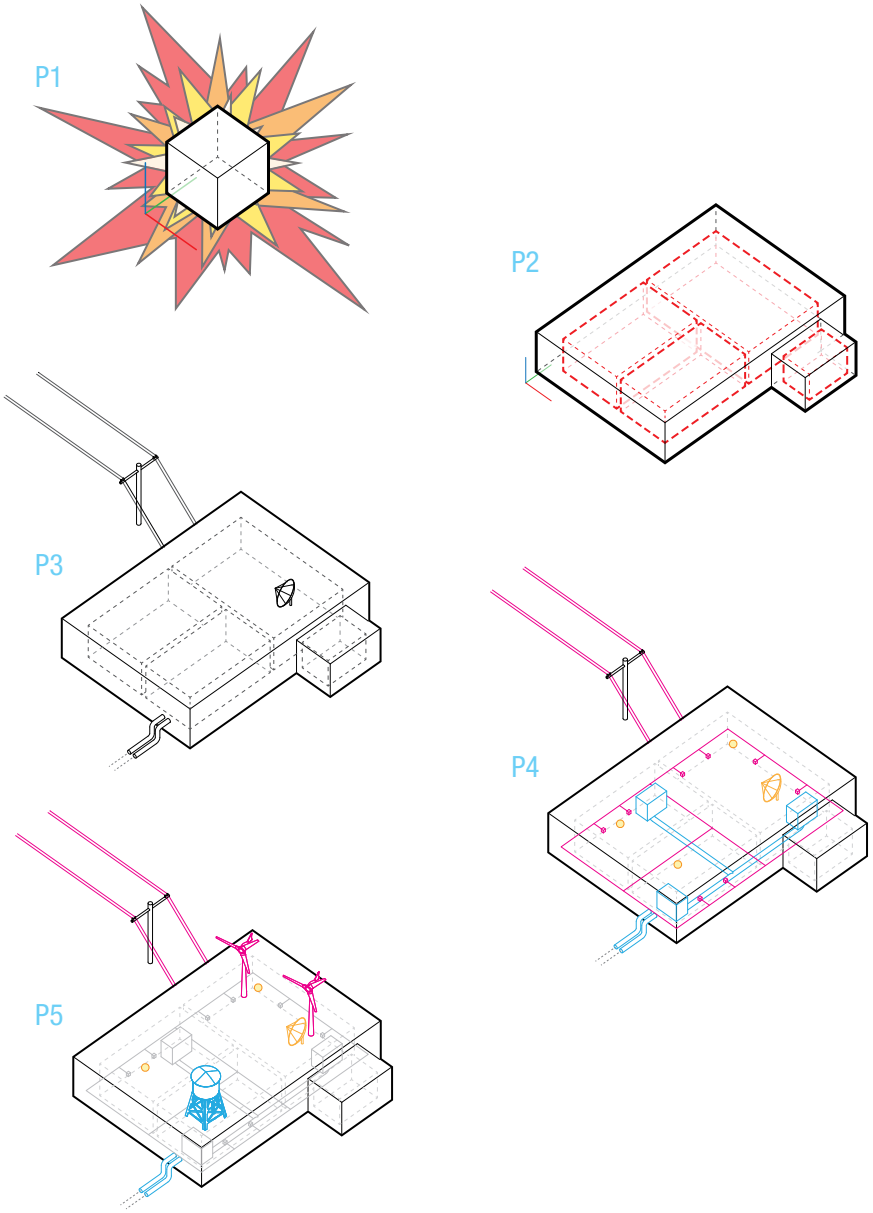
The architectural work, in recognizing the invasionary elements that reach from communities and of the collection of the city, finds an obligation to recognize space for public interaction within its individual identity. The architectural responsibility is, as is with everything, both to the self and to the other, which ties to recognition of the multiplicity of scale in dealing with systemic coordination.

Phase One (P1):
The obligation of existence. In examining any piece of architecture there is a basic assumption of its physical appropriation, achieving dimensionality in basic measures. This obligation divides the presence of that which is architecturally focused, such as representation and theory, versus that which is architecture.

Phase Two (P2):
The obligation of spatial appropriation in respect to use. Building on physical existence, the space applied through the architectural work takes on the responsibility of meeting the requirements of the tasks that are to be expected of that space. The programmatic value of this application ranges from loose, as in open planning, or strict.

Phase Three (P3):
The obligation of invasionary inclusions. Ranging from technology to cultural and contextual, invasionary elements provide the connection between the architectural work as an identity to itself, and the otherness of contributive or coercive elements apart from the definition of the project in its autonomy.

Phase Four (P4):
The obligation of coordination. Beyond the presence of invasionary forces, the architecturally designed coordination of these non-project generated forces spawns from uncontrolled presence.



Phase Five (P5):
The obligation of generation. Recognizing the broader significance of the generation or production of invasionary forces, the new obligation on the architectural project is to respond to, represent, and become inclusionary to the productive of previously external processes. The localization is imperative for a heightened systemic organziation within the project scale and the larger systems it interacts with.

Infinite Scale
architectural simultaneity

One of the defining factors of the system, and its ability to attain levels of autonomy, is the infinite scales to which it belongs. Whereas object-orientation focuses exclusively on the instance, and the field condition focuses exclusively on the scale at which homogenous collections are interconnected, the scale involves the machinations of the instance to itself, the collection to its connections, and infinitely broader and smaller conditions.

These infinite scales of interconnection and relation are inherent and incontestable - regardless of their adherence they exist. The condition of their interconnection, however, is drastically affected when the power they hold is not respected. The industrial revolution led to an era in which we have had to deal with the affectations of byproducts from methods which were assumed to be flatly progessive. Similarly the modernist doctrine was an application of rigid logics, projected as a solution to countless social and architectural problems manifested from previous forms of the built environment. The fall of these perspectives is their inability to react diversely to natural and basic systems of interelation which have no stable hierarchical control in the ways that they propagate themselves.

The natural systems in place on earth can be negatively affected from a subjective level - we can cause our own atmosphere to reject our presence - but the systems themselves are enduring. Without the application of artificial systems in our own biosphere, interconnectivity on infinite scales is still unavoidable. If nuclear fallout were to take place and all life were to be swept from the earth's surface, atomic bonds and molecular interaction would not change in their organization of exchange.

The systemic proclivity of interaction and interdependence does not exist subjectively, and system "failures" are not actually the negative response of the systems themselves, but the negative response and subsequent failure of components within the system to novel conditions. That being said, from a subjective perspective, there are ways in which to augment and accentuate the conditions of systems in work.

Humanity, as well as every complex identity within a system, is constantly changing the conditions of the system in which it exists. The possibility of future success and sustained acceptance within the system thusly falls into the ability of identities within the system to react and attain levels of momentary control over conditions, rather than assuming the ability to change system organizations at any level. The built environment, and at a general scale our occupancy of our world, depend on our ability to maintain our relevancy to the broader system, which reflexively controls

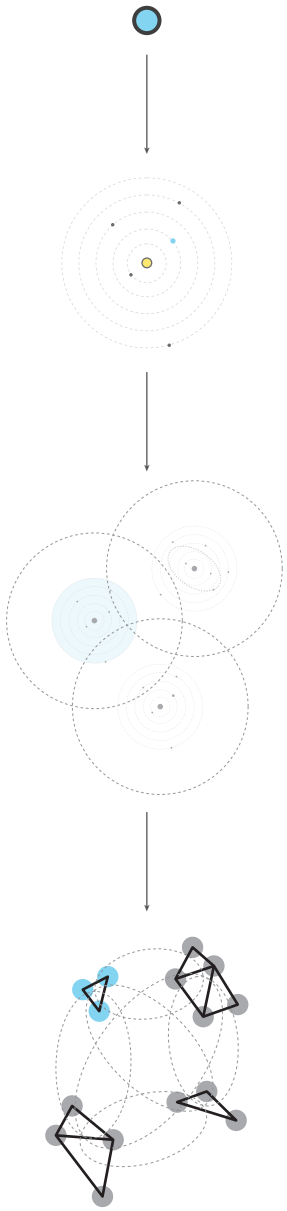


Figure V.06: Scalar broadening of celestial organizations.

the conditions in which it determines interaction. Dichotomously, the expectations of our presence within the system are 1. to not disturb the conditions to a degree that eliminates our relevancy, and 2. to react, stabilize, and manipulate conditions within the system that allow for us to maintain relevancy. Neither of these can be done under the assumption of any control over the intrinsic interactions determined by the system. Unfortunately, that is the exact assumption under which we have created a considerable deal of strife for ourselves.

On a grand scale, the macro-organization of earth in relation to our solar system, our solar system to our local galactic neighborhood, and all scales of connection thereafter show the upward scales of relation. On a microscopic scale, the breaking down of our biosphere into the foundation levels of atomic interaction show the opposite movement of systemic relationships. Expectedly, as we gain more knowledge on the atomic and galactic scales of existence, we fully understand the extents to which there is no resolution in either direction.

In consideration of the built environment and spatial practice in general, the imperative after realizing the uselessness of control is to construct conditions and reactions to novel conditions in order to stabilize our viablility within the system in which we exist.

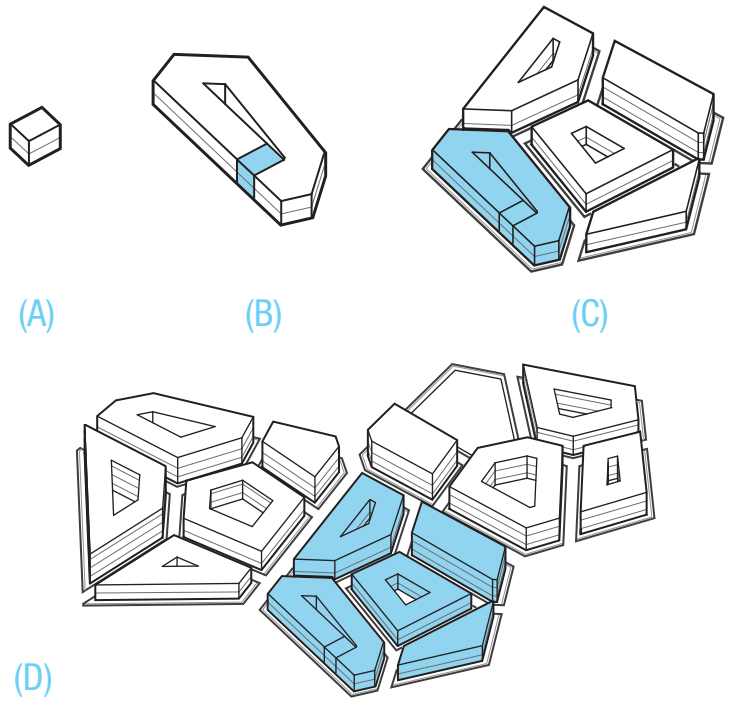
Fundamentally, architectural work has been reaction to these conditions - the very concept of shelter is a reaction to external conditions - but the acceleration in our ability to create conditional changes has had reflexive results. The development of machines which can augment the interior environments of buildings have been directly responsible, along with a long list of other factors, with the overuse of energy and the build up noxious gases within our atmosphere. Instead of only creatively responding to the conditions of our global environment, we made the assumption that we had the ability to negate the systems which controlled the conditions in general.

The transition to System Autonomy in this way is a call to release these assumptions of control, and to begin structuring our buildings and cities towards organizations of productive artificial systems. In response to the infinite scalar levels of any system, what must be done is a strict adherence to building within these scalar levels with a maintained recognition of their affects on adjacent and contributive scales. Untangling this statement, we can no longer focus exclusively on either the project or the field, but on the system of cities. The project cannot be built without the recognition of the resources that support its use, and the field cannot control the organization of the elements within its scope without the recognition of the individual identities which it contains.

The development of this type of built organization is infinitely demanding of focuses, which cannot comprehensively orches-

trated, even given our best efforts. This is to be expected because change within the system is pervasive, and conditions rarely are sessile for any considerable breadth of time. In working towards the ability to react to this infinite demand, the organization of the built environment is paramount, and this organization must be dealt with as an artificial system within itself.

The call for System Autonomy within these infinite scales, is due to the need of redundant sources of production and consumption. In beginning to apply the multiple scales in which the city and built environment exist, there is a basic need to recognize the city, the neighborhood, and the architectural work simultaneously. None can be exclusively supported by external scales, none can be exclusively productive for scales outside itself.



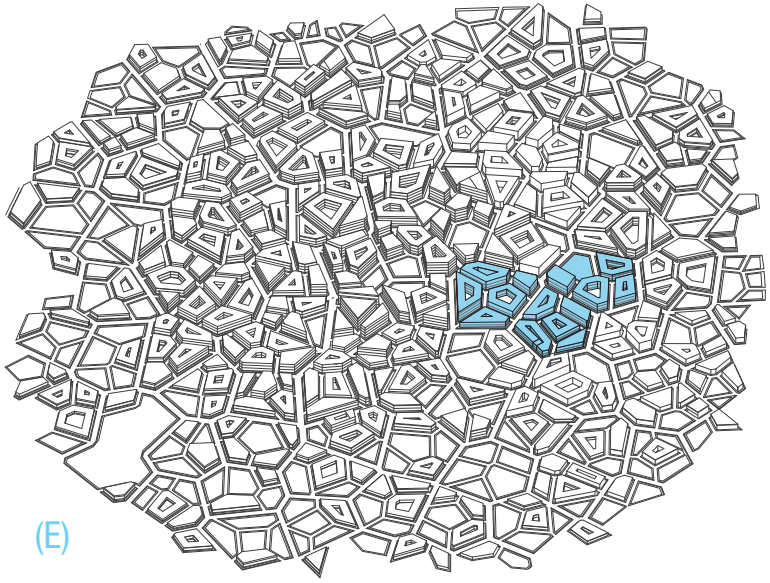
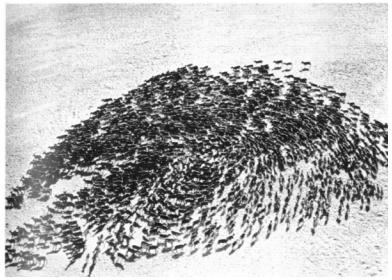


Figure V.07: The scales of the project in relation to the city include an accerleration from architectural work as an instance to the block as a collection, the aggregate block as a collection, the neighborhood as a collection, and the city as a collection.

The obligations of each scale are to recognize the identity of alternate scales to a degree that the project recognizes the block structure and culture, as well as personal necessities within its individual design. The project has an obligation to respond to communities that immediately inhabit and surround it, as well as the extended community of the city it is placed within.

A project scale
B block scale
C block aggregate scale
D neighborhood scale
E urban scale



Above : Swarming conditions, a specific interest of the purveyors of the field condition, were of critical discussion in an attempt to understand the inherent flexibility of flocking or swarming activities. Density, vector, speed, and size are all variables that are analyzed in order to understand relationships within a collective, but price of doing so is to cull levels of complexity out from the inspection. As seen above, in flocking and swarming inspections, the contents are homogenous in their member make-up (reindeer), and the characteristics of indviduals are only considered on the most basic level, rather than simultaneously involving dissimilarities that are present within the group[1].

Control and Influence
object, field, and system

Within the mindset of each of the three architectural organization types (Object, Field, System) the level and specificity of control, whether direct or through influence, varies considerably. Productive ecologies, natural and artificial, do not contain unitary hierarchical controls, and instead each present an index of multiple identities that have reflexive relationships with one another. These combinations of relations among the components of complex systems, such as those that play out in the processes of the city, are specifically challenging to visualize or conceptually resolve because of the ephemeral moments of influence reversal, the limitless ways in which elements of the system can overtly and subtly have an effect on eachother, and the unquantifiable ways in which these effects take place.

As previously stated, the mistakenly applied reaction to these systems of complexity has been to attempt to force unitary solutions in order to simplify and consolidate the infinite interactions at hand. In classically driven architecture, the objectification of space defined very precisely what was to included within the design of the architectural instance, and in the construction of the city. The field attempted to break away from the rigidity of the object, yet in order to do so it mandated increased levels of homogeny in respect to the instances it involved in combination. The field condition, in order to be understood, flattens the complexity of identities within its collection, prioritizing the cohesive understanding of the collective. Elements within the field differentiate themselves, allowing the ability to track, analyze, and understand the basic relationships that play out within the conditions therein, but they can only do so with a unitary scope of inspection.

In order to more correctly understand and visualize the system condition, the aspects of the object and field condition can be broken down in order to divine the methods in which they control the order of their elements.

First, the object, in its rigid application of controlling geometries, very strictly orders its elements in accordance to inflexible structure. As seen in Figure V.08, centralized priority is given to specific elements in the construction of the project. All other elements are required to correspond in direct proportion to the controlling element, which is further built off of an applied proportion itself.

The rigidness of the object has been critically evaluated for quite some time, due to its inability to productively interact with alternate object creations, specifically through several arguments within Robert Venturi's 1977 *Complexity and Contradiction in Architecture*[3]. Both on a

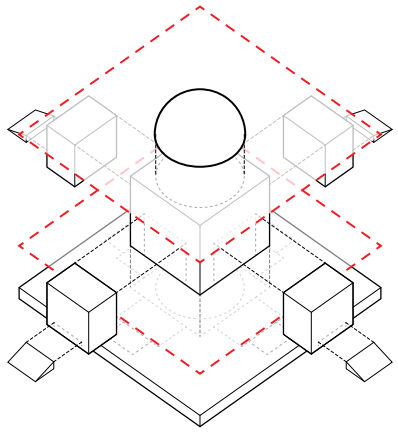


Figure V.08: Object-oriented space, in which elements respond in exact coordination to the proportion of a primary element.

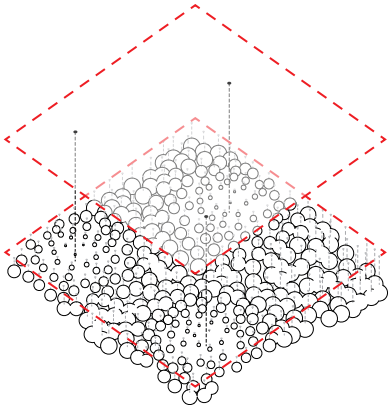


Figure V.09: Object-oriented space, in which elements respond in exact coordination to the proportion of a primary element.

tectonic level, and on an urban level, the simplification of organizational systems that come along with geometrically rigid object space create great tensions due to the elements of each that do not perfectly observe the order applied.

In response to the rigidity of the object, the field condition has been investigated and applied due to its ability to create relationships between instances. As previously stated, this is done at the cost of a necessary flattening of the collective which it examines, but looking through tha variability of elements (even in their flattened state) organized controls can be found.

Figure V.09 exacts a simple field interaction, taking a generated point field and creating differing sized and moved spheres at those points. The organization is intentionally simplified, but the basic elements of the field condition are present. The sphere size and placement are determined by the manipulation through placement of primary points, which ties to the greatest pitfall of the field condition - there is a constant presence of projected or derived points of control. Priority exists within any condition, though often not as a constant. Once the collection has been culled and flattened, the points of control that determine the reaction and relationship of the field cannot be challenged in any way, wheras priority in aspects of a fully evolved system are innevitably challenged through the emergence of priority in other aspects, keeping a dynamic equilibrium within the system context.

In contrast to the Object and Field organizations, the system must make no attempt at flattening or controlling the complexity involved in either the project or the city. In the system, a single element requires specific connections to secondary elements, which in turn can relate to multiple others. There is a redundancy of placement, and a following of logic that produces similar conditions, though differently organized.

As seen in Figure V.10, elements are not formally homogenized, allowing relationships among elments to correspond to adjacent and peripheral elements in different ways. elements demanding higher number of connections can attain them easily, with alternative elements able to create the correct relationships needed in response.

In the creation of the point field, the two Figures V.09 and V.10 are similar due what was a random generation of points within a given area, but the application of the field mirrors the actions of the object in its attempt to implicitly control the interactions of the field elements through organizational manipulation.

At their base, system organizations are formed through the represenation of all elements, as well as the ingrained knowledge of their individual and group requisites that determine their success within the local and comprehensive set up. It is this level of ingrained knowledge that is required to bridge the gap between field control and system autonomy.

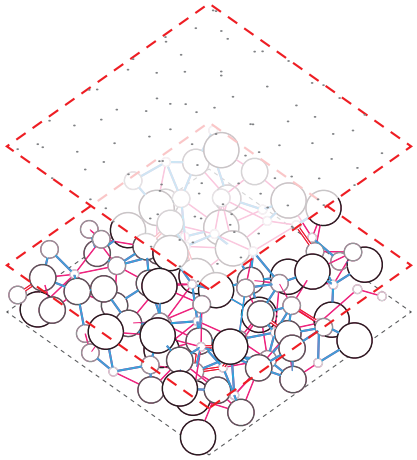


Figure V.10: Object-oriented space, in which elements respond in exact coordination to the proportion of a primary element.

Differentiations
systemic relations

System Autonomy is based in the simultaneous recognition of object and field, the mitigation of exclusive focus on either, and the resolved relationships between interdependent elements. There is no cohesive formal identity that these fundamentals can be equated to, and to attempt to force formal structures upon the system is to misunderstand the organization model that it implies. As with SImon Critchley's theory of anarchist *intersitiatiality* and *dissensus*, the application of system organizations cannot be seen as the negation of either object nor field, the failure of both being the negation of the other.

In the object, this negation comes through the priority of controlling elements, both in organization and in formal technique. In the field, this negation comes through the stripping of instance identity, and the application of a cohesivity that denies inclusion to elements unable to conform. The system is an interpolation between these two methods. The organization of the system can be further resolved through the inspection of analagous methods in contrast to the extremes of object and field: the implied network differentations, the transition through geometry, algebra, and chemistry, and the tectonic appropriation of elements.

Networked Differentiation

Beginning with network construction, a topic previously outlined, the organization of object, field, and system can first be seen in their differentiated structures. In reference back to Paul Baran's network organizational types, the object is tied to the centralized network on a project level, and on a broader level could be visualized as unconnected nodes without dependent relations among them. The field would be similar to either the decentralized, in its abstraction of unitary control, or the decentralized network, in its flattening of nodal identity.

The system can be more correctly visualized through the differentiation of nodal types and connection types, as seen in Figure V.11. On an organizational level the differentiated nodes can be seen to represent either different processes or instances within the network (black dots = power generation, large outlined = high streets, small outlined = neighborhoods), with the orientation, location, and size of each being determined by the density or proliferation of each other.

The connections are also differentiated, understanding that elements are not unilaterally connected through the network, with primary, secondary, and peripheral relationships being determined. The support of each node via connection is not routine, with the composed connections being represented in a variety of ways, as seen in Figure V.12. There is a locality of connections from each node, but there

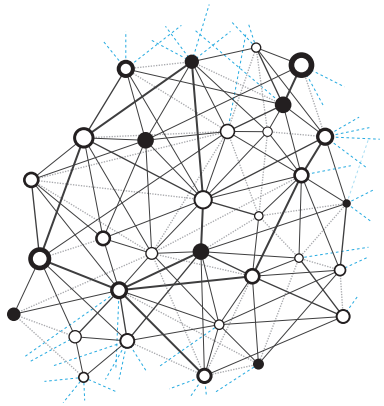


Figure V.11: Systemic network in which nodal identity and connection value becomes differentiated.

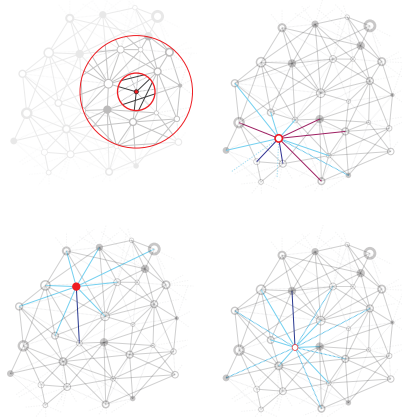


Figure V.12: The system network connections of each node can be supported in various and adaptable configurations.

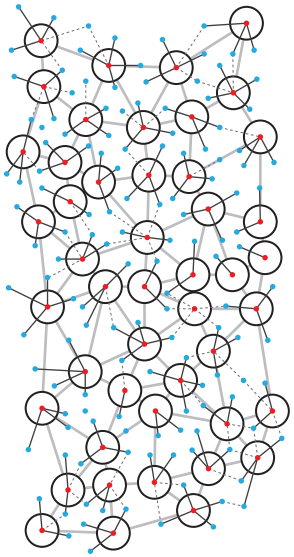


Figure V.13: Systemic network in which nodal instances are also inclusive of supportive elements.

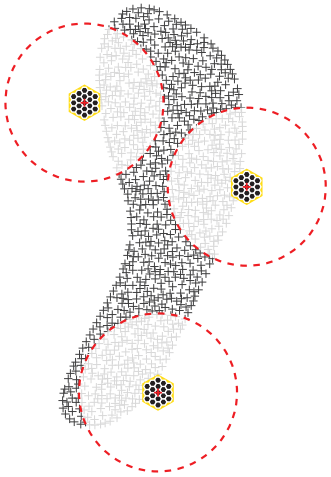


Figure V.14: Systemic network in which nodal instances are also inclusive of supportive elements.

are also represented peripheral connections that link the node with a broader shed of elements. Also, there is the capability of certain nodes to be supported by a heightened number of soft connections or a lower number of hard connections, which responds to the ecological principles of diversity laid out by the biological theories in Bill Mollison's *Permacultures*.

This perspective on different nodal identities and their varied connections on local and peripheral elements has a parallel of the development of *Intersectionality*, the inspection of complex influences within gender and race studies that link simultaneous characteristics to different sources of oppression. The link to *Intersectionality* is not an arbitrary one, recognizing that much of race, gender, and class studies involves a much more evolved systemic perspective on dealing with contradiction and simultaneity. The built environment has as much social and physical complexity as these social fields of study, and the parallel alignment of investigation to the practices of *Intersectionality*.

In comparison to the field condition's use of flocks, swarms, schools, and herds, this intersectionality within the system can be visualized by more complex biological responses than the analysis of a single species interacting within the group. The process of bees pollinating flowers and other plants adds a level of interdependency to the visualization of system, allowing multiple types to interact, determining and limiting the courses of action of the other.

The inherent limitations of each type plays a role in the evolution of the other - in using bees and flowers as a simple analogy, the average radius of bee travel from the hive is approximately a quarter mile, with the potential of up to 5 miles. This basic parameter affects the second type of instance within the simplified system, determining where patches of flowers will be successful, as well as reflexively determining where bee colonization will develop.

In Figure V.14 the hives placed utilized the field of flowers as their local pollen source, creating several interaction or connection types among the components in play: hive to itself, hive to hive, hive to flowers. Beyond this locality, the marking of the full shed that a hive can reach through the pollination process allows the local and peripheral interconnections to be seen (Figure V.15 and V.16).

Even with a simplified system analysis, these interrelations between elements produce the local redundancies and and productive elements that are exemplified through autonomous system construction. No element is directly controlling, and the organization of different element types is fluid because of it.

The realized system of bee pollination can also show the interdependency through the recent fall in bee populations, which has drastically affected the communities of plants that they support through the process of pollination.

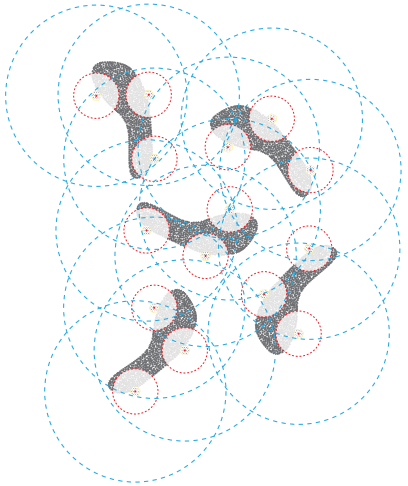


Figure V.15: Syst

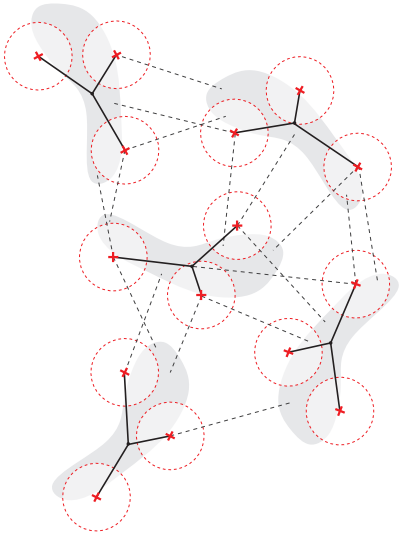


Figure V.16: Syst

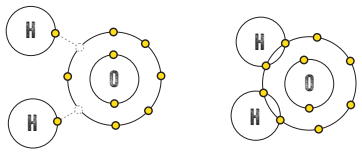


Figure V.17: The bonds and structure of atomic elements within a water molecule.

Geometric, Algebraic, Chemical

Moving from geometrically defined space into algebraically defined field conditions allowed an amazing amount of mobility and flexibility in the perceieved continuity of architectural work, as well as began to be able to accomodate non-proportional analyses of movements through the field conditions created. The ability to add and subtract from the field without the destruction of the composition projected a cohesion of elements undetermined by the finished or unfinished state that strictly defined the object-oriented space. Of course, that cohesion is also the failure of field conditions in the that its composition spread a singular architecture throughout its included instances.

System Autonomy in its transition away from algebraically derived space innately ties to the types of equations involved in chemical structures. Compared to the unitary architecture projected by the field, the system includes a multiplicity of architectures that work interdependently, similar to the difference between atomic elements that react to, resist, or transform within molecular structure.

Figure V.17 shows the atomic connection between oxygen and hydrogen to construct water molecules, an example of two identities in combination without the loss of individual values. The reaction among these components is again relatable both in the scope of individual molecules and collections of multiples, relating back to the scalar variance of system organization (Figure V.18). The combination of a wider range of elements develops a higher understanding for the specific relationships that are preferred within the system, as seen in Figure V.19, which shows a water based molecule that begins to have a defining structure beyond the basic connections of its elements.

In chemical structures there is a wide range of compositions (rigid and loose, symmetrical and asymmetrical, etc.), and the interaction among different molecules can be predicted based on their composition. Basic smaller elements find themselves in redundancies, such as benzene rings, which create the foundation for more complex structures. Each structure must find a level of completion or its degradation into loose elements is innevitable, which is a condition that can be seen throughout the built environment as well.

Against geometry, the chemical equations of the system connect and proliferate without direct endings or beginnings in completeness, always moving towards dynamic equilibrium. Chemical structures have certain qualities that are definitive of the elements involved, which produce the aforementioned range of compositions, such as the controlled repitition of crystal structures. Likened to different programmatic inclusions, the orientation of each element in the chemical structure creates moments of emphasis, though does so while retaining the complexity of all the different contributive elements, which retain their basic identity.

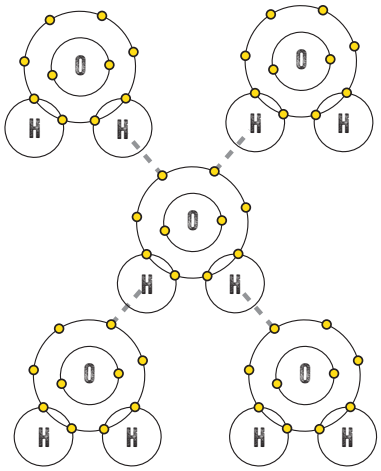


Figure V.18: combination of multiple water molecules and their loose bonding.

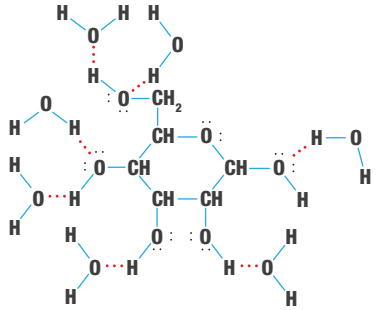
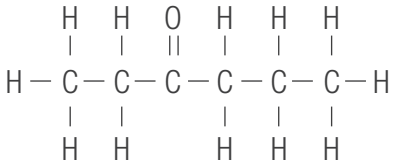
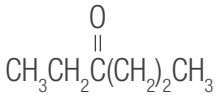


Figure V.19: heightened complexity of molecular structure and bonding.

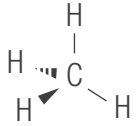


Lewis Structure



Condensed Structure

Skeletal Structure



Sawhorse Structure

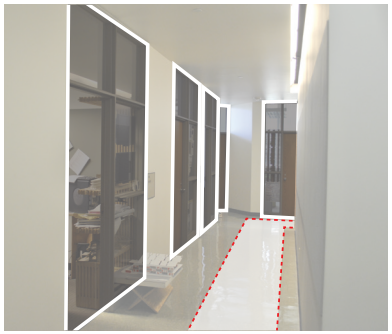
Figure V.20: differing graphic representation styles for chemical structures.

Architecturally, the chemical analogy also makes sense because the chemical structure is considered spatially, and to a degree that includes 3-dimensional orientation in some graphic methods (Figure V.20). The organization of similar elements can be found architecturally in a various range of intelligent and simple ways, understanding that spatial relationships will always be present, but the elements involved have specific preferences for the most stable and resolved organization.

Again, there is a strong relationship to programmatic organizaton within the architectural work over that of formal and tectonic logics, which is the reverse relationship that the field condition has had on the development of architectural works. The chemical analogy is based in reaction, connection, and basic responses to needs or inclinations of the organization as new elements are added or portions are dissolved. Growing out of the molecular scale, there is still a heavy connection to the types of architectural processes on the scale of cell and tissue functions. There is a presence of specialization and of collective function, as Figure V.22 shows with the structure of epithelial tissue, which multiple types of interactions happening simultaneously, along with grouped cells to make collectives which respond to other collectives as well as the voids between.

In both atomic and cellular interaction, there is a necessary appropriation of the correct contributive (or productive) elements in order to achieve the correct process or structure and have it be stable. Architecturally, it must now be understood that there are the same responsibilities for spaces and functions to have the same type of necessary inclusions for contributive redundancies as can be seen in chemical and cellular construction.

Unlike geometry, the relationships involved in the chemical analogy are variously scalable, but their resilience is found in the local imperatives that are lost in the field condition. Chemistry respects difference even as it creates compositions that are completely corrdinated, differentiated on their collective scale, with their contributive elements still unflattened.



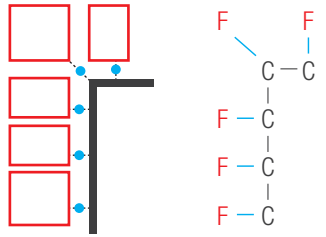


Figure V.21: chemical structure of the corridor to the attached faculty office.

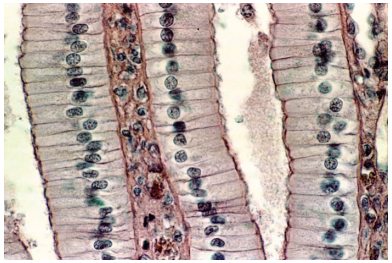


Figure V.22: Simple columnar epithelial tissue[2].

Notes

1 “Minoan Civilization (3000-100BCE)”, last modified 2004, http://www.sewerhistory.org/grfx/wh_era/minoan1.htm

2 Robert Venturi, *Complexity and Contradiction in Architecture* (New York: The Museum of Modern Art, 2002).

Images

1 Stan Allen, *Points + Lines* (New York: Princeton Architectural Press, 1999), 99.

2 “Epithelial Tissues”, last modified (unknown), http://www.stegen.k12.mo.us/tchrpges/sghs/ksulkowski/TissueSlides.htm

The Urban Autonomous
precedent index

In beginning to place the expected execution of the project of autonomous development, it is helpful to begin with examples that at least in part exemplify the spirit of Autonomy - and derive the direction of pursuit from their tangential sucesses and failures.

The utopian and visionary project of the twentieth century often include elements of this spirit, and are included in their most relevant instances, though what is also included in the development of this partial precedence matrix are the vast number of non-utopian examples that exemplify parallel drivers as what is to be expected from autonomous development.

A few of the partial precedent examples are discussed afterward in order to completely describe the potential relevance that specific projects have to the eventual spirit being sought.

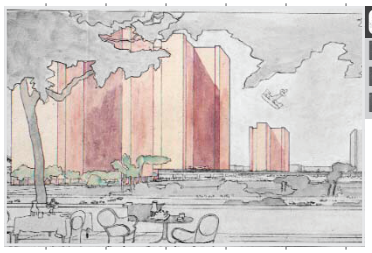
The terms of **Social Autonomy** used here are in tension among many politically radical definitions, the most potent being from the Italian Leftist movement *Operaismo*:

"the project of autonomy had to begin at [the power over production] in order to become politically effective, and it had, moreover, to coincide not with a reform of the means of production but with a demand for political power over them." [1]

And the Situationist International manifesto:

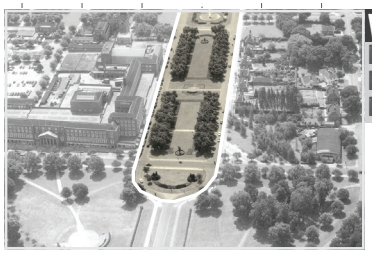
"Against the spectacle, the realized situationist culture introduces total participation." [2]

The definition used here severs the politically radical connections from the term, in defining it as *the full representation of social processes within a community that is active in organizing and performing said processes*. While the Operaists defintion involves itself with "power over production", this production is isolated to the empowerment of the factory worker over commercial production, while the use here is meant to allude to the previously mentioned categories of social process: *habitation, vocation, education,* and *leisure*.



CITY OF TOM.
FRANCE
POP: 3 MIL.
EST: 1929

JAMESTOWN
VIRGINIA
POP: 1200
EST: 1607



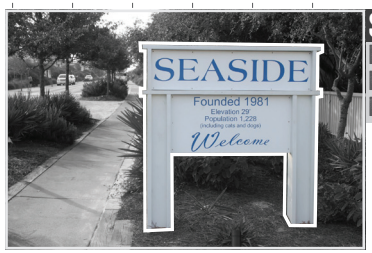
WELWYN
ENGLAND
POP: 42,000
EST: 1920

TOMBSTONE
ARIZONA
POP: 3,000
EST: 1879

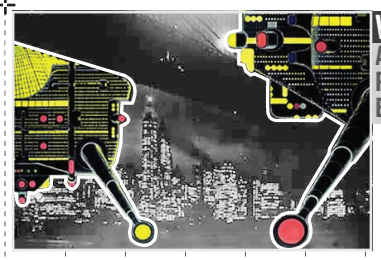
BRANCH DAVIDIANS
WACO, TEXAS
POP: 84
EST: 1981

GAVIOTAS
COLOMBIA
POP: 200
EST: 1971

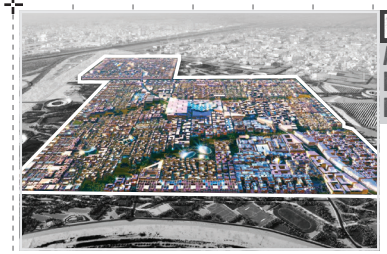
LEVITTOWN
NEW YORK
POP: 52,000
EST: 1947



SEASIDE
FLORIDA
POP: 1,228
EST: 1981



WALKING CITY
ANYWHERE
POP: UNKNOWN
EST: 1964



MASDAR CITY
ABU DHABI
POP: 50,000
EST: 2006

MESA VERDE
COLORADO
POP: 4,000
EST: 400

THE FARM
VARIOUS
POP: 175
EST: 1873

HUTTERITES
VARIOUS
POP: 150 +/-
EST: 1873

LAS VEGAS
NEVADA
POP: 596,000
EST: 1905

DONNER PARTY
SIERRA NEVADAS
POP: 81
EST: 1846

The definition of Resource Autonomy is not as conceptually driven, and maintains strictly the self-production and self-sustainment of necessary resources, specifically in the categories of: *energy generation, agricultural production,* as well as *waste and water management.*

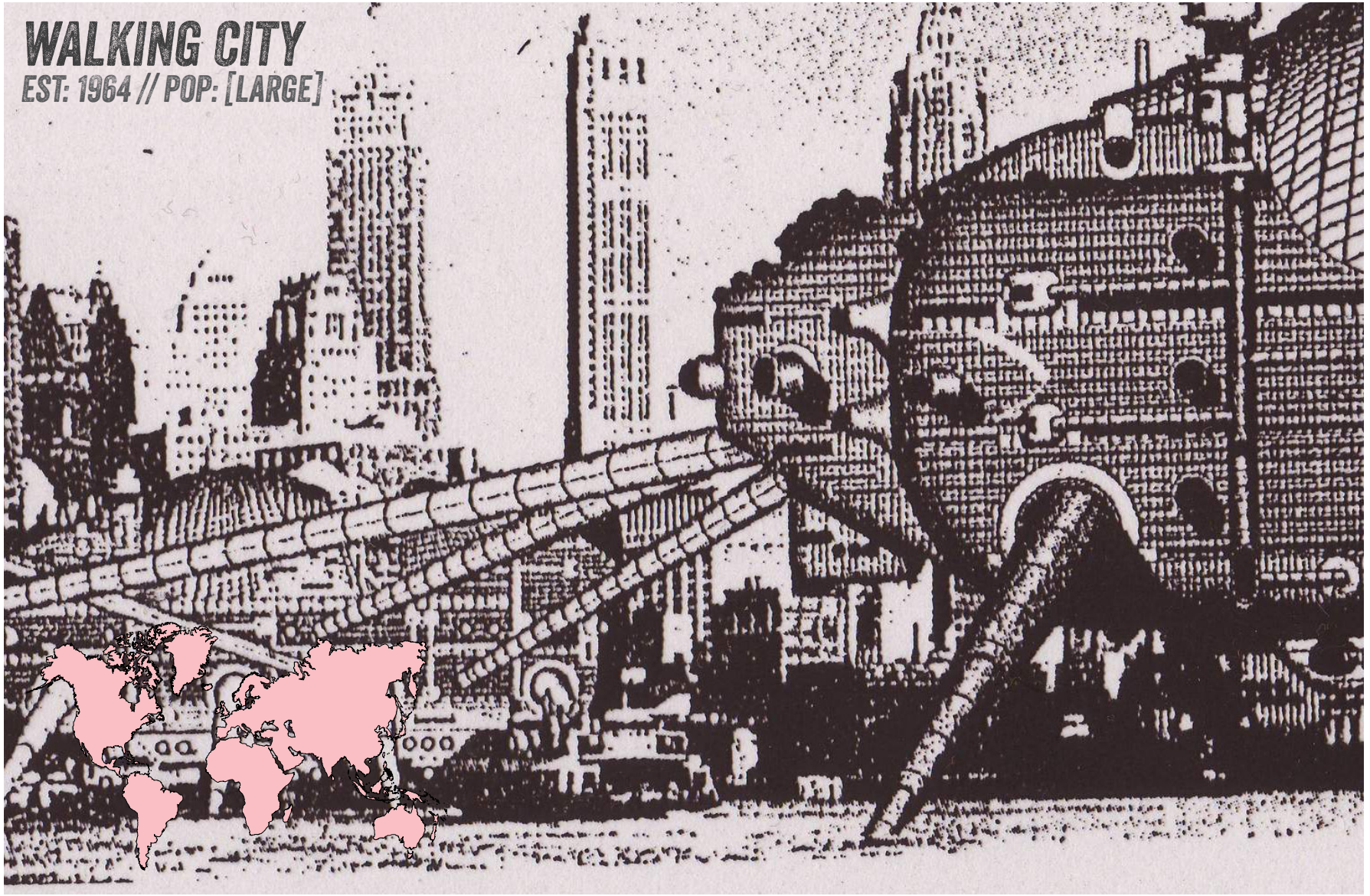
Again, the term has connection to the spirit of both the *Operaists* and the *Situationists*, but differs from both in very basic ways.

Compared to the *Operaists* the "power over production"[3] available through Resource Autonomy is derived from the ability to fully provide these utilites and resources locally, with full or heightened community involvement.

Similarly, this heightened community-based production responds to the essential ideal of the *Situationists'* "total participation."[4]

Though, again the radically political spirit of both defintions is lifted, and only a thoroughly basic standard is applied against these examples.

1. Aureli, *The Project of Autonomy*, 17.
2. Aureli, *The Project of Autonomy*, 17.
3. Aureli, *The Project of Autonomy* , 17.
4. Wollen, "The situationist international," 67-95.


WALKING CITY
EST: 1964 // POP: [LARGE]

Arthur Crompton, *A Guide to Archigram 1961-74* (New York: Princeton Architectural Press, 2012), 130.

Unarguably, the highest functioning partial precedent is Ron Herron's 1964 'paper architecture' concept of the ***Walking City***, though both its resolution and illicitness are tied to inability for any form of actualization. The walking urban, manufacturing, and resource centers were conceived as massive constructions that would roam through terrestrial landscapes, providing the resource surplus that they were imagined to generate, while also supplying an urban environment within themselves.

As seen beside, Herron described them in the caption of one of the conceptual collages that defined their ideation, "Each walking unit houses not only a key element of the capital, but also a large population of world traveller-workers."

The autonomy of the productive network within they work is exceptional and perfectly organized, creating the distributed organization that allows for each urban city node to remain independent while also forming roles within a collective when needed, but again this perfection is only achieved at the expense of any validity, expressed fully in Simon Sadler's exposition on the project:

"Despite its fastidious surface detailing, it is hard to interpret literally: could a big aircraft undercarriage support a building? Could a landscape bear the load? Could Walking City padd in the sea, as other versions of the picture suggested? Even read metaphorically, questions proliferated: did Walking City come in peace?"

Simon Sadler, *Archigram: Architecture without Architecture* (Cambridge: The MIT Press, 2005), 155.

The actualization of Walking City is also so unbelievable because of the fetishization of machinic aesthetics and processes that informed its comprehensive design. While comfortable in a setting where the capabilities of natural production of resources has been compromised, such as in nuclear fallout, the figure of the Walking City is remiss in its efficient control of dissemination. With contemporary knowledge of distribution networks, the proposal of physical transportation of resources seems outlandish and untethered.

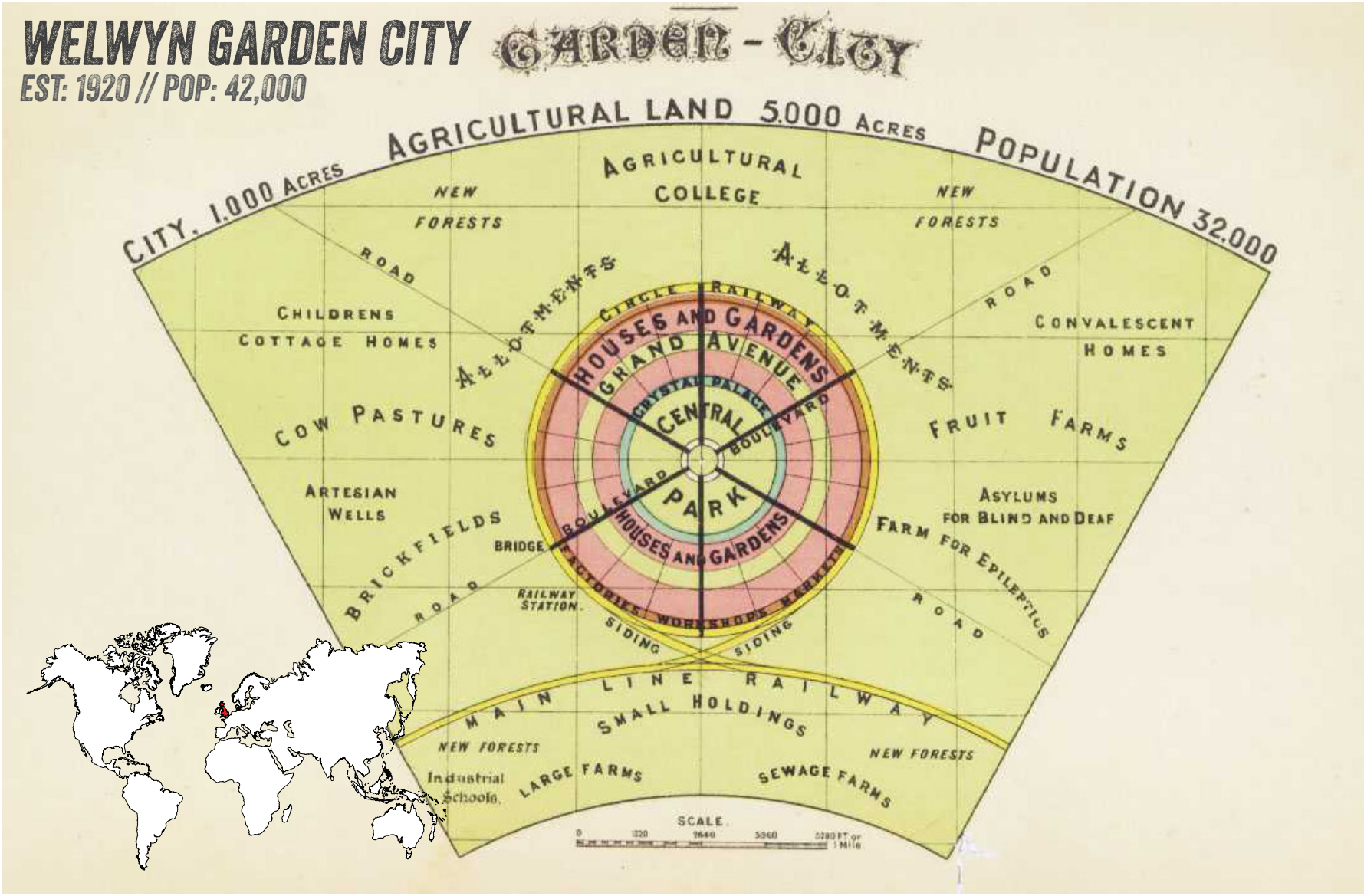
Further, the design of these cities, while speculatively capable of producing infinite amounts of supportive processes, does not avoid an authoritarian control over its users, as any machine would. During the Folkestone Conference in the southern English town, it has been anecdotally proposed that Herron's creation receieved, "cries of 'Fascism, war machine, totalitarian,' etc."

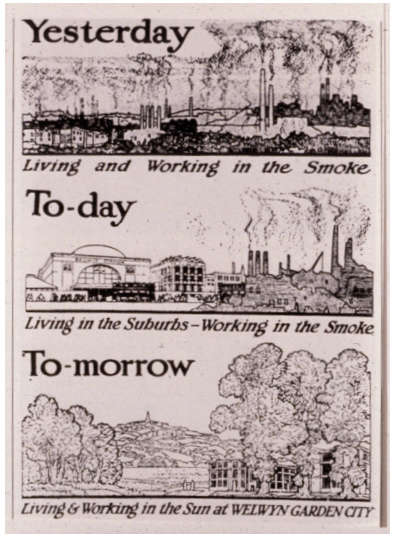
Sadler, *Archigram: Architecture without Architecture*, 155.

The blaring inadequacies, conceptual tensions, and obsollesence aside, Walking City still remains a resolutely radical and clear instance of autonomy in production and community. Utopic as the project was constantly presented, the foundational ideas are immediately necessary - though, probably in a form alternative to city sized robots that travel the world.

WELWYN GARDEN CITY

EST: 1920 // POP: 42,000





The development of practical utopianism during the late 19th and early 20th was most widely adopted through the Garden City proposals of Ebenezer Howard, whose idea of liberating the contained worker both holds ideological similarity and tension to the suburban development intents of William Levitt.

In the actualization of garden city ideals in its second project as ***Welwyn Garden City***, the utopic vision of Howard most closely represented the intended form of communal autonomy through its recognition and dissolution of manufacturing processes in favor of resource and social processes.

As seen in this 1919 poster for ***Welwyn Garden City***, the slogan that represented the development was "Yesterday: Living and working in the smoke. To-day: Living in the suburbs - working in the smoke. To-morrow: Living and working in the sun at Welwyn Garden City".[8]

Moving away from industrial production, as was the case "Yesterday", the promise of the garden city is a fully involved and autonomous social and resource production in that way every citizen would be involved in garden culture, and that their *habitation, vocation, education,* and *leisure* would be consolidated into the same proximal location.

Of course, these promises weren't perfect in the execution, and where as the conceptually driven utopia was interesting, the application of the ideals into the prototypical city resulted in the same problems of social stratification that were taking place in the suburban movement:

"Until after World War II, the difficulty of building lower-cost housing in the town meant that the working class was a minority of the residents. Keeping to their neighborhoods, they stayed aloof from the general life of the community."[9]

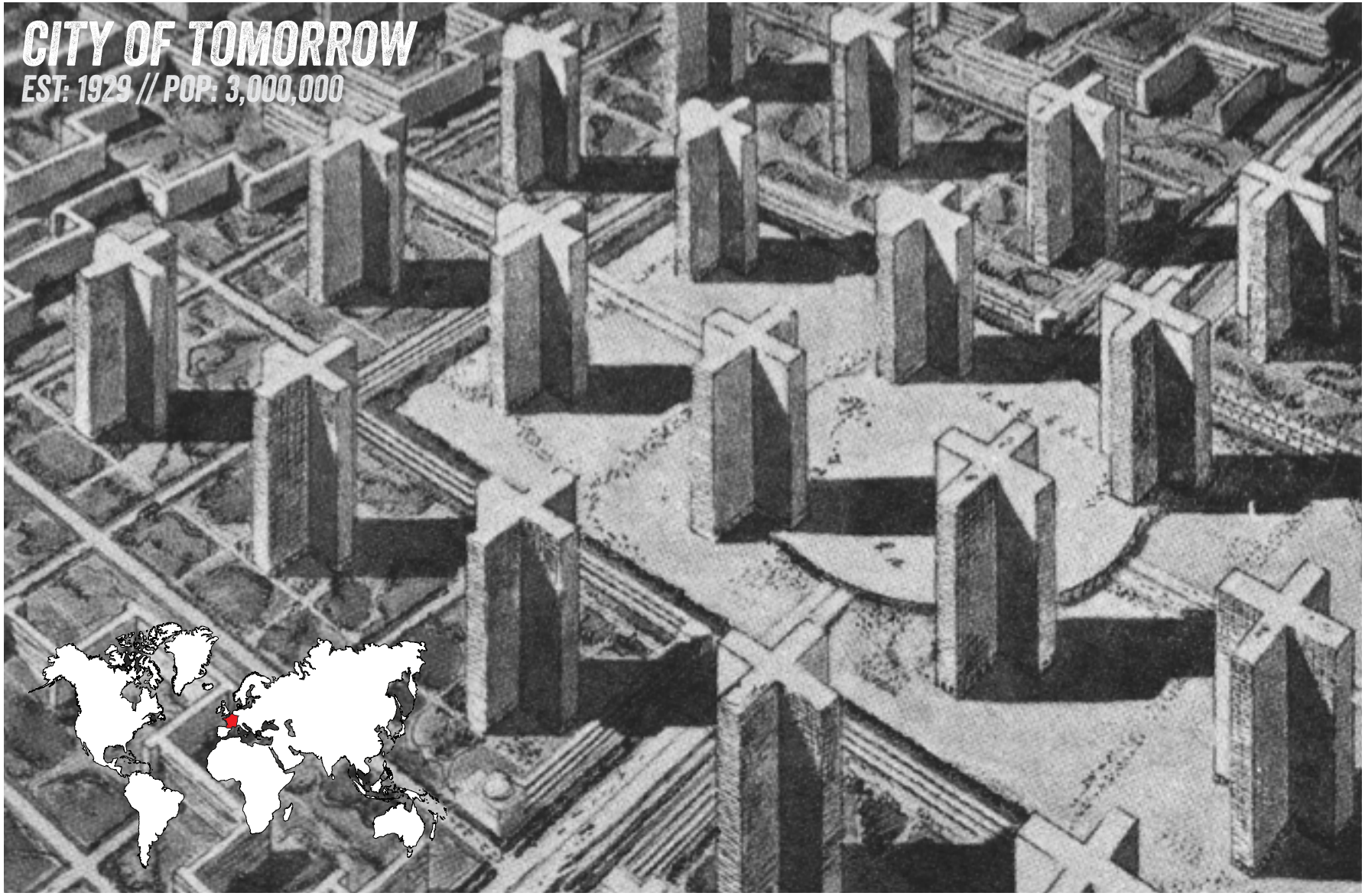
Stanley Buder, *Visionaries and Planners: The Garden City Movement and the Modern Community* (Oxford: Oxford University Press, 1990), 127.

Although this failure was codified into the design through unknown and implicit commercial processes that would only intensify, ***Welwyn Garden City***, in comparison to the first attempt at garden city creation (Letchworth), had been responsive to the cultural zeitgeist:

"[Welwyn Garden City] had been promoted as an approach to redirecting the pattern of metropolitan expansion into satellite new towns."[10]

Buder, *Visionaries and Planners*, 127.

The shift proved too similar to the commuter population that was involved in the suburban flight, but the specificity of individual and communal autonomous production and representation identifies **Welwyn Garden City** as anachronistically conscious of the non-moral resource imperatives of communities that were inclusive of both agrarian sensibilities and increased density of inhabitants and social distribution.


CITY OF TOMORROW
EST: 1929 // POP: 3,000,000

Contemporary disillusionment with the machinations of the modernist agenda might be concisely defined by the following, now gratingly counter-intuitive, statement from Le Corbusier's 1929 ***The City of To-Morrow and its Planning***:

"Now that the machine age has let loose the consequences attaching to it, *progess has seized on a new set of implements with which to quicken its rhythm"*[11]

Le Corbusier, *The City of To-morrow and its Planning* (Cambridge: The MIT Press, 1929), 87.

The orchestration of the ***City of Tomorrow*** was correctly centered around the reorganization of urban planning in a way that allowed both open space and concentrated populations, with Corbusier saying of density, "The more dense the population of a ciyt is the less are the distances that have to be covered. The moreal, therefore, is that we must *increase the density of the centres of our ities, where business affairs are carried on."*[12]

Corbusier, *The City of To-morrow and its Planning*, 162.

Unfortunately, as with his ruminations of the methods to alleviate the congestion of urban centers, the implements of modern planning have already fallen in comparison to the tools of attrition utilized in classical planning. Density, while still a constant subject of discussion in its perceived importance, is not necessarily indicative of the conditions for which Le Corbusier was searching. The density of *habitation* is not necessarily identical to what is needed in the density of *vocation*, which can be seen in New York (a city of Corb's fascination and inspiration):

"It is a mistake to reflexively identify height with density. The "small town" of Somerville, Massachusetts, has long been among the densest American municipalities, and Los Angeles - the quintessential city of sprawl - now has a higher average density than New York."[13]

Michael Sorkin, *Twenty Minutes in Manhattan* (New York: North Point Press, 2013), 13.

The City of Tomorrow emphasizes these densities to reach a level of social autonomy in which the dependence on commuter cultures would be unneeded, because the open space required to sustain populations contently would not just be included, but *available because of density:*

"We must *increase the open spaces and diminish the distances to be covered.* Therefore the centre of the city must be constructed *vertically.*"[14]

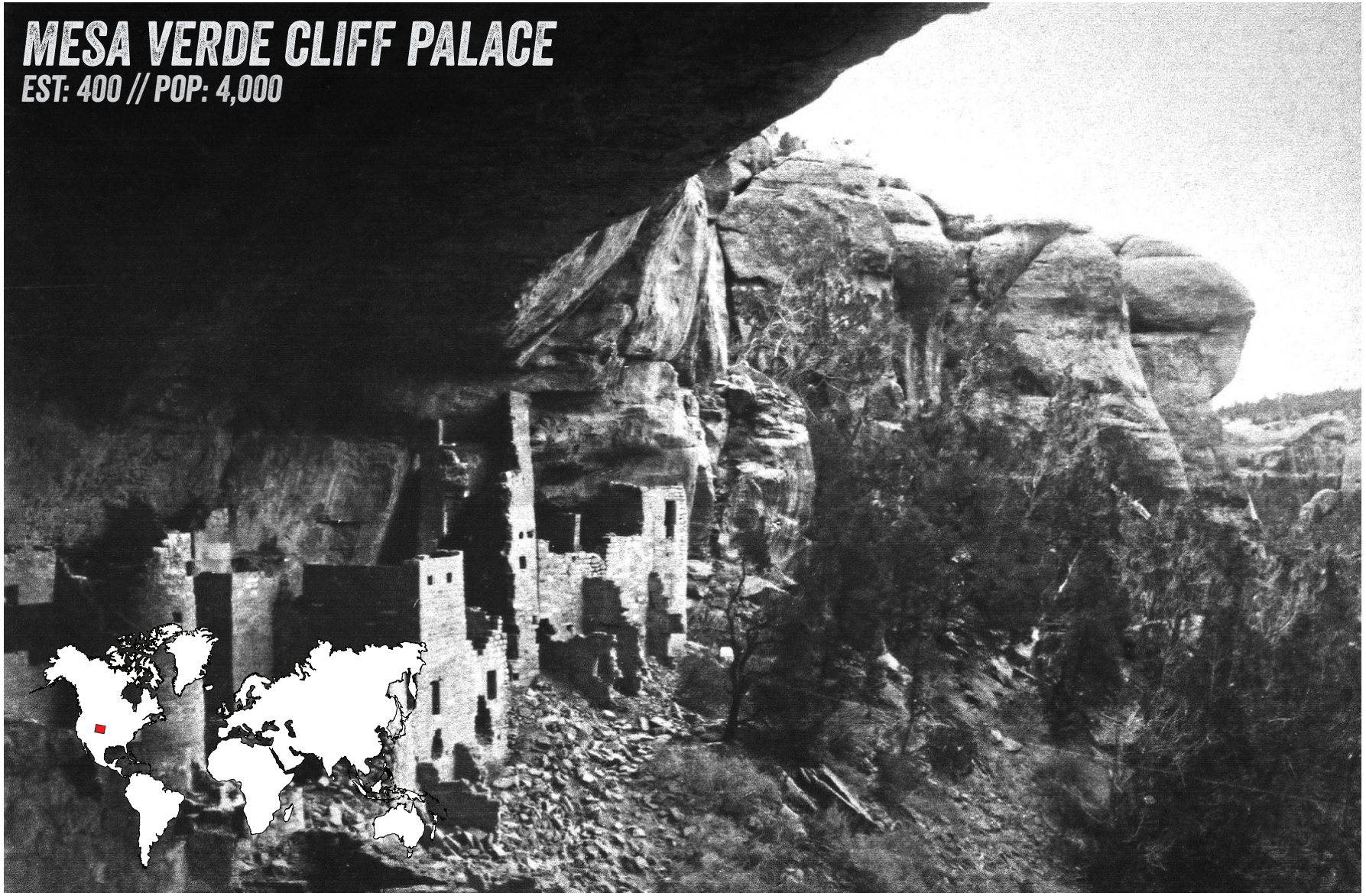
Corbusier, *The City of To-morrow and its Planning*, 163.

This vertical organization, of course, instigates the antithesis of contemporary social equity due to its innate segregation through planned social segregation:

"(a) The sky-scraper: 1,200 inhabitants to the acre; (b) The residential blocks with set-backs: 120 inhabitants to the acre. These are the luxury dwellings; (c) The residential blocks on the 'cellular' system, witha similar number of inhabitants."[15]

Ibid., 168.

This organization seems frightfully similar to the satirical plot of *Brave New World.*


MESA VERDE CLIFF PALACE
EST: 400 // POP: 4,000

Mesa Verde, located in Southwestern Colorado, evidences a level of stable social and resource autonomies in a certain way that no contemporary culture is able to - mainly because the new abilities of global trade have made the self-sufficient practices utilized by the Ancestral Puebloans seem primitive and limited.

Many agrarian civilizations can boast the same localized production and coordinated social structure, yet the Anasazi's concentrated habitations and vertically stratified areas of social and resource processes allow its abandoned cliff villages to represent a mode of harmious self-sufficiency with the geography it inhabited in a way unparalleled by any other North American example.

Culturally, as well, the autonomous collective ideals permeated the view of citizen roles:

"The fields are owned in common by the clans but usually each man works a certain portion that he feels is his own. If he neglects it the clan leaders give it to someone else."[16]

Don Watson. *Cliff Palace: The Story of an Ancient City* (Ann Arbor: Edwards Brothers, 1940), 69.

The social structure of the Anasazi preffered collective good above that of the individual, and as such the balance between each citizen and the collective was based on one's ability to provide in his/her role.

"The social unit is the family and a group of closely united families means a strong, self-sufficient family group or clan. The interests of each person are important only as they affect the welfare of the clan group."[17]

Watson, *Cliff Palace,* 83.

While inhabiting the cliff houses of a canyon, the Anasazi would cultivate their agricultural yield on the mesas above, localizing their production as much as possible. The mesas were never completely utilized, but specific regions were often modified to create catchment areas for the runoff of summer storms, efficiently using the small amounts of annual rainfall that occured in the area[18]:

Susan Lamb, *Mesa Verde National Park: life, earth, sky* (Mariposa: Sierra Press, 2001), 28.

"The fields are seldom large and they are never regular in shape. An acre here, a few acres there, they dot the mesa tops, the rich red soil standing out sharply against the green cover of the vast 'green table'."[19]

Watson, *Cliff Palace,* 84.

Of course, the primary attribute that threatened the resource autonomy of the Anasazi cliff villages was the climatic conditions of the area, which eventually forced the civilization to be abandoned. Drought, quite common even now in the South West, caused the failure of the agrarian villages, lasting for 24 years in the region. [20]

Ibid, 136.

In observing the potential of systemic failure based on natural forces, the parallel of modern urban centers becomes the intelligent preparation fo such events.


MASDAR CITY
EST: 2006 // POP: 50,000

Most recently, the promises of pragmatically utopian actualization in the Foster and Partners designed ***Masdar City*** in the UAE have captured the full essence of resource autonomy (at least when it comes to energy) with their proposal of a city plan that generates the entirety of their own energy locally, utilizing evolved technological processes:

"In the Masdar City project the power of science is used to control the environment and ecological problems following a line of thought similar to that popularized under Modernism: the domination of nature leading to freedom from natural calamities."[21]

Federico Cugurullo, "The Business of Utopia: Estidama and the Road to the Sustainable City," *Utopian Studies* 24 (2013): 76.

While the project is not anywhere close to finished in its total development, and the affectations of its completion can not be entirely speculated upon, there are many immediate reasons to keep from classifying the project as successfully autonomous in any regard.

First of all, the political structure in which it exists is autocratic, and thus the regime's willingness to apply standards of social sustainability in addition to environmental sustainability has been limited. The city's development has ignored the conditions of fair labor, social equity, and the promotion of health and happiness for all demographic sections, as well as changing the discourse it agreed upon in adhering to the One Planet Living scheme that has verified its environmental performance potential.[22]

Laurence Crot, "Planning for Sustainability in Non-democratic Polities: The Case of Masdar City," *Urban Studies* 50 (2013): 2816.

These social affectations doubtlessly derive from the model of combining economic and environmental priorities, though the balance of these primary goals has also been critiqued for being false:

"The study of the Masdar City project reveals a strong preponderance of economic objectives over those related to the environment."[23]

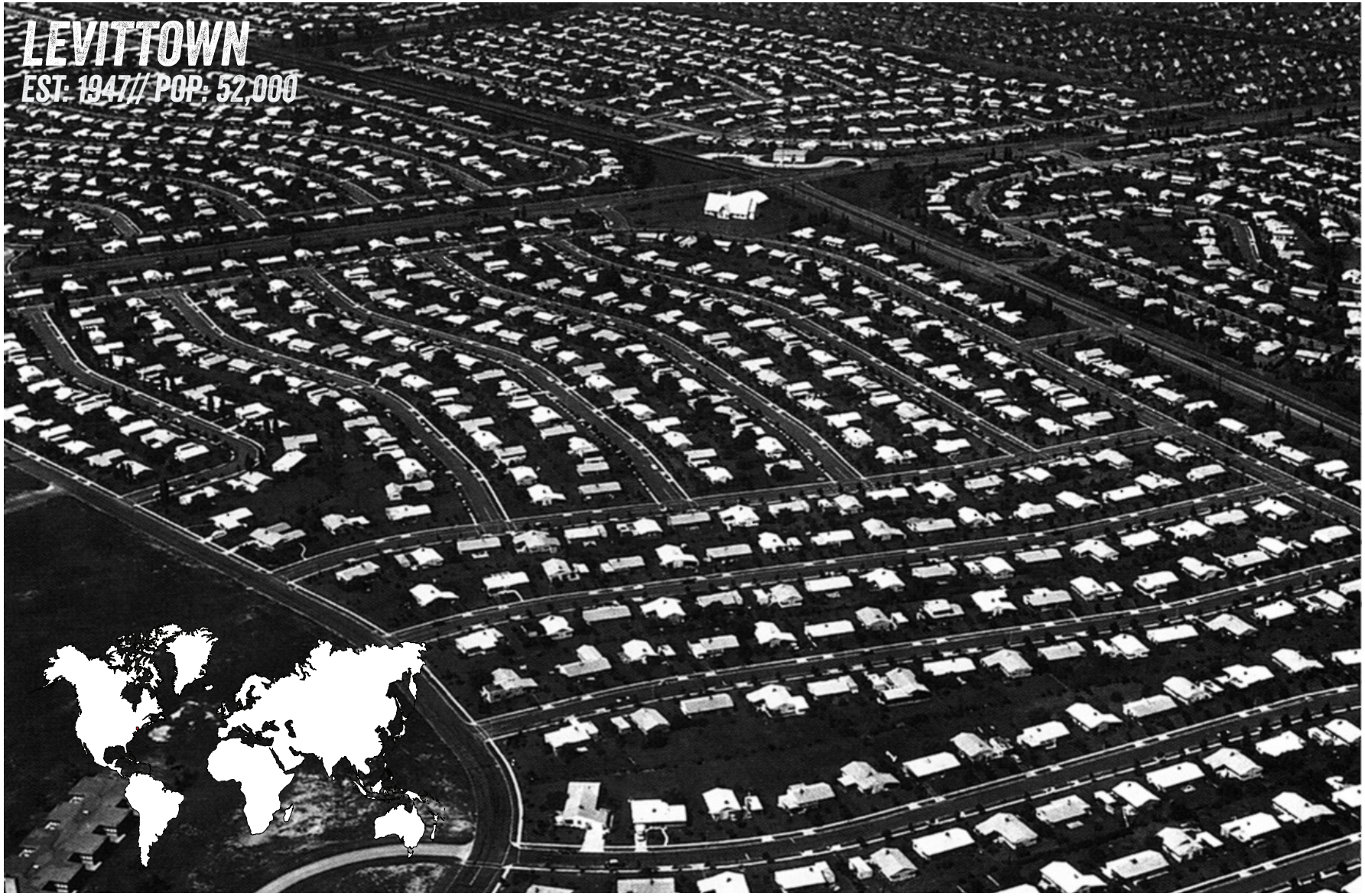
Cugurullo, "The Business of Utopia," 85.

Unfortunately, the second fundamental reason to question the autonomous nature of ***Masdar City*** is the ideological atrophy that also takes place in its ability to achieve environmental performance:

"Computer tests have shown that the construction of large solar panels would be less effective than anticipated due to local dust storms, with solar power output reduced by at least 40 per cent. A further disappointment is the abandonment of on-site energy generation, which had been expected to represent Masdar's only source of power. The city will now have to purchase nergy from off-site locations."[24]

Crot, "Planning for Sustainability in Non-democratic Polities," 2818.

The placement of ***Masdar City*** in context of autonomy, in all actuality, is similar to that of Archigram's *Walking City* in the way that the dialogue that Foster and Partners' design has started will be much more influential than the final product.


LEVITTOWN
EST. 1947// POP: 52,000

Far from autonomous in either consideration, Levittown is an interesting case study in the way it was marketed in the post-war era as individual parcels of autonomy. While suburban developments have not traditionally created sustainable resource lines, nor particularly admirable social equity models, they have promised the fundamentals of what was the twentieth-century 'american dream': personal autonomy through the vessel of a white picket fence and a back yard.

The individualism available of Levittown, specifically, is an odd outlier in the way it has achieved a particularly varied set of styles from the one homogenous context of identical units:

"the individuality that each family brought to Levittown continues to show through in many ways' namely, the paint on the house exterior, the maintenance and arrangements of grounds, the design of house alterations, the home interiors, and, of course, in such personal aspects of living as clothing, cooking, selection of friends, hobbies, political and social though, and the like."[25]

Harold L. Wattel, "Levittown: A Suburban Community," in *The Suburban Community*, ed. William M. Dobriner (New York: G. P. Putnam's Sons, 1958), 297.

While this individualism was available (or at least seen to be in 1958), the suburban form on large was an exclusionary force that was limited in the scope of sexes and demographics that it catered towards:

"Rather, it has been apparent that until recently susburbia gnerally has served as a support apparatus for the husband-father adn his career. At the same time the wife-mother frequently forwent meaningful employment, remaining home either bored or maybe stultified by day after day of unrelieved parenting."[26]

John Archer, *Architecture and Suburbia: From English Villa to American Dream House, 1690 - 2000* (Minneapolis: University of Minnesota Press, 2005), 260.

In the spatial severance between Levittown, as a prime suburban example, the opportunity for women to pursue non-traditional lifestyles was stimmied, and in such implicitly denied. In this same spatial distancing from the urban center, the class organization of the community is also kept with a specific range, as stated by Eric Larrabee at the beginning of Levittown's expansion:

"The community that Bill Levitt has fastened onto the Long Island soil is of the most class-stratifying sort possible."[27]

Eric Larrabee, "The Six Thousand Houses That Levitt Built," *Harper's Magazine* 197, no. 1180 (november 1948): 88.

This position on Levittown found it summarily "undemocratic" in its modes of class-stratification and innate denial of true individuality, which has continued to be a poignant critique on the general suburban concept, while the overall extradition of the middle class from the social processes and productive functions of the urban center can well be seen as the privileged removal of blame for urban ills that would soon need to be addressed at length in the coming decades.[28]

Archer, *Architecture and Suburbia,* 260.

Conclusively, Levittown , as a prototypical suburb, was failed a promise of autonomy.


LAS GAVIOTAS
EST: 1971// POP: 200

Housed in the Las Llanos region of Colombia, the Las Gaviotas ecovillage is the most operationally relevant example of autonomous development. Placed among the multiple narco-production sites that populate the area, as well as paramilitary and guerilla groups that inhabit the Llanos, the village of 200 inhabitants has remained apolitical in its organization in order to maintain its independence from the conflicts that have plagued Colombia since the La Violencia period of the late 1940s and early 1950s.

The terraformation process inherent in the agricultural and derivative production processes that support Las Gaviotas through research intensive technology and systems knowledge exports. The technical data that describes the complete Gaviotas campus is, of course, not as important as the concept of the ecovillage itself:

"'Is the idea to build a city here?' she asked Alonso Gutierrez. [He said] 'Cities don't work. The idea is to build something that does.'"

Alan Weisman, *Gaviotas: A Village to Reinvent the World* (Chelsea Green Publishing Company, 1998), 94.

The social aspect of the ecovillage is complex, and although the justification for limiting the population size and each members specialization, the model cannot be considered globally applicable if the model is only capable of supporting 200 members at a time - especially if those members are also required to hold advanced knowledge sets or other specific skills. The inclusion of the unskilled worker, and the entrance level vocation is of the utmost importance in the sustainable care of a fully evolved social structure.

The ecovillage has lasted for the past 32 years, and the impressive nature of its successes are widely lauded for the lengths in convincing the global population of the ability to live with the means of a specific area range. That said, the population limitations as well as the under-developed social structure define Gaviotas as an extremely endearing and extremely isolated experiment that might not have direct implications in the needs of new city organizations.

Previous arguments aside, the prospect of autonomous communities that work within the government of the region that they are in, yet still hold organizational control of their operations is a great hope for the actualization of fully connected networks of autonomous communities throughout the world on both regional and global scales.

The liberatory effects of Las Gaviotas' self-sufficiency is evidenced in their ability to educate and provide social necessities without the intervention of state authorities. This liberation is the primary end-goal of any autnomous community, and the evaluation of their execution can find its measurement only within the degree of social and resource liberation that it achieves.

Precedent Summation

Sifting through the individual situations in which partial communal autonomy has been enacted, there arises several lessons from the successes and failures of the examples given. Each of the conclusions is broad and can be approached in several different ways, but the fundamental of each is imperative. In no specific order of importance they can be examined as the following.

Non-Rigidity

The systemically autonomous center must refrain from rigidity. The fall of the utopian scheme is that it is both resolved and rigid, as can be seen in Le Corbusier's *City of Tomorrow*. The rigidity, if imposed, causes a great deal of hierarchical structure in which the rigidity can be used for processes of control, implicit and explicit. In the designation of where working class housing, upperclass housing, and middle class housing the *City of Tomorrow* allows for class distinctions and subsequent insulated cultures to be denominated, as is true in any organization that so cleanly divides the population which it involves.

In another context, the rigidity of culture in autonomous centers is classically the fall into either totalitarian control, as is quite often given to the organization of the Stalinist government of the Soviet Union and other centralized forms of comprehensive government. In the example of the Branch Davidians in Waco, Texas, the rigidity of their culture, and their unwillingness to involve themselves in the cultural and municipal processes of the country in which they lived caused a violent friction with an opposing federal rigidity, causing the death of 76 men, women, and children.

Multiple Center Growth

Following the lessons learned from communities such as The Farm and the Hutterite colonies, the number of members in a population that can be supported locally is limited. The social structure of these examples are limited by the processes they employ, but the recognition of efficient use of production and conumption within a locality is important.

The Hutterites specifically do not grow beyond 175 members, with each colony hovering around 150 members on average. These numbers are not arbitrary, but based on the efficient support of each colony within the limits of the production that can be maintained on site. The passing of the predetermined member range results in the splitting of the colony so that multiple centers can grow to their extents, and although this is not a process that can be so strictly enforced on the urban scale, there are applications of the same logic available.

Building urban centers so that there are radii of productive and consumptive processes maintains an efficient organization of multiple centers ranging in size, fundamental in avoiding current urban conditions that involve non-access to food, energy, viable water, or community processes. The intelligent development of these centers also leads to sustainable models of urban growth that depend on the addition of radii, rather than the endless reach of unsupported sprawl.

Urban Complexity

While many of the more successul examples of autonomous communities are tribal, rural, and intimate in their structure it is important to maintain the focus on density, diversity, and the urban. The insularity and homogeneity that arises in these smaller and isolated cultures is not advantageous, as well as avoiding the efficiency of the productive density of an urban environment.

Richard Sennett speaks on this point, explaining the drive of revolutionaries such as Franz Fanon to seak refuge from the urban environments that still the flames of revolution in the minds of those that would incite them, but refuting the claim as curbing the social diversity that is necessary for progressive communities.

On a social level the disorder and diversity of the city is needed in maintaining greater acceptance and generating tolerance. On an efficiency level the density of the urban environment allows for the greatest level of people possible to draw from locally produced or transmitted resources.

It is also essential to support urban complexity because the insular quality of limiting system autonomous urban centers into the same type of communities as Gaviotas, Hutterite colonies, or the Welwyn Garden City plan would undeniably cause the same limitation of those viably useful in such communities. In Gaviotas the extreme necessary knowledges of those that live there is a bar that few in any setting can meet, and not allowing general access to sustainable conditions on a large scale is quite unthinkable.

Gaviotas and the Hutterite colonies have been successfully insular because of the experimental nature of Gaviotas and the cultural insularity of the Hutterite culture, but the implementation of systemically autonomous urban centers can not bend to these same situations.

Welwyn Garden City gives another warning to which the urban environment is no stranger. The suburban repurposing of the garden city plan shows the strong draw of communities of limited sizes to solidify along social lines, and this can still be seen in the reorganization of urban sectors through the mid-century event of ‘white flight’ and currently through the process of gentrification.

Urban complexity is needed, and so must be both allowed and supported.

Productive-Consumptive Locality

Specifically from Archigram's *Walking City* it is clear that conceptual resource autonomy is not indicative of social liberation or lack of oppression. The division of productive centers which walk over the earth to provide for centers of consumption shows a stark division of those privileged enough to live within structures that hold power over areas that can be explained in no other way that subservient. While not intentional of this situation, the scheme has still be critiqued as fascist in execution, and finding disagreement with that critique is not wholly possible.

A more realized and modern example is one that the suburban project, such as that taken by Levittown, shows that the severance between centers of production and consumption results in heightened productive demand to cover the consumption that is inherent in transportation and the inefficiency of transmission.

Consumption is lowered when production is localized, and the effects of production are potentially related to heightened local employment opportunities, as well as the development of more productive cultural connections. Of course, the result of this productive-consumptive locality is not one of exclusivity, because there are no specific barriers on the importation or exportation of commodities or culture. Especially with the use of the internet there is no limit on the access of one community to the intellectual or cultural production of the other, but localized resource and commodity production would limit the expense and transportation of total consumption, a condition which currently defines more than a dominant portion of urban centers.

Technological Non-Reliance

Specifically in response to the failures of Masdar City in its exaction of technological mechanisms to support the consumptive needs of its community, it must be seen that over-reliance on technological systems is not healthy for urban environments. The future or imminent failure of such systems put entire populations at risk, especially when their expected returns fall as flat as those of Masdar City, and the time, energy, and maintenance demands of such technological mechanisms cannot be the exclusive basis of efficient use within the city.

Of course, the involvement of technological mechanism such as wind-energy generators, solar panels, and vertical farming techniques should not be admonished or avoided, because these systems have extreme potential in balancing the adverse effects of human settlements and can, in concert with ecologically and environmentally minded techniques of process, provide the execution of truly sufficient urban centers.

Though these technological mechanisms can not be of primary consideration for the operations of the city, examples such as Mesa Verde prove that the cooperative of

human settlements and the environment in which they exist is possible with careful consideration and response. The purposing of materials appropriate to the climate and topography of the urban landscape is imperative to not requiring drastic forms of infrastructure that deal with the inadequacies of the built environment.

Proactively thinking about reacting naturally to urban conditions usually dealt with artificially has led to many possible ideas for dealing with the heat island effect that arises from heavily impermeable surfaces that retain the heat from the sun, as well as dealing with the vast amounts of contaminated water that needs to be transported from these artificial surfaces. Working with environmental and climatic conditions is not a novel process, and has been extraordinarily necessary for urban survival in the history of human settlements, yet we've abandoned these practices. They must be returned to.

• • •

These basic summations from the partial precedent conditions provide a general framework in how to begin to react to urban organizations of productive and consumptive processes, as well as condition the design of urban space in a way that is as constructive as possible.

That said, there give no specific solutions or fail-proof advisories because each condition needs to be reacted to individually and distinctly within the environment it exists within. Social, political, environmental, and cultural processes are not to be assumed nor underestimated in the effects that they have on the urban structure.

Moving into the explanation of current conditions in the generic urban environment it is essential to remember the qualities of the examples given, as well as the examples that constantly surround us. Much of the current urban project is progressive, but much of it is also returning to tactics formerly rendered obsolete by the infatuation of populations with the industrialized, the modern, and the novel. The forward movement of urban design is on a trajectory of ethics, having been discarded while on the path to self-service, and it is important to remember all that is owed to the populations that live within urban areas and to the environment they are placed within.

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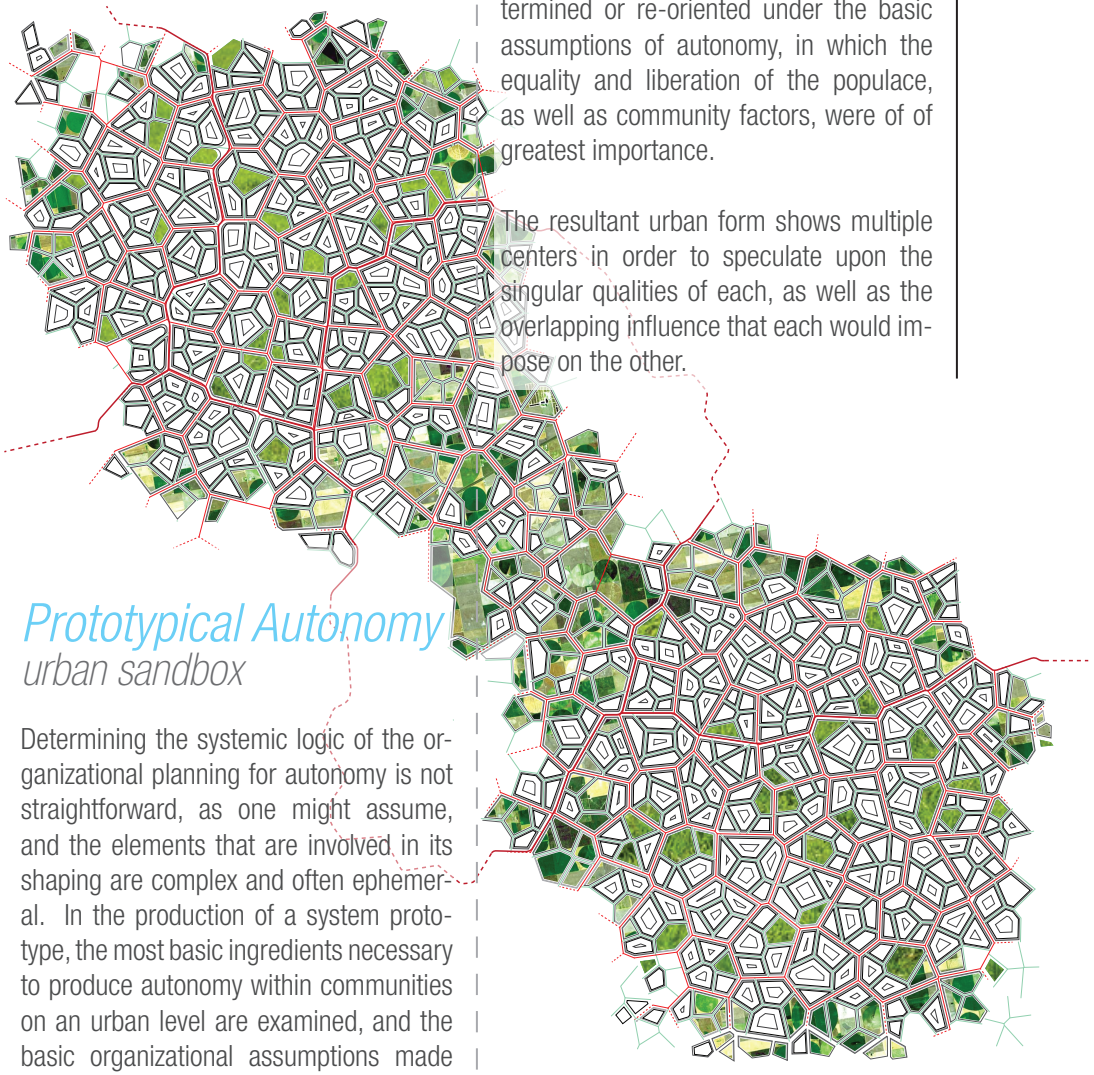


Prototypical Autonomy
urban sandbox

Determining the systemic logic of the organizational planning for autonomy is not straightforward, as one might assume, and the elements that are involved in its shaping are complex and often ephemeral. In the production of a system prototype, the most basic ingredients necessary to produce autonomy within communities on an urban level are examined, and the basic organizational assumptions made in routine organizational procedure are re-examined.

In this portion of the investigation, the expectant result was the necessary gradient of population density, building height, program location, and production location. Each element under investigation was determined or re-oriented under the basic assumptions of autonomy, in which the equality and liberation of the populace, as well as community factors, were of of greatest importance.

The resultant urban form shows multiple centers in order to speculate upon the singular qualities of each, as well as the overlapping influence that each would impose on the other.

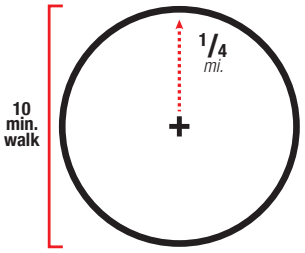


Figure P.01: Traditional model with quarter-mile radius.

Autonomy Parameters

The most fundamental organizational problem to solve in examining the prototypical autonomous city is size. The radius that determines the general developmental extents of the community has great effect on the operative tactics of transportation, as well as building density, population size, and program segregation.

The radius of development extents does not necessary define a strict border, but it does influence the type and density of the built environment so as to not allow the sprawl nature of the suburbs or the exclusionary nature of prioritized centers within urban environments. The autonomous center, in this view, would need to be walkable, so as to not disenfranchise those without the privilege of the automobile in pursuing the opportunities available in their locality.

Traditionally, the model for walkable neighborhoods has been, as can be seen in Figure P.01, limited to a quarter-mile radius in which the time to walk the full diameter would take only 10 minutes. This distance provides an easy distance for citizens to walk to the businesses and residences in the locality, but the assumption that 10 minutes is the longest amount of time that a person should walk before the use of an automobile is validated is quite erroneous at this point. Recognizing the success of high density urban centers in providing populations that walk longer distances to locations than in locales, the development of a quarter-mile walking radius is perhaps too small for the comprehensive development required for community autonomy.

The traditional system is unfulfilling for two broad reasons: lack of program consideration, and lack of density consideration. The quarter-mile system only seems to apply itself to residential developments and residential neighborhoods, which removes the relevance of the radial distance from the inclusion of alternate programs to housing, which does not meet the needs of the autonomous development.

The second element that the quarter-mile model left out is the presence of alternating or uniform densities. The radius does not involve itself with the subsequent levels of the built environment within it.

In fully developing the correct radial limitation of the autonomous community, both of these unfulfilled sections need be involved, and when applying them the resultant radial qualities both get larger and begin to segregate regions of building height and density, as is seen in Figure P.02 and Figure P.03.

The radius of the autonomous center can be easily manipulated between the values of the quarter-mile and half-mile,

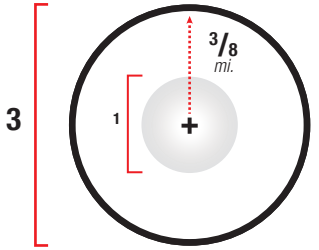


Figure P.02: Widened radii allow for the heightened inclusion of differenct programmatic and productive systems, while the density sectors allow for gradients of higher densities for the programmatic inclusions that require centralized organization.

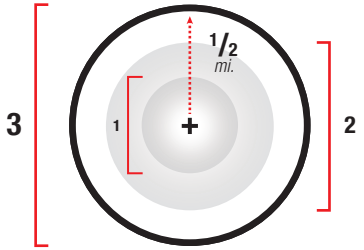
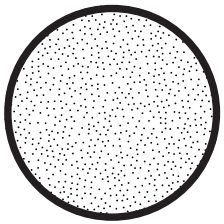
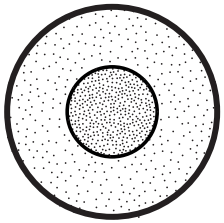


Figure P.03: Multiple density differentiations allows for a more prototypical organizational inclusions of infinite variations within a singular centers.

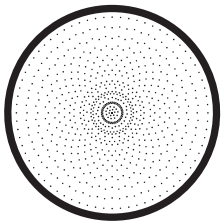
Figure P.04: The three primary density relationship types, as shown here, are homogenous density, distinct heterogenous density, and relative heterogenous density. Each has its relative location to the built environment, and each has different levels of validity for inclusion in the autonomous community.



homogenous density



distinct heterogenous density



relative heterogenous density

and although the latter is a doubling of the former, both the distance and time taken for travel are manageable, if not completely expected in many urban situations throughout the world. Any constesting of the validity of the half-mile radius is primarily because of the tension it causes in societies socially and spatially organized around the automobile, which have developed the illusion of complete dependence on motor-vehicles for personal transportation, and the loudest voices of dissent always seemingly spring from those who exclusively enjoy the luxuries of such a system, rather than those who are disenfranchised through it.

In beginning to respond to the question of density within these radii, the three options of density relationships among the entire community become apparent: homogenous density, distinct heterogenous density, and relative heterogenous density (Figure P.04).

Homogenous density supplies an equal distribution of building program and height, and as such has positive qualities in supporting the communities that it in applied in, though in contradiction to these qualities there is an increased distance among the community support programs and a heightened distance among the neighborhoods and sub-dependent communities, however representative these neighborhoods might be within themselves. Homogenous density can be either high or low in the amount of building levels that it implements, though the most similar example at hand for homogenous density would be that of the suburbs or exurbs, in which the distribution is that of low density that allows each member of those communities to have an increased amount of land to devote to personal yards or mild amounts of personal agricultural production. In this way, whether high or low in nature, homogenous density is extremely restrictive of the system overall, and authoritarian in the imposition of limited possibilites of programmatic or organizational variation.

Distinct heterogenous density avoids some of the pit-falls of homogenous density in the way that it supports districts in which there might be a higher density of specific programs that require collaborative inclusion with other programs or even higher sizes of in-transit populations to support its use. Unfortunately, this is coupled with an integrated edge condition between the two differing sections of alternate densities, which is most often resolved by the application of arterial roadway or another severance operation that distinctly divides the two sides into socially and spatially separate community spaces. The undercurrent of this operation is the creation of differing values among the density spaces, subsequently creating imbalance that will drive the population types that can afford to live in specific locations. This absolute shift can be seen in Figure P.06 in the way that the implied building height limiations react to the ob-

Figure P.05: Homogenous density proves to be both limiting and strict in its execution across the system, whether the density is categorically high or low. Below is a populated radius of low density - low height buildings similar to the example of the suburb or exurb community.

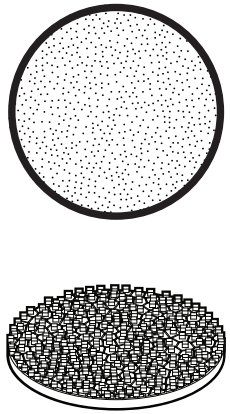


Figure P.06: Distinct heterogenous densities creates severe edges that provide segregatory qualities within the commmunities they separate.

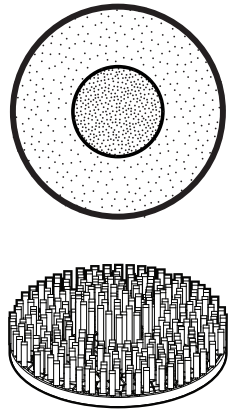
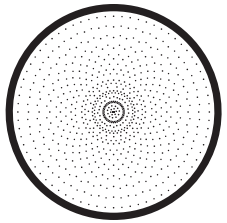


Figure P.07: Relative heterogenous density create the different sections of density necessary for the location of specific program types, while also fluidly treating the edge condition between the sectors of specific density type.



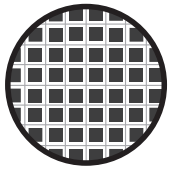
vious shift in alllowed density within the radius programmed into the model.
The third density relationship type is that of relative heterogenous density, and to its namesake it allows the differentiation of section or neighborhood densities and building heights, similar to that of distinct heterogenous density, but through a method that does not inspire severe edge conditions between the sections. Allowing different densities and building hieghts is necessary for the inclusion of a comprehensive programmatic and social index, and allows for the implement and re-orientation of multiple sizes of development for whatever use is needed.

Fluid transitions from different types of densities allows the freedoms and niceties of categorically different sections of the city, while also allowing the sections to be connected to easily and unalienatingly without strictly defined edge conditions, as seen in the density transition represented in Figure P.07.

Programmatic location is another element that is of importance in examining the affectations of autonomous centers. Within the given quarter-mile system, there is an assumption that all necessary amenities are reachable within the distances available, though this is an assumption that proves false in any except the most situations. The orientation of the comprehensive grid, in its innate divisibility, implies the projection of transit arteries and other hierarchical model of paths of import versus paths of non-import. As seen in the breakdown of the grid into represented programmatic roles in Figure P.08, this grid aggregation into super-grid imposition creates perimeters of valued space in which retail and offices and services are located because of their exposure to the consumer who must use the transit arteries that are developed along them. This orientation of valued space along a super-grid perimeter implies, and directly manipulates the value of space in proportion to the proximity of that space to the already valued perimeter space. During this operative valuation the prices of housing types are stratified and this process creates certain gradients of implied high-income versus low-income sectors on a micro-level within the perimeter of a unit of the super-grid.

Also to take into consideration is the fact that the segregation of programmatic spaces creates an unresolved tension between the instances that abut across the division edge between two or more programmatic division lines. The valuation, both economically as well as socially, of these adjacencies is highly affected by the claimed pure logic of zoning segregation within the comprehensive grid system. The logic of gird hierarchy instinctually divides and categorizes, which has helped organize the development of many American cities due to its ease of implementation, but has also had extreme social and efficiency negative affectations. The re-distribution of programs within the grid,

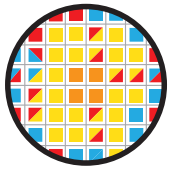
Figure P.08: The quarter-mile radius of the comprehensive grid with programmatic distribution its usual method of distribution, showing blue as office spaces, red as consumer spaces, orange as educational space, and marigold as residential. The reorientation and location of the programmatic components of the grid achieves more logical results in respect to designing in repsonse to community walking distances.



comprehensive grid

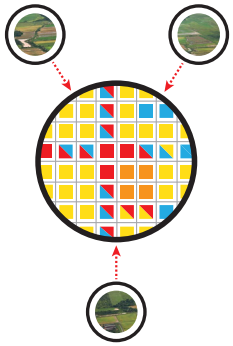
programmatic orientation

quarter-mile example
Lincoln, NE

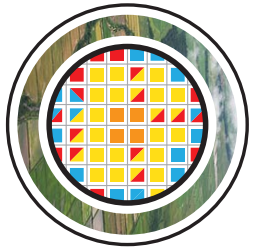


programmatic re-orientation

Figure P.09: Agricultural production, in being naturally spatial, requires the consideration of its local orientation to the community that it supports. Utilizing novel techniques of agricultural yield, the space required for production can be severely minimized to the point where local and constant production is achievable.



normative conditions of importation



local production orientation

overlooking the grid identities tension with full distribution, shows the way in which communities might reorient the valuation of the spaces that are distance achievable within the radius of a quarter-mile by the internalizing of necessary community components, such as educational facilities, community centers, local-oriented businesses, etc., as shown in the terminus of Figure P.08.

After re-orienting the progammatic inclusions of the walking fallshed, the spatial integration of agricultural production must be considered. Much of the different generation and management sites in respect to water, waste, and energy can be either located ubiquitously or require specific siting based on the natural formation of the resource being considered, though though the location of agricultural land is often sited based only on the available total area in which to produce. This amount of production area can, in relation to the population it will support, be sited locally, especially considering the new techniques of greenhouse hydroponics and aeroponics that have now proven to be quite applicable.

Whereas the routine operation of agricultural production relies on the importation of produced yield, the new locality of production calls to question what the relation of agricultural land would be to the community it supports (Figure P.09). Based on the amount of land needed (.17 acres minimum to support a single person on average), the required land area can be located on the periphery of the communal radii, though again the division between agricultural land use and alternate uses needs to be considered as fluidly as possible.

Another aspect of the programmatic organization that is positive for autonomous communities is the heightened engagement of mixed use developments. Although mixed use of buildings is not a novel idea by far, its application has not been completely resolved, and routinely the term is used to describe projects that minimally adjust to respond to multiple programs in any positive way (Figure P.10).

In discussing the use of mixed use programming within multiple levels of density, a logic must be set up for programmatic inclusion responding to building height. As seen in Figure P.11, the mid-level city (buidling heights rarely exceeding 12 stories) can be broken into three primary levels of development: low density (1-3 stories), medium density (3-6 stories), and elevated density (6+ stories). In addition to these levels, the mono-programmatic agricultural space is included as an example of productive development that dmeands a larger amount of space and may not be combined with multiple other programs unless said programs repsond contributively to the productive value of the agriculture.

Figure P.10: Standard examples of mixed use apply the rote definition of combined programmatic spaces, but lose the intent of the exercise. Below the Larson Building of Lincoln, NE serves as an example of this - mixed use in this condition refers to the combined restaurants and apartments to the primary focus of the buidling - six levels of parking.

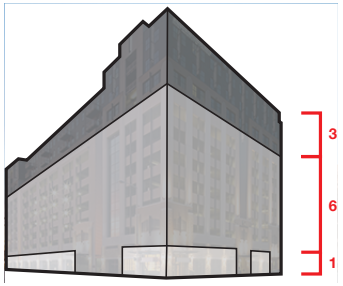


Figure P.11: (*next page*) Density and Building Height sectors will be desinged with a logic that provides ranges of heights and programmatic mixed use standards.

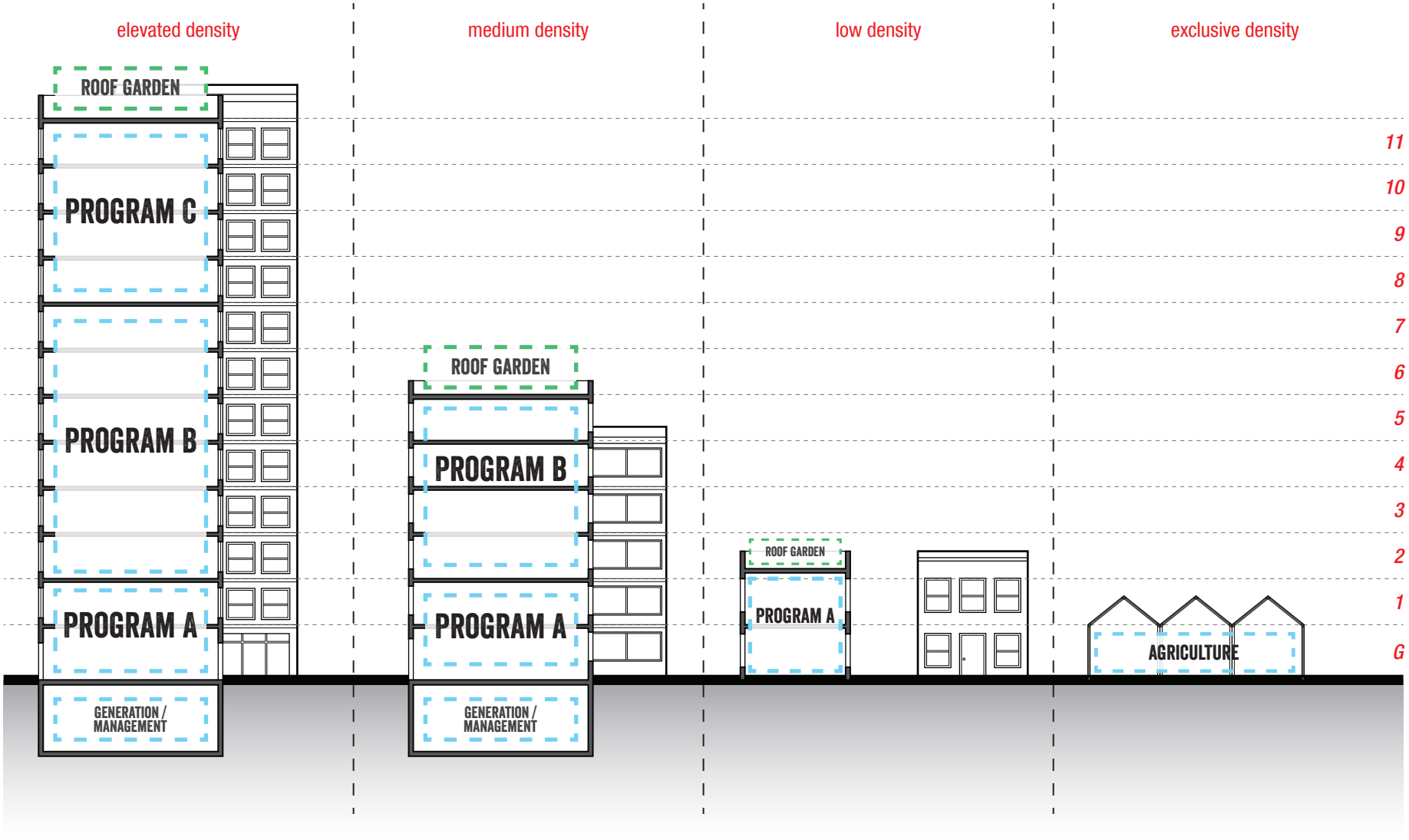
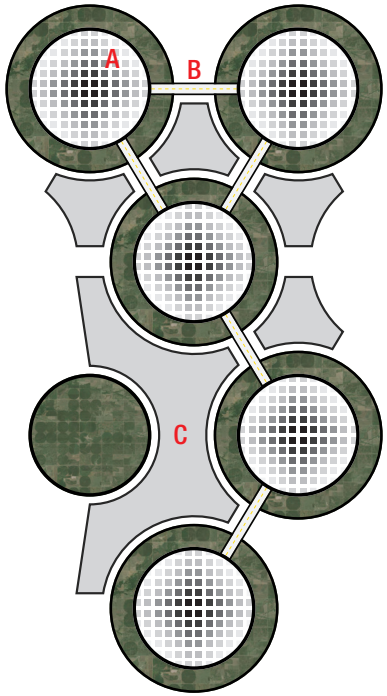

elevated density
medium density
low density
exclusive density
ROOF GARDEN
PROGRAM C
PROGRAM B
PROGRAM A
GENERATION / MANAGEMENT
ROOF GARDEN
PROGRAM B
PROGRAM A
GENERATION / MANAGEMENT
ROOF GARDEN
PROGRAM A
AGRICULTURE
11
10
9
8
7
6
5
4
3
2
1
G

Figure P.12: Network organization among the multiple community inclusions provides specific opportunities for replacing specific nodes with unitary uses, and also begins to divulge the elements needed to be resolved in respect to their interactions among eachother: (A) nodal instances, (B) connective devices, and (C) interstitial area.



network aggregate

Beyond the unitary consideration of singular communities, the network connection of multiple community radii in their self and system roles must also be evaluated. Rather than the scalar operation of multiplying the population basis, once the necessary density of each center is decided the expansion of the network is the growth operation that must be followed.

The connection between community centers is paramount in its ability to allow free and unobstructed immigration among the nodal locations within the network, separating the connotation of autonomy with imposed and strict independence from its network exaction, as was exposed during the examination of autonomy in its previous section.

The network breakdown, as can be diagrammatically examined in Figure P.12, identifies the contributive elements required to be resolved in the exaction of any network organization as the nodal instance (communal centers), the transit connections among these nodal instances, and the interstitial area that is created between multiple nodal instances.
The edge condition among these elements yet again must be much more fluid than the separation of the elements at hand, and thus a gradient of each fading into eachother is the primary goal of any resultant resolution.

Another consideration of the network aggregate of multiple nodes is the recognition of unique instances within any given node. A clear example would be the development of a large scale health care center that could service all of the adjacent nodal instances, and as such define its communal role in relation to the network as health-oriented.

The full autonomy of the nodal instances within the network is not completely achievable, nor is it necessarily desired. The unique identities and roles of each instance are what define the communities that they hold within, and as long as they are not exclusionary in the construction of their operational role, and does not create sustained dependence on that role for every scale of the operation it primarily provides, the differentiation of operative specialty is not destructive in the pursuit of balanced communal autonomy within the network.

Following the development of included consumption and production levels examined in Figure A.05 and A.06 the differential of these specific roles or qualities of unique types within the ubiquitous network of autonomous nodes can be examined through Figure P.13 in which each section is balanced between included consumptive and productive forces, yet the size and operation of specific nodes can be manipulated to act as centers for consolidated use.

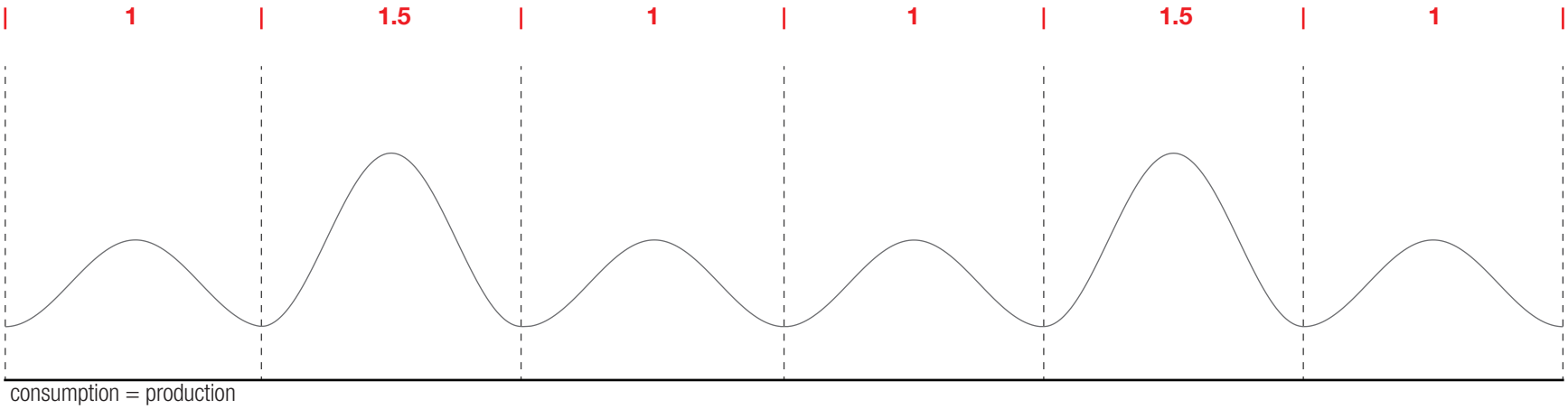
Again, each node that would enclose such extended uses would represent the consolidation of the larger needed amenities of its operational type, but each node

Figure P.13: Operational hubs at relative centers of nodal aggregates in which hubs might service multiple adjacencies with larger operational roles within given fields, while each nodal instance would still provide the basic necessary operational inclusions of any given use.

would house the necessary qualities of the same operations at their own scale. For example, if an augmented node is used an operational hub for health care and as such houses a larger hospital facility, each node would still include health care related operations, such as general practitioner clinics, dentist offices, optometrists, etc. This same logic can be applied for the instances of operational hubs considering transportation, governance, et al.

The intent of providing autonomy on the urban or community level is to provide the liberation of self-sufficiency and the advantages that autonomy provides, but also considers the extents to which autonomy is advantageous or achievable. The consolidation of larger uses into operational hubs would be required at certain scales, and superfluous at others, but it is a condition that must be recognized and planned for, regardless of its pure application of autonomous logic to the network.

Finally, the most basic element of organization must be examined. The formation of grid types has a dramatic effect on the social ability of the community that inhabits it, as well as the level of interaction available among the members of a given community with another. The rigid grid, in respect ot the development of positive walkability and social interaction has proven extremely negative, and the extent to which it is found neglectful of important



social cultivation is more and more often written about. In this investigation, though, what is of interest in the examination of grid types is the way in which they influence the autonomy of the community. The types of organizational structures chosen were: comprehensive grid, super-imposed grid, and decomposed tessellation.

The comprehensive grid achieves a good deal of democratic equality in its exaction, yet has its down fall in market valuation, as discussed earlier in speaking to the validity of segrated program locations. Additionally, the ease of pedestrian understanding leads to a lack of experiential bonding with unique markings of the city. The small amount of variation allows for an infinitely organizable urban structure, but the picture is always painted with the same colors. Overall, while the grid is democratized, it has been proven to be democratic in many of the disadvantages as well - institutional prejudices that have become more implicit than explicit and have grown complexly ingrained in the operations that provide validation to grid.

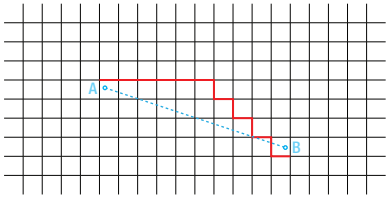
Next, the super-imposed grid, as is commonly seen in the jeffersonian grid mile length measurements that provide space enough for entire suburban subdivisions, falls much into the same hole as the comprehensive grid. The inside of each of the super grid cells is complex, non-linear, and organically woven in order to provide lower automobile speeds to disincentivize the use of the internal streets and passageways from one side of the cell to the other. This creates a transit system that is always brought to the super grid level for any sort of trip to an external location if its not directly adjacent. The flattening of transit arteries to the hierarchical level of the super grid leads to the decomposition of the culture within any of the grids because the location of necessary amenities is located at this transit level and a higher level of reliance on the automobile is required to achieve the distances from residence to amenity with any ease.

Subsequently, the super-imposed grid, while supporting a heightened ease of walking within the cell in which one exists, provides again the sever edge conditions of the transit arteries that exclude any prominent pedestrian presence. Even within the traditional super grid the large land areas of each property drive down the interaction occurences among neighbors, and thus the utilization of the then superior ability of internal pedestrian circulation is often left unused.

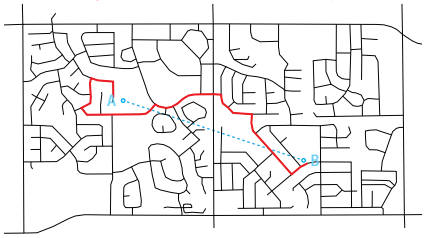
Finally, decomposed tessellation patterns, often characterized by voronoi tessellation is examined due to its characteristic opposition the identity of the grid - infinite variation. Keeping instance blocks of a similar size to the previous two examples, the decomposed tessellation pattern proves to superior in the pursuit of autonomous planning for a couple of different reasons. First, the path distances from one point to another within the organizational model have dramatically lower differntials between the straight line and the path used,

Figure P.14: shortest path grid type comparison, showing the efficient path distances from the start point of a mile long straight distance cutting through the organizational logic. Of the grid types shown, they are vertically as follows from top to bottom: comprehensive grid, suburban super grid, decomposed tesselation

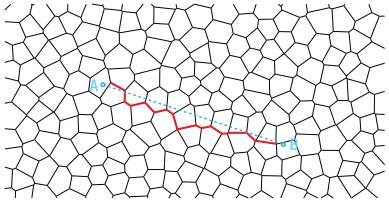
AB : 7,420 ft *+2,140 ft*



AB : 10,044 ft *+4,763 ft*



AB : 5,718 ft *+438 ft*



whereas both previous situations betray large differentials that begin to affect the potential of pedestrian users within their systems (Figure P.14).

Next, similar to the super-imposed grid, except containing more potential in its exaction, the decomposed tessellation allows for scales of community inclusion, in which singular blocks can build self-identies, but the ability to travel among mini-communities is unhindered by the transit scale of the organizational model. In this way as well, the infinite variation of paths through the cityscape provides a deeper experiential connection to the city by the citizen, though this reason is not factored in with equal importance in the evaluation of the network aggregate.

Third, the decomposed tessellation repsonds to the natural topography of any given locations much more intimately than the euclidean force of the pure grid geometries. This is self-evident, so exposition upon it is seemingly unneeded.

Finally, and hopefully most irrelevantly, the infinite variation of the decomposed tessellation disallows the facile conquest of the area due to necessary local knowledges and tighter streets. Whereas Hausmann might have organized the boulevards in Paris in order to squash any future potential of rebellion in the city by widening the streets to a size that an army might march through, the return to equalized and variegated block organizations can be seen as a return to allowing a level of self-order that is not under threat of disintegration by the state that controls it.

Far more relevant, but equally as political as the last, is the note that without primary imposed transit passageways there are additional benefits to the heightened time efficiency and lessened congestion that it provides. The use of the boulevards and other forms of primary transit through urban centers has traditionally been for the different incarnations of the ceremonial triumph, in which power displays are marched through the streets. While not on the same scale as the Roman triumphs of returning emperors, there are elements of these political motivations on both local and national scales. The very presence of the Interstate system is the evidence of immediate military infiltration of any area across the United States given the need.

Whereas the grid is democratic, the variation of the decomposed tessellation pattern is simultaneously uniqe and ubiquitous in its application. These characteristics also provide a solid basis for its choice as a organizational model in which to investigate the logic of the autonomous city or community. There are no implicit standards against which fundamental rules might react - in a system of infinite variance, the rules that can be derived to govern it can be used to govern any system it would like.

Abstract Resolution

Processing the autonomous parameters exposed in the previous section leads to the complex aggregation of a systemic logic in which radial distances determine the extents of development growth for each nodal instance in the autonmous urban network, though the density within these radii can only be determined by the urban aspects desired in the final form of the urban array.

The datascape of these abstract values can be seen in Figure P.15, in which the underlying logic and the subsequent affectations can be seen on a conceptual level. The index of possible process inclusions, derived from the list of complex relationships arrived at in Figure A.07, are distributed based on the volumes allowable, which are controlled based on the proximity to each perimeter centroid and the population size desired for each of the radii.

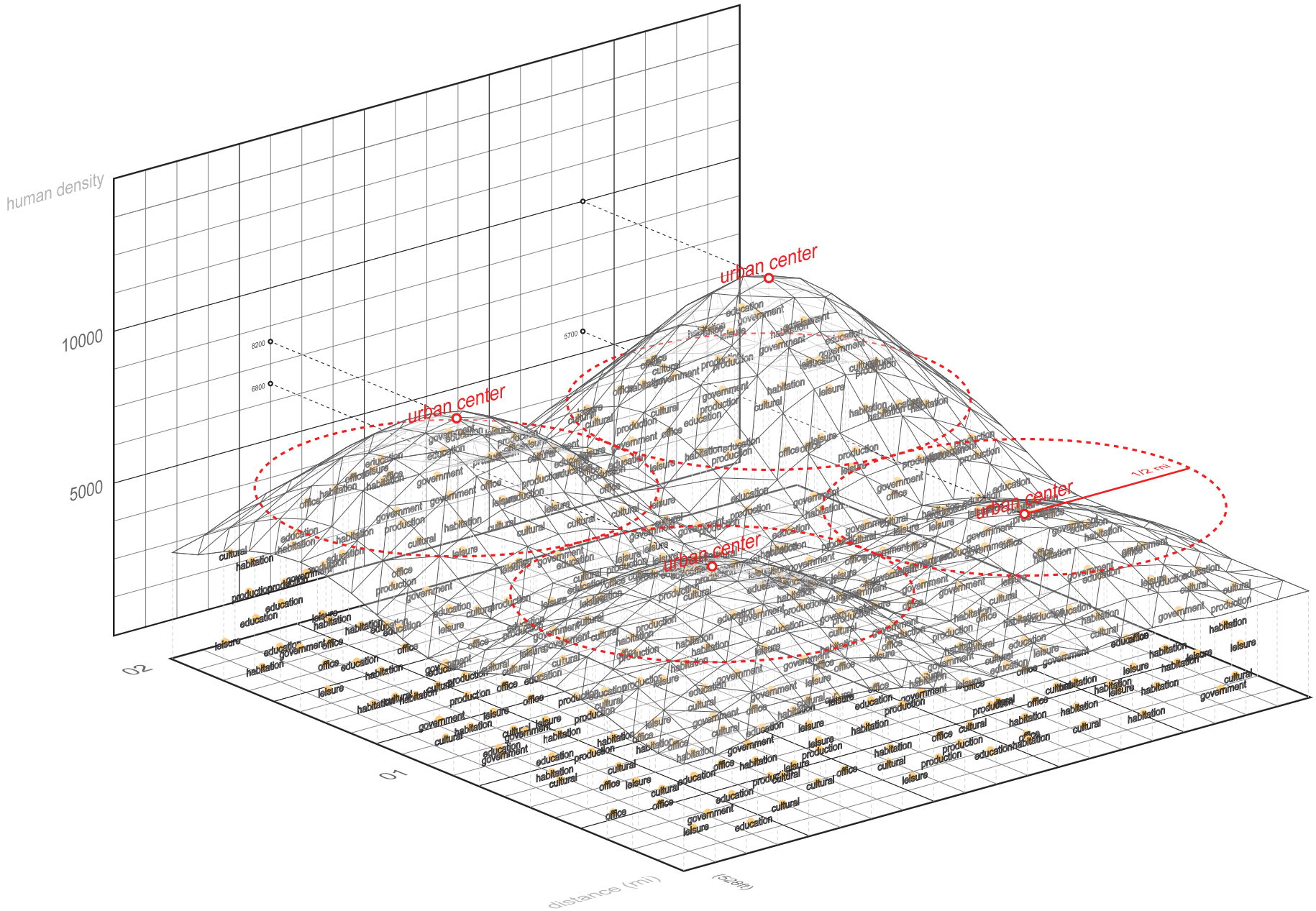
The underlying spatial organization used for distances is still the comprehensive gird, but the placement of processes is not limited to the values that fall within the lines of the grid, allowing there to be a generative nature to the process aggregation rather than strict logics for placements. This generative method escapes the extreme disadvantages of employing strict criterion for process placement, which undoubtedly fail because of their rigid application of factors that are complex and unpredictable.

The flexible surface shows the fluid manipulation of densities reaching their apex at each urban center point. The non-uniform application of density relationships is prioritized so as to not strictly define the edge conditions among the multiple radii within the point network.

The radius distance was chosen to be a half-mile because of the extent to which it capably encloses the required process instances with the support of a substantial population size, although the population of each center varies from approximately 5,000 to 10,000 within the areas of 21,896,00 ft^2 given.

The values and process placements of this abstract resolution can viably be applied to a multiplicity of grid types through the interpolation of the current points and the structure of the desired grid. Variety of application at this point was intended, though the decisions required to actualize the abstractions visualized in Figure P.15 imply certain speculative outcomes, some of which are not as innately autonomous as others. The application of the system in a more realized situation follows in the next section.

Figure P.15: (adjacent) Abstract resolution of the systemic qualities of the organizational parameters included in pursuit of autonomous cultures in a multi-nodal distributed urban network. The system here has been placed within the confines of a regular square grid that represents distances of miles, while also compared to the population sizes of the communities included within each center.


human density
10000
5000
8200
6800
5700
urban center
urban center
urban center
urban center
1/2 mi
02
01
distance (mi)
(scale)

Applied Autonomy

Figure P.16: The decomposed Tessellation grid with its two appied levels creating block aggregates.

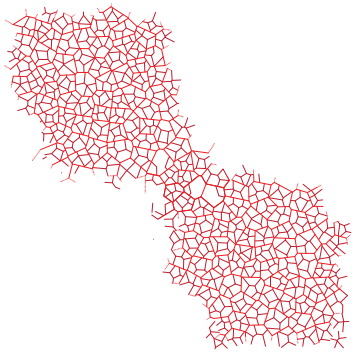
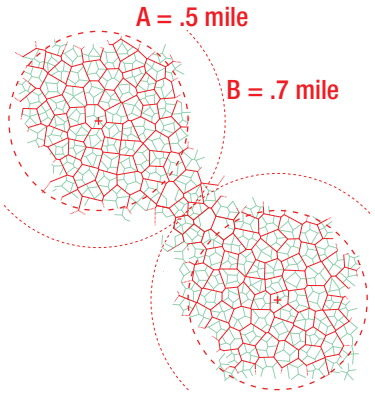


Figure P.17: The prime radii (**A**) and the comprehensive radii (**B**).



This section will show the application of the system elements into a prototypical situation. The beginning assumptions are of the most basic level. The grid type chosen for application is the decomposed tessellation for reasons explained in the section covering the *Autonomy Parameters*.

The decomposed tessellation organization has two ingrained levels that act as cell blocks with communal internal pathways, as seen in Figure P.16. The radius chosen was, as described on the previous spread, a half-mile, yet the radii of the urban centers are coupled with comprehensive radii that describe the total distance that envelopes both the radius space of development and the interstitial space that is not involved in the prime radii (Figure P.17).

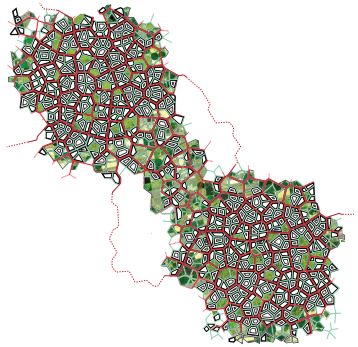
Two centers were chosen for actualization so as to both separate them visually from the underlying organizational 1-mile grid and allow them to be accessed as individual centers as well as understand the relation between them.

The block sizes are given a range of arm lengths in which each internal unit is limited to 120 - 300 feet, which allows a positive variation of block sizes, with the average aggregate block being 500 feet along its primary edges. The block size was determined by limiting each aggregate to five internal blocks, and limiting the size of each aggregate based on the average extents of the comprehensive grid systems in order to maintain both positive amounts of square footage in building areas for development, as well as keeping the size of each internal blocks small enough to visually and socially exhibit processes of locality.

Beyond the the transit corridors among the aggregate blocks there is a slight imposed hierarchical level of streets in which there are slightly identified primary streets (Figure P.18), aggregate streets, and internal streets, which have been visualized in the Appendix (Figure ap.01).

The width of the streets, as well as their subtle differentiation are carefully calculated for a number of reasons. First, the prioritization of arterial streets creates valuation of specific areas within communities, as has been stated in previous sections. Second, the priority streets that were once assumed to aleviate congestion and provide quick ways to travel through dense urban areas have proven to be less efficient than the methods that they replaced. The system of smaller streets keeps the vehicle speeds lower and distributes the street usage due to the multiple pathways that can be used to access any location. As with the information provided in Figure P.14, the paths allowable change the street distance from location

Figure P.18: Hierarchical thoroughfares, though not differentiated from aggregate level streets by that much, provide more fluid avenues for transit from one center to another.



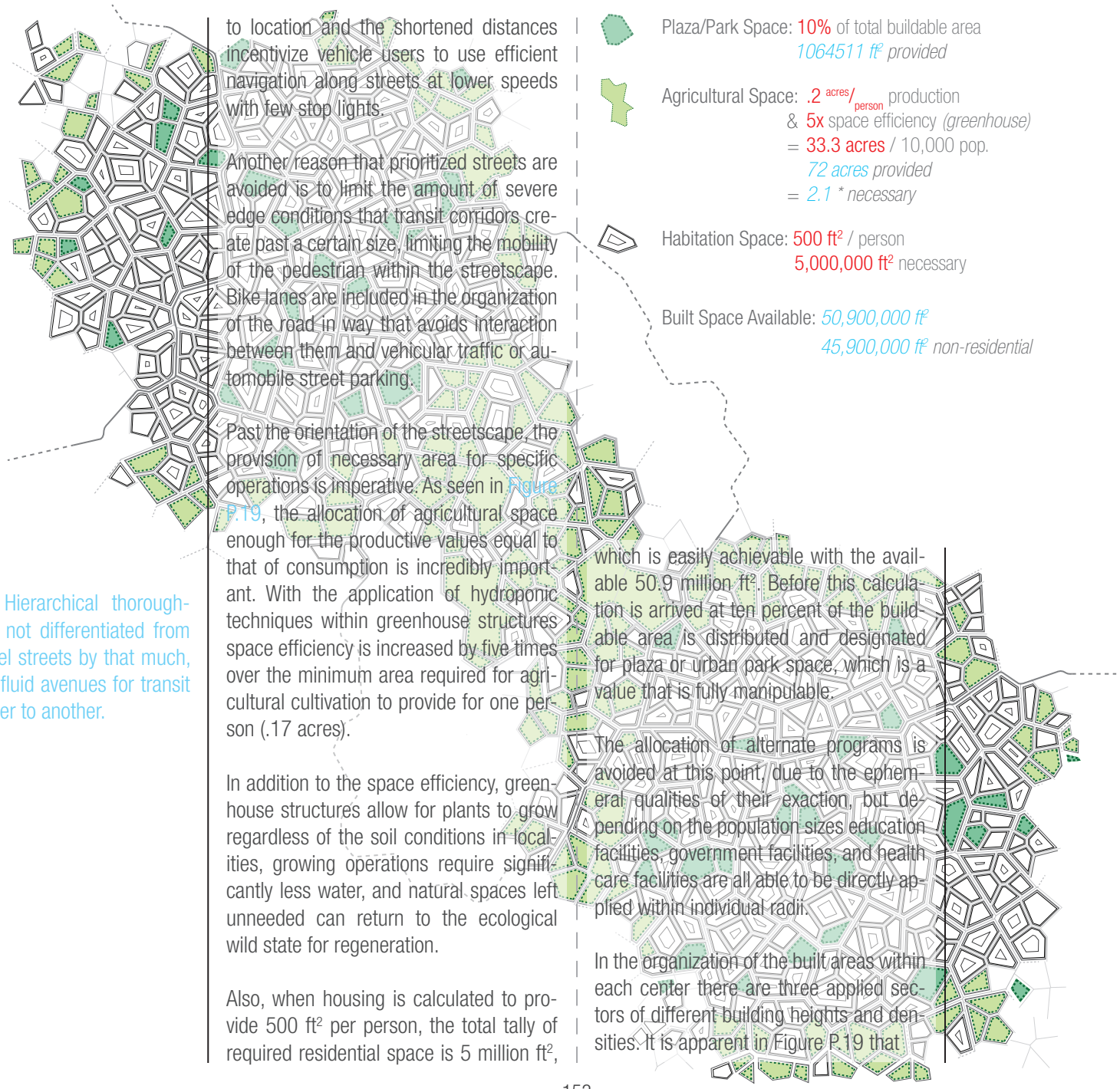


Figure P.19: Hierarchical thoroughfares, though not differentiated from aggregate level streets by that much, provide more fluid avenues for transit from one center to another.

to location and the shortened distances incentivize vehicle users to use efficient navigation along streets at lower speeds with few stop lights.

Another reason that prioritized streets are avoided is to limit the amount of severe edge conditions that transit corridors create past a certain size, limiting the mobility of the pedestrian within the streetscape. Bike lanes are included in the organization of the road in way that avoids interaction between them and vehicular traffic or automobile street parking.

Past the orientation of the streetscape, the provision of necessary area for specific operations is imperative. As seen in Figure P.19, the allocation of agricultural space enough for the productive values equal to that of consumption is incredibly important. With the application of hydroponic techniques within greenhouse structures space efficiency is increased by five times over the minimum area required for agricultural cultivation to provide for one person (.17 acres).

In addition to the space efficiency, greenhouse structures allow for plants to grow regardless of the soil conditions in localities, growing operations require significantly less water, and natural spaces left unneeded can return to the ecological wild state for regeneration.

Also, when housing is calculated to provide 500 ft² per person, the total tally of required residential space is 5 million ft², which is easily achievable with the available 50.9 million ft². Before this calculation is arrived at ten percent of the buildable area is distributed and designated for plaza or urban park space, which is a value that is fully manipulable.

The allocation of alternate programs is avoided at this point, due to the ephemeral qualities of their exaction, but depending on the population sizes education facilities, government facilities, and health care facilities are all able to be directly applied within individual radii.

In the organization of the built areas within each center there are three applied sectors of different building heights and densities. It is apparent in Figure P.19 that

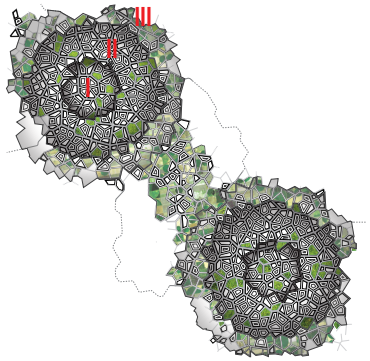
Plaza/Park Space: 10% of total buildable area
1064511 ft² provided

Agricultural Space: .2 $^{acres}/_{person}$ production
& 5x space efficiency *(greenhouse)*
= 33.3 acres / 10,000 pop.
72 acres provided
= *2.1 * necessary*

Habitation Space: 500 ft² / person
5,000,000 ft² necessary

Built Space Available: *50,900,000 ft²*
45,900,000 ft² non-residential

Figure P.20: The differentiated sectors within each center determine the building height ranges available to sites contained within each: (**I**) 5 - 9 stories, (**II**) 3 - 5 stories, (**III**) 1 - 3 stories. Each sector also determines the amount of combined mixed use programs contained within each building, with the minimum of 3 program types enclosed in sector **I** buildings, 2 program types in sector **II**, and a single program type in sector **III**.



the overlapping region contained in the comprehensive radii, but not in the prime radii, that the land is heavily used for agricultural purposes, but within each prime radius the sectors designate the differential of both building height, but also mixed program inclusion. Figure P.20 and Figure P.21 shows the three concentric sectors, each of which contain specific ranges of building heights in descending order from the inner sector.

The building height gradient allows the ability for the differentiation of environment, but does so in a way that avoids the pitfall of prioritizing specific areas for exclusive use. The monumental nature of downtown is eased into a recurrent sense where density is constantly being manipulated, rather than being relegated to specific places where density is heightened but flat-lines in its expansion outside of those areas.

Cutting a cross-section of this transition, as is done in Figure P.21, there can begin to be seen a flow from the higher density of the center nodes to the low-rise of the external rings of each radius. Still, there is a comfortable transition through each stage, not resulting in distinctly separate spaces within the distance of the half mile. In the decomposed tesselation scheme, the architectural reaction of programs and plots is implied by their location within the radius, yet not determined by it in an authoritative way. The breaking up of the basic offsets and court dispersal can be done easily, creating unique spaces for each architectural work, though prioritizing the multiple scales at which the urban area can be seen. Figure P.25 (pg. 155)shows the operation of basic design in reaction to breaking the block forms that are found in Figure P.21. The proliferation of uses due to the scale of each rings parameters allows for easy localization of agricultural and energy generation spaces, and also the larger low-rise complexes that are required for supportive use in those situations.

The difference between the radius in total and the block structures, as well as the architectural works themselves can be done simultaneously. Each building recognizes its context in the city as well as in the block. Localized and interconnected community is essential in the autonomous identity of the urban form. This intent is also met on the level of transportation networks, namely the street-scapes.

There are three levels of street sizing, each transitioning to larger travel sheds, and each extending throughout the urban radii. The subtle transition between each is to allow the level of ease in public movement which does not institute or imply hard barriers which limit the access or movement of residents.

In the sectional quality of Figure P.21, one can also see the presence of public space in a manner that establishes a redundancy of locations for urban populations to meet, rather than exclusively locating these types of spaces against controlled institu-

Figure P.21: (adjacent) The cross-sectional sliver of the system provides a more in depth look at the building height transitions in their gradient form, along with a closer inspection of the street constructions. The building forms at this point are still abstract and based on few principles, such as the 60 foot offset to provide 30 foot distances from the median of the building for sunlighting conditions. A more refined example of the architectural identity of the gradient from center to periphery can be found in Figure P.25.

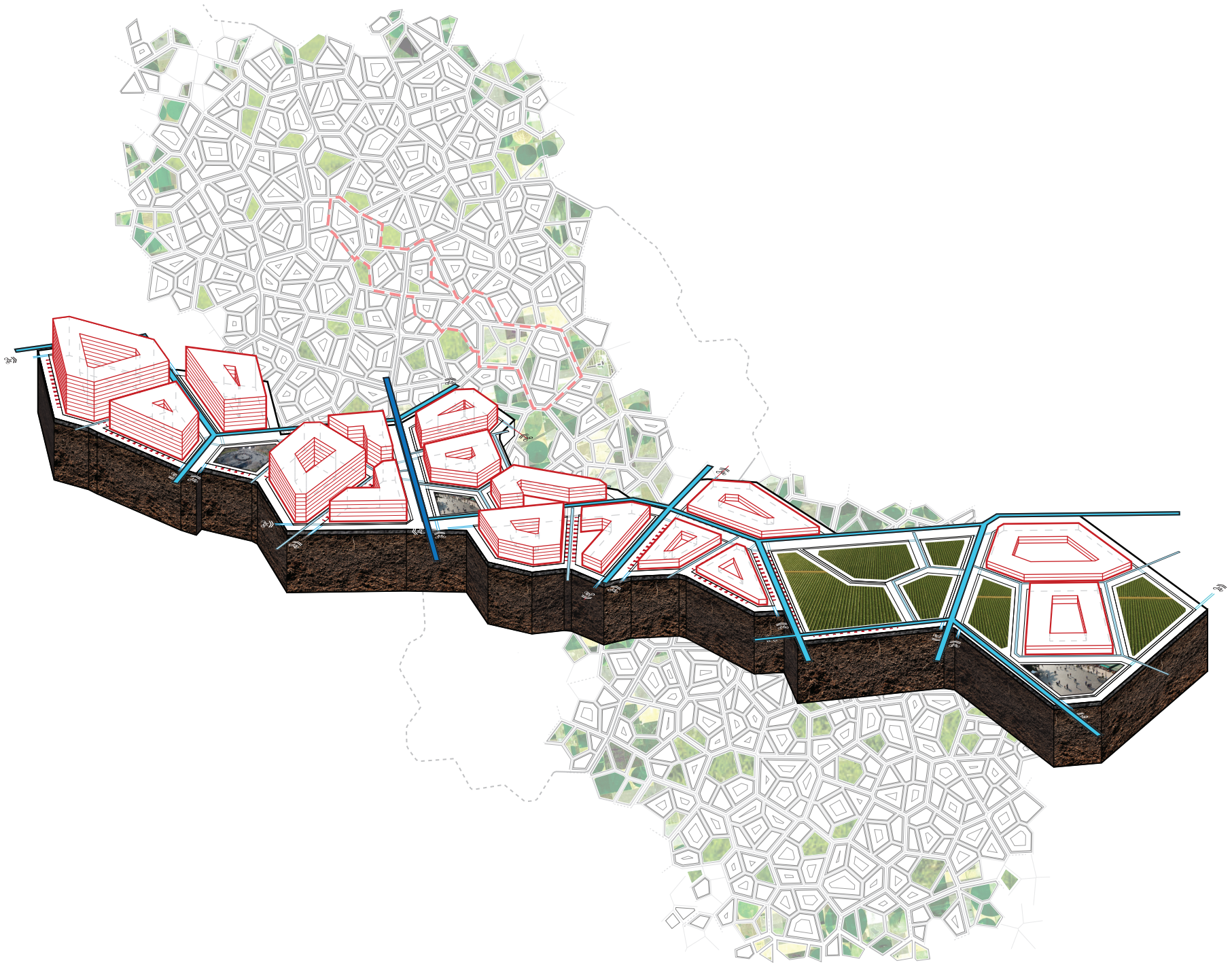


Figure P.22: The gradient sector quality of building heights, and agricultural production and plaza/park space placement, can be most clearly seen in this perspective, in which both centers are visible, with their connective relation also present.

tional programs. The redundancy of public space is incredibly important, making sure that there are not exclusive connections being made between where public action is allowed to take place and where it can be controlled environmentally.

In the perspective view of Figure P.22 the full gradient of the two radii can be seen, and in the same way as the cross-section of Figure P.21, the transition between center and exterior is noted, but not dominant in its character. The density of the centers is noticeable, yet there is still a littering of public spaces and parks based on the basic code set out in the organization of the city. Also, in the deceleration that takes place on the outer rings of the radii, there is the ability to perform combinations of the spaces, as can be seen in the overlap of the two radii.

The system for determining basic building height is also not linear, but is based on specific ranges, so that there is not a determined uniformity or cohesion that is forced on the urban form. Cohesion, often sought after, is not possible for any sustainable length of time in urban areas, and so the determination of broad form must be avoided, and the allowance of anomaly, connection, and unique identities must be considered important.

Beyond just the basic form of the built enviornment in the urban plan, there is also

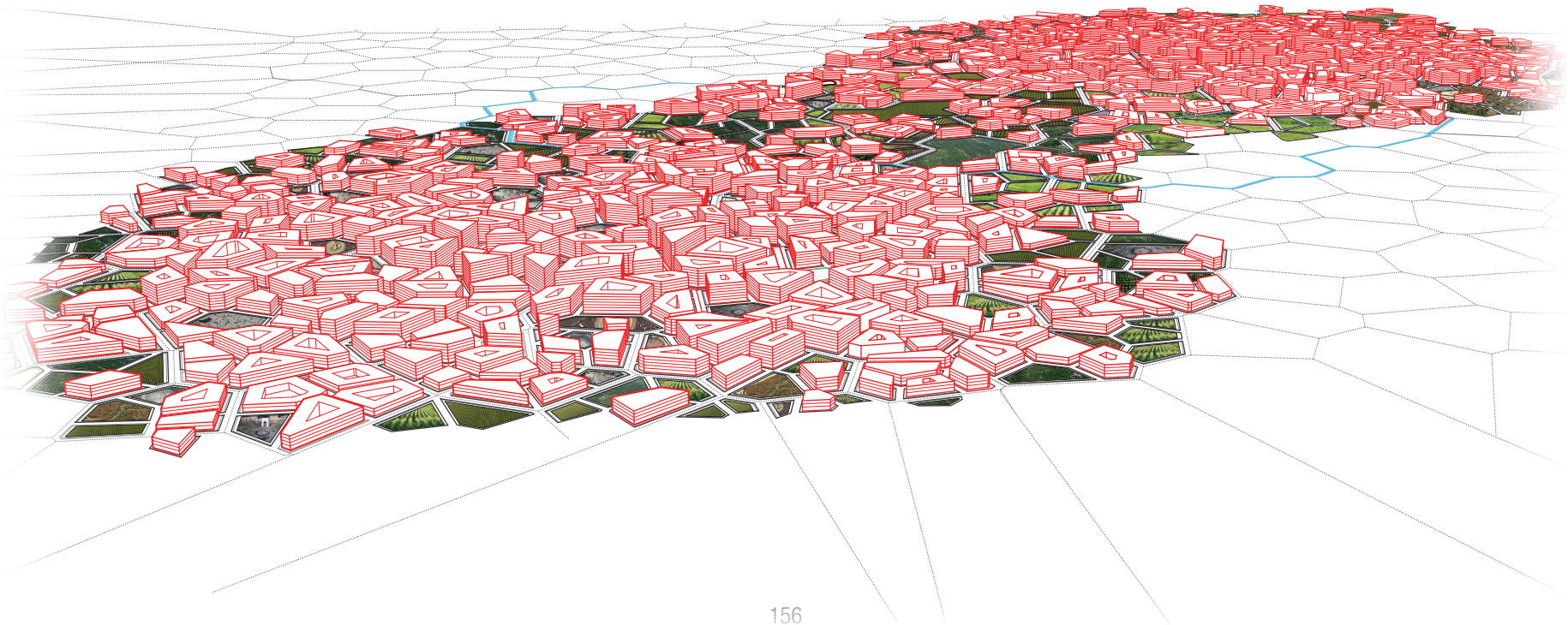


Figure P.23: The three types of program are shown here in blue, marigold, and lavender. Lavender marks personal space, which could be residential, studio space, or any type of reflective space. Marigold marks productive space, which could be seen as generation, office space, or any program that if restricted from public occupation and produces outside of itself. Blue marks consumptive space, which would restaurants, theatres, coffee houses, grocery stores, or any other program which is made available for the public to consume.

a determination of particular programmatic locations, in recognizing how programs like retail, residential, and office work within specific building heights. Instead of dealing with such specific terms, the urban plan utilizes ambiguity within which program is differentiated on the terms on whether it is personal, productive, or consumptive, as can be seen visualized in Figure P.23.

The specific placement of program cannot be completely determined, as the failure of functional zoning has showed, though there can at least be a flexible schematic which can be referenced. In the truly autonomous city, the placement of program becoming more nuanced and important than in the capitalist system, which evaluates the fiscal advantage of land, rather than its functional value. Thus, the placement of program must be thoroughly thought out before its installment, which flies in the face of modern practice. The question of program is much more ethical than it has been treaten.

The final aspect in which the city acts is in concern to growth patterns. The expansion of the decomposed tesselation is of specific interest, especially considering that much of the patterning is not developed until growth is solidly taking place. The growth of autonomous cities is of utmost importance, considering that the expansion of systems is one of the rea-

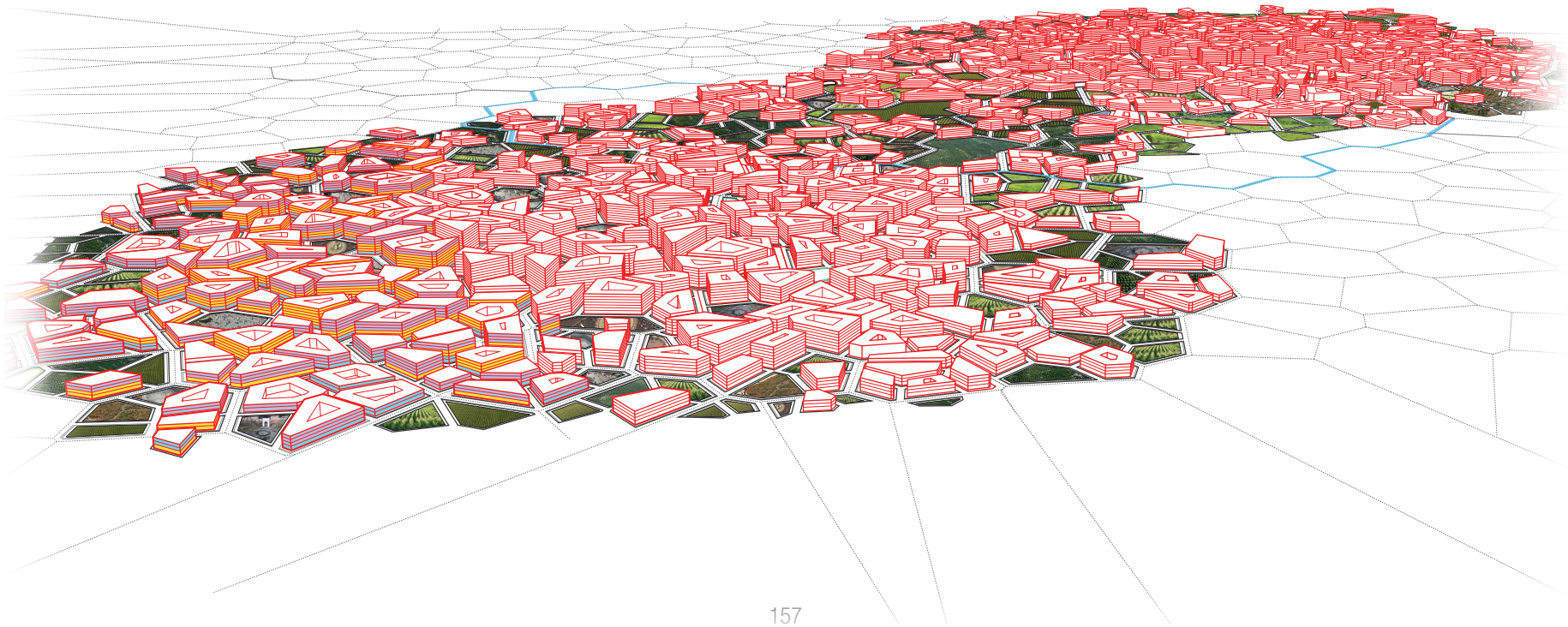
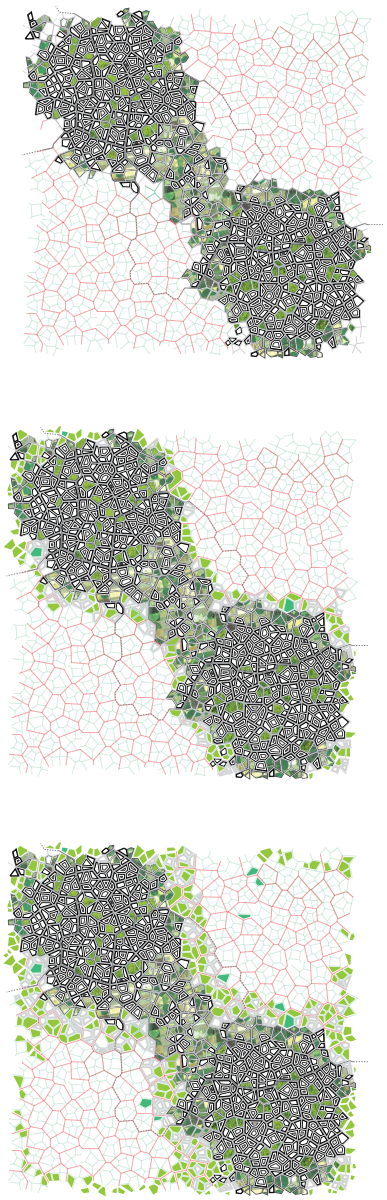


Figure P.24.1: The potential for decomposed tessellation extention and urban growth through 6 steps: steps 1-3 shown below.



sons for failure in the generic modern city. In responding to the necessary levels of redundancy, production, and consumption in the city organization, growth is considered in both a vision of completion and in transition.

In Figure P.24, the series of steps towards complete growth are shown. The autonomous city must grow in a way that incrementally provides the proportionate levels of built environment and the supportive programs that allow it to exist. Growth cannot be supported from a centralized model - the failure of 20th century cities show this.

The complete growth of the city can be met eventually, but the process through which it fills in must be seen in its execution far before that of the completed model. The decomoposed tesselation works well in the sense of giving an idea of infill without projecting in the usual method of urban development. Especially in concert with the building height limitations, the steps of growth must be more coordinated, accepting that the broad redevelopment of specific aggregate plots through the usual capitalist means is no longer a viable route for urban design.

The abstract resolution of the autonomous urban center is not intended to be a strict doctrine of urban design, but a set of flexible fundamentals which lead to better designed and more equal cities. The development of urban areas is very important, considering the amount of the world population that has been transitioning into urban life. The continued practice of outdated techniques or modernist methods must be stopped and replaced with better functioning standards.

These methods of developing heightened autonomy in urban centers can be applied in completely basic or more nuanced ways, and the extent to which we gain the knowledge of how to apply them will intimately depend on how quickly we are willing to transition to their use.

Figure P.24.2: The potential for decomposed tessellation extention and urban growth through 6 steps: steps 4-6 shown below.

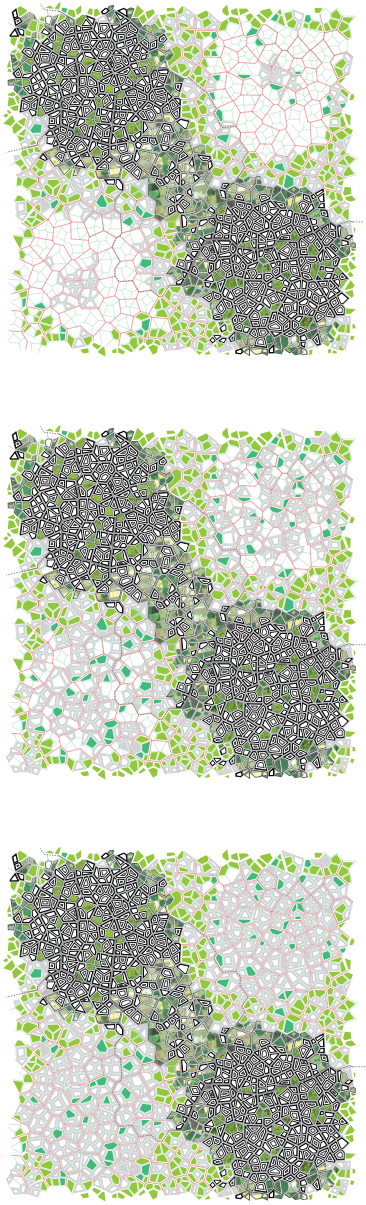
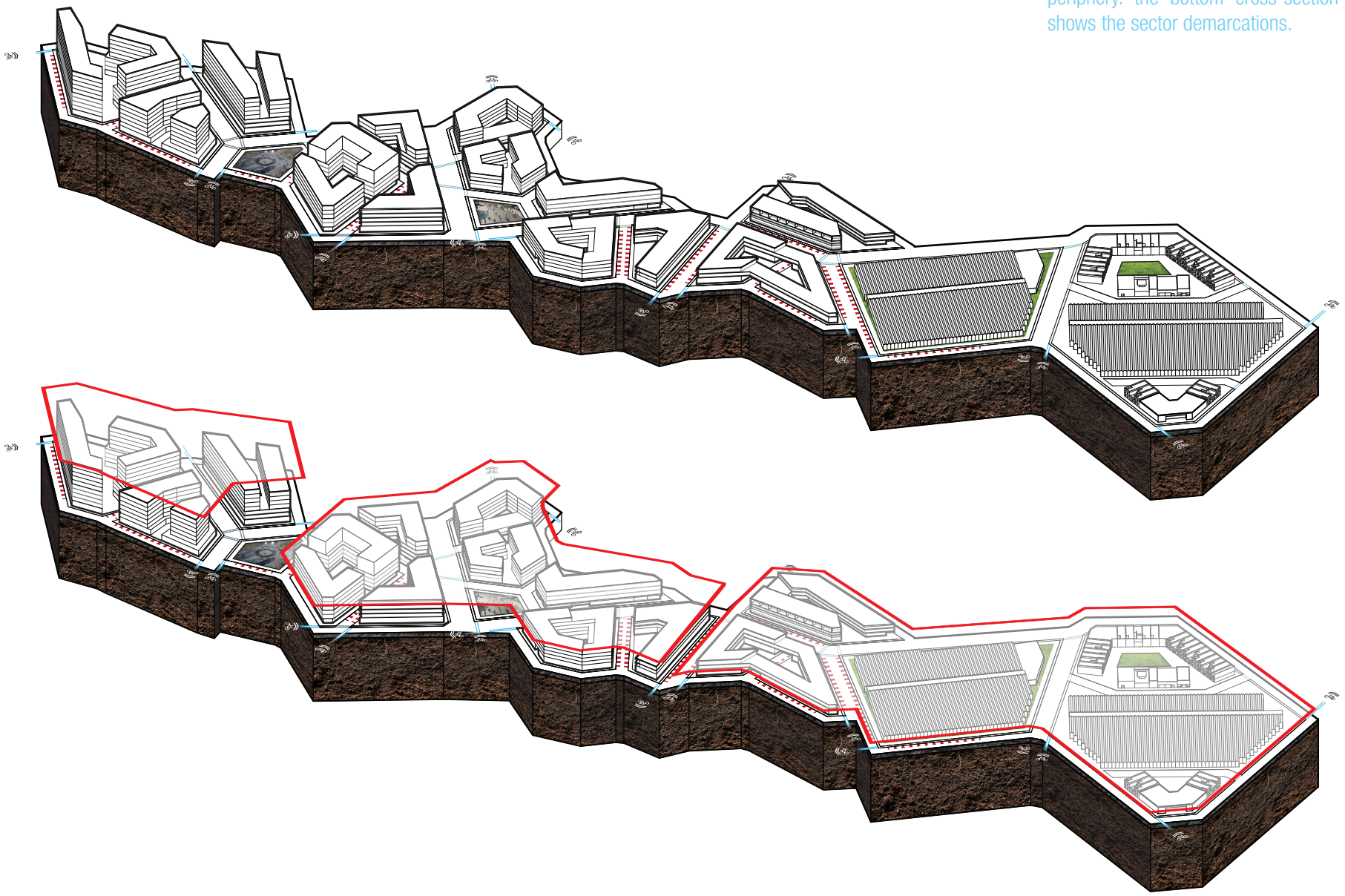


Figure P.25: A more finely resolved cross-section shows the possible architectural identities of the building gradients from the inner sector to the periphery. the bottom cross-section shows the sector demarcations.



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